Internship on Computer Networking at ISP as a Trainee in Network Support Engineer

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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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APPROVAL

This Internship titled "**Internship on Computer Networking at ISP as a Trainee in Network Support Engineer**", submitted by Md Abdus Salam, ID No: **221-15-5690** 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 **13 January, 2025.**

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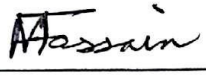

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Mr. Narayan Ranjan Chakraborty, Associate Professor & Associate Head,** Department of CSE Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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I would like to convey our heartfelt gratitude **to Dr. Sheak Rashed Haider Noori, Professor and Head** of the Department of CSE, for his generous assistance in completing our project, as well as to the other faculty members and the staff of the CSE department at Daffodil International University.

I also want to thank all our classmates at Daffodil International University, who actively participated in discussions while we worked on our course work.

Finally, I must express my appreciation for the continuous support and patience of my parents.

ABSTRACT

This internship report is prepared to accomplish the degree requirement of B.Sc. respective for the Daffodil International University. I did my internship at one of the well-established organizations namely; DTech Online Limited as a Trainee under the tenure of "Network Support Engineer." This is the reason I want to point out my experience and the knowledge I have gained during the internship. Shifting to my role, as a Network Engineer intern, I specifically aimed at mastering on networking, and gaining information about Switching, Routing, IP addressing, fiber connection solutions etc.; different types of routing and their relative protocols. Today, most of the network engineers are engaged with new technologies. This organization is provided with several gadgets that are linked with others through the interfaces. In the server room we have different Mikrotik routers, switches, OLTs, hubs, computers, printers and other important items. The ISP segment is to connect people and enterprises with the Internet and provide Internet services. I learned about the wiring of routers, Router Operating System for Mikrotik, switch configuration, routing, static and bridge configurations, installation of wireless routers, DHCP configuration, NAT configuration, bandwidth management, PPoE settings, IP addressing, fiber optic cable, local UTP cabling, and home and corporate router as well as switch installation. My conclusion of the internship is presented and highlights of the report are discussed in this section. This is why I opted to make this specific topic of my report: This internship made me to learn the practical aspect of working within the networking environments, and improve on my communication skills. In addition, an attempt was made to determine the degree of success of my internship.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

We are currently living in the age of information technology. All types of industries nowadays depend on software-driven communication and Internet technologies. An Internet connection is not possible without an available server. Nowadays, we can hardly get a job without accessing the Internet or using a computer system to get things done. It will be a difficult task to do without the web. Nowadays, communication and networking form the backbone for companies, offices, banks, exchanges, and many other institutions. Networking forms an indispensable part of the operations of a business office and plays a vital role for any ISP agency in offering access to the Internet. I would now like to present some of the weaknesses I found during this survey, which is essential for networking. One important milestone for engineering students is serving an internship. The internship program, which has now been made a regular part of the Computer Science and Engineering course, was organized by the CSE department.

1.2 Motivation

Technology is being applied now more often and even daily in the current environment. From personal activities to business, the internet is being used. This means that there is great volatility and lots of employment opportunities for the Information Technology employees. As most of our important assignments are based on the Internet and we cannot even begin to contemplate life without it, there is a need for people who are able to perform the services. There are diverse career prospects in it that I prefer as a network engineer. I can say that I derive pleasure in setting and designing networks. The actual emphasis of DIU's internship programs is this: Students are released from the world of fictional books and classroom approaching and introduced into this real world of learning application. Anybody stands to gain from the wealth of knowledge and experience attained via employment in an organization when hiring a full-time specialist to support students in proving consistency, activity, inventiveness and polished methodology in the project that they are assigned.

1.3 Internship Objectives

An Internship is generally a form classroom practical affiliation or workplace exposure which allows learners to undertake practical working experience in a course or career path they intend to pursue. The program enables the student to go through an employment ladder as well as get to master something new. On the positive side interns introduce new dynamics within the organization, they offer new thinking and positive attitude to work, they are potential for talent building and can be potential future employees too.

1. To apply what we have learned in the practical world.

2. The student will learn the basic concepts of networking principles, protocols, and technologies.

3. To learn about various routing techniques.

4. To learn the introductions of different layers of the protocol stack.

1.4 Introduction of Company

Dtech Online Ltd. is amongst the leading ISPs of our country. They are The specific objectives of this study are: The objectives of this study will be The overall research questions for this study are: Of interest in this study is the ICT Division that the company has launched. It's an IT service provider that has been established in January 2003 and has its license to operate. It is an organization that is fully equipped with the new technology, and is often replacing its services. The last key aspects are regarded as high priorities; for instance, Commitment to Customer Care is acknowledged as a valuable experience for a company from the sphere of information and communication technology.

Currently, Dtech online ISP target and has over 5000+ clients with various services; business internet, IP telephone, residential Internet, and Pop. Presently, we are establishing broadband Internet Service but also advertise well known firms' products/ services to corporate offices, Manufacturing Industries, Small & Medium Businesses, to the large Corporate Houses in Bangladesh.

1.5 Report Layout

Chapter 1: This section contains a summary of my sources of inspiration in addition to stating the Chapter's purpose and detailing my inspirations, career aspirations, Internship objectives, & the establishment of the Internship company.

Chapter 2: In this Chapter, I discussed the Organization and structure structure of the firm, as well as a quick overview of my previous employer It company and its management.

Chapter 3:I've addressed various topics such as everyday including daily events and activities, tasks and responsibilities, challenge and exercise, as well as driver and router operating systems, and more in this chapter.

Chapter 4: I emphasized clever techniques and practical skills in my discussion of this chapter.

Chapter 5: In terms of networking, MikroTik, Cisco Switch, and other issues, I have provided the end of this chapter as well as future employment opportunities.

CHAPTER 2

ORGANIZATION

2.1 Introduction

DTech Online is among the oldest and most seasoned Internet service providers in the industry. It owns its fibre optic network and currently has been approved by the BTRC as a legal ISP to provide Dtech online services. Dtech Online boasts of being an Internet Service Provider (ISP). This pride is based on one of the core concepts of ICT sector which includes relationship selling, business strategy that hinges on the need to sell most of its products to the customers in the market. Like most modern organizations, Dtech Online operates as an Internet Service Provider.

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2.2 Product and Market Situation

Some of the technologies I interacted with during my internship include; (Cisco cloud networks, DNS, Mikrotik, DHCP, TP-LINK and ATM Networking). However, the most valuable information was in the area of cisco packages. The following technologies are utilized by Commercial & Industrial Network Corporation. Cisco Systems product line encompasses wireless systems, unified fabrics, switches, routers, wan, warehouse networking, ATM Networking, customer service and support, and pole computing services. In the field of networking, there exist so many requirements. The case will be different according to each field and type of organization. Since an organization is offering good career promises, it looks quite promising.

2.3 Target Group

To be stay powerful and successful in the face of global change, any firm and organization must increase PC and time capacity. Dtech Online Limited has created a one of a kind combination of skill sets that are commonly cited in the current business sector. Dtech Online Limited is pressing ahead with the proper drive to achieve its goal.

2.4 SWOT Analysis

The SWOT analysis examines the following aspects: SWOT, which is an acronym for strengths, weaknesses, opportunities as well as threats. That is used to highlight the major factors within and outside an organization that are deemed to be paramount in realizing a particular aim.

Strengths:

- Interest and commitment
- Flexibility
- Chance to come up with plans for any type of eventuality.
- Business intelligence

Weaknesses:

- Writing and speaking on to people is not possible if there is no content to support what needs to be passed.
- There are communication deficiencies.
- A tendency to have a disposition towards not updating your application.

Opportunities:

DTech Online proves to be the best Internet service provider company out of all the companies. The former main channeled initiatives involve corporate networking, networking for individual customers, and channel partnership with small ISPs. Additionally, it is one of the biggest clients of Data Soft. In this case, I have many opportunities to acquire experience in different business environments to improve my abilities.

Threats:

Several issues come up whenever connection is being made and such include power surges, lack of cables, Point of Presence (Pop) outages, fiber cutoff, etc. I will work as hard as possible to do so.

