ISP SERVER CONFIGURATION AND MAINTENANCE ON MIKROTIK AND LINUX PLATFORM

SUBMITTED

 $\mathbf{B}\mathbf{Y}$

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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

SUPERVISED BY

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APPROVAL

This Project/internship titled **ISP SERVER CONFIGURATION AND MAINTENANCE ON MIKROTIK AND LINUX PLATFORM**, submitted by Abdul Awal Chowdhury, ID No: 161-15-6776 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 09-12-2018.

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DECLARATION

I hereby declare that, this internship report has been done by Abdul Awal Chowdhury, ID: 161-15-6776 to the department of Computer Science and Engineering, I overtake 4 months of Industrial Training Program at Daffodil Online Limited (DOL) and this report is written by me to the best of the practical knowledge I gained during the course of the training program, Under the supervision of Ms. Most. Hasna Hena, Senior Lecturer, Department of CSE, Daffodil International University.

I also declare that neither this internship report nor any part of this internship report has been submitted elsewhere for award of any Degree or Diploma. I also declare that, I collect information from Daffodil Online Limited (DOL), Data Center and Internet Service Provider (ISP) Based Company, Books and Internet.

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ACKNOWLEDGEMENT

I would like to express my appreciation extremely and respect for the following members for their help and support, without them this training could not have been continued. To my academic supervisor **Ms. Most. Hasna Hena** who was a great help for me, by giving me instructions and guidance to make this training possible and i also again wish my deep compulsion to **Ms. Most. Hasna Hena, Senior Lecturer, Department of CSE**, Daffodil International University, Dhaka.

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

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

We would like to thank our entire course mate in Daffodil International University, who took part in this discuss while completing the course work. Finally, I must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

This internship involves "ISP Server Installation and Maintenance on MikroTik and Linux Platform". MikroTik is a network operating system which is widely used by Internet Service Providers for the purpose of a firewall or network router. MikroTik is one of the very popular platforms in Bangladesh. I can do almost everything using MikroTik including router static connection, DHCP connection, site block, Bandwidth Management, Routing, Hotspot, PPPoE, DNS server, DHCP server and many other features. During my internship period configured above mention connection. Among all, each of this has a particular uses. Such as, we have to put ip manually in pc, router or other network devices on static connection, wherelse in dynamic connection do not need to put ip manually because it takes ip automatically. I also did bridge connection in office to get same network in every network device. I can make a secure connection by using PPPoE connection. It is dial up connection and to access this connection we need user name and password. Got clear concept on website blocking. It uses in training center, office or any organizer for unauthorized access or restriction site. Also know how to configure network in networking device using Linux. Linux is always considered as very secure operating system. I think it would get the opportunity to work in ISP company. Every ISP company and other organizer gives priority more on MikroTik and Linux knowing people. i am eligible to work taking both of these. In this report mostly the detailed steps for configuring the MikroTik and Linux has been described.

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CHAPTER 1 Introduction

1.1 Introduction

We can not detection anything without the server during this information technology. Therefore, the DNS server for the web server is required. Today every business and business programming is specifically marked with web based innovation. Such as Web Banking is one of these, SMS alert banking also, as well EFT (electronic Fund Transfer) there are so many imaginary except server. DNS as exceptionally useful server and we can work sorting by putting this framework. In the present world without server there is no anyone telecommunication, Mobile innovation. Today every telecommunication and banking sites are depending online. Every online transaction particularly has a different server. To secure more, using Linux is the best secure media. It makes the online media very easy. Nothing unsecure in Linux. It has been formed in a work structure for business, instruction, and personal profits.

1.2 Motivation

I am a student of Daffodil International University and studying in Computer Science and Engineering. I know the important of gaining practical experience which would be complement with the text book acquirement as well help student to gain immense aspect to the subject. After taking 3 months internship a found that i am completely skilled in MikroTik router and Linux (Centos). I got my exact purpose very well as an Internet Service Provider as well communicating with clients. Providing service what exactly their needs and better service to the customers. I have great ability to read my skills and understand the situation and work quickly.

1.3 Internship Objectives

Extreme objective of my internship is to making myself to an eligible place in the competitive job market. This is the way to increase my skill level. I am curious to gather anything like extraordinary quality to present myself as a expert one. This internship on Networking is design to provide work while students are eligible to understand about computer science and engineering with the help of academic training and they have to able to understand to make themselves eligible to present in a job market.

1.4 Introduction to the Company

As I am a student and i took my internship from Daffodil Online Limited which take a pride in as an leading statewide Internet Service Provider (ISP) in Bangladesh. They are most experienced in the ICT field as well it is an oldest company in Bangladesh. They have ethics to make relationship longer with customers by giving well services. From their inception, they got lots of national and international prizes from the domestic and outer platform. Because they worked with many national and international project and organization to achieve reputation. They started their operation in 2002. In this time they have various services to provides customer. in the past years of their inception they usage the modern and latest technologies for upgrading the required service. They have a group of employee who are very co-operative and capable to provide technical and communication solutions [1].

1.5 Report Layout

In the chapter (1) I discussed details on objective of internship, Motivation of internship and Introduction to the company.

In the chapter (2) I discussed details on the IT service offered in DOL and what are the roles of in jobs market of MikroTik and Linux.

In the chapter (3) I discussed details on daily task and activities, Events and Activities and Challenges.

In the chapter (4) I discussed details on the Competencies Earned, Smart Plan and Reflections.

In the chapter (5) I discussed details on the Conclusion and Future Scope.

CHAPTER 2 Internship Enterprise

2.1 About the Company

I have taken my industrial training from Daffodil Online Limited. Daffodil online Limited is glorious to become one of the promoter ISP and ASP in Bangladesh. This ISP company provides compact Internet service with solution since 2002. They have own Fiber Optic and Radio link and WAN to serve corporate level customer, individual clients and SME. This organization worked with National and International organization with their high perception of all aspect. They have modern and latest device, using these they serve their customer to get ultimate goal to connect them. Their high skilled experts are always ready to solve corporate network problem and they are capable to design state of art network as well telecommunication. Daffodil Online limited has some strong's expert engineer and professional management team who are certified and associated with Linux, Cisco, Microsoft and Oracle including world leading association IEEE, BCS. Their corporate responsibility secure the sense of community, Market Place and Workstation. Daffodil Online Limited provides three major platform such as environment of working and learning, education as well nation building. So that they can promote their service [2].

