BASIC MIKROTIK & CISCO SWITCHING

BY MD. NURUZZAMAN MIA ID: 163-15-8303

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

Supervised By

GAZI ZAHIRUL ISLAM

Assistant Professor Department of Computer Science and Engineering Daffodil International University



DAFFODIL INTERNATIONAL UNIVERSITY DHAKA, BANGLADESH SEPTEMBER 2019

APPROVAL

This internship titled "**Basic MikroTik & Cisco Switching**" submitted by Md. Nuruzzaman Mia, ID No: 163-15-8303 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as reasonable for the partial achievement of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its technique and contents. The presentation has been held on 12 September 2019.

BOARD OF EXAMINERS

Dr. Syed Akhter Hossain Professor and Head Department of Computer Science and Engineering Faculty of Science & Information Technology Daffodil International University

albro

Internal Examiner

Chairman

Abdus Sattar Assistant Professor Department of Computer Science and Engineering Faculty of Science & Information Technology Daffodil International University

Shah Md. Tanvir Siddiquee Assistant Professor Department of Computer Science and Engineering Faculty of Science & Information Technology Daffodil International University

Dr. Dewan Md. Farid Associate Professor Department of Computer Science and Engineering United International University **Internal Examiner**

External Examiner

DECLARTION

I hereby announce that, this internship report is organized by me Md. Nuruzzaman Mia, ID No: 163-15-8303 to the department of Computer Science and Engineering, Daffodil International University. I also announce that internship report nor any part of this internship report has been submitted in another place for award of any degree or Diploma. I also announce that, collect information form Daffodil online limited (DOL), Data center and internet Service Provider (ISP) Based Company, Books and Internet.

Supervised by:

Mr. Gazi Zahirul Islam Assistant Professor Department of CSE Daffodil International University

Co-supervised by:

Mr. Md. Tarek Habib Assistant Professor Department of CSE Daffodil International University

Submitted by:



Md. Nuruzzaman Mia ID: 163-15-8303 Department of CSE Daffodil International University

ACKNOWLEDGEMENT

I am thankful to Sabbir Ahamed, General Manager of Daffodil Online Limited. I am thankful to Mr. Mohammad Abul Basher, (System, Network & Training) of Daffodil Online Limited. Without their continuous support I can't continue my internship in the company. Other members of the company helped me exceptionally for doing my internship.

I fell really thankful and wish my major my responsibility Supervisor **Mr. Gazi Zahirul Islam, Assistant Professor,** Department of CSE Daffodil International University, Dhaka. Profound Knowledge & keen interest of our supervisor in the field of "Basic MIKRO TIK & Cisco Switch", to carry out this internship. She is incessant patience, discerning direction, ceaseless consolation, consistent and fiery supervision, helpful feedback, perusing numerous second rate outline and remedying them at all stage have made it conceivable to finish this entry internship.

I would like to express my heartiest gratitude to Dr. Syed Akhter Hossain, Department of CSE, for his kind help to finish my internship and also to other faculty member and the staff of CSE department of Daffodil International University.

I would like to thank my entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, I must acknowledge with due respect the constant support, motivation and patients of parents

ABSTRACT

MikroTik is simple terms an operating system .It is the software on a Basic computer operator to access the devices on the computer to perform preferred functions. It is very useful for our daily life. In this sector we will know about Cisco Switch, MikroTik, Cabling, Linux System etc. Network devices are connected to computers, peripherals, devices. Switch, routers and wireless access points are the fundamental networking basic during them device connected to network can communicate with one computer to another computer and with other networks, like the internet. Now a day's big number of people all over the world usage internet technology. So networking is so much important. Now-a-days every single people, business and e-commerce, every work station is fully depend on software based communication and internet technology. That is the reason it's extremely helpful to attach the system. Computer system and peripheral are connected to form a network. They provide various advantages, for example Immediate messaging, parallel computing, video conference, interaction with other users using dynamic web pages, sharing information by using internet or web.

TABLE OF CONTENTS

CONTENTS	PAGE NO
Approval	i
Declaration	ii
Acknowledgement	iii
Abstract	v
CHAPTER 01: INTRODUCTION	1-2
1.1 Introduction	1
1.2 Objective	1
1.3 Motivation	1
1.4 Internship Goals	2
1.5 Introduction to the organization	2
1.6 Report Layout	2
CHAPTER 02: ORGANIZATION PROFILE	3-4
2.1 About the Company	3
2.2 Roles in Job Market	3
2.3 Organization Structure	4
CHAPTER 3: TASKS, PROJECT AND ACTIVITIES	5-26
3.1 Daily Work and Activities	5
3.2 Event and Activities	6
3.3 MikroTic Router OS	7
3.3.1 Router OS	7
3.3.2 Configuration	7
3.4 Features	7
3.5 Mikrotic Router	8
3.6 Propose Network Diagram	9
3.7 Configuration a Router	9
3.8 Static Configuration	11
3.9 Bridge Configuration	13

3.10 DHCP Configuration in MIkroTic Router	15
3.10.1 DHCP Setup	15
3.11 PCQ Bandwidth Management	18
3.12 PPPoE Setup	21
3.13 IP Address	23
3.14 Fiber Optic Cable	24
3.15 Crossover Cable for color Coding	25
3.16 Challenges	26