2.5 Organizational Structure

DTech Online Limited ISP (Internet Service Provider) Organizational Structure is given below figure 2.1

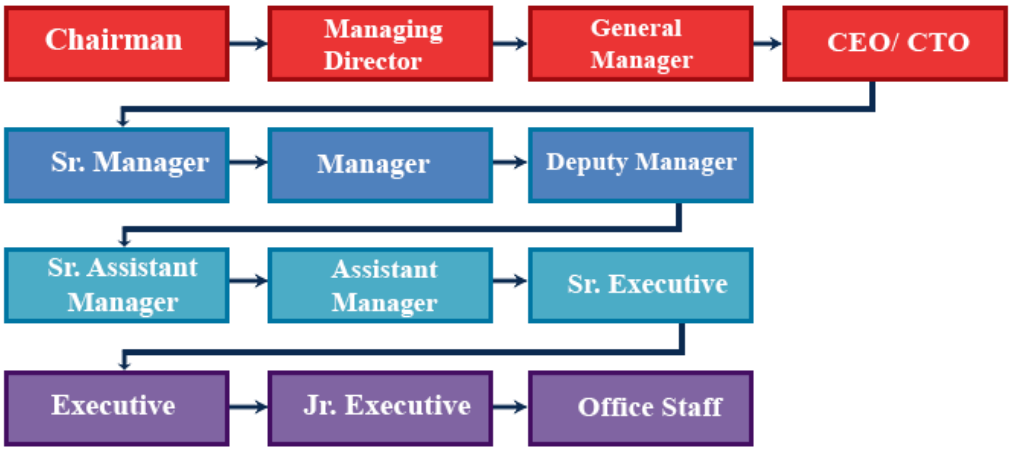

Figure 2.1- Org. of the Dtech Online Ltd

2. 6 Mission & Vision of Dtech Online Limited

Dtech Online strives to make it easier for people and companies to connect and improve their experiences to discover a world of possibilities.

With realization of the vision of the institute, to be an institute that offers diverse knowledge to the society.

CHAPTER 3

TASK & ACTIVITIES

3.1 Every day Task & Activities

I had been able to complete my internship at Dtech Online Limited as a Network Support Engineer under the IT department. The Company would like to give me a permanent offer of employment to join this company. On average, the network operations division works for six days a week, and they have Friday off. In working hours here are from 9:30 am to 6:30 pm. My internship also starts on the same time, starting from 9:30 am to 6:30 pm. Here, I will start my internships from 1st July 2024 to 30th September 2024.

1. **Month 1:** - During the first month, I completed the following tasks and gained knowledge.

- Recognize the fundamental hardware components and Network Components.
- How to Setup Internet on a Computer.
- Computer System Networking.
- Known about Networking Device.
- Technical Assistance Group.
- Call Center Support / Customer Support.
- Receive Client Problem and Create Complaint Ticket.

2. **Month 2:** -In the second month, I completed the following tasks.
    - All type of Cabling.
    - Optical Fiber and UTP cable are required for operation.
    - The entire backbone is being monitored.
    - All Client Links are being monitored.
    - Troubleshooting.
    - Checking all client packets.
    - LAN, MAN, WAN.

3. **Month 3:** - During the third month, I acquired knowledge and completed the following tasks.
    - Mail Checking.
    - Physical Assistance.
    - I worked in the account area of an ISP.
    - Wireless Router Configuration.
    - Setup and configuration of the client's home router.
    - Corporate Office Assistance.
    - Configuration of the Mikrotik Router Operating System.
    - Installation system.
    - Static Routing Setup.
    - DHCP Routing Setup.
    - Bridging system designs.
    - PCQ bandwidth control administration.
    - NAT and Firewall Setup.
    - Configuration of PPPoE.
    - Complete Setup of Mikrotik Router.
    - Survey of all components.
    - Addressing client issues Make a complaint ticket, remedy the problem, and close the complaint.

Before commencing work, I first went through the report of the previous day and then before closing my work for the day I prepared the report of problems encountered in the day and forward the end of the working day report to the right authority.

3.2 Basic Networking, Class & IP addresses

3.2.1 IP addresses:

A number used to identify a computer or network of computers.

Types of Logical Addresses:

- IPv4
- IPv6

- **IPv4 ADDRESSES:**

An IPv4 address is a 32-bit address that distinctly and universally represents a device's connection to the Internet.

The total address space of IPv4 is 2^32 or 4,294,967,296 unique addresses.

Types of IPv4 Address

- Classful Address
- Classless Address

- **Classful Addressing:**

In classful addressing, the address space is segmented into five classes: A, B, C, D, and E.

- Class A features a 24-bit host address along with an (8-bit network ID.)
- Class B features a 16-bit host address along with an (16-bit network ID).
- Class C features a 8-bit host address along with an (24-bit network ID).
- Class D and E are set for multicast and research purposes.

- **Finding the IP address category:**

Class	1st octet of IP address	Default Subnet Mask	Network / Host	Number of networks	Maximum nodes in a network
A	1 - 126	255.0.0.0	N.H.H.H	126	16,777,214
B	128 - 191	255.255.0.0	N.N.H.H	16,384	65,534
C	192 - 223	255.255.255.0	N.N.N.H	2,097,152	254
D	224 - 239				
E	240 - 254				

TABLE 3.1: Finding the IP address category

3.2.2 Subnetting

A subnet is an off shoot of a larger network and may also be referred to as a sub network or subnetting.

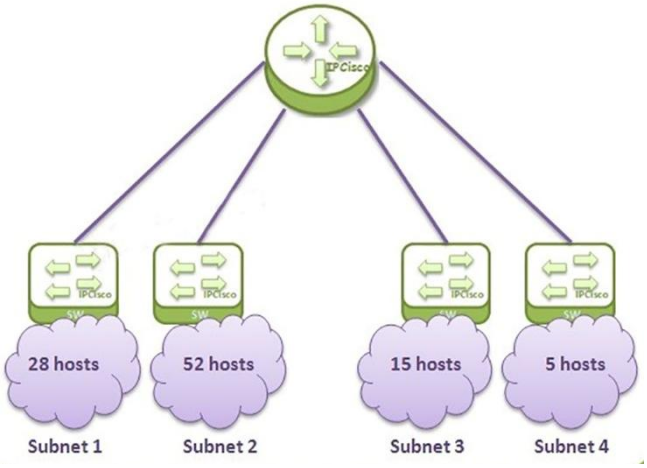

Figure 3.1- Subnetting

Types of Subnetting include:

- Fixed Length Subnetting (FLSM).
- Variable Length Subnetting (VLSM)

- **Fixed Length Subnetting (FLSM)**

In Fixed Length Subnetting the length of subnet is fixed and all the subnets are in equal size.

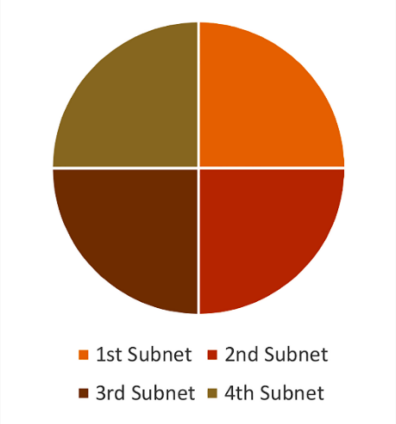

Figure 3.2- FLSM IP Size

Example:

Let's , consider an IP address 198.168.10.0

Find 4 Subnet Blocks

Now,

This is class C IP range

Default subnet mask for Class C is 255.255.255.0

IP every octet consists of 8-bit (binary): 11111111.11111111.11111111.00000000

Here,

4 subnets need to borrow 2 bits from the host

2^n

2^2 = 4

We get

11111111.11111111.11111111.11000000

updated subnet mask is:

255.255.255.192

Maximum subnet Mask	255.255.255.255
Updated subnet Mask	255.255.255.192
	0. 0. 0. 63

Now range is 0. 0. 0. 63

First Network Block:

198.168.10. 0
+ 0. 0. 0.63
198.168.10.63

So,
Network address is : 198.168.10.0
Broadcast address is : 198.168.10.63
First host address is : 198.168.10.1 (NA+1)
Last host address is : 198.168.10.62 (BA-1)

Second Network Block:

198.168.10. 64
+ 0. 0. 0.63
198.168.10.127

So,
Network address is : 198.168.10.64
Broadcast address is : 198.168.10.127
First host address is : 198.168.10.65 (NA+1)
Last host address is : 198.168.10.126 (BA-1)

Third Network Block:

198.168.10. 128
+ 0. 0. 0. 63
198.168.10.191

So,
Network address is : 198.168.10.128
Broadcast address is : 198.168.10.191
First host address is : 198.168.10.129 (NA+1)
Last host address is : 198.168.10.190 (BA-1)

Forth Network Block:

198.168.10.192
+ 0. 0. 0. 63
198.168.10.63

So,
Network address is : 198.168.10.192
Broadcast address is : 198.168.10.255
First host address is : 198.168.10.193 (NA+1)
Last host address is : 198.168.10.254 (BA-1)

- **Variable Length Subnetting (VLSM)**

A variable length subnet mask (VLSM) is a technique of dividing an IP network in to subnets such that they use different subnet masks.

3.2.3 Supernetting

Supernetting means the method of joining together a number of Subnetted networks which are in adjacent areas.