2.2 Product and Market Situation

Bangladesh is an adequating populated creating nation and by 20021 it targets are set to be digital. So each segment and every organization in our country should be digitized. So in the next few years IT masters and IT specialists need a lot. So Daffodil Online limited estimates an essential part of showcasing activity by providing various administrations like:

IT Services

- Internet Solution in Corporate Level
- Security problem solution.
- Open source application problem solution.
- Internet Service Providing
- State of the Art in Data Centers.
- Hi speed Wi-Fi Zone at any area.
- Data Connectivity, Data center & Co-Location.
- Proxy & DNS Server solution, Mail Server Solution.
- And All computer accessories and peripheral selling
- Professional course and trainings environment.

Professional Training Services

- Providing ISP Setup and administration using Linux.
- Providing Training Course on Certified Ethical Hacking (CEH).
- Providing ISP Setup and Administration using MikroTik.
- Providing Red Hat Certified Security Specialist (RHCSS).
- Providing Red Hat Certified Engineering (RHCE).

2.3 Target Group

The company subscriber foundation dominated all small and average sized businesses, including all customers and started-ups. The company is planning to focus on all clients, because it holds the best growth target for our new high-speed proposals and the maximum growth potential for the company. Web Solutions believes that these market divisions have special needs and services and create more dedicated, reliable customers.

2.4 SWOT Analysis

SWOT Analysis is an effective strategy to understand your strengths and weaknesses and to keep both opportunities open to you and your threat.

> Strengths:

- ✓ Communication between people separated by distance (at home and within the workplace)
- \checkmark Work at home with ease
- ✓ Set up online business
- ✓ Data collection (business valuable resources)

> Weaknesses:

- ✓ The devaluation level of the skill required to survive in the new entrepreneur market
- ✓ Large amount of money needed to set up business
- ✓ Competition for small rebuilding
- ✓ Many price rates and service options

> **Opportunities:**

- ✓ Changing in the structure of age of population
- ✓ Number of families growing in the UK
- ✓ Easy Custom Launch
- ✓ Correction of regulatory framework

> Threats:

- ✓ Financial crisis is unlikely to increase their broadband subscription, lack of confidence in the digital market of the stock market.
- \checkmark It is still visible how far the customer can go to embrace Internet access.

2.5 Organizational Structure

Organ gram construct of Daffodil Online Ltd. shows in fig 2.5:



Figure 2.5.1: Shows Organogram of Daffodil Online Limited

CHAPTER 3 Tasks, Projects and Activities

3.1 Daily Task and Activities

- Month 1: At the 1st month of internship in daffodil online limited I learnt and performed the following tasks:
 - Router Basic
 - MikroTik Basic, Installation of PC based MikroTik using VMware
 - First Login to the Router OS
 - Interface
- Month 2: At the 2nd month of internship in daffodil online limited I learnt and performed the following tasks:
 - How to configure ISP link: Static, Dynamic, PPPoE user password
 - Bandwidth uses/consumption Interface wise, per client, per group, with restriction/security.
 - How to configure LAN network
 - Giving IP/Internet to the client in the way of Static, DHCP, PPPoE, Bridge
 - Firewall: web site filter(per user/group wise/all user): Web site including https per user or group wise or for all user, filter bypass blocking process.
- Month 3: At the 3rd month of internship in daffodil online limited I learnt and performed the following tasks:
 - Getting Started with Linux Installation
 - Managing User Accounts and passwords
 - File and Directory details
 - File and Directory Permissions

3.2 Events and Activities

- Trouble-shooting servers and routers.
- Trouble-shooting LAN (local area network) and switches.
- Fixing network with faults.
- Technical support detecting for people using the network.
- Day to day admin and monitoring of network use.
- Checking Fiber Optical Media Convertor & Fiber Optic Transmission devices.

3.2.1 Basic Concept on IP Addressing



Figure 3.2.1.1: network addressing classification

IPv4:

- 1. Total bit=32
- 2. Total portion/octet=4
- 3. Each portion divided by a single dot (.)
- 4. Each portion contains 8 bits
- 5. There are 2 main parts of all IP address
 - (a). Network(N)
 - (b). Host(H)

<u>N | H</u>

172.16.10.0

Network and Host classification:

Class-A: N.H.H.H Class-B: N.N.H.H Class-C: N.N.N.H



Figure 3.2.1.2: shows the table of Network & Host bit

IP class and Range:



Private IP Range:

Class-A: 10.0.0.0-10.255.255.255 Class-B: 172.31.255.255-172.31.255.255 Class-C: 192.168.0.0-192.168.255.255

3.2.2 MikroTik Router

MikroTik device is well known devices to use in networking. It is a Latvian manufacturer networking equipment for computer. They sells various networking wireless product such as router. Established in 1995 with the aim of selling wireless technology market. They increased number of employee 100 more than previous year during 2014. They have low prices product alternative to expensive router as well Ethernet radio lines [3].

3.2.3 Router OS

The main product of MikroTik is an operating system based on the Linux kernel, which is known as the MikroTik Router Operating System. Installed on company-owned hardware (router board series) or standard x86-based computers, it turns a computer into router and uses several additional features such as firewalling, Virtual Private Network (VPN) services and clients, bandwidth size and service quality, wireless access point function and other commonly used features when interacting with the network. The system is capable of serving as a portable-based hotspot system [4].

3.2.4 Features of Router OS

Router OS supporting lots of applications used by ISP (Internet service providers), For example

- It can be used like a router
- It provided OSPF, BGP, Multiprotocol Label Switching (VPLS/MPLS), Open Flow etc.
- It can be used as a switch or bridge
- Provides PPPoE Client-Server
- Provides VPN-Virtual Private Network.
- Provides Firewall rules with NAT
- Provide DHCP Server services
- Bandwidth management is easy
- Easy administration also

The product is supported by MikroTik through a forum and a wiki, providing assorted and thematic examples of configurations. Router OS supports Internet Protocol Version 4 (IPv4) as well as Internet Protocol Version 6 (IPv6).

The software provides support for virtually all network interfaces that the Linux kernel 2.6.16 supports, except wireless, where the Others and Prism chipsets are the only supported hardware, as of 3.x version [4].

3.2.5 Propose Network Diagram (MikroTik Configuration)



Figure 3.2.5.1: Shows Network Diagram

Winbox is the graphical configuration utility for MikroTik router OS. At first we should download winbox. After download the winbox it can be run straight away as no installation is required 3.20 network diagram.