CHAPTER 04: CONCLUSION AND FUTURE CAREER

4.1 Discussion Conclusion	27
4.2 Scope for the Future Career	27
REFERENCES	28
APPENDIX	29

LIST OF FIGURES

FIGURES	PAGE NO
Figure 2.1: Organization of Daffodil Online Limited	4
Figure 3.1: MikroTik wireless Router	8
Figure 3.2: Network Diagram	9
Figure 3.3: Reset System	10
Figure 3.4: IP address assign	10
Figure 3.5: Enter the Address Details	11
Figure 3.6: Gateway setup	12
Figure 3.7: DNS setting	12
Figure 3.8: NAT Rule	13
Figure 3.9: Bridge port assign	14
Figure 3.10: IP address assign of bridge configuration	14
Figure 3.11: DHCP server interface	15
Figure 3.12: IP address assigning in DHCP Setup	16
Figure 3.13: Gateway for DHCP Network	17
Figure 3.14: DNS setup	17
Figure 3.15: DHCP Setup	18
Figure 3.16: Mangle Rule	18
Figure 3.17: Mangle Advanced Setting	19
Figure 3.18: Creating Queue	20
Figure 3.19: Queue types	20
Figure 3.20: import address.rsc	21
Figure 3.21: PPPoE Setup	22
Figure 3.22: PPPoE Profile Create	23
Figure 3.23: Fiber Optic Cable	24
Figure 3.24: Network Cable	25

LIST OF TABLES

TABLE	PAGE NO
Table 3.1: Address Classes	24
Table 3.2: Network Cable Crossover	25

CHAPTER 01 INTRODUCTION

1.1 Introduction

The major goal of learning is to gain wisdom. I choose an internship because I gain to developed skill. Now huge number of people using information technology and server in worldwide over the internet. The Information Technology (IT) industry is one of the most growing industries worldwide. In Bangladesh, the IT sector has started growing particularly after 2000 years because of some positive rules of the government. So our country huge working places would be creating in future. Our country young generation IT learning knowledge apply this station. As a result our country would be developed.

1.2 Objectives

- > The major goal of study is to acquire wisdom.
- > I choose an internship because I gain to developed skill.
- Everyday learn about latest technology &challenge to improved & developed sets of skills.
- Network Support Engineer performed responsibility and working Action analyzing from different aspects.
- > To achieve the internship requirement under the program of CSE.
- > To gain detailed Wisdom on MikroTic & Cisco Switch.

1.3 Inspiration

The CSE Program prepares students for a professional career in IT sector. Internship to get the applied knowledge in this sector in computer technology. It is important to gaining practical knowledge. It increases our professional experience in engineering or information technology system & it help to make me professional. I hope internship skill help me face to challenge in job market of my future professional life. That's why I choose internship for my future professional life [2]

1.4 Internship Goals

- ✓ Install MikroTik interactively and with kick start
- ✓ Perform user and group administration
- ✓ Study about every networking device
- ✓ Managing of networking system
- \checkmark How to Communication between customer
- \checkmark How to allocate excellent facility to Customer Etc.

1.5 Introduction to the organization

Daffodil online Ltd. is single of the outstanding internet service provider (ISP) in our country. They are oldest organization in ICT division. This Company includes Information Communication Technology services & authorization in since July 2002. This Company applies the newest technologies and upgrading the services where it required. This company is very expert and advanced in the field of information communication technology where their initial occupation rules are long-standing concern with our customer. They worked finished many national projects with international organizations [1].

1.6 Report Layout

Chapter-1: I have explained this chapter internship purpose, inspiration, goals of internship And inception to the internship company structure.

Chapter-2: I have explain this chapter about the organization & organization Structure, and also explain this company the offered and roles in job promote of MikroTic & Cisco Switch.

Chapter-3: I have explained & shown this chapter everyday work and activities, Event and Activities, Challenge & Router OS Etc.

Chapter- 4: I have described this chapter Conclusion & Scope for Future Career about MikroTic and Cisco Switch.

CHAPTER 02

INTERNSHIP ORGANIZATION

2.1 About the Company

Daffodil online Ltd. is single of the most important internet service providers (ISP) in our country. They are oldest organization in the ICT division. This Company vision is Proficiency in customer service through potential integration between individual departments. This Company are membership with Bangladesh Computer Samity, Asia Pacific network Information Center etc. This company all employee potential professional skill is very well .they are also certified and linked with Cisco, Linux, Oracle, and Microsoft. This company provides internet services and also deliver training like as Linux, MikroTic, and MTCNA Etc [1], [3].

2.2 Roles in Job Market

The roles in job market of Daffodil Online Limited (DOL) are as following IT Services:

- Linux Administration
- Network Administration
- Web Server Administration
- System Administration
- Security Engineer.
- Technical Support
- Senior Network Engineer
- Manager of Broadband Network (ISP)
- Network Engineer-(CISCO/Juniper/Ethernet)
- Support Engineer As like- (Windows/ Linux /VMware /Network) Etc [2].

2.3 Structure of Organizational



Figure 2.1: Diagram of DOL Structure

CHAPTER 03

TASKS, PROJECT AND ACTIVITIES

3.1 Every day Work and Actions:

Month 1: In the 1'st month I have completed following work and I have learned.