Example:

Here Finding out the supernet of the below IP addresses:

(192.168.16.0)

(192.168.17.0)

(192.168.16.0)

(192.168.30.0)

Now Convert the Ip addresses into binary digits :

192.168.16.0/24 ⟶ 11000000. 10101000. 00010000. 00000000
192.168.17.0/24 ⟶ 11000000. 10101000. 00010001. 00000000
192.168.30.0/20 ⟶ 11000000. 10101000. 00011110. 00000000
192.168.31.0/24 ⟶ 11000000. 10101000. 00011111. 00000000

Here we Locate the bit where the common pattern of digits is ends:

11000000.10101000.00010000.00000000
192 . 168 . 16 . 0

So, the supernet is 192.168.16.0

3.3 Basic Types of IP Routing Protocol

- Static Routing.
- Dynamic Routing.

3.3.1 Static Routing

Model a small company static routing:

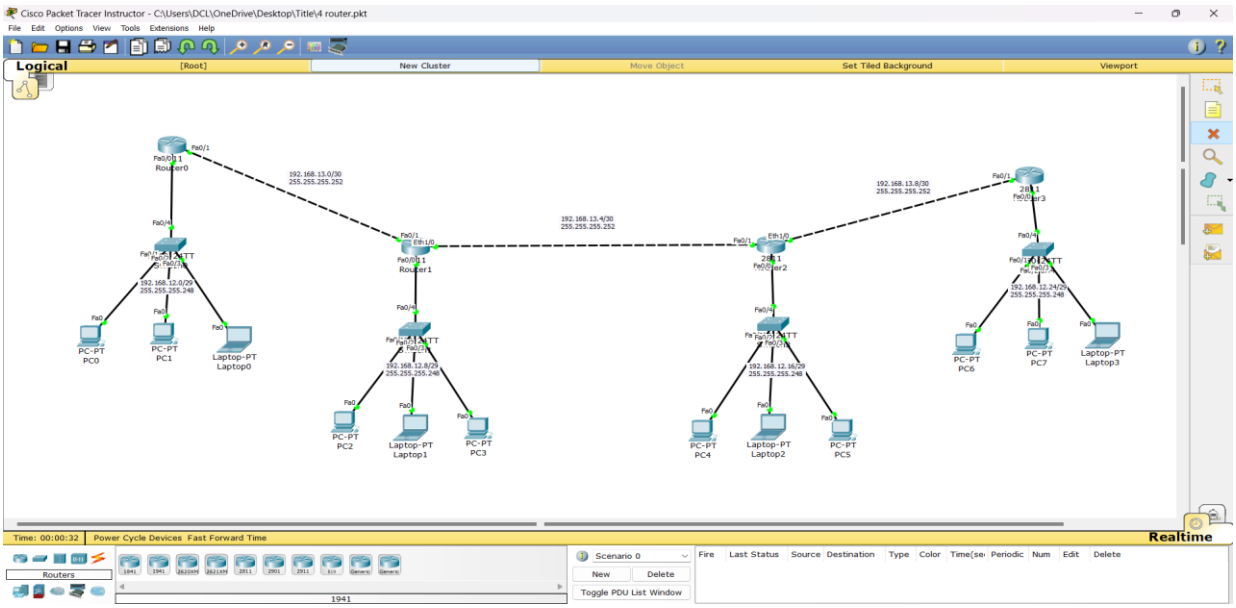

Figure 3.3 - Device add for static routing

Add IP into each PC:

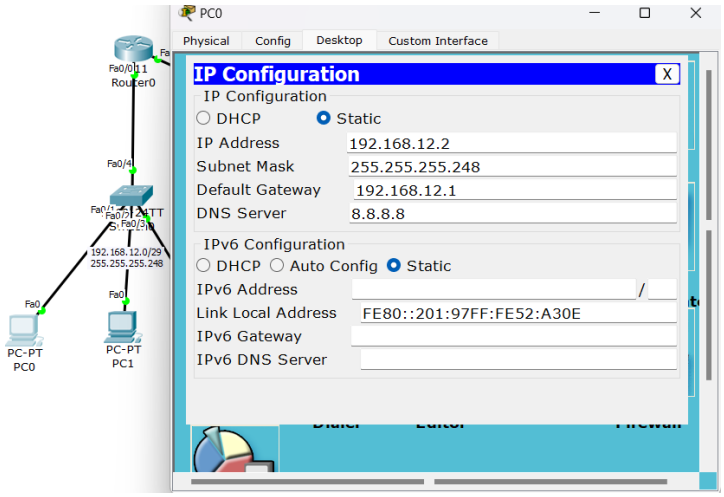

Figure 3.4- Add IP address into PC

Configure all routers:

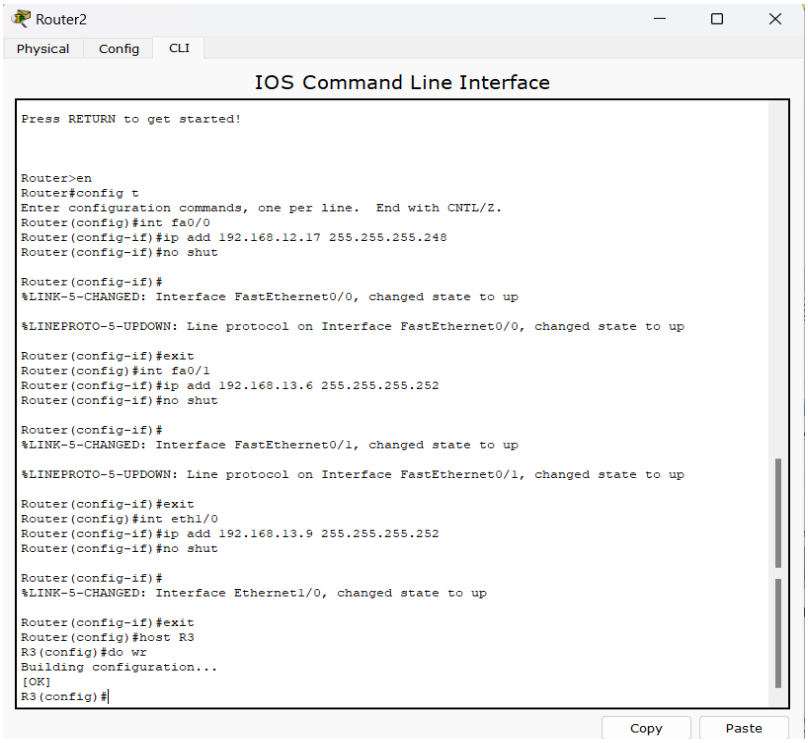

Figure 3.5 - Configure all routers

Ip route:

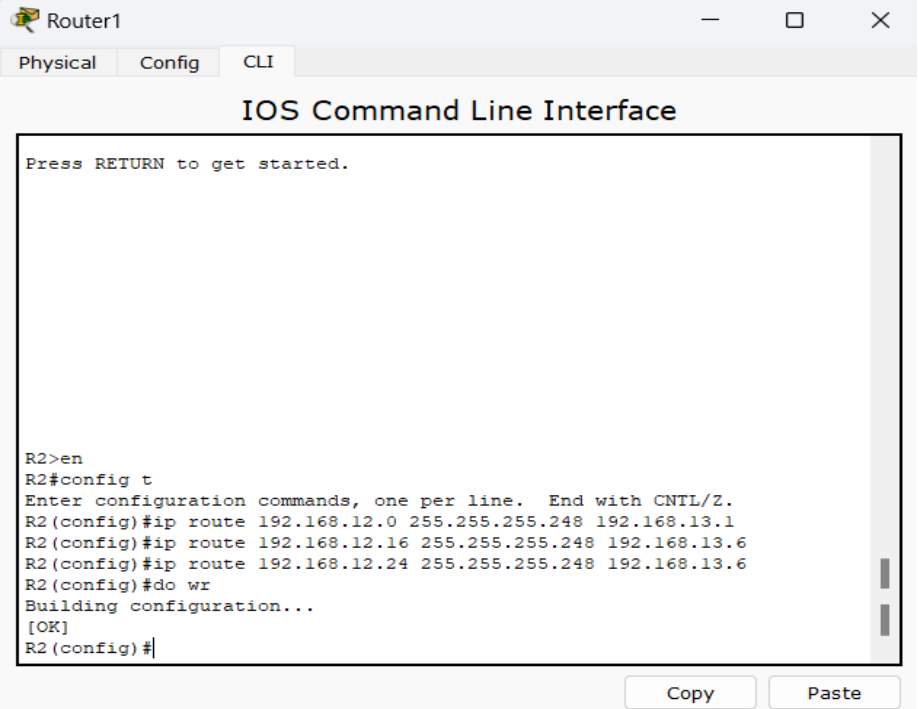

Figure 3.6- Set IP route

Ping Test :

