### Internship on Microtik certified Network Associate (MTCNA) 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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# DAFFODIL INTERNATIONAL UNIVERSITY DHAKA, BANGLADESH JANUARY-2022

### APPROVAL

This Internship titled "Microtik certified Network Associate (MTCNA)" submitted by Md. Omar Faruq Patwary, ID: 151-15-5169 International University, has been accepted as satisfactory for the partial complete 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 06-Jan 2022.

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### DECLARATION

I prepared the internship report, Md. Omar Faruq Patwary, ID: 151-15-5169 Daffodil International University's Department of Computer Science and Engineering, under the leadership of **MS**.

**Subhenur Latif, Department of CSE** and Daffodil International University. I am declaring that, I gather data for Daffodil Online Limited (DOL), a Data Center and Internet Service Provider (ISP) based company, as well as for books and the internet.

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Ms. Subhenur Latif, Daffodil International University, Department of Computer Science and Engineering, Dhaka, is my course teacher, and I am quite pleased of her. My supervisor's extensive knowledge and deep interest in the topic of "Microtik certified Network Associate (MTCNA)" enabled me to finish this internship

Professor Dr. Touhid Bhuiyan, Professor and Head, Department of CSE, deserves my heartfelt gratitude, as well as the CSE department's other academics and employees at Daffodil International University, for their assistance in completing my internship. I'd want to express my gratitude to everyone in our Daffodil International University course who contributed to the completion of the course work. I also want to express my gratitude to a classmate who assisted me in preparing the report and working.

Finally, I must respect my honour and respect for my parents to giving the opportunity, and support to me to come this places.

### ABSTRACT

"Microtik certified Network Associate (MTCNA)" is the title of my internship. I use a MikroTik Router, a Switch, and Linux. The Internet is essential for communicating with one another. As a result, I see a lot of opportunities to improve my networking skills in the future. I believe that once upon a time, many companies entered the market to assist and secure our data. As a result, we require a large number of network engineers. As a result, the market provides numerous opportunities to begin a career. That is why I chose "Microtik certified Network Associate (MTCNA)" as my internship topic.

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# CHAPTER 1 INTRODUCTION

#### **1.1 Introduction**

This is the age of information technology. Servers are being used by a large number of individuals all over the world, and they are a component of Internet technology. Linux is widely regarded as the most significant free software success since, if not more recently, the original Space War. We can't do anything involving Internet communication until we have a server. As a result, DNS servers are critical for Internet technology. The internship approach is an old practice that helps students comprehend the real world of work, the surroundings, and the obstacles that come with it. Internships are important in all areas of study, but they are especially important before receiving a degree.

Every business, corporation, and job education is now heavily reliant on software-based communication and Internet technologies. We like to use more E-services, often known as E-Commerce. E-government, Internet Banking, SMS Alert Banking, Mobile Banking, EFT (Electronic Fund Transfer), and other services are not possible without a server. DNS (domain name system) is yet another extremely useful server that we may use to run numerous services such as Internet technology, e-mail, e-business, telecommunications, and mobile technology. These functions are not possible in the absence of a server and DNS. I'm sure it's one of them. Today's banking industry, transportation, and other corporate organizations rely fully on various forms of software and Online technology, and the server is vital.

Banking Software, ATM Technology (Switching Software), Debit Card, Credit Card, Online Transactions, and so on are all heavily reliant on software and various types of servers, one of which being Linux. It has evolved into a commercial, education, and personal productivity operating system.

#### **1.2 Motivation**

At Daffodil International University, I am now studying a Bachelor of Science in Engineering in Computer Science. I recognize the value of hands - on experience, which is rich in textbook understanding and real-world problem solving. My dream is to establish me as a network security expert. And I enjoyed that networking job very much. During my internship, I discovered that the intricacies of Linux network and server management, as well as MikroTik details, are inefficient.

As an Internet service provider, I've made it a point to engage with individuals in order to better comprehend their requirements and give them with superior services. My abilities remain in my capacity to read and understand the issue, as well as to work fast and beautifully. I also witnessed the server's work and responsibility. I believe that my work will help me to be more successful in life.

#### 1.3 Object of Internship

The ultimate purpose of my internship program is to prepare me to compete in a competitive employment market. As a result, this skill development strategy is incredibly effective. I'd like to collect some remarkable qualities in order to provide myself as a skilled one and make my dream come true.

The computer science internship is designed to provide work experience while students are still in high school or college, to coordinate job experience with academic training, and to assist students who are self-motivated, self-directed, and eager to work in making the transition from classroom to job.

#### 1.4 An Overview of the Company

Daffodil Online Limited. takes pleasure in being one of Bangladesh's premier countrywide Internet Service Providers (ISPs). They are the most experienced and oldest firm in the field of information technology, and their basic business ethics include long-term customer connections. When we look back over the decade since our inception, they are extremely proud of what they have accomplished and even more excited about the future potential. It may be of interest to you to know that they began operations in 2002. Based on client recommendations and time restrictions, they have increased their operating and service portfolio over the years. They built their reputation by working on numerous national initiatives and with international organizations. They are utilizing cuttingedge technology and improving services as needed. With a highly efficient technical knowledge group, their Corporate Network Solution department is capable of providing cutting- edge network and telecommunication solutions.