- Learning about basic Network components
- How to Configure internet to a PC
- Computer Network
- Networking Devices
- File & Folder Share Using LAN

Month 2: In the 2nd month I have learned & completed the following Work

- ✤ Numbering System
 - ➢ Binary
 - Decimal
- IP Addressing
- Cabling
- Networking : Many type of networking concept gaining following this Networking
 - o Local Area Network
 - o Metropolitan Area Network
 - o Wide Area Network

Month 3: In the 3rd month I have learned & completed the following Work

- > Configuration of MikroTik Router operating System
- mechanism of installation
- Configuration of Static routing
- Design of Bridging System

- Configuration of DHCP routing
- Bandwidth administration using PCQ
- > PPPoE Configuration

Month 4: 4'th month I Have completed following this work

Switch Configuration

- Hostname Setup
- Console Password Setup
- Banner Setup
- Enable Password Setup
- Enable Secret Password Setup
- > IP Address Assign to Interface & Comment the Interface
- Telnet Configuration
- SSH Configuration
- Username and Password Configuration
- VLAN Configuration
- Port Assign to Single interface
- Saving and Erasing Configuration

3.2 Events and Activities

In the Education Sector capable and knowledgeable Manpower is important issues for best value education. Daffodil Online Limited prefers the Best superiority Teacher for professional training and Courses. Daffodil Online Limited maintains efficient approach for recruitment. first time candidates have a sit on written test, then written exam test pass candidates again vaiva exam face & finally working or practical exam attend, then will be join this company, otherwise any exam fail the candidates will be rejected. Daffodil Online Ltd (DOL) is very state forward & 0% tolerances rules any Event like as employee appoints. Daffodil Online Ltd. has totally qualified the conventional idea of polytechnic, technological & occupational ability expansion education sector in our country. Now daffodil online Ltd is too much fashionable honor

in the commercial label. It has acquired international recognition too much small time. On the other hand Daffodil Online Limited provided best value professional training. Daffodil Online Limited Provided the Training for Diploma Engineers, business line professional and Human Resource [1].

3.3 MikroTik Router OS

MikriTic Latvian institute was recognized in 1996 .This Company generate switch and distant ISP frame. Now This Company Provide MikroTic internet connectivity provides hardware & software in the various countries [5].

3.3.1 Router OS

Router OS means network manage approach based on Linux design for installation on MikroTik Router Board routers. It know how to be also set up on the PC, Structure into a router through firewall, VPN server and client access point [6]. The system can serve as a interned on a wireless access system.

3.4 Features

Routers OS supports feature are bellow that...

- Hardware Support
- ➤ Firewall
- > MPLS
- ➢ Wireless
- > DHCP
- > Hotspot
- > QoS
- > Proxy
- Spanning tree protocol like as (RSTP, STP), Firewall, Bridge, MAC etc.
- It protocol Label switching, etc.
- ➢ It protocol Label switching, etc.

3.5 MikroTik Router

Router is the operation directors of the worldwide internet. Routers communication with every Network, and prepared network packets out into a network. It dictates the best way to send data over the Internet. MikroTic router has many types such as cloud core router .this router has up to 4 SFP ports 12 GB Ethernet port, and it also has USB port. This device or router home Access point is a perfect small device for your home or office. This router has high performance scale, unified communication and virtualization ready platform. The commits bandwidth transmitted rate very faster over the internet [4].



Figure 3.1: MikroTic Router

3.6 Network Diagram (MikroTik & Switch Configuration)



Figure 3.2: Network Diagram

3.7 Configure a Router

- Step 1: At First Time We Connect The MikroTic Router Our PC or Laptop. Then We Working Easily Using Win box Software then Open This Software & Go to New Terminal.
- ✓ Step 2: New Terminal Option Click & open the Dialog Box & Reset this Router Show The Reset System Figure 3.3



Figure 3.3: System Reset

- ✓ Step 3: IP Address Assign System At First click IP>>Address
- ✓ Step 4: When it Open Address dialogue Box then click Add (+) Option to open the add IP Address Window.

Address List	
+ - / × / /	Find
Address 🛆 Netwo	rk Interface 🔻
::: LAN	
172.16.1.1/24	6.1.0 ether2
::: WAN	
🕆 192.168.50.20 192.10	68.50.0 ether1
2 items	

Figure 3.4: IP address allocate

✓ Step 5: After the New IP address Box Open & Enter the new Address Details As like Address, Interface Select Then Click OK Option.

New Address	
Address: 0.0.0/0	ОК
Network:	Cancel
Interface: wlan1 Ŧ	Apply
	Disable
	Comment
	Сору
	Remove
enabled	

Figure 3.5: Enter the Address Details

3.8 Configuration of Static Routing

✓ Step 1: Method

At first Go to IP > Route > Add (+) > Gateway

Then > Click OK Option



Figure 3.6: Gateway setup

✓ Step 2: Method

Go to IP > DNS Then DNS Select & Click



Apply > OK Option

Figure 3.7: Domain name system setting

```
✓ Step 3: Method:
```

Go to IP Then > Firewall > Then NAT > Add > Action

Masquerade Then Click Apply OK

Show Network address translation rule setting in Figure 3.8



Figure 3.8: Network address translation rule

3.9 Configuration of Bridge Routing

✓ Step 1: At First Click The Bridge option >Then Add (+) Write Bridge Name Of Action

