# INTERNSHIP REPORT ON ISP SETUP AND CONFIGURATION WITH MIKRO-TIK AND LINUX PLATFORM

BY

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This report is presented by the partial fulfillment of the requirements for the Degree of Bachelor of Electrical and Electronic Engineering

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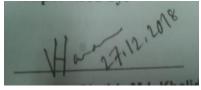


DAFFODIL INTERNATIONAL UNIVERSITY DHAKA, BANGLADESH DECEMBER 18-19

### DECLARATION

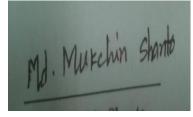
I hereby declare that, this internship report is prepared by me **Md. Mukchin Shnato**, ID No: **151-33-2547** to the department of Electrical and Electronic Engineering, Daffodil International University, under my honorable Supervision **Mr. Abu Shahir Md. Khalid**, Lecturer, Department of EEE, Daffodil International University. I also declare that, I collect information from my internship organization Daffodil Online Limited (DOL), ISP based Corporation, Books, Internet and my friends also.

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# ACKNOWLEDGEMENT

At first, I wish to convey my cordial thanks and gratitude to Almighty Allah for everything. I would like to thank my Co-Supervisor- **Mr.Abu Shahir Md. Khalid** Lecturer, Department of EEE, DIU for supporting me with lots of effort and time to perform the internship program.

I am grateful to **Sabbir Ahmed** (**Polash**), the CEO of Daffodil Online Limited. I also thanks to **Md Abul Basher and Md. Imran Hossain**, (**System and Network Trainer**) of Daffodil Online Limited for their support. Without their help of support, I can't complete my internship training in the company. Other members of the company also my batch mate helped me tremendously for doing my internship program.

I would like to thanks my heartiest gratitude to **Prof. Dr. M. Shamsul Alam** (**Department Professor and Dean of EEE, DIU**) for his kind help to finish my internship and also to other faculty member and the staff of EEE department of Daffodil International University.

Finally, I must acknowledge with due respect the all support and inspiration of my parents.<sup>[1]</sup>

#### ABSTRACT

MikroTik operating system is designed for a network router. These functions include IP Addressing, Firewall & Nat, Routing, Bandwidth Limiter, Point to Point Tunneling Protocol, DNS server, DHCP server, Hotspot, and many other features. It is very useful for our daily life. In this sector we will know about Cisco, MikroTik, Cabling, Linux System etc. Network devices are connected to computers, peripherals, even LOT devices. Switches, routers and wireless access points are the essential networking basic. Through them device connected to network can communicate with one computer to another computer and with other networks, like the internet. Now today a large number of people all over the world usage internet technology with their dally life. So, the networking is so much important fact right now. Now-a-days every single people, business and ecommerce, every work station is fully depending on software-based communication and internet technology. That is the reason it's extremely valuable to anchor the system. Computer system and peripheral are connected to form a network. They provide various advantages, for Example-Instant messaging, parallel computing, video conference, interaction with other users using dynamic web pages, sharing information by using internet or web.

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# CHAPTER 1 Introduction

### **1.1 Introduction:**

A network device is connecting to computer, peripherals, even LOT devices. Routers, switches and wireless access points are the essential networking basics. I choose this internship because I wanted to benefit from the experience. Through them device connected to network can communicate with one computer to another computer.

## **1.2 Motivation:**

I am currently pursuing in the final semester of my Bachelor Degree program in CSE. I choose my internship at Daffodil Online Limited (DOL) because I discovered that the Daffodil Online limited has overcome every customer satisfaction & services because of their excellent reputation. Daffodil Online Limited (DOL) is now a well-known and reputed Internet Service Provider (ISP) in Bangladesh. I think that I can successfully prove my experience by the help of Daffodil Online Limited.

## **1.3 Objectives:**

Now in the modern world "Basic MIKRO TIK & LINUX" is a very generic term. The internship program is making me as a compatible one in the job market. Temporary job in software engineering is a stage to give better work encounter when an understudy is still in school, to equivalent occupation aptitude with scholarly preparing, and to assist understudy with preparing the change from school to work.

- Install Mikro Tik and perform network configuration.
- Install Linux for server administration and maintained hardware Equipment. Perform user and group administration.

### **1.4 Introduction of Company:**

Daffodil Online Ltd is a top-rated Internet Service Provider (ISP) in Bangladesh and furthermore the most experienced and prominent organization in the ICT field where they are essential business morals is Long Term Relationship with their clients. They are exceptionally future. In the time of 2002 they are begun their excursion. Since the earlier years, they expounded grateful of what they have picked up, and furthermore more enthusiastic about their viewpoint for a similarly cheerful their exercises and administration office following to the client's proposal and thinking about need of time.

### **1.5 Layout of the Report:**

In this report I shown the introduction, motivation, objective, introduction of company, introduction about my internship organization, and also about the company, company product for marketing and organization structure of the company.

After that I show my internship dally task with activities events and project task and activities.

At last I described Conclusion & Discussion, Future Career & Scope, and also discussed Future Scopes of the platform MikroTik and Linux.

# CHAPTER 2 Organization

### **2.1 Introduction:**

The internship enterprise where I have taken my Training is Daffodil Online Ltd. Daffodil Online Ltd. (DOL) is proud to be one of the promoters and oldest ISP/ASPs in Bangladesh and providing one stop integrated ICT services and solution since July 2002. During. the past years, they extended their operation and service portfolio according to the customer's recommendation and considering demands of time.

## 2.2 Product for Marketing:

Daffodil Online Ltd. prides itself as one of the main across the nation Internet Service Provider (ISP) in Bangladesh. They are the most experienced and most seasoned Organization in the ICT field where they are fundamental business morals is long Term Relationship with their clients. As they take a gander at the development throughout the Decade since our origin, they are to a great degree glad for what we have accomplished And considerably more amped up for our viewpoint for a similarly encouraging future. Daffodil Online Ltd likewise gives distinctive IT Services and professional Training Administrations. These are given underneath

The Daffodil Online Ltd provides us particular IT Based Professional Training services. These are:

- ISP support.
- IT Security protection.
- Web Hosting & Domain Registration.
- Corporate level Internet Solution.
- IT based Professional Courses & Training.
- Open Source application solution.
- Web site Development.