#### **1.5 Layout of the report**

I described the internship's goal, motivation, and introduction to the firm in Chapter 1.

I detailed the process of my internship in Chapter 2. And this chapter tells you where you can get an internship to help you with this program. Also included are details about how the internship was carried out, about the organization, what IT services are provided by DOL, and what roles exist in the Linux employment market.

I explored daily duties and activities, Events and Activities, and Challenges in Chapter 3.

Chapter 4 discusses Earned Competencies, Smart Planning, and Reflections.

Conclusion and Future Scope are discussed in Chapter 5. I offer a conclusion after discussing the Linux's Future Scopes

### CHAPTER 2

### **ORGANIZATION OF INTERNSHIP**

#### **2.1 Introduction**

Daffodil Online Ltd. (DOL) is proud to be one of Bangladesh's first and longest-running ISP/ ASPs, offering one-stop integrated ICT services and solutions since July 2002. It makes corporate, small and medium-sized businesses, and individuals service its own fiber optic and radio connection in a hazy infrastructure.

The Institute is involved in a number of national programs, many of which are associated with highly regarded international organizations.

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It makes use of cutting-edge technology and services whenever an upgrade is required. With a team of highly skilled technical professionals in the Corporate Network Solutions division, The Center can offer cutting-edge network and telecommunications solutions. DOL has a very strong professional engineering and management team that is certified by Sun, Cisco, Microsoft, Linux, and Oracle, and is actively involved with the world's best computing associations like as IEEE-ACM, ACS, BCS, and PMI.

Its Corporate Social Responsibility program fosters a sense of responsibility in the community, workplace, location, and market environment. DOL emphasizes three core platforms through its activities and services as a Group concern: education, nation-building, and the environment[1].

#### 2.2 Situation of the Product and Market

Daffodil Online Limited is the major national Internet Service Provider (ISP) and is proud to be one of Bangladesh's leading ISPs. They are the most experienced and oldest organizations in the ICT area, where they are the major business policies, and where they have long-term ties. They foresee growth in a decade from our foundation, are quite proud of what we have accomplished, and are much more excited about our possibilities for an equally bright future. Daffodil Online Limited offers a wide range of IT services as well as professional training. This is shown below.

### **IT Services**

- Solution for Corporate Internet
- Security solution.
- Registration of domain names and web hosting.
- Website creation.
- A solution based on open source software
- Provider of Internet Access
- High-speed Wi-Fi Zone
- Data Connectivity, Data Centers, and Co-Location are all terms used to describe data connectivity, data centers, and co-location.

#### **Services for Professional Training**

- Setup and administration of a Linux-based ISP.
- Course in Certified Ethical Hacking (CEH).
- MikroTik ISP Setup and Administration
- Joomla website development.
- For website development, PHP and MYSQL are employed.
- Certified Engineer by Red Hat (RHCE).

#### **2.3 SWOT Analysis**

SWOT reanalysis is a great tool for identifying our strengths and weaknesses in relation to both the changes we encounter and the threats we face.

### Strengths

- Connecting persons who are separated by distance.
- Working from home is simple.
- Starting an Online business.
- Obtaining details.

#### Weaknesses

- New entrants undervalue the level of expertise required to succeed in the market.
  - Large amounts of money are necessary to start a firm.
  - Small resellers struggle to compete.
  - A wide range of pricing and service possibilities.

#### **Opportunities**

- The aging population is shifting.
- The number of households in Bangladesh is developing.
- Imposition of lower taxes.
- Improvements to the regulatory framework.

#### Threats

- The Financial Crisis Homeowners are less willing to raise their mortgages. Broadband subscriptions reflect the stock market's lack of confidence in the digital-communications industry.
- It will be interesting to watch how far customers can be convinced to adopt Internet access.

#### 2.4 Target Group

All individuals and small to medium-sized enterprises are among the company's customers. The company intends to concentrate on SOHO clients because they are the best growth choice for our new high-resolution proposal and have the most potential for the company's growth. If the organization takes the appropriate steps and focuses on customer service, it will continue to grow. Web Solutions feels that this market sector has unique pricing and service requirements, as well as more decision-making, dependable clients. As a result, it is critical for each.

#### 2.5 Organizational Structure

The organizational structure of Daffodil Online Ltd is depicted in Figure 2.1.



Figure 2.1 Daffodil Online Limited's Organization

# CHAPTER 3 DAILY TASK AND ACTIVITIES

### 3.1 Daily Task and Activities

**Month - 1:** I learned and executed the following duties during my first month of internship at Daffodil Online Limited:

- Gaining knowledge and comprehension of network components.
- understanding & Learningthe fundamentals of MikroTik
- MikroTik HDD Partitions: What You Need to Know
- Understanding and learning the fundamentals of MikroTik
- Learning and comprehending the MikroTik Level.
- Installing VMware Workstation

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**Month - 2:** : I learned and executed the following things through my second month of internship at Daffodil Online Limited:

- Centos Commands for Novice
- Management of MikroTik users and passwords.
- In a MikroTik, set the IP address
- Set the ip subnet mask '
- Copying and relocating files and directories.
- File and Directory compression and Decompression.