3.2.6 Initial Step to Run

- Keeps Power to the MikroTik Router
- Plug in a UTP cable in MikroTik LAN port and the other port to the PC.
- Browse with Winbox.
- Click to icon and here show a IP address and MAC address. Click to Mac address then write 'admin' in login box and don't need to give Password.

3.2.7 Static Configuration

Static: We configure static for setup ip manually. That depends on what ISP gives the connection! Is that Static or something else? If gives static line then we have to configure static in Router as well PC.

2nd step for Static: Defining Interface

Process:

Interface>"+">Ethernet1-WAN

Interface>"+">Ethernet1-LAN

Apply>Ok

[N.B: Here choose the Ethernet port for make sure the WAN and LAN. Then we can set our IP Address]

3rd step: Setting up IP Address

Process:

IP>Address>"+" Address>192.168.50.51/24>Network>192.168.50.0>Interface>Ether-WAN

IP>Address>"+" Address>172.16.1.1/24>Network>172.16.1.0>Interface>Ether-LAN



Figure 3.2.7.1: Shows Setting up IP Address of Static Configuration

4th step: Setting up DNS Process: IP>DNS>Server>8.8.8.8 IP>DNS>Server>8.8.4.4>Apply>Ok N.B: we use here Google's DNS

5th Step: Setting up Firewall

Process:

IP>Firewall>NAT>"+">Action>Masquerade>Apply>Ok



Figure 3.2.7.2: Shows Settin Up Firewall Of Static Configuration

6th Step: Setting up Routes Process: IP>Routes>"+">Gateway>DstAddres>0.0.0.0/0 IP>Routes>"+">Gateway>Gateway>192.168.50.1

7th Step: Implement Static Connection to PC Process: Network & Internet setting>Change Adapter Option>Ethernet>Properties>IPV4(TCP/IPV4) >double click> following IP address then use following DNS Server Address>OK

| Ceneral Ceneral Connection PH4 Connectivity: No network access PF4 Connectivity: No network access Media State: Enabled SDD: Viras Detected Duration: 00:14:31 Speed: 150.0 Mbps Signal Quality: Image: Consect Lip Protocol Sent Received Pfes: 167,952 Properties Dispose Dispose Diagnose | ططاً Wi-Fi Status | Wi-Fi Properties | Internet Protocol Version 4 (TCP/IPv4) Properties X |
|---|--|---|---|
| Connection Pi-4 Connectivity: No network access Media State: Enabled SSID: Viras Detected Duration: 00:14:31 Speci: 150.0 Mbps Signal Quality: Image: Connect with provide protocol Setting: Wireless Properties Activity: Setting: Setting: 167,952 Bytes: 167,952 167,952 307,914 Chronet using: Image: Connection protocol /Internet Pr | General | Networking Sharing | General |
| Details Wireless Properties Activity Microsoft Network Adapter Multiplexor Protocol Microsoft Network Adapter Multiplexor Protoco | Connection IPv4 Connectivity: No network access IPv6 Connectivity: No network access Media State: Enabled SSID: Viras Detected Duration: 00:14:31 Speed: 150.0 Mbps Signal Quality: | Connect using: Realtek RTL8723BE 802.11 bgn Wi-Fi Adapter Configure This connection uses the following items: | 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. Obtain an IP address automatically O Use the following IP address: IP address: 192 . 168 . 50 . 51 Subnet mask: 255 . 255 . 0 Default cateway: 192 . 168 . 50 . 1 |
| Properties Diagnose Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks. | Activity Sent — Received Bytes: 167,952 307,914 | Internet Protocol Version 4 (TCP/IPv4) Microsoft Network Adapter Multiplexor Protocol Microsoft LLDP Protocol Driver Install Install Properties Description | Obtain DNS server address automatically Use the following DNS server addresses: Preferred DNS server: 8 . |
| OK Cancel | Properties Disable Diagnose Close | Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks. | Validate settings upon exit Advanced OK Cancel |

Figure 3.2.7.3: Implement Static Connection to PC

3.2.8 Dynamic Configuration

To get dynamically IP in PC we configure DHCP/Dynamic configure. DHCP Server provide IP and DNS automatically.

Process:

To configure Dynamic, I have to configure Static before. I have already configure Static, so now I will show Dynamic configure bellow-

IP>DHCP Server>DHCP Setup>DHCP Server Interface>Ether_LAN2>DHCP Address Space>Next>Gateway for DHCP Network>Next>Address to give out>DNS Server>Lease Time-24.00.00>Next>Ok

To implement the Network to PC we setting up Network & Internet>Change Adapter>Ethernet>Propertise>IPV4(TCP/IPV4)>Obtaining an IP Address Automatically and also select Obtaining DNS Server Address Automatically>OK>OK

We also keep it Make Static due to Fixed the IP always

| Sadmin@00:0C:29:D2:5 | 6:24 (MikroTik) - WinBox v6.42.6 on x86 (x86) |
|------------------------|---|
| Session Settings Dash | nboard |
| Safe Mode | Session: 00:0C:29:D2:56:24 |
| 🄏 Quick Set | |
| CAPsMAN | |
| im Interfaces | |
| Wireless | Address Lat |
| 📲 🖁 Bridge | |
| ei PPP | Address / Network Interface 🔽 |
| °t <mark>8</mark> Mesh | |
| 255 IP D | |
| 👳 IPv6 🛛 🗅 | |
| Ø MPLS | |
| 😹 Routing 🗈 | UTCP Networks Lease Options Option Sets Nerts |
| iiii System ▷ | Image: Construction of the setup Find |
| Dueues | Name / Interface Relay Lease Time Address Pool Add AR |
| Files | andp i ether2-Exity ita 00.00.00 andp_boolu no |
| E Log | DHCP Setup |
| A Radius | Select interface to run DHCP server on |
| X Tools | DHCP Server Interface: ether2-LAN |
| New Terminal | |
| S Dude | |
| KVM | Back Next Cancel |
| Make Supout.rif | |
| Manual | |
| New WinBox | |
| Exit | 1 Rem |

DHCP Server setup:

Figure 3.2.8.1: Shows Setting up DHCP setup for Dynamic Configuration

3.2.9 PPPoE Configuration

It's a Dial Up Connection. It gives an User, User Name and Password. It's a secure connection. No one can access internet without user name and password Process:

IP>Pool>"+">Name>PPPoE6mbps

Address>172.16.10.0/24

Pool>Apply>OK (copy)