# 2.3 Organizational Structure of Daffodil Online Limited:

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

Figure 2.3.1.0: Organization of Daffodil Online Limited

# CHAPTER 3

# Internship Roles & Responsibilities

#### 3.1 Daily Task and Activities:

- Month 1: In the first month of my internship at daffodil online limited I have learned and performed the following tasks:
  - □ About IP address.
  - Introduction of MikroTik.
  - Dec based Installation of MikroTik Router OS using VMware.
  - Configure Mikro-Tik Router with Commands.
  - How to configure ISP link.
  - How to configure your LAN Network.
- Month 2: In this month I have learned and performed the following tasks:
  - Bandwidth Control in different ways.
  - □ Bridge mode configure.
  - **Firewall and NAT Configuration.**
  - □ Network Security.
- Month 3: In this month of I have learned and performed the following tasks:
  - Introduction of LINUX.
  - Installation of Linux CentOS 6.4.
  - □ Managing User Accounts and passwords.
  - Basic Linux Commands.
  - **I** File and Directory Making and Control.
  - U Work effectively on the Unix Command Line and Run level concept.
- Month 4: In this month of my internship at daffodil online limited I have learned and performed the following tasks:

- □ File and Directory Permissions.
- User and Group Add and Modification.
- Ownership, Group and User Permission.
- ACL Permission Configuration.
- Linux System Administration.

#### 3.2 Events and Activities:

Preparing is critical for temporary position is the main stage, when an understudy faces some issue amid entry level position, at that point it is obligatory to give preparing to address the issue. Issue has been identified& preparing can be tackling it. Preparing can be depicted aptitudes, ideas, enhanced execution in temporary position condition. In this internship on daffodil online limited I have learned and performed the following tasks:

- About IP address for all class of IP with Subnet.
- □ Mikro-Tik Router and Configuration.
- Learning & understanding About Network Components.
- I Install and Configuration in Linux, step by step full describe with figure.
- Linux System Administration.

#### 3.3 Project Task and Activities:

#### 3.3.1 About IP address:

An Internet Protocol address (IP address) is a numerical name pointed to every gadget associated with a PC organizes that uses the Internet Protocol for correspondence. An IP address serves two main capacities: host or system interface ID and area tending to. Web Protocol form 4 (IPv4) characterizes an IP address as a 32-bit number. Be that as it may, in light of the development of the Internet and the exhaustion of accessible IPv4 addresses, another adaptation of IP (IPv6), utilizing 128 bits for the IP address, was created in 1995, and institutionalized as RFC 2460 out of 1998. IPv6 organization has been continuous since the mid-2000s. IP addresses are normally composed and shown in intelligible documentations, for example, 172.16.254.1 in IPv4, and 2001:db8:0:1234:0:567:8:1 in IPv6. <sup>[3]</sup>

#### **3.3.2 Introduction of MikroTik:**

MikroTik is a network-based equipment manufacturing company. MikroTik was founded by Latvia in 1996 to develop ISP System with Router & Wireless Devices.<sup>[4]</sup>

#### 3.3.3 PC based Installation of MikroTik Router OS using VMware:

**Requirement Items:** 

- VMware Workstation Application.
- Mikro-Tik Router OS ISO image file.
- Winbox.

Now I show the Install Guideline Step by Step:

Step 1: At first install VMware application and open it, then click on File>New Virtual

#### Machine>Typical>Next.



Figure 3.3.3.1: VMware welcome screen

Step 2: Now Select on the Installer disk image file(iso) and choose the iso image file and then click on Next. After that create a virtual machine name and also choose location where the machine is Install, then click Next. Now configure the Hardware requirement how we have need.

New Virtual Machine Wizard	×	New Virtual Machine Wizard	>
Guest Operating System Installation		Name the Virtual Machine	
A virtual machine is like a physical computer; system. How will you install the guest operatir		What name would you like to use for this virtual machine	27
Install from:		Virtual machine name:	
O Installer disc:		Test02	ר
CD Drive (H:)	~	Location:	
	N	C:\Users\Mahmud\Documents\Virtual Machines\Test02	Browse
	G₂ (	The default location can be changed at Edit > Preferences.	
Installer disc image file (iso):			
E:\MikroTik\MikroTik\mikrotik-6.22.iso	V Browse		
Could not detect which operating system is	in this disc image.		
You will need to specify which operating sys	stem will be installed.		
I will install the operating system later.			
The virtual machine will be created with a blank	k hard disk.		
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Figure 3.3.3.2: VMware Configuration for MikroTik OS

Step 3: Now click on the "Power on the virtual machine" and then show a welcome screen where click "a" for select all and then press "I" to install. Then press "n" to do not keep configuration and "y" to continue. After install complete show a login screen,

where press MikroTik Login: admin and password: admin then enter.

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Test02 Shared VMs	Prover, on the United mac Did this intractione settle Devices Memory Processor Memory Processor Mathematic Mathem		Contest and resource (X) system (X) shepp (X) shepp (X) shepped (X) solve (X) system (X) system	[X] ipv6 [X] istn [X] kon [X] kon [X] mp1s [X] mp1s [X] mijicast [X] ntp	(X) routing (X) security (X) ups (X) user-wanager (X) wireless (X) wireless-fp		
			system (depends on noth	(mg):			
	<ul> <li>Description</li> <li>Type here to enter a descript machine.</li> </ul>	tion of this virtual	Main package with basic	services and drivers			
	Type here to enter a descript machine. system (depends on not) fain package with basic lo you want to keep old		Main package with basic	6.22 Login: admi	n		

Figure 3.3.3.3: MikroTik OS Installation

#### 3.3.4 MikroTik Router Configuration:

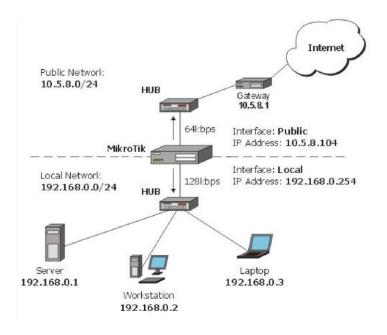


Figure 3.3.4.1: Network Topology of MikroTik

At first download Winbox and router os ISO image file, after that install router os in vmware and run winbox, now click on the Mac address type "admin" in login window and do not need to give user Password. <sup>[5]</sup>

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Figure 3.3.4.2: Winbox Dashboard

#### **3.3.5 Static-IP Configuration in MikroTik Router:**

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×T	ew Terminal		Max L2 MTU:					To	orch
1000	N Channels	•	MAC Address:	00.0C 29.96 E	4:CD			Cabl	e Tes
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			1000					Reset MA	

At first Click on "Interface" to show and define our port such as LAN, MAN, WAN.

Figure 3.3.5.1: Interface

Now, click on "IP>Address>Add IP on Address and Network>Apply OK".

	Address <	192 168 50 222/24:			
Address 令172.16.1	Address:	192.168.50.222/24		ОК	
守 192.168	Network:	192.168.50.0	-	Cancel	
	Interface:	ether1 WAN	Ŧ	Apply	
				Disable	
				Comment	
				Сору	
				Remove	
	enabled				

Figure 3.3.5.2: IP Addressing

Next, click "IP>DNS>Add Server IP address>Apply OK".