Then Apply > OK Option

Showing The Bridge Path Assigning figure 3.9

		Jugaion		00.00.00.0	0.11									
	嶺 Quick Set													
	CAPsMAN													
	🛲 Interfaces													
	🚊 Wireless													
	📲 Bridge													
	📑 PPP													
	🕎 Switch													
	°t <mark>8</mark> Mesh	Bridge												
	📴 IP 🗈 🗅	Bridge	Port	ts VLANs	MSTIs	Port MST Overrid	des Filte	rs NAT	Hosts	MDB	}			
	🖉 MPLS 🛛 🗅			/ / /	- 7									
	😹 Routing 🛛 🗅	#			Bric		Horizon	Trusted	Priority (b	P	ath Cost	Role	Root Pat	
	∰ Svstem ►	0 H	1	terher2	brid	lge lae1	110112011	no	r noncy (r	80	10	designated port	NOUT AL	
		1 IH	1	tether3	brid	lge1		no		80	10	disabled port		
	Queues	2 IH	1≃	tether7	brid	lge1		no		80	10	disabled port		
	Files	3 IH	1≃	tether8	brid	lge1		no		80	10	disabled port		
	📄 Log													
	🧟 RADIUS													
	🄀 Tools 🛛 🗅													
	📰 New Terminal													
	🖳 LCD													
	E MetaROUTER													
	🤚 Partition													
	📑 Make Supout.rif	4.3												
č	😧 Manual	4 items	_		_		_	_	_	_	_			
B	S New WinBox													
Nin	📕 Exit													
S														

Figure 3.9 Allocate of Bridge port

✓ **Step** 2: IP Address allocate of bridge configuration bellow this figure



Figure 3.10: IP Allocate for Bridge

3.10 DHCP Configuration of MikroTic Router

Dynamic Host Configuration Protocol (DHCP) is a client server protocol. It is also Network Management protocol provides by IP Address & another subnet, Gateway and also DNS to DHCP server. Every MikroTic Router has working in DHCP perfection.

3.10.1 DHCP Setup

✓ Step 1: Method:

At first Go to IP then >DHCP > Add (+) > Action Then choose DHCP Server Interface showing figure bellow

DHCP Server		
DHCP Networks Leases Options Option Sets	Alerts	
🕂 🖃 🖉 💥 🍸 DHCP Config DHCF	⁹ Setup	Find
Name / Interface Relay	Lease Time Address Pool Add AR	•
dhcp1 ether2	DHCP Setup	
	Select interface to run DHCP server on	
	DHCP Server Interface: bridge1	
	Real Net Creat	
1 item		

Figure 3.11: DHCP server interface

✓ Step 2: Method

Go to IP > DHCP> DHCP setup then Next Option C	Click & DHCP address assign
--	-----------------------------

DHCP Server	
DHCP Networks Leases Options Option Sets Alerts	
+ - 🖉 X T DHCP Config DHCP Setup	Find
Name / Interface Relay Lease Time Address Pool Add AR	•
DHCP server can not run on slave interface!	
dhcp1 ether2 DHCP Setup	
Select network for DHCP addresses	
DHCP Address Space: 172.16.1.0/24	
Back Next Cancel	
4	
l tem	

Figure 3.12: IP Address assign for DHCP setup

✓ Step 3: Method

IP > DHCP > DHCP Setup Then

Gateway for DHCP Network as like 172.16.1.1 then Next Option Click

40.000					
CAPeMAN					
T Wireless					
Bridge					
PPP					
T Switch					
°18 Mesh	DHCP Server				
	DHCP New	orke Lazeae Ontione Ontion Sate Alarte			
Ø MPLS ►					
Routing		B DHCP Comig DHCP Setup		Find	
Svstem	Name DHCP at	/ Interface Helay Lease Time	Address Pool Add AR	•	
Cueues	dhcp1	ether2 DHCP Setup			
Files		Select gateway	or given network		
E Log		Gateway for DH	CP Network: 172.16.1.1		
A RADIUS					
🗶 Tools 🗈 🗈		_			
New Terminal			Back Next Cancel		
📮 LCD					
MetaROUTER					
Partition					
Make Supout nf					
🙀 Manual	T Rem				
New WinBox					
📕 Ext					
					へ 町 chi) ^{4:39 PM}
					7/18/2019

Figure 3.13: Gateway DHCP Network

✓ Step 4: Method

Go to IP > DHCP > DHCP setup > Then every Process Complete have Next button

DNS Setup Show in figure 3.14

DHCP Networks Leases Options Option Sets	Alerts	
🕂 🖃 🖉 🕅 DHCP Config DH	CP Setup	Find
Name 🕢 Interface Relay	Lease Time Address Pool Add AR	•
DHCP server can not run on slave interface!		
dhcp1 ether2	DHCP Setup	
	Select DNS servers	
	DNS Servers: 8.8.8.8	
	Back Next Cancel	
1 item		

Figure 3.14: DNS Setup

✓ **Step 5**: Finely DHCP setup has Completed Show in Figure 3.15

DHCP Server			
DHCP Networks Leases Options Option Set	s Alerts		
+ - 🖉 💥 🍸 DHCP Config 🛛	HCP Setup		Find
Name 🔺 Interface Relay	DUCD Seture	Add AR	•
DHCP server can not run on slave interface!	DHCP Setup		
dhcp1 ether2		no	
dhcp2 wlan1 0.0.0.	Setup has completed successfully	no	
	OK		

Figure 3.15: DHCP Setup Completed

3.11 Bandwidth Management or Sharing of PCQ

✓ **Step 1**: At first Go to IP > Firewall then > Mangle option & click Add (+)