**Month** – **3**: I learned and completed the following duties during my third month as an intern at Daffodil Online Limited:

- Learning and comprehending the fundamental of Linux.
- Basic command of Linux
- Configuration of Centos IP Addresses

**Month** – **4:** I learn and completed the following tasks throughout my third month of training at Daffodil Online Limited:

- Network cabling systems
- Routing protocols

### **3.2MikroTik Router**

Since 1996, MikroTik, a Latvian company, has been creating routers and wireless ISP systems. In most nations throughout the world, MikroTik currently produces hardware and software for Internet connectivity. The company's products are well-known for being low-cost substitutes for high-cost routers and Ethernet radio relay lines. As of 2016, the company employed more than 100 individuals. [5].

### 3.3RouterOS&Release History

MikroTik RouterOS is a standalone operating system based on Linux. The MikroTikRouterOS, an operating system based on the Linux kernel, is the company's flagship product. When deployed on the company's own hardware (Router board series) or on standard x86-based PCs,

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It turns a PC into a network router and adds capabilities like firewalls, VPN server and client, bandwidth shaper and quality of service, wireless access point operations, and other features that are often used when joining networks. The system has the capability of acting as a captive-portal hotspot. [6].

#### **Release history**

MikroTik has published many versions of RouterOS at various times. Some examples are presented below [7].

- RouterOS version **3**, Jan-2008
- RouterOS version 4, Oct-2009
- RouterOS version 5, Mar-2010
- RouterOS version 6, May 2013

#### **3.4 Features**

RouterOS is MikroTik's stand-alone operating system based on Linux kernel. The following list shows features found in the latest RouterOS. It supports a wide range of applications used by Internet service providers. It can function as a router.

a subset of hardware availability (user maintained)

- Support for switch chip setup
- MAC based access for initial configuration
- Android based configuration tool.

Protocols such as OSPF, BGP, Multi-protocol Label Switching (VPLS/MPLS), Open Flow, and others are supported.

#### **3.5 Useable routers**

In the network world, there are numerous routers, switches, and routing protocols. Different routers and routing protocols are used by different companies and ISPs. That is their favored method. The Mikrotik Router Rb2011UI, Mikrotik Router RB450, CRC1016 and simple switches are Cisco switches, such as the Cisco 2800 series, are used by Daffodil Online. Use Juniper EX-Series in server stations. And for the Wi-Fi networks, Cambium was primarily used, as seen in Figure 3.1.



Figure 3.1: Screen Printto Mikrotik Rouret

### Mikrotik Router Rb2011UiAS

The most popular and easiest of all our Wireless Routers is the Mikrotik Router Rb2011UiAS, which boasts a 600MHz 70K MIPS network CPU. SFP cage, 128 MB RAM, 5GB LAN ports, and Ethernet connections It features a robust dual-chain 2.4GHz 802.11 bgn wireless connection, as well as an RJ45 serial interface and a micro USB port. It also has a touchscreen LCD display, two indoor antennae for wireless power, and a desktop enclosure.

In the Daffodil Online network diagram, a main router is used to take bandwidth and another router is given to it. They connect to a distribution switch, which converts the connection to a different trade, then each determent has LAN and Wi-Fi for the user.

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### **Cloud Core Router**

CCR1016 Cloud Core Router is a good router with a cutting-edge 16 core CPU. If you need to send millions of files every second, this is the perfect router for you. It comes in a 1U rack mount container with twelve Gigabit Ethernet connections, a serial console cable, and a USB port. The CCR1016-12G has two SODIMM slots and comes with 2GB of RAM by default, however RouterOS 06 has no memory restriction (will accept and utilize 16GB or more). It includes a power supply as well as a 1U rack mount case. This device is aimed at medium-sized network providers and attempts to be a cost-effective alternative to other more well-known brands, as seen in Figure 3.2, a cloud core router. CCR1016 [9].



Figure 3.2: Screen Print to Cloud Core RouterCCR1016

#### Cisco 2800 series

The Cisco2800 series of smart, fixed-configuration Gigabit switches offer reliable switching capabilities to expanding mid-size businesses that require a cost-effective dynamic routing and Layer 3 switching solution that is built for scalability which is shown in figure 3.3.



#### Figure 3.3: Screen Print to Cisco2800 series

#### MikroTik OS Step in Linux

MikroTikRouterOS is a router and thin router operating system based on Linux. It does not necessitate any additional resources. The basic steps for installing and configuring a running MikroTikrouterOS are described here.

Step1: Open a new computer in virtual box and move to the next to check custom button. Then pick the option to the disk, enter the machine's name, and select next, as shown in figure 3.4.



Figure 3.4: Screen Print create a new virtual machine

Step2: After that, go to the virtual machine settings and add the IOS storage CD/DVD location. Then, under Network Adapter, add an additional network adapter. In this network adapter 1, click custom and select Vmnet08 (NAT) for network adapter 1 and Vmnet0 for network adapter 2. Then, as shown in Figure 3.5, click OK to start the installation.