ONS Settings			
Servers:	203.190.10.252	\$	ОК
	203.190.10.253	\$	Cancel
Dynamic Servers:			Apply
	Allow Remote Re	quests	Static
Max UDP Packet Size:	4096		Cache
Cache Size:	2048	KiB	
Cache Used:	8		

Figure 3.3.5.3: DNS Server

After that click on "IP>Firewall>Add+>Action>Select=masquerade>Apply Ok".

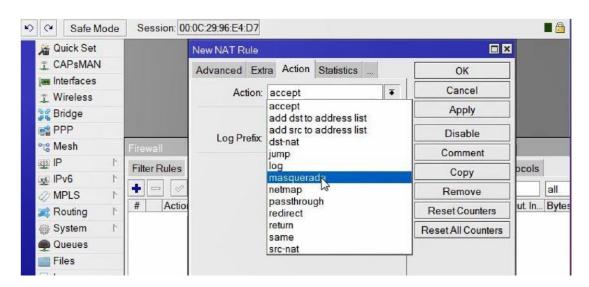


Figure 3.3.5.4: Firewall

Now click "IP>Routs>Add+ New Route=Dst. Address + Gateway>Apply OK".

	🔏 Quick Set				
	CAPsMAN				
	Interfaces				
		New Route			
	Stidge Bridge	General Attribute	20		
	PPP	Provide Control of			
	ets Mesh	Dst. Address:	0.0.0/0		
	1 PI	Gateway:	192.168.50.1	•	
	we IPv6 ►		N		
	MPLS N	Check Gateway:	L3		
	😹 Routing 🗈 🗈	Type:	unicast		
	tiliti System ►				
	Queues	Distance:			
	Files	Scope:	30		
	Log	Target Scope:	10		
×	All the second se				
Bo	🗶 Tools 🛛 🔿	Routing Mark:			
Vin	📺 New Terminal	Pref. Source:			
<b>NinBox</b>	ISDN Channels				
č	I KAMA				

Figure 3.3.5.5: IP Routing

After process are complete then check the instruction by "New Terminal>Terminal= ping (IP)>OK".

Quick Set							
T CAPSMAN							
-	- 100						
Interfaces							
Wireless	Terminal						C
📲 Bridge		/ ()]	3				
PPP	7 \111/	7. 7. 11/					
🕎 Switch		<      (_) / /     < \	(c) 2013				
•ts Mesh		aterOS 6.41.1 (c) 1999-2		://w	w.mik	rotik.com	
255 IP N	[2]	Gives the list of ava	ilable command	9			
MPLS N	command [?]	Gives help on the con	mand and list	of an	rgumen	its	
😹 Routing 🛛 🗅	[Tab]	Completes the command	word If the	innut	is a	mbianous	
System N		a second [Tab] gives				and ignorably	
Queues	1	Move up to base level					
Files		Move up one level					
Log	/command	Use command at the ba	se level				
A Radius	SEO HOST	ik] > ping 192.168.50.1	ST7P	TTI	TIME	STATUS	
Tools	0 192.168.	.50.1		64		SIAIOS	
	1 192.168		56	12.2	Oms		
New Terminal	2 192.168		56	64 64	Oms		
📕 LCD 🛛 🔋	3 192.168. 4 192.168.		(C) 24	64			
MetaROUTER	5 192.168		56				

Figure 3.3.5.6: IP Ping

Final Step, now connect pc with static IP click on "PC Setting>Network>Change adapter setting>Ethernet>Properties>IPv4=Use your static IP address, gateway, subnet mask and DNS server>Apply OK". [6]

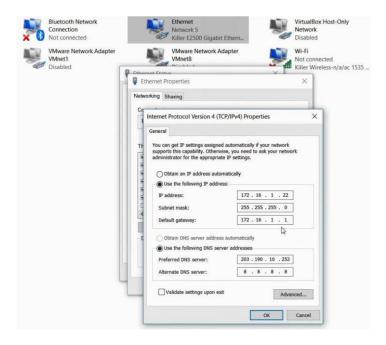


Figure 3.3.5.7: TCP/IPv4 Configuration

**3.3.6** At first click on "IP>DHCP Server>DHCP Setup= select needed server interface>Next>DHCP Address Space= example (172.160.20.0/24)>Next>Gateway DHCP Network= example (172.160.20.1)>Next>Address to Give Out>Next>DNS Server>Next>Lease Time".

#### 6 (DHCP) Dynamic Routing Configuration with MikroTik:

🚳 IP 🗈 🖻	DUCD Control	
	DHCP Server	
MPLS M	DHCP Networks Leases Options Option Sets Alerts	
Routing N	+ 📼 🧭 🐹 🍸 DHCP Config DHCP Setup	Find
⊜ System ト	Name / Interface Relay Lease Time Address P Add A	
Queues	DHCP Setup	
A real real real real real real real real	Select interface to run DHCP server on	
E Log		
Tools	DHCP Server Interface: wlan1	
Mew Terminal	ether2	
LCD	ether3 ether4-LAN	
MetaROUTER	ether5	
Partition	ether6	
Make Supout rif	ether7 ether8	
🚱 Manual	ether9	
New WinBox	0 items ether10 stp1	
Exit	sipi wlan1	
	Back Next Cancel Back	Next Cancel
	DHCP Setup	
	DHCP Setup Select pool of ip addresses given out by DHCP server Addresses to Give Out 2.160.20.2-172.160.20.254 Back Next Cancel	
DHCP Setup Select DNS serv	Select pool of ip addresses given out by DHCP server Addresses to Give Out 2.160.20.2-172.160.20.254 Back Next Cancel	
	Select pool of ip addresses given out by DHCP server Addresses to Give Out 2.160.20.2-172.160.20.254 Back Next Cancel	

Figure 3.3.6.1: Dynamic (DHCP) Configuration

Back

Net

Cancel

Next

Cancel

Back

Now Restart winbox and reconnect ethernet port IPv4 into automatic from pc then click from winbox "**IP**>**ARP**= where show ARP list". <sup>[6]</sup>