>> General: chain then routing Action then press apply >Ok

😻 admin@E4:8D:8C:0D	:DC:11 (MikroTik) - WinBox v6.43.16 on RB2011UiAS-2HnD (mipsbe)							
Session Settings Da	shboard							
Safe Mode	Session: E4:8D:8C:0D:DC:11							
🔏 Quick Set		New Man	ngle Rule					
CAPsMAN		General	Advanced 8	Extra Action Statist	tics	ОК		
Interfaces			Chain:	prerouting	₹	Cancel		
Wireless			Src Address:		•	Apply		
and ge Bridge			Die All					1
ei PPP	Frewai		Ust. Address:		•	Disable		
🕎 Switch	Filter Rules NAT Mangle R	aı	Protocol:		-	Comment		
°T8 Mesh		7	Src. Port:		-	Сору	al 🔻	
I III N	# Action Chain	4	Det Port-			Remove	es Packe▼	
MPLS N	1 / mar prerouting		Dat. Fort.			Repet Countern	10.2 KiB	
🐹 Routing 🗅			Any. Port:					
∰ System Γ			In. Interface:			Heset All Counters		
Queues			Out. Interface:		•			
Files			. Interfaces Inte					
Log		in in	1. Interrace List:					
M RADIUS		Out	t. Interface List:		•			
X Tools			Packet Mark		-			
Mew Terminal		6	unnection Made		_			
			ATTRECTOT Mark.					
MetaROUTER			Routing Mark:					
Males Current of	•		Routing Table:				•	
Make Support.m	2 items	6	nnection Type:		•			
Now WinPox								
			nnection state.					
		Connect	tion NAT State:		•			
ö								
j								
nc								

Figure 3.16: Create Mangle Rule

✓ Step 2: Method

IP > Firewall >> then Mangle >> Add (+) then Advanced General Option Click & address List

Select As like Address List: Facebook Action

Then Apply> > Ok

♥ Safe Mode Session: E4:8D:8C:0D:	DC:11				
Quick Set		New Mangle Rule			
CAPsMAN		General Advanced Extra Action Statistics		ОК	
m Interfaces		See Address List: III Esseebaak IP		Canaal	
L Wireless			121	Caricei	
🐇 Bridge		Dst. Address List:	•	Apply	
🖆 PPP	Firewall	Layer7 Protocol:] -	Disable	
2 Switch	Filter Rules NAT Mangle Ran			Comment	
8 Mesh		Content:	•	Сору	al 🔻
EIP N	# Action Chain \$	Connection Bytes:	•	Pamaya	tes Packe▼
MPLS N	1 / mar prerouting	Connection Rate:	•	- Nemove	10.2 KiB
Routing		Per Connection Classifier:	→	Reset Counters	
System		Src. MAC Address:	•	Reset All Counters	
Queues					
Files		Out. Bridge Port:	•		
Log		In. Bridge Port:	•		
RADIUS					
Tools		In. Bridge Port List:	•		
New Terminal		Out. Bridge Port List:	•		
LCD		IDeea Delianu	1.		
MetaHOUTER		Insec Folicy.			
Partition		ILS Host:	•		+
J Make Supout.nt	2 items	Ingress Priority:	-		
Manual Mire Davi		Priority	•		
rvew winBox					
g, cx					
		TCP MSS:	•		
		Packet Size:	•		
		Random:	•		

Figure 3.17: Advanced Setting of Mangle

✓ Step 3: Procedure

Press Queues Option >> Add (+) then General Name:

Queue: 1 Action

Then Apply >> Click OK Button

Creating Queue figure Bellow That

Quick Set Tanget Quick Verse Set Tanget Quick Tange	Safe Mode	Session: E4:8D:8C:0	D:DC:11										
Subject Constant CAPBAN Professor CAPBAN Professor CAPBAN Professor CAPBAN Professor CAPBAN Professor Profess	See Outlink See	Queue List											6
Wrefes # Wrefes # Name: Toget Upload Toget Toget Toget Toget Toget Toget Toget Upload Toget Toget Upload Toget Toget Toget Toget Toget Upload Toget		Simple Queues Inte	face Queues Qu	eue Tree 0	ueue Tynes								
Wreise				Boast Cour	ntorm 00 Poset Al	Countom							
# Indirection Indirection Openande Download	T Wireless			I heset Cour	Deveload May Link	Desket Made	Ibbed	Dennelsend	Total Mary Darks				10
1 Byseed 172 16 1233 5M 3M 0.0ps 0.0ps 0.0ps 2 Byseed 172 16 1230 5M 5M 0.0ps 0.0ps 0.0ps 3 Byseed 172 16 1230 5M 5M 100 0.0ps 0.0ps 3 Byseed 172 16 1230 5M 5M 5M 100 0.0ps 3 Byseed 172 16 1230 5M 5M 5M 100 0.0ps 0.0ps 4 Byseed 172 16 1231 5M 5M 100 0.0ps 0.0ps 0.0ps 6 Mein 1 Byseed 172 16 1231 5M 5M 100 0.0ps 0.0ps 6 Mein 1 Target Upload Target Upload Target Upload Target Upload Canced Canced Canced Canced Canced East	Pridae	0 1 Total N	172.16.1.0/24	unlimited	Unimited	t Packet Marks	117.6 kbps	7.2 kbps	Total Max Limit	DI			
Image: Province 2 Iffication: Province March Image: Province Provinc	ang bilage	1 Bqueue1	172.16.1.253	5M	3M		0 bps	0 bps					
witch 3 include 4 1/2 ls 1.201 3/4 New Single Oucus 4 include 4 include 5 include 5 include 5 include 5 2 Media Name: include 5 include 5 include 5 2 Redning include 5 include 5 include 5 include 5 2 Redning include 5 include 5 include 5 include 5 2 Queues Files include 5 include 7 include 7 include 7 1 Log ARDIUS Name: Sand include 7		2 @queue2	172.16.1.252	5M	5M		0 bps	0 bps					
General Advanced Statistics Traffic Total Total Statistics Warl WILS Marce System Cueves Target bridge1 We Cueves Target Dublad Target Dublad <t< td=""><td>Switch</td><td>4 aqueue3</td><td>172.16.1.250</td><td>5M</td><td>5M</td><td>Vew Simple Queue</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Switch	4 aqueue3	172.16.1.250	5M	5M	Vew Simple Queue							
March March March March System Cancel Gaueue Target Inde Target Dati Dati <td>Tig Mesn</td> <td>-</td> <td></td> <td></td> <td></td> <td>General Advance</td> <td>ed Statistics Traffic</td> <td>Total Total Sta</td> <td>istics</td> <td></td> <td>OK</td> <td></td> <td></td>	Tig Mesn	-				General Advance	ed Statistics Traffic	Total Total Sta	istics		OK		
Image: Indige: Indi	∰ IP /2 MDIS ►					Name:	queue5				Cancel		
System © System © Oucues Files Dat: Taget Upload Bust Int:	Reuting	-				Tamet	bridge 1			∓≜	Annh		
Consert Consert Copy Files Consert Target Upload Target Download Max Limit: SM SM Copy Colo Max Limit: SM Copy Colo Copy Copy Colo Copy Copy Colo Copy Colo Copy Copy Colo Copy Copy Copy Colo Copy Copy Copy Colo Copy	System	-				Date	undge i						
Files I Log Max Limt: SM Tools Tools New Tennial UCD MakaROUTER Patton MakaROUTR Patton MakaROUTR Patton MakaROUTER Patton MakaROUTER Patton Enabled	Queues					Dat					Disable		
Log Max Lint: 5M SM Data Image: ADU/S Tools F Bunt F F Bunt F F Bunt F <	Files	-					Targel	Upload	Target Downl	bad	Comment		
ADUS Cobs New Tennial Bust Intradict Ininited Inin	Log					Max Limit:	5M	∓ 5M		∓ bits/s	Сору		
Tools New Teminal New Teminal LOD MataPOUTER Patton Make Supoutifi Manual New WinBox E bat	A RADIUS	-				- Burst					Remove		
Inverter Bust Threahold: Initial Bust Threahold: Bust Threahold: </td <td>🗶 Tools 🗈 🗈</td> <td>-</td> <td></td> <td></td> <td></td> <td>Burst Limit:</td> <td>unlimited</td> <td>∓ unlimite</td> <td>H</td> <td></td> <td>Reset Counters</td> <td></td> <td></td>	🗶 Tools 🗈 🗈	-				Burst Limit:	unlimited	∓ unlimite	H		Reset Counters		
Burst Time: 0 0 s WeakaPOUTER Image: Comparison of the second seco	New Terminal	-				Burst Threshold:	unlimited	∓ unlimite	ł	➡ bits/s			
MetaPOUTER MetaP	LCD	-				Burst Time:	0	0		s	Reset All Counters		
Patiton American Support of the sup	MetaROUTER					-▼- Time					Torch		
Make Suport of enabled Manual Manual Make Suport of the suport of the supervision of the	🐣 Partition												
enabled When WinBox E bit	📜 Make Supout.nf	-			-								
	🚱 Manual				e	enabled							
	🔘 New WinBox	-											
	🖪 Exit	-											
	2												
	B												
	R .												

Figure 3.18: Creating Queue

✓ Step 4: Process

Press Queues Option Then >> Queue Type

General: Setting then press Address Action & finally

Apply >> Ok button

Sessio	min@E4:8D:8C:0D: in Settings Das	DC:11 (MikroTik) - WinBox v6 hboard	.43.16 on RB201	1UiAS-2HnD (mipsbe				-	Ċ
5	Safe Mode	Session: E4:8D:8C:0D:DC:11							1
ź	Quick Set	Queue List							[
1	CAPsMAN	Simple Queues Interface Que	eues Queue Tre	e Queue Types					
10	Interfaces	4 - 7							Find
3	Wireless	Type Name	/ Kind						
3	Bridge	DW	pcq						
	PPP	Download youtube.com	pcq						
	Switch	* default	pcq						
1	Switch	* default-small	pfifo		New Queue Type				
- L	5 Mesh	* ethemet-default	pfifo						
브	§IP ►	* hotspot-default	sfq		Type Name	e: queue1	ОК		
4	MPLS N	* only-hardware-queue	none		Kin	i: pcq 🔻	Cancel		
2	Routing 🗈	* pcq-download-default	pcq				Apply		
6	System	* pcq-upload-default	pcq		Rate	e: 0 bits/s	1000		
6	Queues	synchronous-deraut	neg		Lim	t: 50 KiB	Сору		
	Files	* wireless-default	sfq		Total Lim	t: 2000 KiB	Remove		
	l nes						Hemove		
	Log				Burst Rate	e: ▼ bits/s			
					Burst Threshold	d: 📃 🔻			
	New Terminal				Burst Time	: 00:00:10			
					Classifie	r: Src Address 🖌 Det Address			
	MetaROUTER					Src. Port Dst. Port			
	Partition				Src. Addrage Mael	. 32			
	Make Supout if				Dat Address Mad				
ă	Manual				C ALL CM	C. 52			
۳ ۳	New WinBox				Src. Address6 Masi				
	Exit				Dst. Address6 Mas	.: [64			
eros								-	
ute									
R		14 items							
			-						1.50 DM