-10100a	Dia X m	Salar Stational Systematic				2	1
Lubery * *	taskilur	Terns Terns	Success 105 1 2 GB Using Tel C Libert PCK Deside Land	August 11gan	Deves glata Corrected Correct at passe at Asses Waged		×
	Devices     Minimum     Minimum     Devices     Minimum     Dia (00)     CO1040 (00)     Sound Cast     Sound Cast     Sound Cast     Description     Loss register	Source Card An Alter English	What have of hardware do you want to relat?		o servit to Facility		
						a tant Tanda	set
			ANL	lattore			L

Figure 3.5: Screen Print adding network adapter

Configuration network adapter whih is shown in figure 3.6.



Figure 3.6: Screen Print to configuration network adapter

A print to complete install which shown in figure 3.7.



Figure 3.7: Screen Print to complete install.

### **3.6 Static routing**

Assigning IP addresses to the WAN and LAN interfaces is the first step in configuring a MikroTik router. So, to configure your new MikroTik router's WAN and LAN IP addresses, follow the steps below.

On the power MikroTik router, set up a Mikrotik router. Then connect the UTP cable to the MikroTik LAN port and the PC via the other port. Also, give ISP a WAN connection in a port. Open Win box now. [8].

**Step1:** Enter your IP address and MAC address into WinboxGUI. Click on the Mac address, then in the login field, type 'admin' (this is the default), and then OK. As demonstrated in Figure 3.8, there is no need to input a password.

Connect To Login:	4C 5E 0C 28 54 65			□ Ke	ep Pasevo xen in New	ed Windov
	Add/Set		Connect To RoMON Co	nnect		
Managed Neigh	bon					
Managed Neigh	bon			Find	(Pv4)	only ¥

Figure 3.8: Screen Print to connecting win box interface

Step2: Now go to the text and click ip, then pick address list and click plus, then give two ip addresses, one Lan and the other Wan, and then select the cross button as shown in figure 3.9.

8	Cel Safe Mode Guick Set CAPsMAN	Session:	D4:CA:6D:83:DE:E9			
	🖀 Quick Set 🗊 CAPsMAN					
	CAPSMAN					
1	Interfaces					
	🛴 Wireless					
	🔓 Bridge					
Q.	PPP	Ac	ldraee liet			
9	定 Switch					
•	t <mark>8</mark> Mesh			1.0.0	Find	
12	된 IP 비	×	Address	172 16 1 0	ether2	
	MPLS	×	帝 192.168.50.209/24	192.168.50.0	ether1	
3	Routing	×.				
4	🕃 System	<ul> <li>Image: A set of the set of the</li></ul>				
6	Queues					
	Files					
0	Log					
3	🥵 Radius					
	Tools	1				
$\times$	New Terminal					
8	LCD	+			•	
ul l		21	tems			
5	Partition					
00	Ante Supout.rif					
a (	😧 Manual					
no	New WinBox					

Figure 3.9: The address List

Step3: Insert the Gateway in the document by first going to ip, then clicking route, and coming up with a text here a gateway option, put the gateway as shown in figure 3.10.

admin@D4:CA:6D:83	:DE:E9 (MikroTik) - WinBox v6.42.2 on RB2011UiAS-2HnD (mipsbe				
C C Safe Mode	Session: D4:CA:6D:83:DE:E9				
A Guick Set     CAPsMAN     Min Interfaces     CAPsMAN     Min Interfaces     CAPsMAN     Min Interfaces     System     Constraint      Org     Oucues     Oucues     Coucues     Coucues     Coucues     New Teminal     LCD     Make Suport Iff     Make Suport Iff     Make Suport Iff     Oucues     Make Suport Iff     Oucues     Make Suport Iff     Oucues     Oucues	Rode Litt     □ ★       Rodes     Nexthops       Poil     Boll       Poil     Poil       Poil     Boll       Poil     Poil       Poil     Poil	New Route General Attributes Dat. Address: [0.0.0.0/0 Gateway: [152:168.50.1 Check Gateway: Type: unicast Distance: Scope: [30 Target Scope: [10 Routing Mark: Pref. Source:		÷	OK Cancel Apply Disable Comment Copy Remove
Son New WinBox		enabled	active		
Exit					

Figure 3.10: The Gateway in the text

Step4: To set up a DNS server, first pick IP, then go to DNS and enter the DNS as shown in Figure 3.11.

	Session: D4:CA:6D:83:DE:	E9		
Quick Set		New NAT Rule		
I CAPSMAN		Advanced Extra Action Statistics		OK
New Interfaces		Action: masquerade	Ŧ	Cancel
🗊 Wireless				Apphy
Bridge			4	, apply
PPP		Log Prefix:	-	Disable
Switch		To Ports:	1-	Comment
°t≋ Mesh	Firewall			Сору
IP P	Filter Rules NAT Mangl			Remove
MPLS N	+ - < = =			
😹 Routing 🗈 🏱	# Action Chain			Reset Counters
tie System ►	0 ≓ll mas… srcnat			Reset All Counte
Queues				
Files				
Log				
🥵 Radius				
🔀 Tools 🗠				
New Terminal				
LCD				
E LCD MetaROUTER				
MetaROUTER				

Figure 3.11: Farewell Setup

Step5: DNS Server set up at first we should select Ip then go to DNS and put the DNS which is shown in the figure 3.12.