		-	Law.
•		T	Find
	IP Address /	MAC Address	Interface
C	172.160.20.2	4C:CC:6A:DF:88:9A	ether4-LAN
)		4C:CC:6A:DF:88:9A	ether4-LAN
C	192.168.50.1	D4:CA:6D:81:6D:56	ether1-WAN
iten	IS		
🖗 (	twork Connection I		× ]
Ne	thernet Status		× ]
Ne Ne	Thernet Status twork Connection I	s: Value	× ]
Ne Ne	Thernet Status twork Connection I twork Connection Details roperty onnection-specific DNS lescription	Value S Killer E2500 Gigabit	Ethernet Controller
Ne Ne	Thernet Status twork Connection I twork Connection Details roperty onnection-specific DNS lescription hysical Address	S Killer E2500 Gigabit 4C-CC-6A-DF-88-9A	Ethernet Controller
Ne Ne P C D P C	thernet Status twork Connection I twork Connection Details roperty onnection-specific DNS lescription hysical Address HCP Enabled	s: Value S Killer E2500 Gigabit 4C-CC-6A-DF-88-9A Yes	Ethernet Controller
Ne Ne P C D P C	thernet Status twork Connection Details roperty onnection-specific DNS lescription hysical Address IHCP Enabled 2v4 Address	S Killer E2500 Gigabit 4C-CC-6A-DF-88-9A Yes 172.160.20.254	Ethernet Controller
Ne Ne P C C D F I F	Thernet Status twork Connection Details roperty onnection-specific DNS lescription hysical Address IHCP Enabled Pv4 Address Pv4 Subnet Mask	x Value S Killer E2500 Gigabit 4C-CC-6A-DF-88-9A Yes 172.160.20.254 255.255.25	Ethernet Controller
Ne Ne P C D P C C C F I F I F I F	thernet Status twork Connection Details roperty onnection-specific DNS lescription hysical Address HCP Enabled 2V4 Address 2V4 Subnet Mask ease Obtained	x Value S Killer E2500 Gigabit 4C-CC-6A-DF-88-9A Yes 172.160.20.254 255.255.0 Tuesday. October 9	Ethernet Controller . 2018 4:57:53 PM
Ne Ne P C C D F I F I F I F	Thernet Status twork Connection Details roperty onnection-specific DNS lescription hysical Address IHCP Enabled Pv4 Address Pv4 Subnet Mask	x Value S Killer E2500 Gigabit 4C-CC-6A-DF-88-9A Yes 172.160.20.254 255.255.0 Tuesday. October 9	Ethernet Controller
Ref Ne	thernet Status twork Connection Details roperty onnection-specific DNS lescription hysical Address HCP Enabled 2v4 Address 2v4 Subnet Mask ease Obtained ease Expires	x Value S Killer E2500 Gigabit 4C-CC-6A-DF-88-9A Yes 172.160.20.254 255.255.0 Tuesday, October 9 Wednesday, October	Ethernet Controller . 2018 4:57:53 PM
P C C C C C C C C C C C C C C C C C C C	thernet Status twork Connection Details roperty onnection-specific DNS lescription hysical Address HCP Enabled 2v4 Address 2v4 Subnet Mask ease Obtained ease Expires 2v4 Default Gateway	x Value S Killer E2500 Gigabit 4C-CC-6A-DF-88-9A Yes 172.160.20.254 255.255.05 Tuesday, October 9 Wednesday, October 172.160.20.1	Ethernet Controller . 2018 4:57:53 PM
P C C C C C C C C C C C C C C C C C C C	thernet Status twork Connection Details roperty onnection-specific DNS lescription hysical Address HCP Enabled 2v4 Address 2v4 Subnet Mask ease Obtained ease Expires 2v4 Default Gateway 2v4 DHCP Server	x Value Xiller E2500 Gigabit 4C-CC-6A-DF-88-9A Yes 172.160.20.254 255.255.255.0 Tuesday, October 9 Wednesday, October 172.160.20.1 172.160.20.1	Ethernet Controller . 2018 4:57:53 PM
Ne Ne P C C D P C C C P C C C P C C C P C C C P C C C F F C C C F F C C C F F F C C C F	thernet Status twork Connection Details roperty onnection-specific DNS lescription hysical Address HCP Enabled 2v4 Address 2v4 Subnet Mask ease Obtained ease Expires 2v4 Default Gateway 2v4 DHCP Server 2v4 DNS Servers	S: Value S Killer E2500 Gigabit 4C-CC-6A-DF-88-9A Yes 172 160.20.254 255 255 255 0 Tuesday, October 9 Wednesday, October 172 160.20.1 172 160.20.1 172 160.20.1 203 190 10.252 203 190 10.253	Ethernet Controller . 2018 4:57:53 PM
Ne Ne P C C D F F F F F F F F F F F F F F F F F	thernet Status twork Connection Details roperty onnection-specific DNS lescription hysical Address HCP Enabled 2v4 Address 2v4 Subnet Mask ease Obtained ease Expires 2v4 Default Gateway 2v4 DHCP Server 2v4 DNS Server 2v4 WINS Server letBIOS over Topip Enabl	s: Value S Killer E2500 Gigabit 4C-CC-6A-DF-88-9A Yes 172 160 20 254 255 255 255 0 Tuesday, October 9 Wednesday, October 172 160 20.1 172 160 20.1 172 160 20.1 203 190 10 252 203 190 10 253	Ethernet Controller . 2018 4:57:53 PM er 10. 2018 4:57:54 PM
Nee PCC CC IF IF IF IF IF IF IF IF IF IF IF	thernet Status twork Connection Details roperty onnection-specific DNS lescription hysical Address HCP Enabled 2v4 Address 2v4 Subnet Mask ease Obtained ease Expires 2v4 Default Gateway 2v4 DHCP Server 2v4 DNS Servers	S: Value S Killer E2500 Gigabit 4C-CC-6A-DF-88-9A Yes 172 160.20.254 255 255 255 0 Tuesday, October 9 Wednesday, October 172 160.20.1 172 160.20.1 172 160.20.1 203 190 10.252 203 190 10.253	Ethernet Controller . 2018 4:57:53 PM er 10. 2018 4:57:54 PM

Figure 3.3.6.2: ARP for Dynamic (DHCP) Configuration

#### 3.3.7 Bridge Configuration with MikroTik:

#### "Bridge>click + Add>Bridge n= 1,2,3....> +name fill up>Apply Ok"

Select Ports:

- ✓ ether2
- ✓ ether3\_LAN
- ✓ ether6\_MAN
- ✓ ether9
- ✓ wlan1

#### "IP>DHCP server >DHCP setup>Next>Apply Ok".

**O** Step 1:

C* Safe Mode Session: D4:CA:6D:86	C0.D0	
CAUCK Set I CAPSMAN Interfaces I Wreless States Bridge	New Interface	
BPP         Best           12: Setch         Setch           12: Setch         Bodge           12: Setch         Bodge           12: Setch         Image           13: Setch         Image           14: Setch         Image           14: Setch         Image           15: Setch         Image           16: Setch         Image           16: LO         Image      <	Image         General         STP         Statue         Traffic           NAT         Hosts         Name         \$5550           Type         Bidge         MTU:	OK Cancel Apply Deable Commert Commert Commert Remove Torch