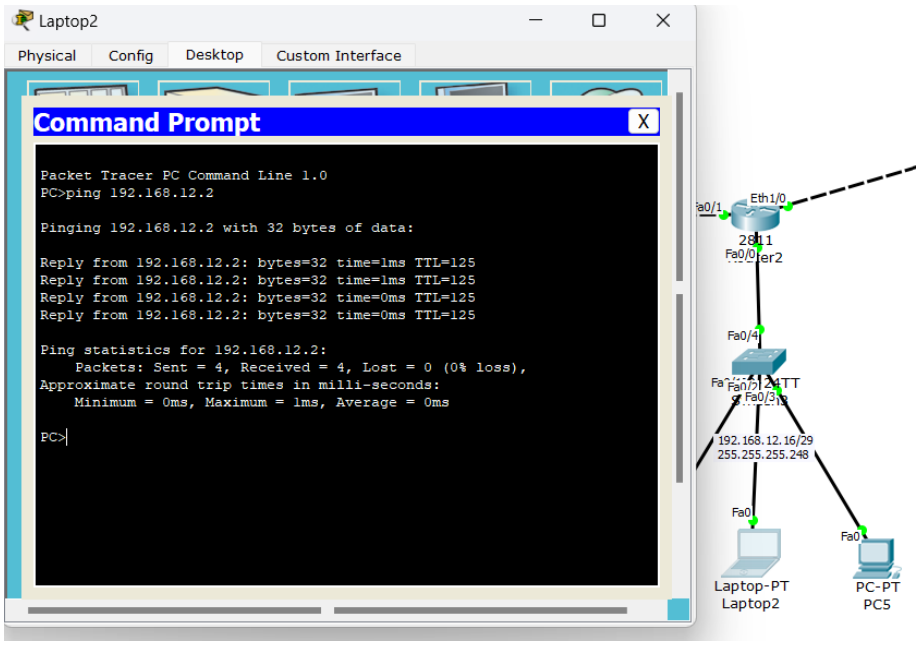

Figure 3.7- Ping Test

Packet send:

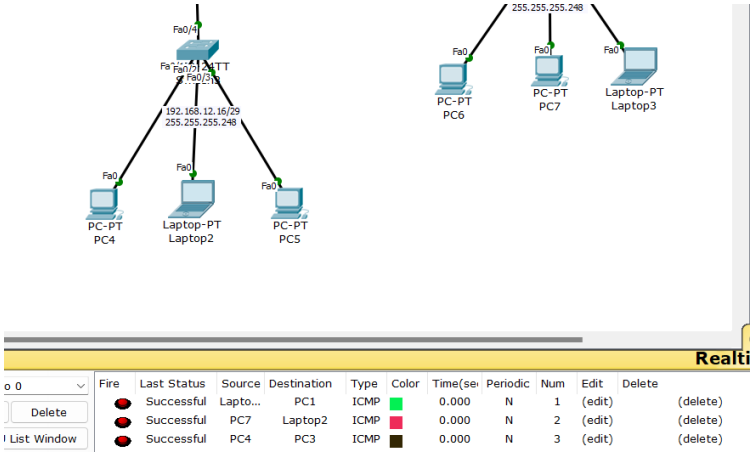

Figure 3.8- Packet send

Here First of all we take some PC or laptop, Switch, Router & connecting wire. Than connect each pc through switch. Connect the switch to router. Than connect each router and create a network.
After that we set IP address into each pc. Than configure all routers and set route. After that every process is complete than we test the ping in pc and send our packet. This is the process of static routing.

3.3.2 Dynamic Routing

- Routing Information Protocol (RIPv2)

Configure RIP version 2 for small organization:

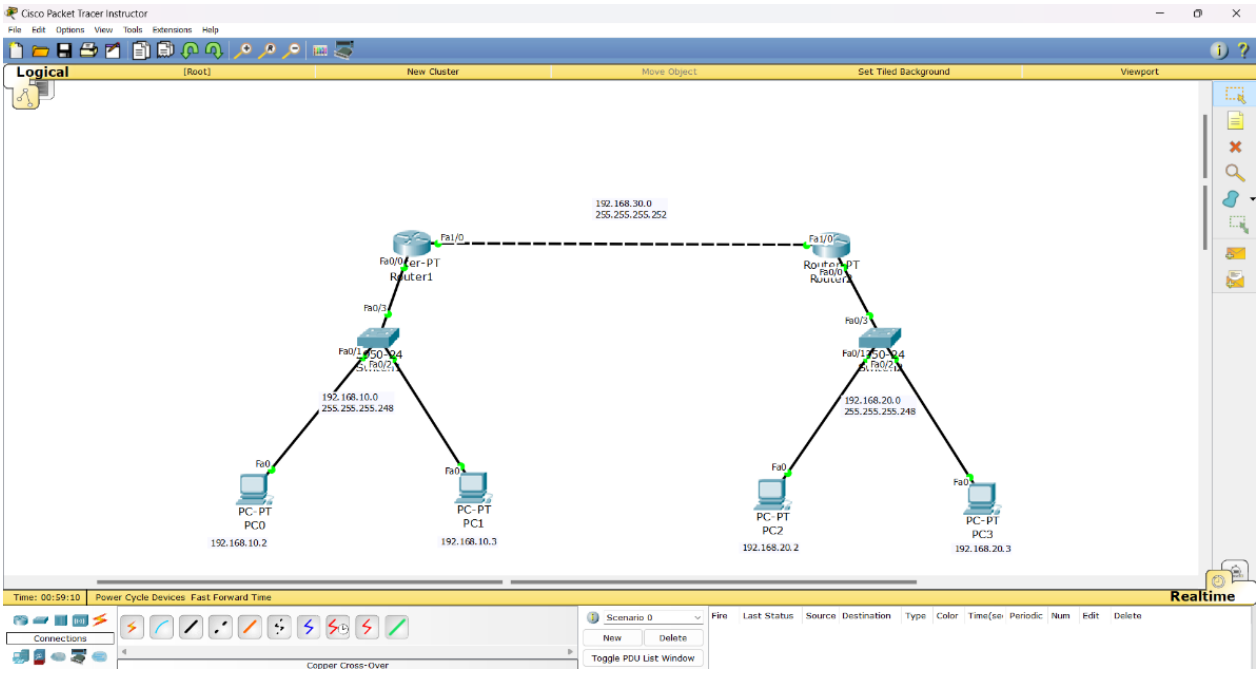

Figure 3.9- Device add for dynamic routing (RIP v2)

Add IP into each PC:

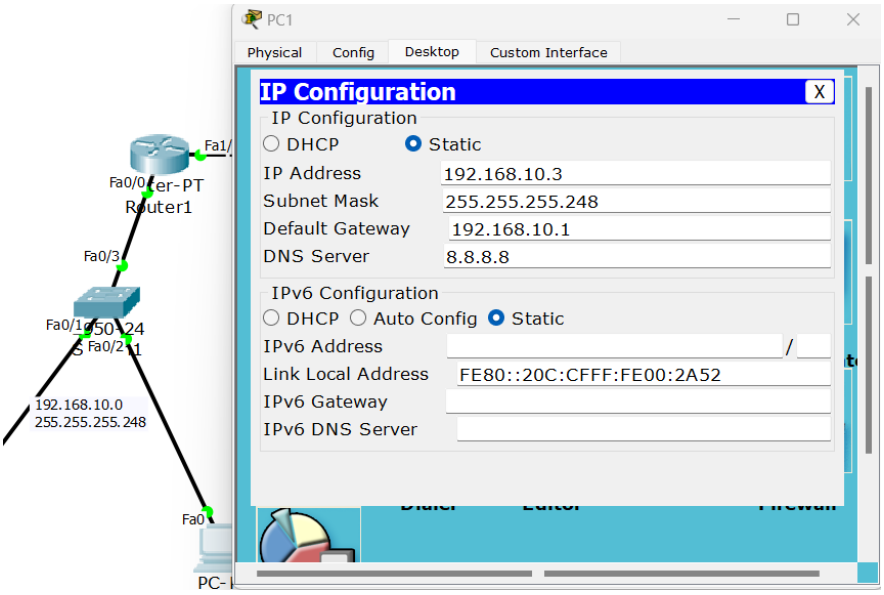

Figure 3.10- Add IP address into PC

Configure all routers:

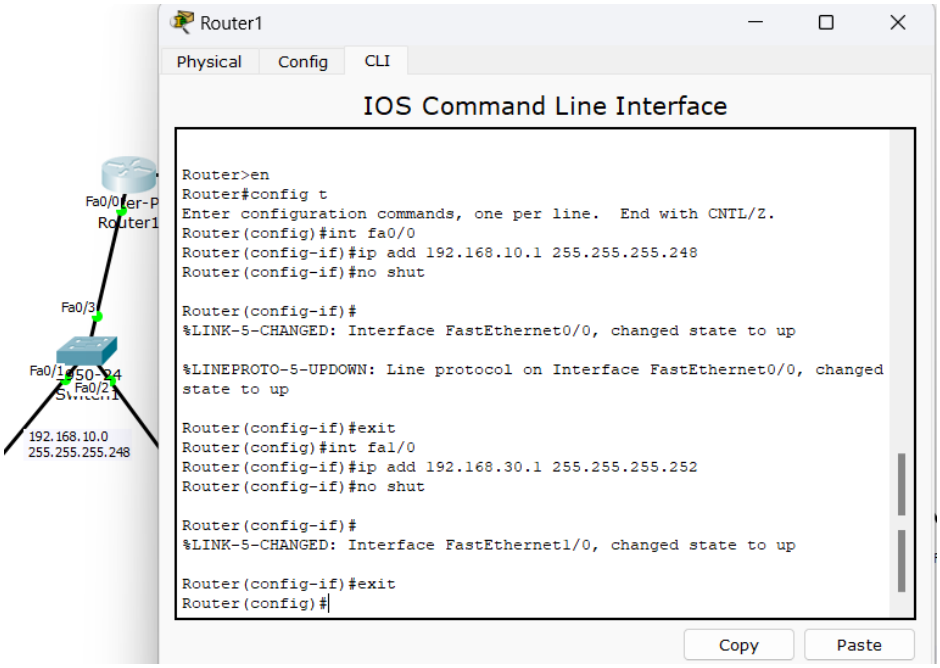

Figure 3.11 - Configure all routers

Router RIP:

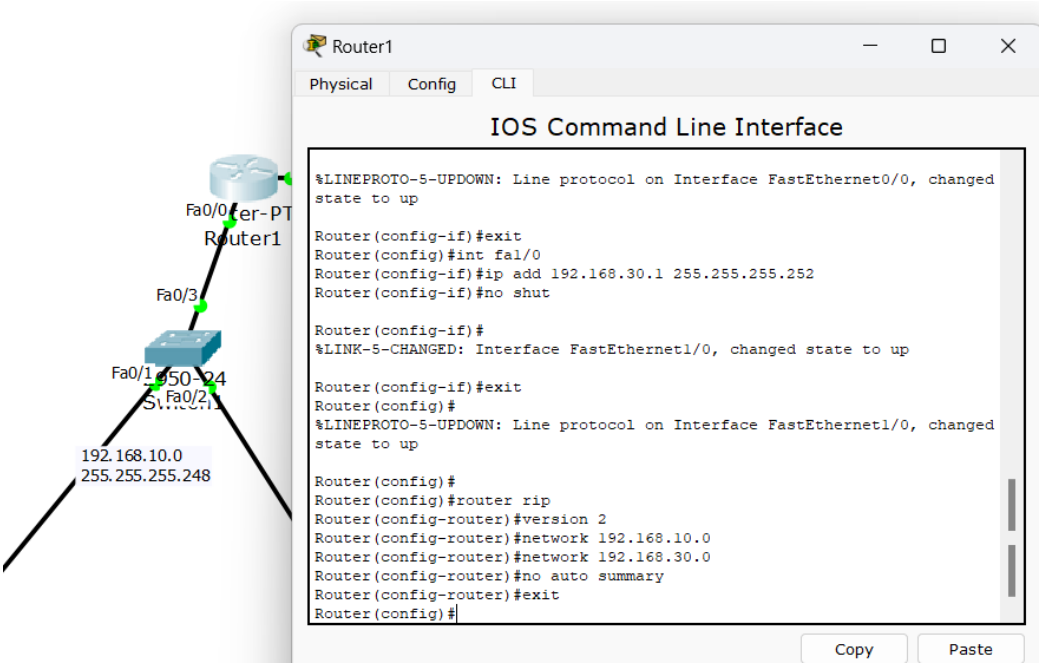

Figure 3.12 - Set Router RIP

Ping Test:

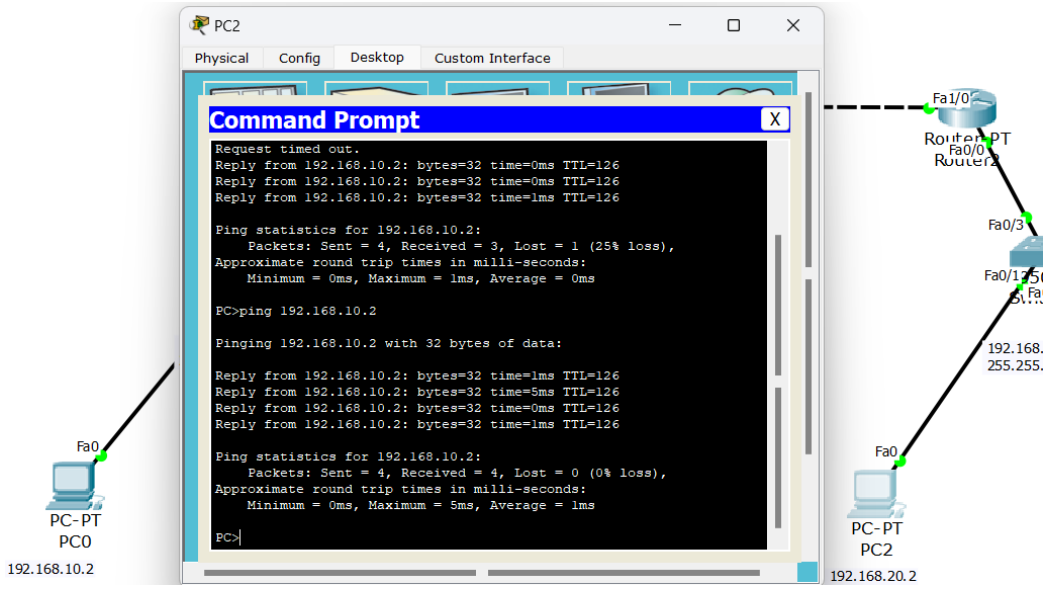

Figure 3.13 - Ping Test

Packet send:

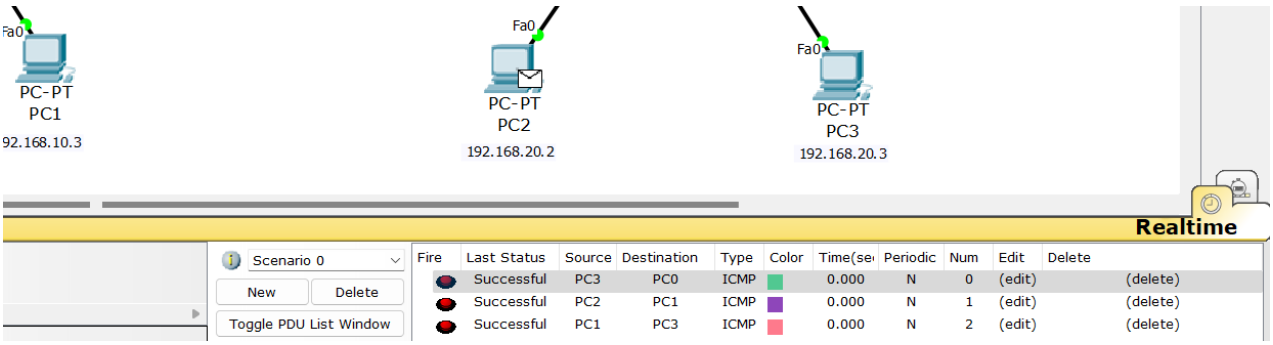

Figure 3.14 - Packet send

Here First of all we take some PC, Switch, Router & connecting wire. Than connect each pc through switch. Connect the switch to router. Than connect each router and create a network.

After that we set IP address into each pc. Than configure all routers and set Router RIP. After that every process is complete than we test the ping in pc and send our packet. This is the process of dynamic routing (RIP v2).

3.4 Using Devices & Components for networking:

Networking Devices	Networking Tools & cables
● Juniper Router	● Cable Tester
● CISCO Switches & Firewalls	● Fiber
● MikroTik Routers	● Crimping Tools
● Dell Server	● RJ45 Connectors
● Bdcom OLT	● Splitter
● Bdcom ONU	● Splicer Machine
● SFP Modules	● TJ box
● Basic Home & Office Router	● Cat 6 cables

TABLE 3.2: List of using devices & components for networking

3.4.1 Optical Fiber Cable

A fiber-optic cable can contain from some tens to several hundred of optical fibers surrounded by a transparent plastic sheath. These cables are also commonly referred to as optical fiber cables or optic cables, which use light to transmit data and can go far greater distance at a markedly faster speed than what is possible with most electronic conductors.