C* Safe Mode	Session:	04:CA:6D:83:DE:E9				
Cuick Set						
CAPSMAN						
Interfaces						
Wireless						3
Bridge	D	NS Settings				4
PPP		Servers:	203.190.10.252	<b>\$</b>	ок	
🕎 Switch			8.8.8.8	<b>\$</b>	Cancel	
°t8 Mesh		Dynamic Servers:	[		Apply	
1255 IP						
MPLS			Allow Remote Reque	ests	Static	
😹 Routing 🗈 🗠		Max UDP Packet Size:	4096		Cache	
System h		Query Server Timeout:	2.000	s		
Queues		Query Total Timeout:	10.000			
Files		Guery Fotal Filleout.	10.000	3		
E Log		Max. Concurrent Queries:	100			
🥵 Radius		Max. Concurrent TCP Sessions:	20			
💥 Tools 💦			E-case-re-re-	1		
New Terminal		Cache Size:	2048	KiB		
LCD		Cache Max TTL:	7d 00:00:00			
MetaROUTER		Cache Used:	17 KiB			
Partition						12
🛄 Make Supout.rif						
🕢 Manual						
S New WinBox						

Figure 3.12: The DNS server

Step6: We go to the interface list and display the interface list to see which port of the router is enabled, as shown in figure 3.13.

Section Setting Dathbard (MikroTik) - WinBox v6.42.2 on RB2011UiAS-2HnD (mipsbe)

C- Jaio Mo	ode Session: D4:CA:6D:83:	DE:E9										
Guick Set												
CAPSMAN												
Miralaaa												
		_										
Bridge		Inter	face List									
PPP		Inte	face Interface Lis	Ethemet FolP Tunnel	IP Tunnel	GRE Tunnel VI	AN VERP Bonding 11	re				2023
Switch					IT FOREIGN		of the bonding c					
8 Mesh		-		Detect Inte	emet							Find
0 ID	N		Name	/ Туре	Actual MTU	L2 MTU Tx	Rx	Tx Pad	(et (p/s)	Rx Packet (p/s)	FP Tx	
e ir		R	ether1 WAN	Ethemet	1500	1598	0 bps	0 bps		D	0	0 bps
MPLS	D	R	♦ ether2 LAN	Ethernet	1500	1598	156.8 kbps	11.4 kbps	2	0	20	156.2 kbps
Routing	Ň		<pre>*/*ether3</pre>	Ethemet	1500	1598	0 bps	0 bps	2	D	0	0 bps
Contant	N		♦ ether4	Ethernet	1500	1598	0 bps	0 bps		0	0	Ubps
System	<u></u>		<i>lether5</i>	Ethemet	1500	1598	0 bps	0 bps		0	0	0 bps
Queues			diasther7	Ethemet	1500	1550	0 bps	0 bps		0	0	Obps
Files			<pre>sether8</pre>	Ethemet	1500	1598	Obps	Obps	-	n	0	0 bps
1			€tether9	Ethemet	1500	1598	0 bps	0 bps		0	0	0 bps
Log			ether10	Ethemet	1500	1598	0 bps	0 bps	1	D	0	0 bps
Radius			* >sfp1	Ethemet	1500	1598	0 bps	0 bps	-	D	0	0 bps
Tools	1	X	≪≫wlan1	Wireless (Atheros AR9	1500	1600	0 bps	0 bps		D	0	0 bps
New Termina	al											
										1		
M-A-DOUTE	-0	12 it	ems									
Melanouic	-	<u> </u>										
Partition												
Make Supout	t.rif											
Manual												
New WinBox	č											

Figure 3.13: The enable port of the router

Step7: We'll proceed to DHCP setup and pick next and last to get a message that says "successful," as seen in figure 3.14.

admin@D4:CA:6D:83	3:DE:E9 (MikroTik) - WinBox v6.42.2 on RB2011UiAS-2HnD (mipsbe) — 🛛 🗙
Session Settings Dash	hboard
Safe Mode	Session: D4:CA:6D:83:DE:E9
Quick Set	
I CAPSMAN	DHCP Server
Min Interfaces	DHCP Networks Leases Options Option Sets Alerts
🔔 Wireless	DHCP Contin     DHCP Setup
Bridge	
es PPP	X dhcp1 ether2 LAN 00:10:00 dhcp_pool2 no
Switch	
°ta Mesh	
IP I	
🥔 MPLS 🗈 🗅	DHCP Setup
🜌 Routing 🗈	Select network for DHCP addresses
🍪 System 🗅	DHCR Address Space 172 16 1 0/24
Queues	Direct Address Space. [172:1010/72]
Files	
E Log	Back Next Cancel
🥵 Radius	
🔀 Tools 🗈 🏱	
🔀 🔚 New Terminal	
MetaROUTER	
Partition	
Make Supout.rif	
🕑 🍳 Manual	
New WinBox	1 item

Figure 3.14: DHCP setup

It is successfully setup which is shown in figure 3.15.



Figure 3.15: The successful of the text

Step8: Bridge is a method of using another router port as a switch without using the Lan or Wan ports. Select the Bridge port first, then the port displayed in the figure 3.16.