Figure 3.3.7.1: Create Bridge name

**O** Step 2:

Quick Set						
I CAPeMAN						
Interfaces						
T Wreless						
3 Bridge						
PPP						
😰 Switch						
Ca Mesh	Bridge	New Bridge Por	0			
1 P P	Bridge Ports Filters NAT Hosts	General Stat			ОК	
MPLS P	+					
Routing D		Priority (h Path		Ŧ	Cancel	
<ul> <li>⟨</li></ul>	I \$12 mlan 7 bridge 1	Priority (h Path 80 Bridge	saddam	Ŧ	Apply	
Queues		Priority	80	hex	Disable	
Files		Path Cost			Comment	
E Log				-1-		
🥵 Radius		Horizon		•	Сору	
🗙 Tools 🗈 🗈		Edge	auto	-	Remove	
New Terminal		Point To Point		-		
ECD 📑		External FDB		Ŧ		
MetaROUTER		External FUB	auto	•		
Partition			Auto	solate		
Make Supout nf	1 dem					
Manual		enabled				 
New WinBox						

Figure 3.3.7.2: WAN configure of Bridge port

#### **O** Step 3:

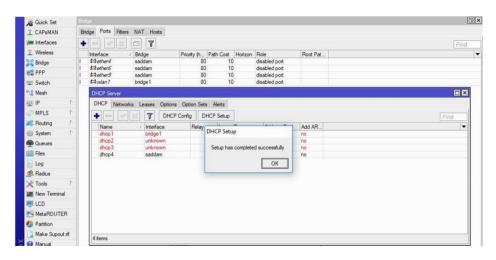


Figure 3.3.7.3: DHCP Setup configure

#### 3.3.8 Site Blocking Configuration:

Site Blocking Rules: "Such as YouTube and Facebook"

Regexp>

```
^. + (youtube.com).*$,
```

^. + (facebook.com).\*\$

This is the rule for block site, we need to apply these rules.

"IP>IP address>IP assign 172.10.0/24>Firewall>New firewall 7 Protocol>YouTube name assign>Apply Ok>New firewall rule>General>source address IP assign 172.10.0/24>Apply Ok".<sup>[6]</sup>



Quick Set	Address Unt			
I CAPSMAN	+			Find
Interfaces	Address	/ Network Interface		
T Wreless	+ 172.50.10.1/24 + 192.168.50.24/24	172.50.10.0 saddam 192.168.50.0 ether2		
Bridge	9 132 100 30 24 24	132.100.30.0 60.612		
PPP				
witch				
📽 Mesh	Frewat			
gi IP (		Raw Service Ports Connections Addres	Liste Laver7 Protocols	Line Line
MPLS 1	Annual Sciences Concerned Concerning Concerning			· · · · · · · · · · · · · · · · · · ·
Routing 1		New Firewall L7 Protocol		Find
💮 System 🕴	Name / Regexp	com) *\$ Name: voutube	ОК	•
Cueues	● fb ^.+facebo	iok.com).*\$	Regexp: Cancel	
Files		^.+(youtube.com).*\$	Apply	
E Log			7657	
Radius			Comment	
🗶 Tools 🕴			Сору	
New Terminal			Remove	
LCD				
MetaROUTER			1994	
Partition				
Make Supout If	2 items			

#### Figure 3.3.8.1: Block IP configure and create rule

**O** Step 2:

Guick Set	Address List			New Firewall Rule					۵×
CAPsMAN	+ - 🖌 🗶 🗂 🍸			General Advanced E	otra Action Statis	lics	ОК		Find
Interfaces	Address	/ Network		Chain:	Forward	Ŧ	Cancel		*
T Wireless		172.50.1		Src. Address:	172.50.10.0/24		Apply		
Bridge						-	(Abb)		
PPP 📲				Dst. Address:			Disable		
🛫 Switch				Protocol:		-	Comment		
°t <mark>8</mark> Mesh	Frewal			Src. Port:		-	Сору		
IP I	Filter Rules NAT Man	ngle Raw Serv	ice Ports Conne			-	Remove		
MPLS 1			Reset Counters	Dat, Fort,		- 1		1	
😹 Routing 🗈 🗈				Any. Port:	<u> </u>	-	Reset Counters	<b>₩ Ŧ</b>	
💮 System 🗈 🗠		Chain Src. forward	Address	P2P:		•	Reset All Counters	Pack	
Queues	1 X 3€drop 1	forward		In. Interface:		-		D B	
🧱 Files		forward forward 172	50.10.0	Out, Interface:		•		08	
E Log		forward forward	30.10.0	GUL, FREHOUE.		_		4B 17	
🔏 Radius			50.10.0 50.10.0/24	In. Interface List:		-		0 B NB	
🗙 Tools 🗈 🕅	6 Xdrop f	forward 172	50.10.0/24	Out. Interface List:		•		NB	
New Terminal									
LCD				Packet Mark:		•			
MetaROUTER				Connection Mark:		-			
緀 Partition				Routing Mark:		-			
Ake Supout of	•			a constant a second		5.1		•	
Manual	7 items			Routing Table:		- 1			
S New WinBox				Connection Type:		•			
Exit				Connection State:	<u></u>				
						- 1			
				Connection NAT State:		-			

Figure 3.3.8.2: IP source configure, drop and forward

## **O** Step 3:

🔏 Quick Set	Address List							6,
CAPsMAN	+ -	🖌 🗶 🔁 🍸						Find
Interfaces	Address		/ Network	Interface				
🚊 Wireless		.50.10.1/24 .168.50.24/24	172.50.10.0 192.168.50.0	saddam ether2				544 
Bridge	0 132	.100.30.24/24	132.100.30.0	eu lei z				
PPP								
🕎 Switch								
°t <mark>8 Mesh</mark>	Fin	ewall						
IP	N	iter Rules NAT Mangle		C	11 11 1 1 1 1 1 1 1 1 1	or7 Protocolo		
Ø MPLS		and processing processing processing	Haw Service Port	s Connections A	Idress Lists Laye	er / Protocols		
😹 Routing							Find	
💮 System		lame / Regexp ⊛fb ^.+(faceboo	l				<b>T</b>	
Queues		ID .+(iacebook	K.Com). Ş					
Files								
📄 Log								
🧟 Radius								
💥 Tools								
Mew Terminal								
LCD								
Partition								
📑 Make Supout.rif								
Manual		item						
Mour MinBox								

Figure 3.3.8.3: Final Result of Site Block

#### 3.4.1 Installation of Linux CentOS 6.4:

In this session, I will show that how to install **CentOS 6.4** using the ISO image file in USB device.<sup>[7]</sup>

#### 3.4.2 CentOS 6.4 Installation Guide:

1. First we need to download the **CentOS 6.4** DVD ISO image file and then create a bootable USB stick using LiveUSB Creator called **Rufus**.

2. After that, boot our pc and select the bootable USB, press any key to access the Grub boot menu, then select USB disk and click **Enter to Install**.