Figure 3.19: Queue Type

✓ Step 5: Procedure

Finally previous all process saving or backup file this system flow this rule At first go to New Terminal then>> Type import address.src then press Enter. Show this figure 3.20 import address.src



Figure 3.20: Import Address.rsc

3.12 Configuration of PPPoE

✓ Step 1: Method

At first Go to Pool > Add (+) > >PPPoE

✓ Step2: Process

Go to PPP> PPPoE Server then > Add (+) Show the figure 3.21 PPPoE Setup

○ Safe Mode	Session: E4:8D:8C:0D:DC:	11						
🔏 Quick Set	PPP							
I CAPsMAN	Interface PPPoE Servers	Secrets Profiles	Active Connecti	ons L2TP Se	ecrets			
🕅 Interfaces	+ - 🖉 💥 🍸							
🚊 Wireless	Service / Interface	Max MTU	Max MRU MRRU	Default Pr	ofile Authentication			
월럝 Bridge	Service1 ether10			default	mschap2 mschap.			
📑 PPP								
🛫 Switch								
°t¦8 Mesh								
≝ IP N					Ne	w PPPoE Service		
🖉 MPLS 🛛 🗅						Service Name:	service2	ОК
🙈 Routing 🛛 🗅						Interface:	bridge1	Canad
💮 System 🗈						Mar MTU		Cancer
👰 Queues						Max MITU:	· · · ·	Apply
Files						Max MRU:		Disable
📄 Log						MRRU:	•	Сору
A RADIUS					Ke	eepalive Timeout:	10 🔺	Remove
🔀 Tools 🗈 🕅						Default Profile:	default 🔻	. ISHIOVE
New Terminal							One Session Per Host	
ECD						Max Sessions:	~	
MetaROUTER						PADO Delav:	▼ ms	
Partition						Authoritication	I make a la make a l	
🛄 Make Supout.rif						Authentication:	✓ mschap 2 ✓ mschap I ✓ chap ✓ pap	
😧 Manual					en	abled		
New WinBox					1			
Exit								
S								

Figure 3.21: Setup of PPPoE

✓ Step 3: Process

Go to PPP > PPPoE Profile Create > Action Name > Local Address > Remote Address then >Limit Show the figure 3.22 PPPoE Profile Create

admin@E4:8D:8C:0D:	DC:11 (MikroTik) - WinBox v6.43.16	on RB2011UiAS-2	HnD (mipsbe))							-	٥	×
ssion Settings Das	shboard												
♥ Safe Mode	Session: E4:8D:8C:0D:DC:11												
🔏 Quick Set	PPP												6>
CAPsMAN	Interface PPPoE Servers Secrets	Profiles Active (Connections L	2TP Secre	ts								
Interfaces	+ - 6 7											Fir	nd
🚊 Wireless	Name / Local Address	Remote Address	Bridge F	Rate Limit	Only One								-
📲 🖁 Bridge	@1M 192.168.10.1	1M	1	1M/1M	yes	New PPP Profile			□ ×				
💼 PPP	* default-encr				default	General Protocols	Limits Que	ue Scripts	OK				
🛫 Switch						Name	101		Canad				
°t¦8 Mesh						Name.	1101		Cancel				
1 91 👰						Local Address:	172.16.2.1	₹ ▲	Apply				
🧷 MPLS 🛛 🗅						Remote Address:	1M	₹ ▲	Comment				
😹 Routing 💦 🗅						Diday			Conv				
💮 System 🗈						bridge.			Demous				
🙊 Queues						Bridge Port Priority:		•	Remove				
💼 Files						Bridge Path Cost:		•					
📄 Log						Bridge Horizon:		•					
🧟 RADIUS													
🄀 Tools 🗈 🗅						Incoming Filter:		•					
📰 New Terminal						Outgoing Filter:		•					
💻 LCD						Address List:		\$					
🛃 MetaROUTER						Interface List:		•					
b Partition													
] Make Supout.nf						DNS Server:		\$					
🔞 Manual						WINS Server:		\$					
🔘 New WinBox						- Change TCP MSS	i —						
📕 Exit						Cino Ciyes	default						
						- Use UPnP							
						C no C yes	default						
	-							_]			
	3 items												
1 0 📄	🖸 🚺 🖓 🄞) 🔘 K									~口令	4:55 PM	E.

Figure 3.22: PPPoE Profile Create

3.13 Classes of IP Address

We know many various Class of IP Address like as class A, class B ,class C ,class D And Class E.

Class A IP address has include 24 bit host ID and 8 bit Network ID Class B IP address has include 16 bit host ID and 16 bit Network ID Class C IP address has include 8 bit host ID and 24 bit Network ID Class D & E Reserved for Multicasting & Research.