Figure 3.15 - Optical Fiber Cable (Patch Cable)

3.4.2 UTP Cable

Unshielded twisted pair shield or UTP is one of the most widely used copper cables for Telephone wires and local area Network- LAN all over the world.

The five varieties of UTP cables are designated with the prefix:

- CAT, as in category, each type accommodating a distinct level of bandwidth.

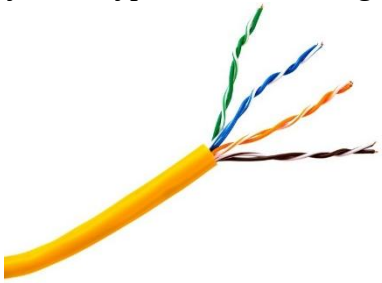

Figure 3.16 - UTP Cable

3.4.3 RJ45 connector

Today the term RJ45 connector applies to both a male RJ45 plug as well as a female RJ45 socket. Plug also referred to as the modular connection is most often identified on the end of the Ethernet cables.

Figure 3.17 - RJ45 connector

3.4.4 Local UTP Cable and Color Code, as well as Name

Begin on the right side. Show how to make a color crossover connection for an RJ45 connector.

Pin No.	Colour	Pair No.	Function
1	white/orange	2	TxData +
2	orange	2	TxData -
3	white/green	3	RecvData +
4	blue	1	
5	white/blue	1	
6	green	3	RecvData -
7	white/brown	4	
8	brown	4	

TABLE 3.3: UTP Cable Color Code

3.4.5 Network Switch

A network Switching means connecting devices in a computer network and then using packet switching to send packets to their corresponding destination.

Figure 3.18 - Network Switch

3.4.6 Optical Network Unit (ONU)

ONU is a box that connects your home to the internet through fiber optic cables. It changes the light signals in the fiber into data that your devices can use and also sends your data back to the internet.

Figure 3.19 - Optical Network Unit

3.4.7 Router MikroTik

MikroTik can be used to mark within switching. The company began its operations in 1996 and initially built switches and remote isp solutions. The company has also gained a good reputation when it comes to the production of networking products. It supplies all stipulated and necessary components for ISPs such as routing, firewalls, bandwidth management, remote access, backhaul links, interest gateways, VPN servers and much more are comprised. It is easy to install and is combined with a simple and intuitive interface. MikroTik CCR router has the uplink RJ45 port and an downlink port and a port for communication as well.

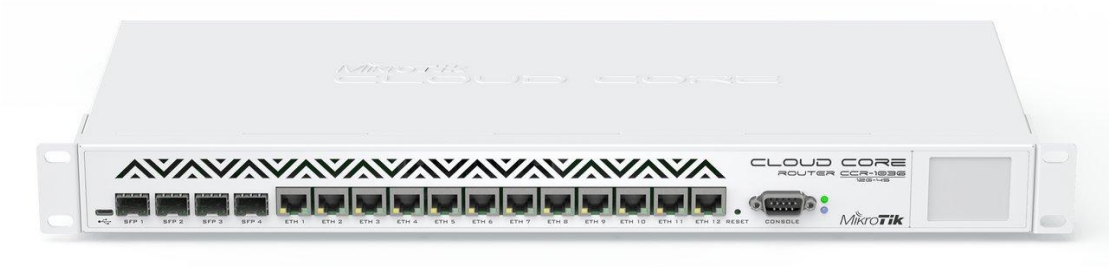

Figure 3.20 - MikroTik CCR Router

3.4.8 OS for Routers

Router Operating System is the system software available for managing networks, which can be used for storing on Mikrotik Router Board devices. It is able to do PC setup, router using a (firewall and VPN) server client access point configuration. Moreover, the device can be used in wireless access system as the core functionality component.

Features for Mikrotik Router OS:

- Configuration.
- Firewall.
- Bridge.
- Hotspot.
- Wireless.
- Routing.
- Proxy.
- Protocol Like (RSTP, STP)
- MPLS.
- VPN.
- DHCP.
- QoS.
- MAC

etc.

3.5 Configure Mikrotik Router

3.5.1 Login to Mikrotik Router:

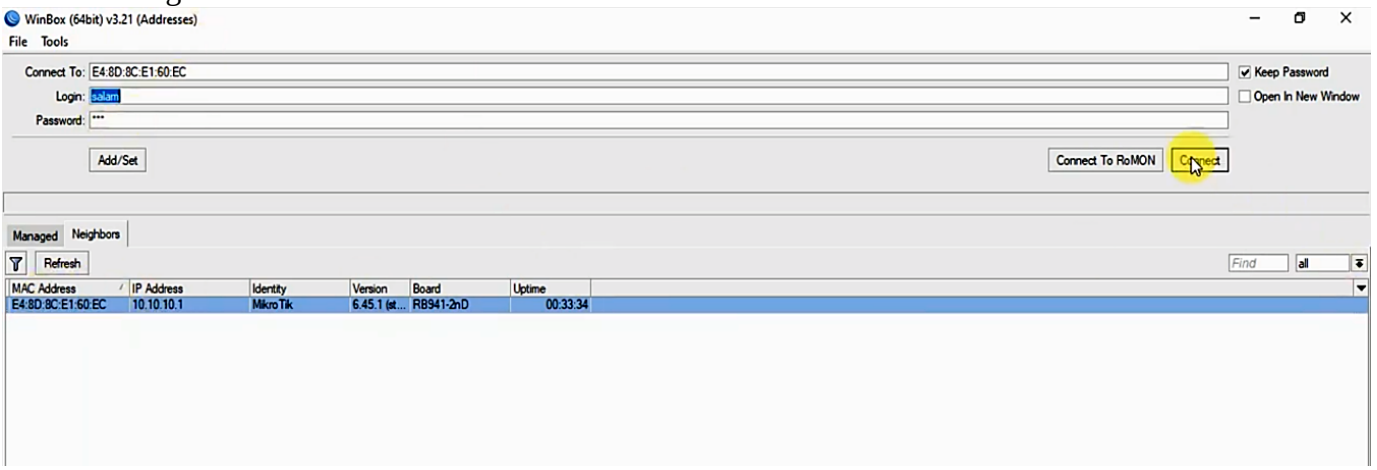

Figure 3.21 - Login Interface for a Mikrotik Router

- Step1:
  First of all, we need to connect our laptop or desktop to the Mikrotik Router through lan port. After that, we launched the WinBox software than it auto detect MAC address of router and connect the router by using UserId and password. as seen in Figure 3.21 above.

3.5.2 Set up a Router:

- Step2:
  After login we need to allocate the interface and rename to easily identify. as seen in Figure 3.22 below.

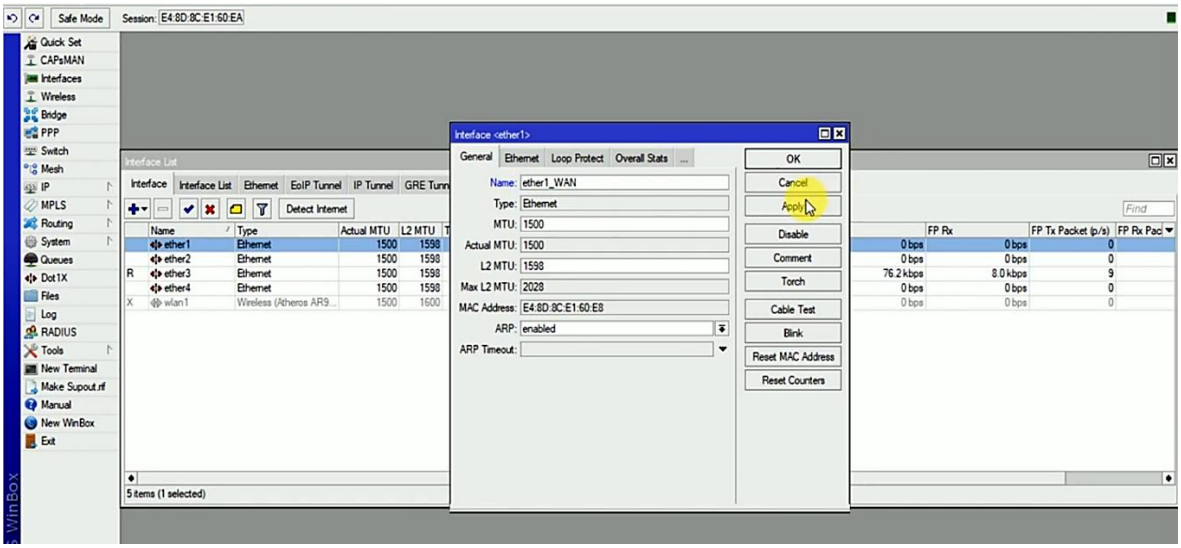

Figure 3.22 – Allocate or rename the interface

3.5.3 Bridge Configuration:

- Step3:

Then open Bridge window, Then Click on the (+ button) option to open a New dialog box. Here enter a bridge name or retain the default bridge1, then click OK. After that Switch to the Ports tab and click on the + button to open another dialog box. Select interface ether2 and bridge bridge1 than click OK to apply the settings. as seen in Figure 3.23 & 3.24 below.