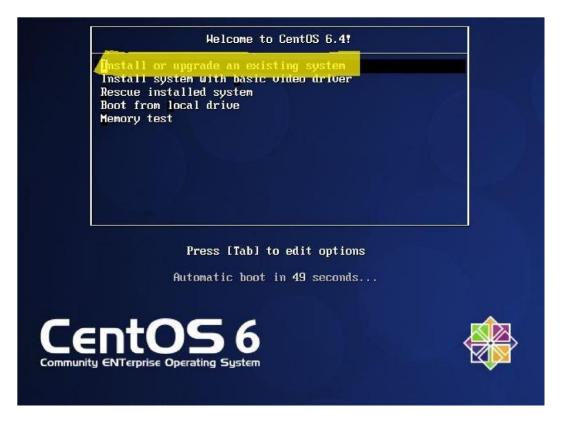


Figure 3.4.2.1: CentOS 6 installation Welcome Screen

**3.** Click on Next to proceed, then choose the **installation language** package whatever you wish to use, and click on Next.



Figure 3.4.2.2: Language pack for Setup

**4.** Select the appropriate **keyboard layout** you wish to use such as "**U.S. English**" and click on **Next** and select the **storage devices** and click **Next** to install process.

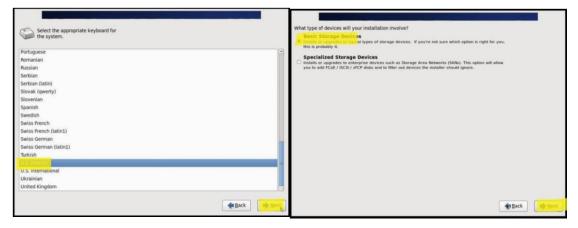
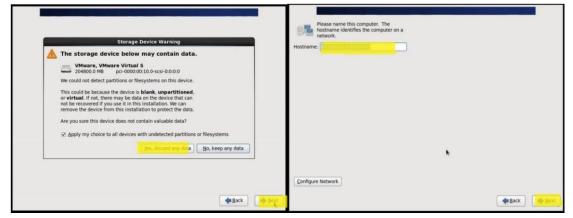


Figure 3.4.2.3: Keyboard Type and Storage Selection

**5.** In storage device warning, select the option to **clear data** on the storage disk by selecting **Yes**, discard any data and click **Next**. Now set the **Hostname** and click **Next**.



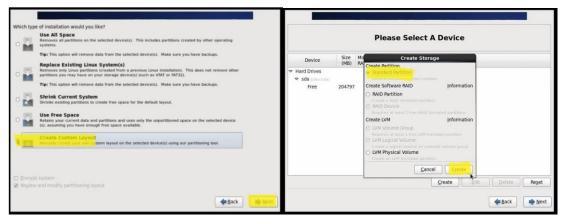
**6.** Set the **Time zone** for your location and click **Next** to proceed, then set the **root** user password and confirm it and click on **Next**.

Please select the nearest city in your time zone:	The root account is used for administering
	the system. Enter a password for the root user.
	Root Password:
💽 🕺 💎 🔊 . A	
Carlosse .	
selected city: Dhaka, Asia	
AsiaChaka	
*	
e Back	the Back

Figure 3.4.2.4: Time Zone Selection

**7.** Now, you need to choose which type of installation you want to install. Now flow the instruction step by step for partition all drive.

Step 1:



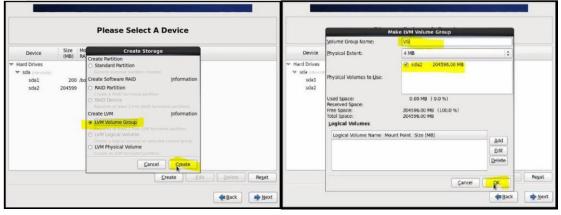
Mount Point:     Coot       Device     File System Type:       vida //doc/dat       Pree       Allowable Drives:       Size (MB):       200       Additional Size Options	
File System Type:     ext4       File System Type:     ext4       Sda /decordeds       Free       Allowable Drives:       Size (MB):	
<ul> <li>✓ sda indevideat</li> <li>Free</li> <li>Allowable Drives:</li> <li>Size (MB):</li> </ul>	
Free     Allowable Orives:     Image: State of the state of	
Size (MB):	
General Street S	
O Fill all space up to (MB):	
Fill to maximum allowable size	
Force to be a primary partition	
Encrypt	

Figure 3.4.2.5: Partition layout Selection

# Step 2:

	Please Select A Device			Add Partition	
Device Size (MB) Hand Drives ♥ 5da (devinda) 5da 22 Free 20459	Create Partition Standard Partition General porpose partition creation /bo Create Software RAID Information	Device ♥ Hard Drives ♥ sda Jacobie Free	Allowable <u>prives</u> : Size (MB): Additional Size C Fixed size Fill all space Fill to maxim	O Drive         IModel           Ø sda         204800 MB         VMware, VMware Virtual S           200	
	Çreate Ed	Delete Reset	Encrypt	Cancel OK	lete Re

Step 3:





Fre	M Volume Group VG (204596 MB)	LVM Volume Group VG (2		
Device	Size MB Size Create Storage (MC Create Partition Create Partition Standard Partition	<u>V</u> olume Group Name: /ice <u>P</u> hysical Extent:	VG 4 MB	
LVM Volume Groups     VG     VG     Free     Hard Drives     sda1     sda1	Santano variano     Santano variano     Santano variano     Santano variano     Santano variano     Santano     Santano	Physical Volum Mount Point: Used Space: Eile System T	Ø såd2     204596.00 MB       Make Logical Volume        < Not Applicable>        ype:     swap        < Logikolito	]

Step 5:

Please Select A Device			ice		Please Select A Device
Device	Size Mount Point (MB) RAID/Volum		Format	Device	Size Mount Point/ Format Warnings
<ul> <li>UM Volume Groups</li> <li>♥ VG LogVol01</li> <li>LogVol02</li> <li>♥ Hard Drives</li> <li>♥ dat (unevrisat) sda1</li> <li>sda2</li> </ul>	204596 100000 / 2048 102548 /home 200 /boot 204599 VG	ext4 swap ext4 ext4 physical volume (LVM)	555 55 K	LVM Volume Groups     VG     LogVol01     LogVol02     LogVol02     VHard Drives     sda Conversary     sda     sda2	Eormat     Cancel     Eormat
		Create	Edit Delete Reset		Create Edt Delete Reset

**13.** Then **Click Write changes to disk** and then click **Next** to proceed and now, **select** the installer to install the boot loader, then click **Next** to start installation process of files.