Name>PPPoE-10mbps>Add-172.116.20.0/24>Next

Pool>Apply>OK

Name>PPPoE-2mbps>Add-172.16.30.0/24>Apply>Ok

IP>Pool>"+">Name>PPPoE Gateway>Add-10.10.10.0/24>Apply>OK

| ssion Settings Dashboard | | | | |
|---|---------------------------------|---|------------|---------------------------|
| Cale Mode Session: D4:CA | 6D 86:C0:CD | | | |
| Quick Set CAPaMAN Interfaces Wreless Gradge Setch | _ | | | |
| * Mesh | N.C. | Interface 🛛 🔍 🗶 | | |
| | Active P Interface P Name | Pools Used Addresses Pools Copy Pools Copy Cop | Find + | r PPPoE ((p/s) Rx Pac |
| Est. | • ena | led familio (sizve (Statue | | |

Figure 3.2.9.1: shows Creating IP Pool, Gateway PPP>"+">PPPoE Server Binding>Name>PPPoE-in1 Type>PPPoE Server Binding>Apply>Ok



Figure 3.2.9.2: Creating profile for Limit

PPP>PPoE Server>+ Service Name>Interface ether4-LAN>Apply>Ok Select (one session per host)>Ok PPP>Profiles>"+">Name>Profile-6M Local Add.>PPPoE-6mbp Remote Add.>PPPoE Gateway

DNS Server-203.190.10.252

Limits>Rate Limit>6M/6M>Ok

| | | | | | | | | - / |
|-----------------|---|----------------------|----------------|--------|-------------|----------|------------------|-------|
| C* Safe Mode | Session: D4:CA 6D 86:C0:CD | | | | | | | |
| Cuick Set | | | | | | | | 6 |
| CAPSMAN | Interface Interface List Ethernet EoIPT | unnel IP Tunnel GF | RE Tunnel VLAN | VRRP | Bonding LTE | | | |
| jas Interfaces | + < ≈ C T Detect Int | arnat | | | | | | Find |
| Wireless | Name | New PPP Profile | | | | | Ty Packet (p/s) | Dr Pa |
| 其 Bridge | R #*bridge1-Total LLAN | General Protocols | Limits Queue S | crinte | OK | 0 bps | TAT BELLET (p) 5 | 0 |
| E PPP | R tether1-WAN | Piolocois | Linits Quede 3 | cripis | | 512 bps | | 0 |
| witch | S weiner2 weiner3 | Name: | profile-6M | | Cancel | 0 bps | | 0 |
| °t© Mesh | R IPether4-LAN | Local Address: | PPPpE-6Mbps | Ŧ . | Apply | 7.6 kbps | 1 | 3 |
| 1 P | <pre> ether5 ether6 </pre> | Pamota Address | PPPoE-Gobrav | - | Comment | 0 bps | | 0 |
| MPLS N | 4 other7 | Remote Address. | гегрс-беккау | • • | Comment | 0 bps | | õ |
| 😹 Routing 🗈 | R @Pether8 | Bridge: | | - | Сору | 0 bps | | 0 |
| 💮 System 🗈 | PPP | Bridge Bart Bright | | _ | Remove | | | |
| Queues | the first page 5 g and a set Dec | Bridge Fort Frienty. | | - | | | | |
| Files | Interface PPPoE Servers Secrets Pro | Bridge Path Cost | | - | | | | |
| E Log | | Bridge Horizon: | | - | | | | Find |
| Radius | Name / Local Addre Remote A | | | _ | | | | - |
| Tools N | * Stefault | Incoming Filter: | | - | | | | |
| New Terminal | | Outgoing Filter: | | - | | | | |
| LCD | | Address List | | | | | | |
| MetaROUTER | | Audiess List | | - | | | | |
| A Partition | | Interface List | | • | | | | |
| Make Supout rif | | DNS Server | 203 190 10 252 | | | | | |
| Manual | | Links adriver. | 203.130.10.232 | - | | | | |
| New WinBox | | | 203.192.10.253 | \$ | | | | |
| Exit | | WINS Server: | | φ. | | | | |
| - | | - Change TCP MSS | | | | | | |
| | 2 items | C no C yes @ | default | | | | | |
| | | - Use UPoP | | | L H | | | |
| | | C DQ C YPS G | default | | | | | |

Figure 3.2.9.3: Making Profile & Limit

PPP>"+">Name and Pass:



Figure: 3.2.9.4: shows make user & password

3.2.10 Bridge mode configure

To get more than 1 Interface in same network we configure Bridge connection.

Process:

Interface>Name>Ether-WAN>Apply>Ok

Bridge>"+">Name>Printer_Name>Apply>Ok

Bridge>Port>"+"interface>Ether_2>Apply>Ok

| Interface <printer_name< th=""><th>ə></th><th></th><th></th><th></th></printer_name<> | ə> | | | |
|--|---|---------|---------|------|
| General STP VLAN | V Status Traffic | | ок | Brid |
| Name: | Printer_Name | | Cancel | |
| Type: | Bridge | | Apply | # |
| MTU: | | | Disable | 0 |
| Actual MTU: | 1500 | C | omment | |
| L2 MTU: | 65535 | | Сору | |
| MAC Address: | 22:C7:E4:39:79:96 | F | lemove | |
| ARP: | enabled Ŧ | | Torch | |
| A New Bridge | Port | | | × |
| Admin. M General | STP VLAN Status | | ОК | |
| Interface: | ether2-LAN | ∓ | Cancel | |
| Bridge: | Printer_Name | ₹ | Apply | |
| Horizon: | | · • | Disable | |
| Leam: | auto | Ŧ | Commer | nt |
| | ✓ Unknown Unicast Flood | | Сору | -1 |
| | Unknown Multicast Flood | | Bemove | |
| | Broadcast Flood | | | |
| an abla d | ✓ Hardware Offload | | | |
| enabled | | | | |
| enabled | inactive Hw. | Offload | 1 | |