Image: Session December 200 (Structure)         Image: Session De		
CAPsMAN   Imm Interfaces   Imm Vineless   Imm Vineless  <		
Image   Image </td <td></td> <td></td>		
Image       Ports       VLANs       MSTIs       Port MST Overnides       Filters       NAT       Hosts       MDB         Image       PPP       Image       Ports       VLANs       MSTIs       Port MST Overnides       Filters       NAT       Hosts       MDB         Image       PPP       Image       Ports       Image       Image       Ports       Ports<		×
##       Bridge         ##       PPP         ##       Interface       Bridge         # Interface       Bridge		
Image: PPP       Image: PPP         Image: Switch       Image: Pice Pice Pice Pice Pice Pice Pice Pice	Trad	
Immerace       bidge       Honzon       Pronty Promy Cost       Point            •1% Mesh           •1% Hesh           1% Hesh	ma	
•*3 Mesh       1       1       H       4±setherd       bridge1       80       10       disa         2       IP       F       3       IH       4±sether5       bridge1       80       10       disa         2       IH       4±sether6       bridge1       80       10       disa         3       IH       4±sether6       bridge1       80       10       disa         4       IH       4±sether7       bridge1       80       10       disa         4       IH       4±sether8       bridge1       80       10       disa         6       IH       4±sether9       bridge1       80       10       disa         6       IH       4±sether10       bridge1       80       10       disa         7       IH       4±sether10       bridge1       80       10       disa         8       tems	ed port	
2 IH       ±1ether5       bridge1       80       10 disa         2 IP       N       3 IH       ±1ether6       bridge1       80       10 disa         3 IH       ±1ether7       bridge1       80       10 disa         4 IH       ±1ether7       bridge1       80       10 disa         6 IH       ±1ether8       bridge1       80       10 disa         6 IH       ±1ether9       bridge1       80       10 disa         7 IH       ±1ether10       bridge1       80       10 disa         7 IH       ±1ether10       bridge1       80       10 disa         *       Icop       *       *       *       *         8 tems       •       •       *       *	ed port	i and
Image:	ed port	t
MPLS       F       In       12 ether/0       Bridge1       80       10       disal         Image: System       F       Image: System       F       Image: System       80       10       disal         Image: System       F       Image: System       F       Image: System       80       10       disal         Image: System       F       Image: System       F       Image: System       80       10       disal         Image: System       F       Image: System       F       Image: System       80       10       disal         Image: System       F       Image: System       F       Image: System       80       10       disal         Image: System       F       Image: System       F       Image: System       80       10       disal         Image: System       F       Image: System       F       Image: System       F       10       disal         Image: System       F       Image: System       F       Image: System       F       10       disal         Image: System       F       Image: System       F       Image: System       F       System       F       System       F       System       System       F	ed port	-
Routing       F         6       IH       424 ether 9       bridge 1       80       10 disal         System       F         Cueues       Files       80       10 disal         Image: Construction       Files       8       10 disal         Image: Construction       Files       8       10 disal         Image: Construction       Files       10 disal	ed port	
Image: System         Image: Non-State (Section of the section o	ed port	
Queues Cueues C	ed port	£ _
<ul> <li>Files</li> <li>Log</li> <li>Radius</li> <li>✓ Tools</li> <li>New Terminal</li> <li>✓ Items</li> </ul>		
Log		
Radius  Tools  Sitems		
Tools     New Terminal     Sitems		
8 items         8 items           Image: CD         8 items		٠
		· · ·
MA-POLITER		
Metanoo IEA		
Make Support in		
Manual Manual		

Figure 3.16 The Port of the Bridge

#### A static routing which is shown in figure 3.17.

đ X ork Connections ✓ ບ້ Search Network Connecti , 🕖 🚽 🛧 😰 > Control Panel > All Control Panel Items > Network Connections F . 🛛 ( ize 🕶 Disable this network device Diagnose this connection Rename this connection View status of this connection Change settings of this connection ٩ Broadband Connection Ethernet Disconnected Network 3 Realtek PCIe GBE Family C... WAN Miniport (PPPOE) Ethernet Status X General Connection Ethernet Properties X IPv4 Conr IPv6 Conr Internet Protocol Version 4 (TCP/IPv4) Properties X Networking Media Sta Connect using: Duration: General Speed: 📄 Realtek PCIe GBE Fami You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings. Details This connection uses the follow Obtain an IP address automatically Client for Microsoft N File and Printer Sharin Activity • Use the following IP address: IP address: 192 . 168 . 50 . 209 Internet Protocol Vers Subnet mask: 255.255.255.0 🗌 🔔 Microsoft Network Ac Bytes: Microsoft LLDP Proto Default gateway: 8.8.8.8 Internet Protocol Vers Propert Obtain DNS server address automatically Install. • Use the following DNS server addresses: Description Preferred DNS server: 203 . 190 . 10 . 252 Transmission Control Protoc Alternate DNS server: 203.190.10.253 wide area network protocol across diverse interconnect Validate settings upon exit Advanced... OK Cancel

i 1 item selected

Figure 3.17 The figure of a static routing to putting ip

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12E 🔳

### **3.7 Dynamic routing**

Dynamic routing is a system in which the IP address is stored in the router rather than on our computer, as seen in Figure 3.18.