Please Select A Device	Install boot loader on /dev/sda.     Change device     Use a boot loader password     Change password	
Device Size Mount Point/ Type Format	Boot loader operating system list	
from the second s	Default Label Device	Add
	CentOS /dev/mapper/VG-LogVol01	Edit
Writing storage configuration to disk		Delete
The partitioning options you have selected in move be write to disk. Any data on deleted or reformated partitions will be lost.  Go back  Write chargees to disk.	Installation Progress Retrieving installation information for CentOS.	
Create Edit Delete	Reget	
	Next	

15. For GUI Select Desktop and then click **Next** to proceed and wait for until complete the installation.

The default installation of CentOS is a minimum different set of software now.	i install. You can optionally select a			
Minimal Desktop     Minimal     Basic Server     Database Server     Web Server     Virtual Host     construction Manufacturation.     Please select any additional repositories that ye	w want to use for software installatio		CentOS 6 Community Extrements Dynamics System	
			Packages completed: 621 of 10 Installing farsight2-0.0.16-1.1.el6.x86_64 (484 KB) Libraries for videoconferencing	89
الله Add additional software repositories	Modify repository	]		
management application.  Customize later Customize now		Rack Next		🖡 🏘 Back 🛛 🔹 Mext

17. After rebooting and starting all services, you will land at the Welcome screen, click on Forward to continue. Now, agree to the CentOS License Agreement and click on Forward.

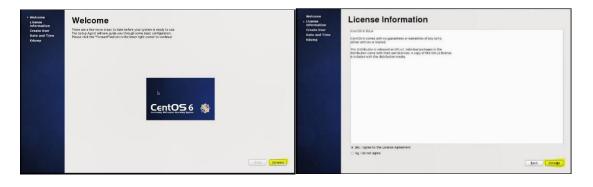


Figure 3.4.2.6: CentOS License Agreement

18. Now create an additional user, enter the username, full name and set for it a password and confirm the password and click Forward to proceed. Next, set the Date and Time for your system. It is recommending to synchronize data and time over network. Once you are done, click Forward.



Figure 3.4.2.7: CentOS User Create, Date and time setting

**19.** Finally, log into new **CentOS 6.4** system as shown. Use your Username and Password to log in.<sup>[8]</sup>



Figure 3.4.2.8: CentOS User Login and Welcome Screen

#### 3.4.3 Introduction to Linux Kernel and Shell:

#### Kernel:

The kernel is a computer program that is use for the core of a computer's operating system, with complete control over everything in the system. The manages resources of the Linux system is–

- Process management.
- Memory management.

- I/O management.
- File management.
- Device management etc.

#### Shell:

A shell is special user program which based on interface to user to use operating system services. Shell program accept human readable commands from user and convert them into something which kernel can understand. It is a command language interpreter that execute commands read from input devices such as from files or keyboards. The shell started when the user log in or start the terminal program. <sup>[9]</sup>

Shell is broadly classified into two categories -

- Command Line Shell
- Graphical shell

😑 🗇 💿 💿 overide@Atul-ł	IP: ~					
overide@Atul-HP:-S 1	-1					
total 212						
drwxrwxr-x 5 overide	overide 409	5 May		03:45	acadenv	
drwxrwxr-x 4 overide	overide 409	5 May		18:20	acadview_dem	
drwxrwxr-x 12 overide	overide 409	5 May		15:14	anaconda3	
drwxr-xr-x 6 overide	overide 409	5 May		16:49	Desktop	
drwxr-xr-x 2 overide	overide 409	5 Oct		2016		
	overide 4096				Downloads	
-rw-rr 1 overide	overide 898	Aug		2016	examples.des	ktop
	overide 4500					
	overide 4514				hs_err_pid20	06.log
		5 Mar		18:22		
drwxrwxr-x 21 overide					Mydata	
		5 Sep			newbin	
drwxrwxr-x 5 overide					nltk_data	
					Pictures	
		S Aug	8		Public	
					scripts	
	overide 409				Templates	
				11:22		
					Videos	
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Figure 3.4.3.1: Command Line Shell and Graphic Shell

3.4.4 How to break Root password in Linux OS:

In VMware we have to do at first

press ctrl alt delete or restart the system >space press > e >kernel /vmlinuz select>e>space 1>enter >b>passwd>new password input>retype password> init 6>login root user with new password then apply.

**O** Step 1:

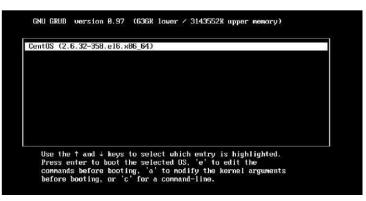


Figure 3.4.4.1: Press space to select centos version mode

**O** Step 2:

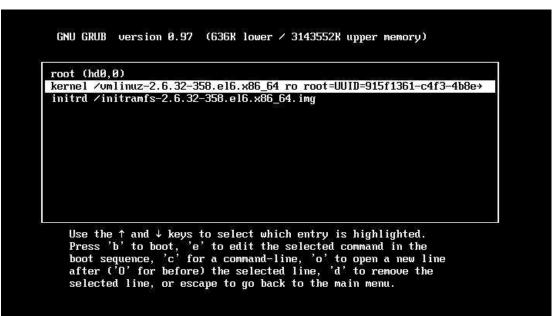


Figure 3.4.4.2: Select Kernel mode

Telling INIT to go to single user mode. init: rc main process (1229) killed by TERM signal [root@localhost /]# root bash: root: command not found [root@localhost /]# passwd Changing password for user root. New password: BAD PASSWORD: it does not contain enough DIFFERENT characters BAD PASSWORD: is too simple Retype new password: passwd: all authentication tokens updated successfully. [root@localhost /]# \_

Figure 3.4.4.3: Password Configuration

#### 3.4.5 Static IP Routing Configuration with Linux:

For Static IP routing, at first configure IP Address, Network and Gate Way By **# vim ifcfg-eth0** and follow my image instruction. <sup>[10]</sup>

#### **O** Step 1:

```
[root@localhost ~]# cd /etc/sysconfig/network-scripts/
[root@localhost network-scripts]# ls
                                                        init.ipv6-global
ifcfg-eth0
            ifdown-isdn
                           ifup-aliases ifup-plusb
ifcfg-lo
            ifdown-post
                           ifup-bnep
                                         ifup-post
                                                        net.hotplug
ifdown
            ifdown-ppp
                           ifup-eth
                                         ifup-ppp
                                                        network-functions
ifdown-bnep ifdown-routes ifup-ippp
                                                        network-functions-ipv6
                                         ifup-routes
ifdown-eth
            ifdown-sit
                           ifup-ipv6
                                         ifup-sit
ifdown-ippp ifdown-tunnel ifup-isdn
                                         ifup-tunnel
ifdown-ipv6 ifup
                                         ifup-wireless
                           ifup-plip
[root@localhost network-scripts]# vim ifcfg-eth0
```

File Edit View Search Terminal Help DEVICE=eth0 HWADDR=00:0C:29:D1:AC:1F TYPE=Ethernet UUID=fdf57d75-46e8-491c-9328-798e5a91b6b4 ONB00T=yes NM\_CONTROLLED=yes B00TPR0T0=static IPADDR=192.168.50.35 NETMASK=255.255.255.0 GATWAY=192.168.50.1