Figure 3.2.10.1: Shows selecting Bridge name & Ether port

IP>Address>"+">Add.>192.168.100.1/24

Interface>Printer_Name>Aply>Ok

IP>DNS>Server>103.3.20.20 again Server>8.8.8.8>Apply>Ok

IP>Firewall>NAT>Advanced>Src. Add.>192.160.100.0/24>Apply>Ok

NAT>Action>masqured>Apply>Ok

IP>DHCP CLIENT>"+">Interface>Ether WAN>Apply>Ok

| DNS Settings | | | |
|-------------------------------|-----------------------|-----|--------|
| Servers: | 103.3.20.20 | \$ | ОК |
| | 8.8.8.8 | \$ | Cancel |
| Dynamic Servers: | 103.60.172.20 | | Apply |
| | 8.8.8.8 | | Static |
| | Allow Remote Requests | | Cache |
| Max UDP Packet Size: | 4096 | | |
| Query Server Timeout: | 2.000 | s | |
| Query Total Timeout: | 10.000 | s | |
| Max. Concurrent Queries: | 100 | | |
| Max. Concurrent TCP Sessions: | 20 | | |
| Cache Size: | 2048 | КiВ | |
| Cache Max TTL: | 7d 00:00:00 | | |
| Cache Used: | 18 KiB | | |

Figure 3.2.10.2: Shows DNS setting

| Firewall | | | | | | |
|---------------------------|----------------------|-------------------------|---------------------|------------------|---------------------------|---------------|
| Filter Rules NAT | Mangle Raw | Service Por | rts Connect | tions A | ddress Lists | Layer7 Protoc |
| + - 🛷 : | × 🖆 🍸 | 00 Reset | Counters | oo Res | et All Counter | s |
| # Action 0 #I mas | Chain Sr srcnat | c. Address [| Dst. Address | Proto | Src. Port | Dst. Port I |
| DHCP Client | | | | | | |
| DHCP Client DHC | P Client Options | | | | | |
| + - < | | Release | Renew | | Γ | Find |
| Interface ether1-WAN | ✓ Use P Ad yes ye | ld D IP Add s 192.16 | Iress Ex 58.1.10 | pires Aft 01: | ter Status 42:35 bound | |
| New DHCP Client | | | | × | | |
| DHCP Advanced | d Status | | ОК | | | |
| Interface | ether1-WAN | ₹ | Cancel | | | |
| | ✓ Use Peer D | NS | Apply | -1 | | |
| | Use Peer N | ТР | | -1 | | |
| Add Default Route | : yes | ₹ | Disable | | | |
| | | | Commen | t | | |
| | | | Сору | | | |
| | | | Remove | • | | |
| | | | Release | | | |

Figure 3.2.10.3: shows DHCP Client Interfacing

3.2.11 Bandwidth uses consumption

I setup 1Mbps for 50 user (192.168.4.1/24) 2Mbps for 40user (192.168.6.1/24)

Process:

IP>Add.>"+">Add.>192.168.4.1/240 Interface>Ether_2>Apply>Ok N.B: during 2Mbps ip would be 6 instead of 4 in octet and Rate 2M

IP>Firewall>NAT>+>Action>masqured>Aply>Ok

IP>DNS>103.3.20.20 & 8.8.8.8>Dynamic Server>103.60.172.20 & 8.8.8.8

Queue>Queue Type>"+">T_Name>1Mbps_Download Kind>pcq Rate>1M>Apply>Ok [mark on Dst. Address] Queue>Queue Type>"+">T_Name>1Mbps_Upload Kind>pcq Rate>1M>Apply>Ok [mark on Src. Address]

[N.B: I show here only 1Mbps_Download, during upload it would be 1Mbps_Upload instead of 1Mbps_Download as well during sane thing as 2Mbps]

| Queue Li | st | | | | | | | | | |
|-----------------------------------|---------|---------------|------|---------------------------|------|----------------------|------------|---|--------|-----|
| Simple G | dueues | Interface Que | ues | Queue Tre | e Qu | ueue Ty | ypes | | | |
| + - | Queue | Type <1Mbps_ | Dow | nload> | | | | | | < |
| Type I | | Type Name: | 1M | ops_Downlo | ad | | | | ок |] [|
| * defaul | | Kind: | pcq | | | | ₹ | (| Cancel | |
| * ethem | | Rate: | 1M | | | E | oits/s | | Apply | |
| * hotspo * multi-q | | Limit: | 50 | | | | KiB | | Сору | |
| * only-h * pcq-de | | Total Limit: | 200 | 0 | | | KiB | R | emove | |
| * pcq-up * synchi * wireles | | Burst Rate: | | | | - H | oits/s | | | |
| | ы | Burst Time: | 00:0 | 00:10 | | | | | | |
| 11 items | | Classifier: | | Src. Address Src. Port | | Ost. Add Ost. Por | dress t | | | |
| | Src. / | Address Mask: | 32 | | | | | | | |
| | Dst. / | Address Mask: | 32 | | | | | | | |
| | Src. Ad | ddress6 Mask: | 64 | | | | | | | |
| | Dst. Ad | ddress6 Mask: | 64 | | | | | | | |

Figure 3.2.11.1: shows Queue name for Upload & Download

Queue>Simple Queue>"+">Name>1mbps Target>192.168.4.0/24

#

 $Queue > Advanced > Q_Type > 1Mbps_Upload..... > 1Mbps_Download > Apply > Ok$

| [N.B: show | s for 1Mbps | _Upload | _Download | l. Same thi | ng would be | for 2Mbps] |
|---------------|------------------|---------------|-------------|---------------|-------------|------------|
| Queue List | | | | | | [|
| Simple Queues | Interface Queues | Queue Tree | Queue Types | | | |
| | | Dear Dearst C | | All Countries | 1 | |

| + - ~ | × 🖻 🍸 | 00 Reset Co | ounters 00 Reset All Co | ounters | Find |
|----------------|------------------|---------------|-------------------------|------------------|---------------------|
| # Name | Target | Upload Max | Limit Download Max Lim | iit Packet Marks | Total Max Limit (bi |
| Simple Queue < | 1Mbps> | | | | |
| General Adva | anced Statistics | Traffic Total | Total Statistics | | ОК |
| Packet Marks: | [| | | \$ | Cancel |
| | | Target Upload | Target Do | ownload | Apply |
| Limit At: | unlimited | Ŧ | unlimited | ▼ bits/s | Disable |
| Priority: | 8 | | 8 | | Comment |
| Bucket Size: | 0.100 | | 0.100 | ratio | Сору |
| Queue Type: | 1Mbps_Upload | ₹ | 1Mbps_Download | Ŧ | Remove |
| Parent | none | | | | Reset Counters |
| | | | | | Reset All Counters |
| | | | | | Torch |
| | | | | | |
| | | | | | |
| enabled | | | | | |