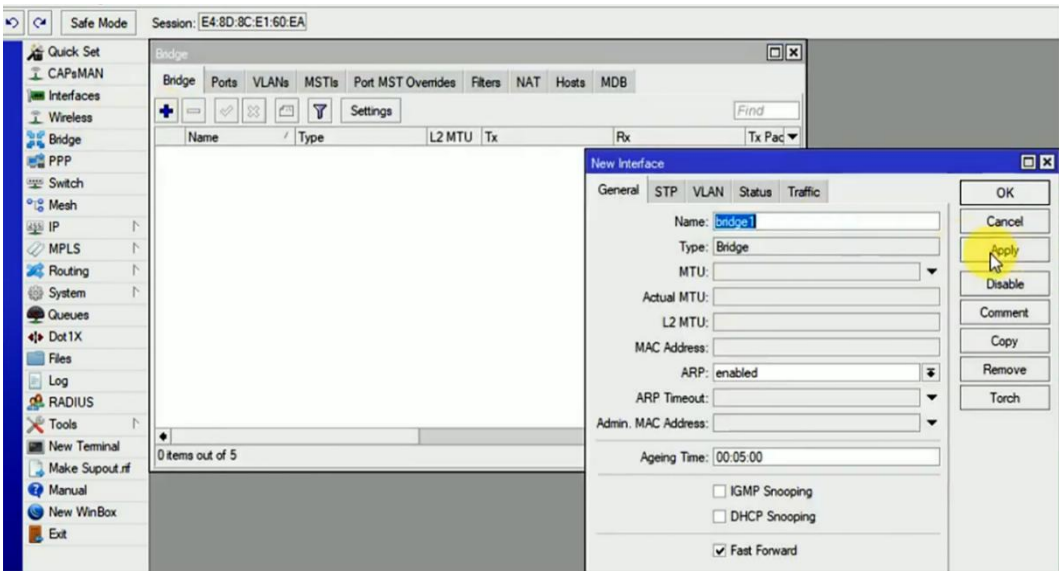

Figure 3.23 – Create bridge

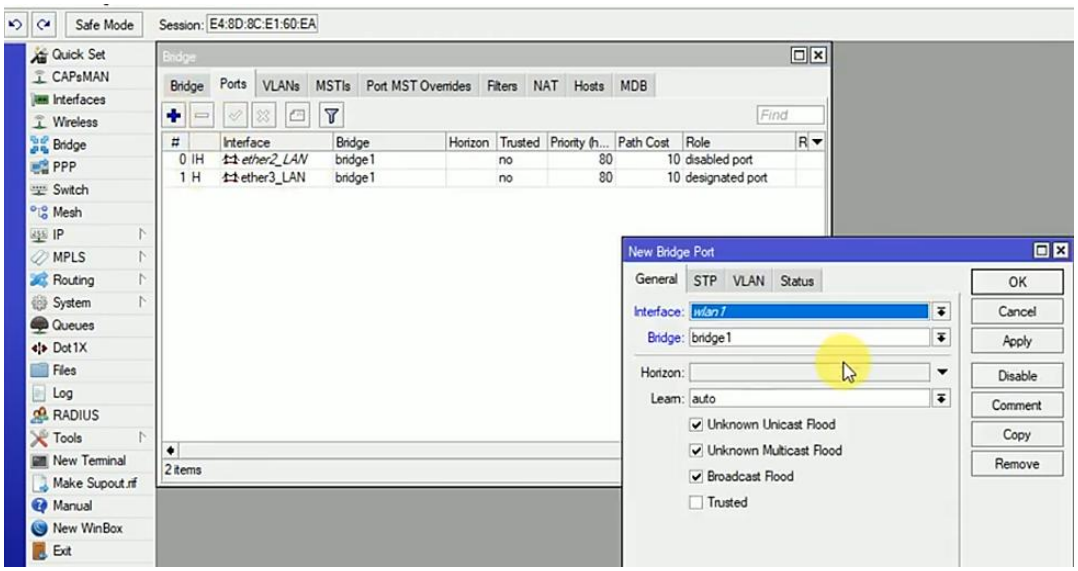

Figure 3.24 – Add interface on bridge1

3.5.4 IP Address Set:

- Step4:
  Access the IP menu and navigate to the Addresses dialog, Then select the + button option to open a new dialog box, here enter WAN IP address (192.168.186.48/24) and select interface (ether1_WAN), after that enter LAN IP address 11.11.11.1/24 and select interface bridge1 than click Ok to apply the settings. as seen in Figure 3.25.1 & 3.25.2 below.

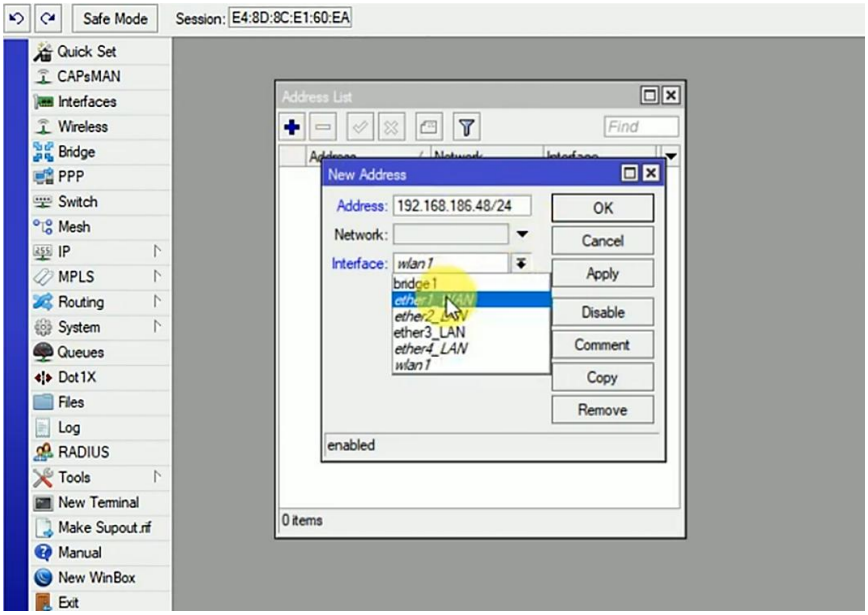

Figure 3.25.1 – Access the IP address

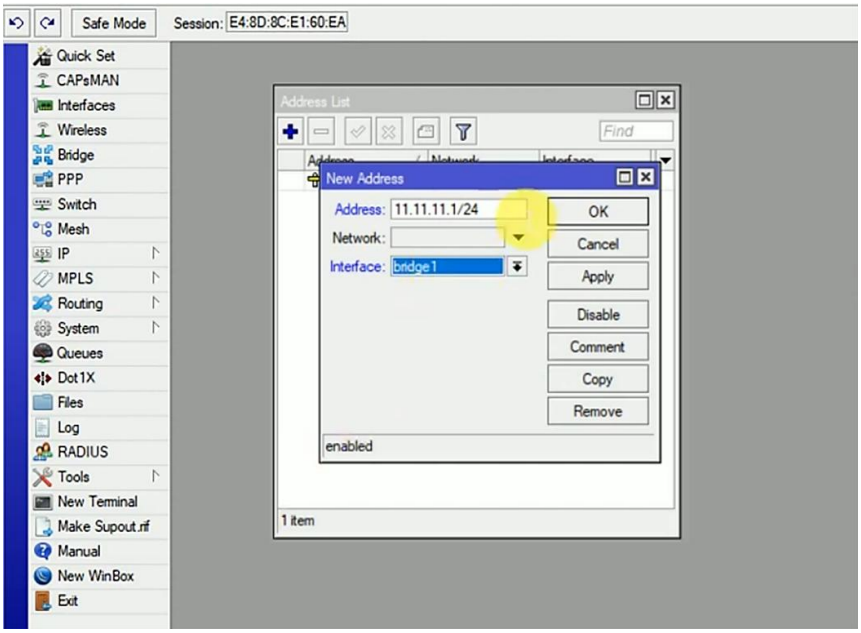

Figure 3.25.2 – Access the IP address

3.5.5 DNS Setup:

- Step5:

Than enter the DNS. Access the IP menu Than Select the DNS option and set the primary DNS is 103.84.36.5 and secondary DNS is (8.8.8.8) then click Ok to apply the settings. as seen in Figure 3.26 below.