Figure 3.4.5.1: IP Configuration Static

**O** Step 2:

DNS server configuration by pressing **# vim /etc/resolv.conf** and assign DNS name server

```
[root@localhost ~]# cd /etc/sysconfig/network-scripts/
[root@localhost network-scripts]# ls
                           ifup-aliases ifup-plusb
            ifdown-isdn
                                                            init.ipv6-global
ifcfg-eth0
             ifdown-post
                             ifup-bnep
ifcfg-lo
                                            ifup-post
                                                            net.hotplug
                                                            network-functions
ifdown
             ifdown-ppp
                             ifup-eth
                                            ifup-ppp
ifdown-bnep ifdown-routes ifup-ippp
                                            ifup-routes
                                                            network-functions-ipv6
ifdown-eth
             ifdown-sit
                             ifup-ipv6
                                            ifup-sit
ifdown-ippp ifdown-tunnel
                             ifup-isdn
                                            ifup-tunnel
ifdown-ipv6 ifup
                             ifup-plip
                                            ifup-wireless
[root@localhost network-scripts]# vim ifcfg-eth0
[root@localhost network-scripts]# vim ifcfg-eth0
[root@localhost network-scripts]# vim /etc/sysconfig/network-scripts/ifcfg-eth0
[root@localhost network-scripts]# vim /etc/resolv.conf
# Generated by NetworkManager
# No nameservers found; try putting DNS servers into your
# ifcfg files in /etc/sysconfig/network-scripts like so:
```

```
# DNS1=xxx.xxx.xxx.xxx
# DNS2=xxx.xxx.xxx.xxx
# DOMAIN=lab.foo.com bar.foo.co
nameserver 8.8.8.8
```

nameserver 8.8.4.4

Figure 3.4.5.2: DNS Name server Configuration

#### **O** Step 3:

willson@localhost:/etc/sysconfig/network-scripts	- 0 *
Eile Edit View Search Terminal Help	12
Starting NetworkManager daemon: [ OK	]
<pre>[root@localhost network-scripts]# service NetworkManager restart</pre>	
Stopping NetworkManager daemon: [ OK	]
Setting network parameters [ OK	]
Starting NetworkManager daemon: [ OK	]
<pre>[root@localhost network-scripts]# service NetworkManager restart</pre>	
Stopping NetworkManager daemon: [ OK	]
Setting network parameters [ OK	]
Starting NetworkManager daemon: [ OK	]
<pre>[root@localhost network-scripts]# service NetworkManager stop</pre>	
Stopping NetworkManager daemon: [ OK	]
[root@localhost network-scripts]# chkconfig NetworkManager off	
[root@localhost network-scripts]#	
<pre>[root@localhost network-scripts]# service NetworkManager status</pre>	
NetworkManager is stopped	
<pre>[root@localhost network-scripts]# service network restart</pre>	
Shutting down interface eth0: [ OK	]
Shutting down loopback interface: [ OK	1
Bringing up loopback interface: [ OK	]
Bringing up interface eth0: ^[ [ OK	]

Figure 3.4.5.3: Service Network Restart

**O** Step 4:

When all configuration is complete then ping the IP **# ping 192.168.50.1** 

willson@localhost:/etc/sysconfig/network-scripts				- O X
Eile Edit View Search Terminal Help				
Bringing up loopback interface:	[	OK	]	2
Bringing up interface eth0:	[	OK	1	
<pre>[root@localhost network-scripts]# vim /etc/resolv.conf</pre>				
<pre>[root@localhost network-scripts]# service network restart</pre>				
Shutting down interface eth0:	[	OK	]	
Shutting down loopback interface:	[	OK	]	
Bringing up loopback interface:	]	OK	]	
Bringing up interface eth0:	[	OK	]	
<pre>[root@localhost network-scripts]# vim /etc/resolv.conf</pre>				
<pre>[root@localhost network-scripts]# vim /etc/resolv.conf</pre>				
<pre>[root@localhost network-scripts]# ping 192.168.50.1</pre>				
PING 192.168.50.1 (192.168.50.1) 56(84) bytes of data.				
64 bytes from 192.168.50.1: icmp_seq=1 ttl=64 time=19.2 ms				
64 bytes from 192.168.50.1: icmp seq=2 ttl=64 time=1.62 ms				
64 bytes from 192.168.50.1: icmp seq=3 ttl=64 time=0.978 ms				
64 bytes from 192.168.50.1: icmp seq=4 ttl=64 time=1.79 ms				
64 bytes from 192.168.50.1: icmp seq=5 ttl=64 time=2.91 ms				
64 bytes from 192.168.50.1: icmp seq=6 ttl=64 time=2.98 ms				
64 bytes from 192.168.50.1: icmp seq=7 ttl=64 time=2.25 ms				
64 bytes from 192.168.50.1: icmp seq=8 ttl=64 time=1.34 ms				
64 bytes from 192.168.50.1: icmp seq=9 ttl=64 time=2.04 ms				
64 bytes from 192.168.50.1: icmp seq=10 ttl=64 time=0.925 m	าร			
64 bytes from 192.168.50.1: icmp seq=11 ttl=64 time=2.93 ms				
				2

Figure 3.4.5.4: IP Ping of Static Routing

# CHAPTER 4 Conclusion and Future Career & Scope

#### 4.1 Conclusion and Discussion:

In short of my internship project I will learn about configuring network by MikroTik and Linux platform and how to make and configure network. I will also learn and complete understanding about IP Classes. Main learning of this project was how to configure ISP link, bandwidth Control in different ways, bridge mode configuration, Firewall and NAT Configuration, Network Security, Linux installation, Run level of Linux, Linux server administration. All of the instruction helps and improved me to increase build my job aims and career skillful. That's why now I can create ISP based setup and administration on the Linux platform and provide entry-level work and support. This project is completely hand course and provides information and aptitudes which will introduce me to a Linux server for informative, informative and basic system administration. Along with improving the most recent forms and server security, we always see the reconstruction and role of the programming department. The MikroTik and Linux operating system provide us a comprehensive introduction of steady, reliable and successful administration. The Linux system provide us almost all system administrators, Web server pioneer, SS, Telnet, DNS, FTP, mail server and so one. Now, today most of the organizations are highly dependent on their work on the network thought Internet. Therefor a proper network design is very important think of an organization, without this it is not possible to manage all network support.

#### 4.2 Future Career & Scope:

In real life finding a job can be a big challenge of anyone of our country, especially if we have no experience. That's why I choose internship, because it can help me to improve my career opportunity into an experience. So, this internship provides me to find scope in future life:

➢ Work in ISP based platform.

- ➢ Work at as an IT manager of a company.
- ➢ Work at as a Network Engineer.
- ▶ Work at as a technical support and security manager.

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## **APPENDICES**

#### **Appendix: Company Information**



# Daffodil Online

#### **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

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