Figure 3.2.11.2: shows general Name & Target

| Queue List | | | | | | | | | [|
|----------------|--------|------------|---------|----------|---------|-------------|---------------|-------------|----------------------|
| Simple Queues | Interf | ace Queue | Queu | ie Tree | Queu | e Types | | | |
| + - 🖉 | 83 | - 7 | 00 | Reset Co | ounters | oo Rese | et All Counte | ers | Find |
| # Name | | Target | Uplo | ad Max | Limit | Download M | Max Limit Pa | acket Marks | Total Max Limit (bi. |
| Simple Queue < | 1Mbps: | > | | | | | | | |
| General Adva | anced | Statistics | Traffic | Total | Total S | Statistics | | | ОК |
| Packet Marks: | [| | | | | | | \$ | Cancel |
| | | | Target | Upload | | Ta | arget Downl | oad | Apply |
| Limit At: | unlim | ited | | ₹ | unlimi | ted | | ▼ bits/s | Disable |
| Priority: | 8 | | | | 8 | | | | Comment |
| Bucket Size: | 0.100 |) | | | 0.100 |) | | ratio | Сору |
| Queue Type: | 1Mbp | s_Upload | | ₹ | 1Mbp | os_Download | d | ₹ | Remove |
| Parent: | none | | | | | | | ₹ | Reset Counters |
| 1 | - | | | | | | | | Reset All Counters |
| | | | | | | | | | Torch |
| | | | | | | | | | |
| enabled | | | | | | | | | |

Figure 3.2.11.2: shows Limitation & Queue Type

3.2.12 Bandwidth Control in different ways

1. Normal control per IP?DHCP-user/PPPoE-user

2. Pick-Off different speed(like day=256k, night=1mb)

3. Brust limit (speed will up-down, like from 128k to 512k for shared users)

4. Equal share in live users (your total bandwidth will equally divided in live

5. Dedicated/Shared

3.2.13 Wireless

It use in limited area without wire connection

Access and accessibility improved

Backwards compatible as standards improve

Process:

IP>Add.>"+">Add.>192.168.100.1/24

Network>192.168.100.0

Interface>WLAN1_Wifi>Apply>Ok

| Address List | |
|----------------------------|--------------|
| + - < × 🗅 🍸 | Find |
| Address 🛆 Network | Interface 💌 |
| 192.168.50.221/24 | ether1WAN |
| 192.168.100.1/24 | 0 wlan1-Wifi |
| | |
| Address <192.168.100.1/24> | |
| Address: 192.168.100.1/24 | ок |
| Network: 192.168.100.0 | Cancel |
| Interface: wlan1-Wifi Ŧ | Apply |
| | Disable |
| | Comment |
| | Сору |
| | Remove |
| enabled | |

Figure 3.2.13.1: shows IP, Network & Interface

IP>DHCP Server>DHCP Setup>Interface>WLAN_Wifi Next>Sequentially Continued Untill Done

Wireless>Security Profile>Mode>Ap Bridge Band>2GHz-B/G/N SSID>DOL>Apply>Ok

| 11.7 | |
|--|---|
| Interface <wlan1-wifi></wlan1-wifi> | |
| General Wireless HT HT MCS WDS Nstreme | e NV2 Status |
| Mada: Instairides | ОК |
| | Cancel |
| Band: 2GH2-B/G/N | Apply |
| Channel Width: 20MHz | |
| Frequency: 2412 | MHz Disable |
| SSID: DOL | Comment |
| Scan List: default | The second sec |
| Wireless Protocol: any | ▼ Torch |
| Security Profile: default | WPS Accept |
| WPS Mode: push button | WPS Client |
| Bridge Mode: enabled | ▼ Setup Repeater |
| VLAN Mode: no tag | Scan |
| VLAN ID: 1 | Freq. Usage |
| Default AP Tx Bate: | Align |
| Default Client Tx Bate: | ▼ bps |
| | Snooper |
| Default Authenticate | Reset Configuration |
| ✓ Default Forward | |
| Hide SSID | |

Figure 3.2.13.2: shows wireless Mode, Band

Wireless>Security profile>Mark on>authentication Type>WPA PSK+WPA2SK Mark on>Unicast Ciphers(aesccm)>Group Ciphers(aesccm) WPA Pre-Shared key & WPA2 Pre-Shared Key>Apply>Ok

| Security Profile <default></default> | |
|--|------------------------|
| General RADIUS EAP Static Keys | ОК |
| Name: default | Cancel |
| Mode: dynamic keys | Apply |
| Authentication Types: WPA PSK WPA WPA EAP WPA | 2 PSK 2 EAP Comment |
| Unicast Ciphers: 🔽 aes ccm 🗌 tkip | Сору |
| Group Ciphers: 🗹 aes ccm 🗌 tkip | Remove |
| WPA Pre-Shared Key: 12345678 | |
| WPA2 Pre-Shared Key: 12345678 | |
| Supplicant Identity: MikroTik | |
| Group Key Update: 00:05:00 | |
| Management Protection: disabled Management Protection Key: | T |

Figure 3.2.13.3: shows Security profile

3.2.14 Website Block

It use for unnecessary access. Specially use in Office, Company and Organization because they avoid restriction site due to security.

Process:

IP>Firewall>Layer7 Protocols>"+">Name>Facebook_Block

Regexp>.+(facebook.com).*\$>Apply>Ok

IP>Firewall>General>Chain>Forward>Protocol>6(tcp)



Figure 3.2.14.1: shows Firewall Rule Protocol

IP>Firewall>Advanced>Layer7 Protocol>Facebook Block

| Firewall Rule <> | | |
|---|--------------------|--|
| General Advanced Extra Action Statistics | ОК | |
| Src. Address List: | Cancel | |
| Dst. Address List: | Apply | |
| Layer7 Protocol: Facebook_Block 🔻 🔺 Disable | | |
| | Comment | |
| | Сору | |
| | Remove | |
| Connection Rate: | Reset Counters | |
| Per Connection Classifier: | Reset All Counters | |
| Src. MAC Address: | | |

Figure 3.2.14..2: shows Firewall Rule for Layer7 protocol

IP>Firewall>Action>drop>Apply>Ok

| | Firewall Rule <> | |
|---|--|--------------------|
| I | General Advanced Extra Action Statistics | ОК |
| ł | Action: drop | Cancel |
| | Log | Apply |
| e | Log Prefix: | Disable |
| s | | Comment |
| 2 | | Сору |
| 5 | | Remove |
| V | | Reset Counters |
| | | Reset All Counters |
| | | |