	Qualcomm A	Internet Protocol Version 4 (TCP/IP	v4) Properties	8 23				
		General Alternate Configuration						
	This connection us           Image: Client for I           Image: Client for I      I	You can get IP settings assigned a this capability. Otherwise, you nee for the appropriate IP settings.	automatically if your netw ed to ask your network a	vork supports administrator				
	File and P	Obtain an IP address automa	itically					
	Internet Pi	O Use the following IP address:	Ci					
	🗹 🛶 Link-Laye	IP address:						
	🗹 🚣 Link-Layer	Subnet mask:	• •					
	Install	Default gateway:	•	+				
	Description	<ul> <li>Obtain DNS server address automatically</li> <li>Use the following DNS server addresses:</li> </ul>						
	wide area netwo							
	across diverse in	Preferred DNS server:	a. a.	4				
		Alternate DNS server:	• •	•				
l		Validate settings upon exit		Advanced				

Figure 3.18: Dynamic routing

#### 3.8 Linux

The Linux kernel serves as the foundation for a number of free and open-source operating systems. Linux is often packaged in a form known as a Linux distribution for desktop and server use. The Linux kernel is the defining component of a Linux distribution. It was first released on September 17, 1991, by Linux Thorvald-Sen.

Linux is well-known for a number of features. It's a free and open operating system. Different operating systems have various advantages. Operating systems such as Microsoft Windows and Apple's Mac OS bring together a variety of software that is maintained on our computer [2].

#### **3.9 Creating Linux Partition**

Partitioning is an important element of the Linux operating system. This separation, I believe, primarily divides two portions. (1) Part of the installation (2) Part of the disk partition Linux must establish at least three primary partitions during the installation process [4].

#### 1. root (/). 2. /boot. 3. Swap.

#### • Root Partition: /

Where have or see "/" is defined as a Root Partition. The root directory is where all files (excluding those in /boot) are stored. A minimum of 128MB of RAM and 2GB of HDD space is required. My workstation has 1024 MB of RAM and an 80 GB hard disk drive.

#### • /boot is the boot partition.

The boot drive (200 MB) contains both the operating system kernel (which enable your machine to boot Linux) and data required during the bootstrap process. Due to space limits, these files must be stored in a native ext3 partition. Most users will be fine with a 200 MB disc partition. The file is 137.1 Megabytes.

#### • Swap Partition: swap

This swap partition serves as an aid to virtual memory. In other words, when there is insufficient RAM to store the data that our system is working with, data is written to a swap partition. Partition

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Swap should be equivalent to 2x physical RAM for up to 2 GB of physical RAM, followed by 1x physical RAM for any amount above 2 GB, but not less than 32 MB. A swap partition of 2 to 4 GB and a root partition of at least 10 GB are required.

#### 1. Disk partition

Disk partitioning is divided into two categories. A disk drive is partitioned into one or more logical disks. Each partition creates its own disk, complete with its own file system. A partition table [3] is used to hold partition information. Primary Partitions

#### **2.Extended Partitions**

The original partitioning scheme for PC hard disks allowed only four partitions, called primary partitions. To create more than four partitions, one of these four

### **3.10Setup Linux in VMware**

VMware is an interface that is used to create a Linux operating system environment. It functions similarly to a router but is not a true router.

Step1: There are two types of installations available. We are able to accept any I consider customs to be advanced, as seen by the figure 3.19.



Figure 3.19: Screen Print to choose configuration type.

Step2: Now choose your operating system and version, which is a crucial step because it affects your computer's setup. Then click the next button, as indicated in the diagram 3.20.



Figure 3.20: Screen Print to add OS location.

Step3: Here are four alternatives for determining what type of network to create. I would like to contribute something. Because the gust operating system requires its own IP address, it uses a bridge network for direct access to Ethernet networks. The second is NAT, which uses an IP address to access the dial-up and external connections. The third option is to utilize host only, which allows networking between a private virtual network on the host computer, and the fourth option is to not use the internet. We also make an effort to use 1st and 4th. Fourth is what I use. Then I choose the controller I prefer. There are three possibilities shown here. We employ LSI logic and select the disk type that I utilize. Selecting the type of I/O controller is done here. There are three types of disks here: IDE, SCSI, and SATA. I use SATA, as shown in the diagram 3.21.

<ol> <li>Type has a second.</li> </ol>	1	in Plane *			
H My Computer Ar stanger B CarroS-bit Charison (a sette des bit Brand/Repre		Workstation	ŋ	10 Sulface a Guard Operating System	1
<ul> <li>Constant and an and a second a second</li></ul>			U.	Guest spending system Theorem Streams Winny Oncode Bestiene Otherene Bits Otherene Bits Otherene Streams Tarretot sealer = 1 Tarretot sealer = 1 T	et te a Remote Gerope la metage official machines en a partier prove Date a Physical Machine CytonPC to a school machine
			1	This class factor canad	and Upstature for collease syderics to VM-use prime.

Figure 3.21: Screen Print to selecting OS & version

Step4: The size of the virtual machine's HHD is given here. Click on the disk storage file system and then on the disk to create several files. Then, as illustrated in the diagram, proceed to the next Figure 3.22.

ney × 2, Yyga haasto pasidi •	😫 Plante 🗵		
195 My Computer Distances Controllation Controll	Workstation	100 These Verbacel Admetheter Withouted Sedence 1/10 Constructive Types which SCEI controller Types which SCEI controller types	
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			lioe a Physical Machina 1 your PC to a vistual machine.
		Their (Sec) Next> Center	ore Updates for cofficient updates to VM-wave ation

Figure 3.22: Screen Print to selecting I/O controller type

Figure 3.23 shows how to print to give hard disk space for storage.