3.1 Table 1: Class of IP Address

Class	Decimal	1'st	Network/Host	Default	Number	Host Per
	Range	Octet	ID	Subnet Mask	of	Network
		High	(N=Network,		Network	
		Order	H= Host)			
		Bits				
Α	1-126	0	N.H.H.H	255.0.0.0	126	16777214
B	128 - 191	10	N.N.H.H	255.255.0.0	16382	65534
C	192 -223	110	N.N.N.H	255.255.255.0	2097150	254
D	224 - 239	1110	Used for			
			reserved			
			multicasting			
Ε	240 -254	1111	Used for			
			research			

3.14 Fiber Optic Wire:

Fiber optic wire prepared has two types masking using. One for inside another for outside thickness. This wire forward signal is leaser lighting's his cable using depend on network size. The fiber optic cable is very protective and reliability any another media or cable .Fiber optic Cable is very pricey connection [9].



Figure 3.23: Fiber Optic Wire

3.15 Crossover Wire for color Coding

Show This Process color crossover connecting for RJ45 connector starting will be right side.

1	White/Orange	Transmit+
2	Orange	Transmit-
3	White/Green	Receive+
4	Blue	Unused
5	White/Blue	Unused
6	Green	Receive-
7	White/Brown	Unused
8	Brown	Unused

Table 3.2: Network Cable Crossover



Figure 3.24: Network Cable

3.16 Challenges

If I do not any work then no challenge will come. I have encountered many obstacles during my internship and I have completed all the hurdles well. Even though I am very tired at work, I still find myself in a new way every day to build myself. Working together with many was a first for me. Talking in English with everyone was very challenging. It was very challenging how I would present my work in the best way possible. Understanding working environment well. Understand talk to clients. Work in new environment. Best way to solved client problems.

CHAPTER 04

CONCLUSION AND FUTURE CAREER

4.1 Discussion and Conclusion

Investigate this internship we known a lovely expertise have MikroTic & Cisco switching. First Time we don't know any idea of Cisco Switching & MikroTic .Now a days we learn known has Cisco switches And MikroTic router working. I have observed the to-be and I will be efficient to help the any ISP base Company .Through this temporary working principle Issues administration abilities and external self-inspiration gaining helping us. Initially beginning me was seven hours every day will be attend an office it did not imagine that. Ensure this temporary work dignified and recoup backdrop. Now I have realized this internship big chance corporate label job helping us. There is an increase for the capable authority in MikroTic, Cisco and so aloud.

4.2 Scope for Future Career

These internship goals provide a clear theory about ISP .this internship knowledge also provide any corporate office Network Diagram designing and it also configuring system. IT section has big opportunities available for the big number of students who want to work in this field. Now we know our country is very little developing so this country high developing IT section knowledge priority unbounded. So our country has developing many working principle be accepted like as many high-tech park creating. This working station big number of students their future career starting opportunities. On average only 25 % graduating have job offers facing graduation; however, once done an internship that shape rises to 75%. So our country technical knowledge people various work station have job like as ICT Division, ISP base company, many Networking company etc.

REFERENCES

[1] Dffodil online Ltd, Online Available <<https://daffodil.family/business-ventures/ict-ventures/daffodil-online-ltd-dol>>, last accessed on 12 March 2019 at 3.30pm.

[2] Career opportunities in MikroTic, Available<< https://www.linkedin.com/jobs/mikrotik-jobs?position=1&pageNum=0>>, last accessed on 29 March 2019 at 12.20pm.

[3] About internship, Online Available, << http://ashleydotson .blogspot.sg/2009/08/in-review-this-internship-has-been.html>>, last accessed on 02 April 2019 at 11.20am.

[4] MikroTik Router, online Available << https://mikrotik.com/training/about25>>, last accessed on 20 April 2019 at 11.00 am.

[5] MikroTic Release history, online available <<https://en.wikipedia.org/wiki/MikroTik>>, last accessed on 2 May 2029 at 10.30pm.

[6] MikeoTic RouterOS, online available << http://www.mikrotik-routeros.net/routeros.aspx,>last accessed on 04 Jun 2019 at 11.00pm.

[7] Switch Configuration, online available << https://www.networkstraining.com/basic-ciscoswitch-configuration>>, last accessed on 28 Jun 2019 at 11.10pm.

[8] Switch Configuration, online available << https://courses.cs.ut.ee/2012/NT/juh/2_1.pdf>>, last accessed on 10 July 2019 at 11.10pm.

[9] Fiber Optic Cable, online available <<_https://en.wikipedia.org/wiki/Optical_fiber_cable> last accessed on 15 July 2019 at 1.10pm.

[10] Concept about IP address, online available << https://en.wikipedia.org/wiki/IP_address>> last accessed on 20 July 2019 at 12.10am.

Appendix:

 Appendix A: Company Detail



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)

Employees 12

BASIC MIKROTIK & CISCO SWITCHING ORIGINALITY REPORT 17% % 1% % PUBLICATIONS STUDENT PAPERS SIMILARITY INDEX INTERNET SOURCES PRIMARY SOURCES africasportnews.com 11% 1 Internet Source Submitted to Daffodil International University 5% 2 Student Paper 2% Submitted to Waterford Institute of Technology 3 Student Paper 1% www.csestack.org 4 Internet Source Submitted to KDU College Sdn Bhd 1% 5 Student Paper M GALLO. "The Internet and TCP/IP", <1% 6 Networking Explained, 2002 Publication Submitted to Informatics Education Limited <1_% <1_% 7 Student Paper Submitted to Impact International College Ltd 8 Student Paper