Figure 3.2.14.3: shows Firewall Action for DROP

| ○ www.facebook.com × + | | | - 0 |
|--|---|----------|------------|
| \rightarrow X (i) https://www.facebook.com | | | ☆ 9 |
| | | | |
| | | | |
| | Ē | | |
| | | | |
| | | | |
| | This site can't be reached | | |
| | The connection was reset. | | |
| | Try: | | |
| | Checking the connection Checking the proxy and the firewall | | |
| | Running Windows Network Diagnostics | | |
| | ERR_CONNECTION_RESET | | |
| | | 077411.0 | |
| | Reload | DETAILS | |
| | | | |
| | | | |
| | | | |

Figure 3.2.14.4: shows Unable to reach Faceboo.com

LINUX

3.2.15 Centos Install Process

Creating Linux Partition

We have to make at least 3 partitions like root(/), boot, as well swap for installing of Linux.

• Root Partition: /

There is a root partition where "/" is the main directory that contains all files (except boots) in the root partition. space is required Minimum 5 GB HDD.

Boot Partition: /boot

Partition Boot (200 MB): A partition mounted on / boot / with files used during the bootstrap process contains operating system kernel (which allows you to boot Linux on your system). Due to constraints, you must create a local ext3 partition to hold these files. For most users, a 200 MB boot partition is sufficient.

SWAP Partition: swap

Partition swap is used to support virtual memory. In other words, data stored on your system is not enough RAM to store data stored on a swap partition. Partition Swap 2 GB virtual RAM for 2 GB of physical RAM, and then there should be an additional 1x physical RAM for any amount above 2 GB, but it cannot be less than 32 MB [5]

3.2.16 Linux Run-Level Used by Centos

- # init 0 = Shut Down.
- # init 1 = Single User Mode.
- # init 2 = Multi User Mode.
- # init 3 = Full Multi User Mode.
- # init 4 = Unused.
- # init 5 = X-Window (GUI Mode)
- # init 6 = Reboot.

3.2.17 The Basic Command of Linux Centos

Shutdown = poweroff, init 0, shutdown -h now . Reboot = reboot or init6 . Shows calendar = Cal ,cal 2014, cal 10 1989 Shows or change date and time = date . pwd: displays the present working directory. Is: lists the directory content cd: changes the directory. clear: clears the screen man: displays the manual pages for a command. Create a blank file = touch awal(File name) Create a directory = mkdirawal(directory name) List information about file = Is Copy = cp filename destination example: cp file1 /home/dir1/dir2 Move = mv filename destination example: cp file1 /home/dir1/dir2

| | | |
|-----------------------------------|--|--------|
| | root@localhost:~/Desktop/awal | × |
| | <u>File Edit View Search Terminal H</u> elp | |
| Computer | [root@localhost Desktop]# pwd /root/Desktop | |
| | [root@localhost Desktop]# ls [root@localhost Desktop]# cd [root@localhost ~]# pwd /root | |
| | <pre>[root@localhost ~]# ls anaconda-ks.cfg Documents install.log Music Public Videos Desktop Downloads install.log.syslog Pictures Templates [root@localhost ~]# cd Desktop</pre> | |
| Trash | <pre>[root@localhost Desktop]# mkdir awal [root@localhost Desktop]# cd awal [root@localhost awa]]# touch "text file" [root@localhost awa]]# □</pre> | = |
| | | |
| awai | | |
| | awal _ 🗆 × | |
| <u>File Edit V</u> iew <u>P</u> l | laces <u>H</u> elp | |
| | | \sim |
| text file | | |
| | | |
| | | |

Figure 3.2.17.1: shows current location & changing directory

#ifconfig
#cd /etc/sysconfig/network-scripts
#vim ifcfg-eth0

root@localhost:~/Desktop _ _ _ ×
File Edit View Search Terminal Help
[root@localhost Desktop]# ifconfig
eth0 Link encap:Ethernet HWaddr 00:0C:29:3B:AF:89
 inet addr:192.168.50.187 Bcast:192.168.50.255 Mask:255.255.255.0
 inet6 addr: fe80::20c:29ff:fe3b:af89/64 Scope:Link
 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
 RX packets:255 errors:0 dropped:0 overruns:0 frame:0
 TX packets:15 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:1000
 RX bytes:19701 (19.2 KiB) TX bytes:3461 (3.3 KiB)
lo Link encap:Local Loopback
 inet addr:127.0.0.1 Mask:255.0.0.0
 inet6 addr: ::1/128 Scope:Host
 UP LOOPBACK RUNNING MTU:16436 Metric:1
 RX packets:16 errors:0 dropped:0 overruns:0 frame:0
 TX packets:16 errors:0 dropped:0 overruns:0 carrier:0
 collisions:0 txqueuelen:0
 RX bytes:960 (960.0 b) TX bytes:960 (960.0 b)
[root@localhost Desktop]#

Figure 3.2.17.2: shows how to check ether port number

#vim /etc/sysconfig/network-script/fcfg-etho
#service Networkmanager stop
#chkconfigNetworkManager off



Figure 3.2.17.3: temporary& permanently off network

#vim /etc/resolv.conf

#service network restart

| E root@localhost:~/Desktop | _ = × |
|---|----------|
| <u>File Edit View Search Terminal Help</u> | |
| # Generated by NetworkManager | <u>_</u> |
| | |
| # No nameservers found: try putting DNS servers into your | |
| <pre># ifcfg files in /etc/sysconfig/network-scripts like so:</pre> | |
| # | |
| # DNS1=xxx.xxx.xxx | |
| # DNS2=xxx.xxx.xxx | |
| # DUMAIN=Lab.Too.com bar.Too.com | |
| nameserver 8.8.4.4 | |
| ~ | _ |
| ~ | = |
| ~ | |
| ~ | |
| ~ | |
| ~ | |
| ~ | |
| ~ | |
| ~ | |
| ~ | |
| ~ "/etc/resolv.conf" 11L. 266C 11.1 | All V |
| | |