### ©Daffodil International



Figure 3.23: Screen Print to giving hard disk space for storage.

Step5: Now choose your preferred language from the drop-down menu. Select English, then click the type of disk partition you want to use, and then click the next button. Figure 3.24. shows OS loading on a CD/DVD.

Devis Summery	Device statue Connected Co
	I and approximation of the second second approximation of the second of
Aubl	Rentre
	Add

Figure 3.24: Screen Print to loading OS in CD/DVD.

I select languages English which is shown in figure 3.25.

#### ©Daffodil International



Figure 3.25: Screen Print to choosing languages.

Step6: Now installing Centos6 which is shown in the figure 3.26.



Figure 3.26: Screen print to installation OS.

Step7: After the installation is complete, we are presented with the window GUI of the Linux operating system, as illustrated in figure 3.27.



Figure 3.27: Screen Print to GUI of Linux OS

### 3.11 Cents uses the Linux Run-Level.

In Linux, the run level command is extremely significant. We may use that command to crack root's and any other user's passwords. Once you've resolved that issue, Single User Mode will be restored.

# Shutdown (Init 0).

# Mode for a single user (Init 1)

# Multi-User Mode (Init 2) NFS isn't possible without it. # Init 3 = Multi-User Mode in Full. NFS is a network file system. # Init 4 is not in use.

# X-11, Window GUI Mode, Init 5 # Reboot = Init 6

### 3.12 Linux Centos's Basic Commands

Here are some fundamental Linux commands. Details can be found here. Reboot is the same as init 6.t

Cal, cal 2018, cal 28 1993 = Show a calendar Date or time = date is displayed or changed.

ls tas1 ls tas1 ls tas1 ls tas1 pwd stands for Present Working Directory.

Shutdown = power off, init 0, shutdown –h now; shutdown –h now; shutdown –h now; shutdown –h now; shutdown –h now Touch tas1 to make a new file (File name).

Make a directory with the command mkdir sweet1 (directory name).

cd/root/Desktop = Change Working Directory (directory path). Logout refers to the process of removing the current user from the system.

#### **3.13Password Management and User Creation**

Set New User's Password = sweet123 (username). Adding a user = sweet57 user add (username). sweet57 ushered sw

Disable/Remove Password = given -d sweet57 (username). -r 6322 (username

#### **3.14 Network cabling systems**

We found some twisted pair cable Cat5, Cat5e, Cat6, Cat7its support up to 100mbps to 10gbps, as shown in figure 3.28.



Figure 3.28: The Twisted pair cable

Fiber optic

A fiber optic cable is used to receive internet over a long distance and can carry data at speeds ranging from 10 Gbps to 40 Gbps, as shown in figure 3.29.



Figure 3.29: A fiber optic cable

## CHAPTER 4

### **COMPETENCIES AND SMART PLAN**

### **4.1 Competencies Earned**

It is expected that we will be able to understand what we are learning, or that we will be able to learn the implications of compatibility or ramifications, or that we will be able to work as a learning process. In two data centers, install and decommission network and server devices. Linux software for LDAP Health, for example, will be available in the future. It assists us in organizing any internships project calculations, item collections, and searches to determine why we require internships, as well as participating in a new look at the Linux Lab web site.

### 4.2 Smart Plan

Many businesses should have a well-thought-out strategy in order to succeed. Develop a sensible plan to make anything small at first. It contributes to the company's long-term success.

### 4.3 Reflections

Daffodil Online Ltd. began operations in 2002. They have upgraded their operations and service offering over the last year in response to customer recommendations and time constraints. We are proud for the DOL training center its help us to learn this topic very good.

# CHAPTER 5 CONCLUSION ANDFUTURE CAREER

### **5.1 Discussion and Conclusion**

Daffodil Online Ltd is where we are doing our internship. It aids in the advancement of our careers. We are proud of this Training Center since it is a clever center. There are many companies in our country that have many opportunities to work in computer networking

### 5.2 Scope for Future Career

In our country, Bangladesh, there are a lot of companies that are growing and require some professional engineers to assist them save data and communicate from one computer to another. They need a lot of engineers to enhance their firm, therefore we will show that training is beneficial in the future.

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### **APPENDICES**

### **Appendices A: Reflection on the Internship**

My internship's main purpose in a professional setting is to apply what I've learned in class to real-world challenges. This internship has given me the opportunity to strengthen my skills and understand how they can benefit me.

### **Appendix B: Company Detail**



Name	Daffodil Online Limited
Address	Dhaka-1207, Bangladesh, 102, Shukrabad (3rd floor), Mirpur Road,
	Dhanmondi.
Telephone	+8802-48119586
E-mail	info@daffodilnet.com
Website	www.daffodilnet.com
Туре	Internet Service Provider with a National Reach

### **Plagiarism Report**

Shown the figure 5.1 plagiarism report



Figure 5.1 Plagiarism report