Figure 3.2.17.4: service network restart

ping google.com

| E root@localhost:~/Desktop | _ 0 × |
|---|-------------------|
| <u>File Edit View Search Terminal Help</u> | |
| <pre>File Edit View Search Terminal Help [root@localhost Desktop]# service network restart Shutting down interface eth0: Shutting down loopback interface: Got Bringing up loopback interface: Got Bringing up interface eth0: [00] [root@localhost Desktop]# ping google.com PING google.com (172.217.194.101) 56(84) bytes of data. 64 bytes from 172.217.194.101: icmp_seq=1 ttl=43 time=57.8 ms 64 bytes from 172.217.194.101: icmp_seq=2 ttl=43 time=51.1 ms 64 bytes from 172.217.194.101: icmp_seq=3 ttl=43 time=51.1 ms 64 bytes from 172.217.194.101: icmp_seq=4 ttl=43 time=51.1 ms 64 bytes from 172.217.194.101: icmp_seq=5 ttl=43 time=51.0 ms 64 bytes from 172.217.194.101: icmp_seq=6 ttl=43 time=51.0 ms 64 bytes from 172.217.194.101: icmp_seq=7 ttl=43 time=51.0 ms 64 bytes from 172.217.194.101: icmp_seq=8 ttl=43 time=51.0 ms 64 bytes from 172.217.194.101: icmp_seq=7 ttl=43 time=51.0 ms 64 bytes from 172.217.194.101: icmp_seq=8 tt</pre> | K] K] K] |
| | ~ |

Figure 3.2.17.5: ping to google.com

3.3 Project Task and Activities



Figure 3.3.1: shows campus network design

Here I design a campus network using networking component. I use 4 Router to make the design. In Router-0 the Multilayer switch has connected and the Multilayer switch has two sub switches. 1 switches uses for PC and Server for Office which is vlan-3. Another switch uses to PC and also make wireless router for LAB which is vlan. The four router's are connected in two Cloud-PT and one Cloud-pt works as ISP which uses 1 router and 1 switch as well 3 server. Head office use connection from switch which is allocated ip 192.168.2.0 and Main Building use vlan-4 with the IP 194.168.4.0. Account office is connecting on a switch uses ip 192.168.3.0 as vlan1 also connected in switch and 3 pc also connected in multilayer which also connect in router and another router has 1 switch which makes another 3 Server. This how i design above campus network.

3.4 Challenges

No work no challenges, but I can know about my internship experience and sharing my happy hour with my batch mates. I discovered some common challenges during internship period. However, Remember that all. An intern may face these different challenges Given below:

- a. Get in with workplace.
- b. Some systems have the ability to gather.
- c. Compatibility with the official decency and quality.
- d. Established relationship with authorities.
- e. Expert with self show offensive activity.
- f. Get some rewards from the association
- g. Develop the relevant range with different level clients. Be useful and keep the calm of the convenience of the client
- h. Ultimately all of a understudy requires to face several different problems including above.
- i. Finally we can say that there is no success if there is no test. Alongside these lines in the way of your prosperity we will take each test very seriously.

CHAPTER 4

4.1 Competencies Earned

An apprentice learns the consequences of a learning process to acquire skills or learn results, a statement of what is able to understand or do. Install and both decommission Network and server machine two data centers. Lead role in the implementation of advanced Linux software, for example LDAP HA, Program Learning Result, Field and Internship Assessment. The Student Association's Office pays intern study results for many students. **Outcomes**: Collecting and organizing information on an internship project. **Description**: Attend a new look on the Linux Lab website. **Learning Outcomes**: Install and configure software and upgrades; Network Employer Services Install, Configure and Test. In addition, consistent with learning outcomes, internship on-site supervisors will provide an orientation to organizational policies and procedures.

4.2 Smart Plan

Each company must have a smart plan to gain success. Originally some common things in combination make a smart plan.

4.3 Reflections

In 2002, Daffodil Online Ltd inception their operation. In the past years, they extend operation and service portfolio according to customer's required demand. From their inception, they got lots of national and international prizes from the domestic and outer Platform. Because they worked with many national and international project and organization to achieve reputation. They started their operation in 2002. In this time they have various services to provide customer. in the past years of their inception they extended the operation and service portfolio according to customers demand. They usage the modern and latest technologies for upgrading the required service.

CHAPTER 5 Conclusion and Future Career

5.1 Discussion and Conclusion

This internship review has a wonderful and rewarded knowledge and experience. I have seen in the future and I will be able to help with network opportunities that many people have been able to make sure.. I discussed above about the MikroTik router and Linux. I configured several connections in MikroTik such Static, Dynamic, PPPoE, Bridge, Wireless and Bandwidth Management etc. As i learn above mention configuration i think if any one use static, there are several advantages these are simple to configure and maintain, secure operation and it updates manually of routes after changes. Dynamic routing would be best when more topology uses in multiple router. Now i am going to talk about the main advantages of PPPoE routing which builds a point to point tunnel between 2 network devices and makes username as well password authentication. Another one is Bridge which can extend a network by acting as repeater, it also reduces collisions but it has a big disadvantages that is more expensive than repeaters. With this way of learning method i think i will get opportunities to get a job any ISP company or any organization. As we know, every company has a network design which configured above mention connection. So there is a opportunity to appoint in job by knowing these routes configure. It would be more priority able who knows well in secure connection.

5.2 Scope for Further Career

Career opportunities are available in various fields under MikroTik and Linux. Linux is career opportunities do not just refer to the Linux platform, it also includes many kinds of applications for kernel and device driver development needs, desktop application development, open source software developers and network engineers. Today many companies have moved to Linux and open source software. Companies such as Google, Yahoo, Being, Wiki.org, many companies have moved to cost effective open source solutions. There are huge demands for skilled professionals such as MikroTik and Linux.

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Last accessed 02-11-2018, 3.18 pm

Appendices

Appendix A: Internship Reflection

The basic knowledge of my internship is to apply my professional knowledge and serve the world. Building a suitable job, qualification and professional environment makes it easy for a job. Applying knowledge from internship and deal with professionals Field How to connect with new members, build new relationships with colleagues, Supervisors and new organizations rely on learning ability. Competition Best the way to prepare for the global market. Knowledge-making work is the key to success Global Market Expert workmanship is a specialist in the field of MikroTik and an expert Linux sector. My internship supervisor and internship provide an Opportunity to take a professional opinion with an evaluation running through personal meeting at the end of the experience. Experience internship ready for life in global society, leadership and service, my gift is able to be able to use it.

Appendix B: Company Detail



Figure 5.3: Daffodil Online logo[6]

Head Office

| Name | Daffodil Online Limited (DOL) |
|----------------------|---|
| 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) |