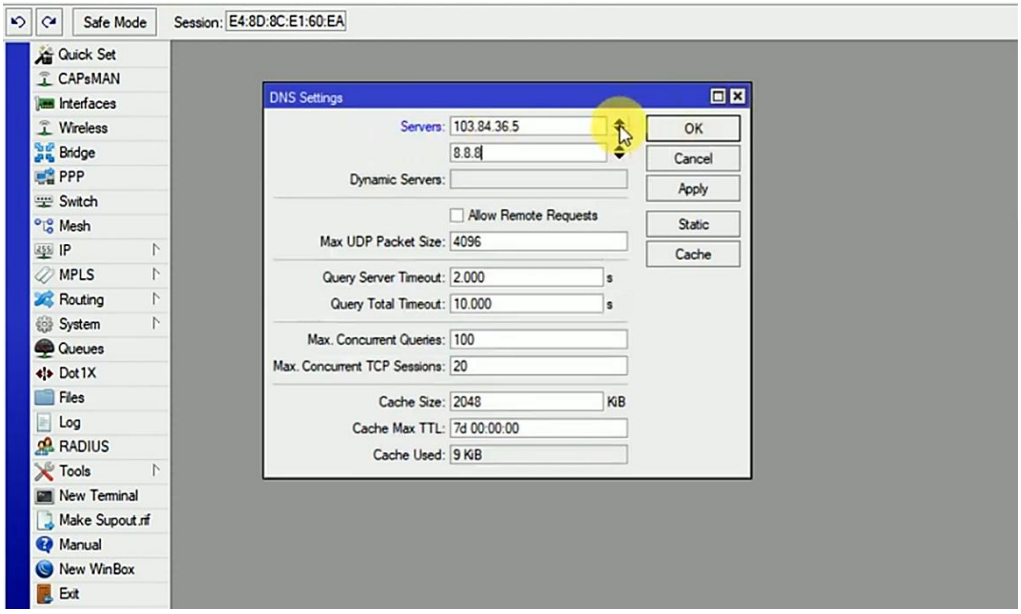

Figure 3.26 – Set DNS

3.5.6 NAT Configuration:

- Step6:

Than set the firewall Open the IP -> Firewall window and navigate to the NAT Rule tab, and Click on the "+" button to open a New dialog option, Click on general option then select "srcnat" for the chain. Then Click on Action option than select "Masquerade". Click on OK to apply the settings. as seen in Figure 3.27 below.

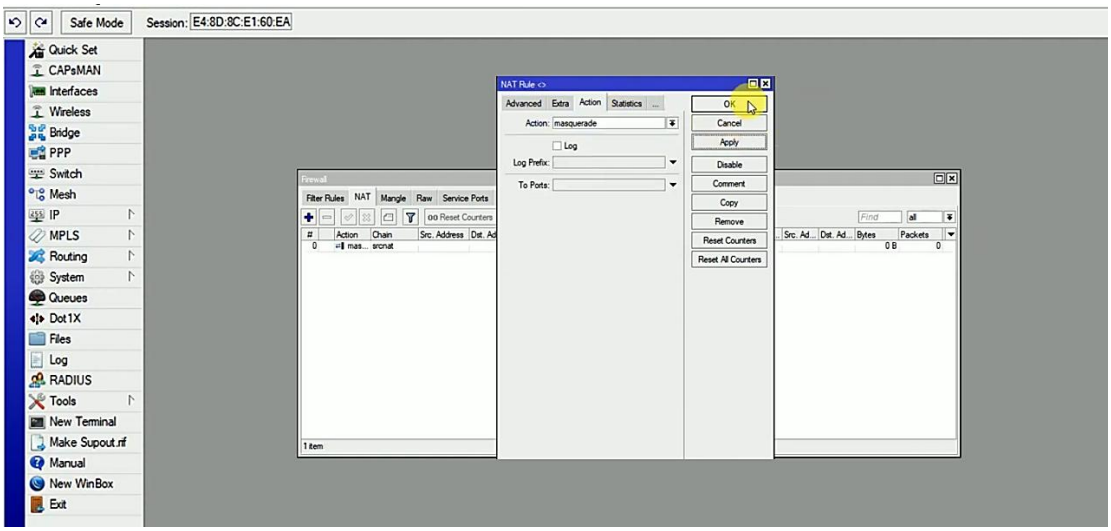

Figure 3.27 – Setup firewall

3.5.7 DHCP Configuration:

- Step7:

  Then setup the DHCP server. Navigate to the IP > (DHCP Server) window, here must ensuring the (DHCP) tab is selected; Click on the DHCP Setup button to open a new dialog; Select the bridge1 as the DHCP Server Interface and click Next; Here below follow the wizard to complete the following setup. as seen in Figure 3.28 below.

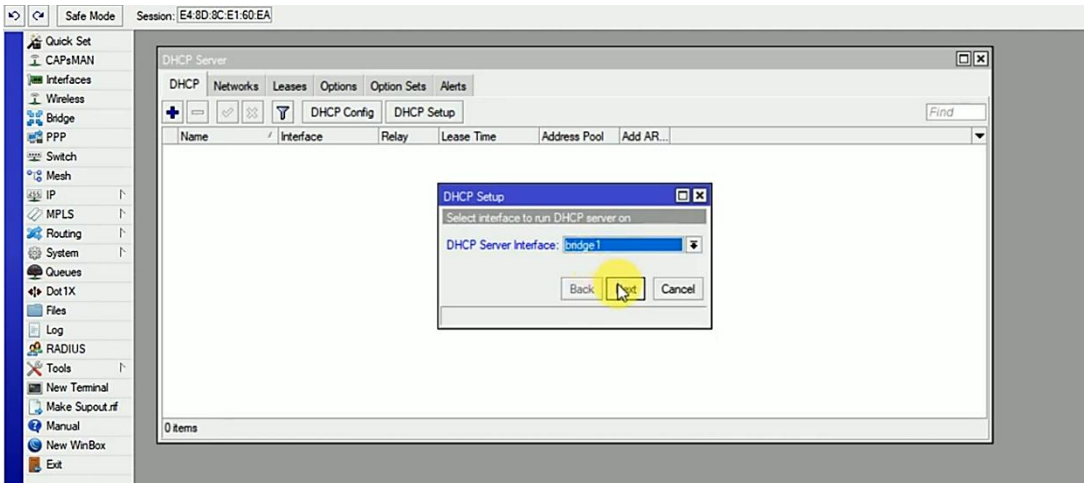

Figure 3.28 – DHCP server setup

3.5.8 Set IP Route:

- Step8:

  Then set the IP Route. Navigate to IP select Route window we can see route list, click on the "+" button to open a new dialog option new route, then enter the Gateway address 192.168.186.1 then Click on OK to apply the settings. Ensuring the Cable is physically connected to the port. After that we can see every route Ip is reachable. As seen in Figure 3.29 below.

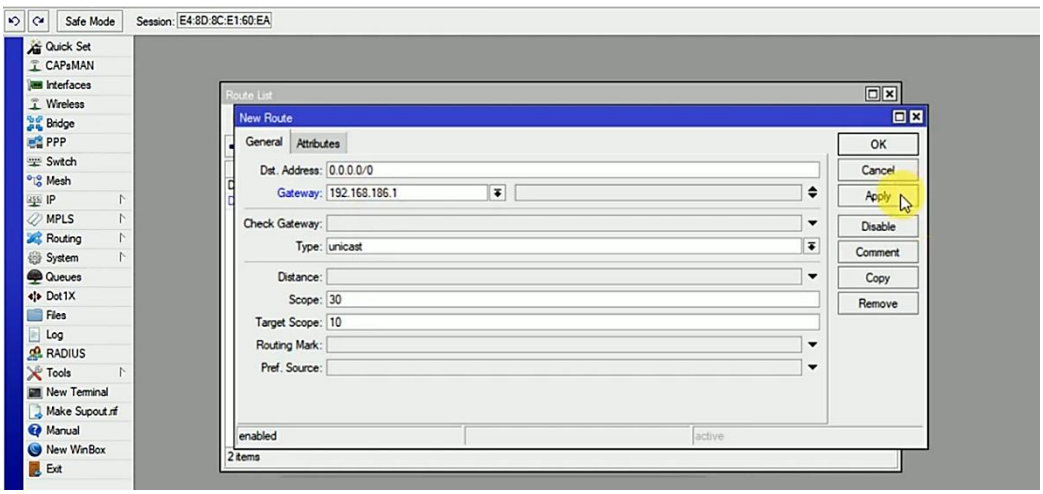

Figure 3.29 – Set IP Route

3.5.9 Ping Test:

- Step9:
  Now test the ping select terminal and type the command ping 8.8.8.8 for test the packet. Here As seen in Figure 3.30 below.

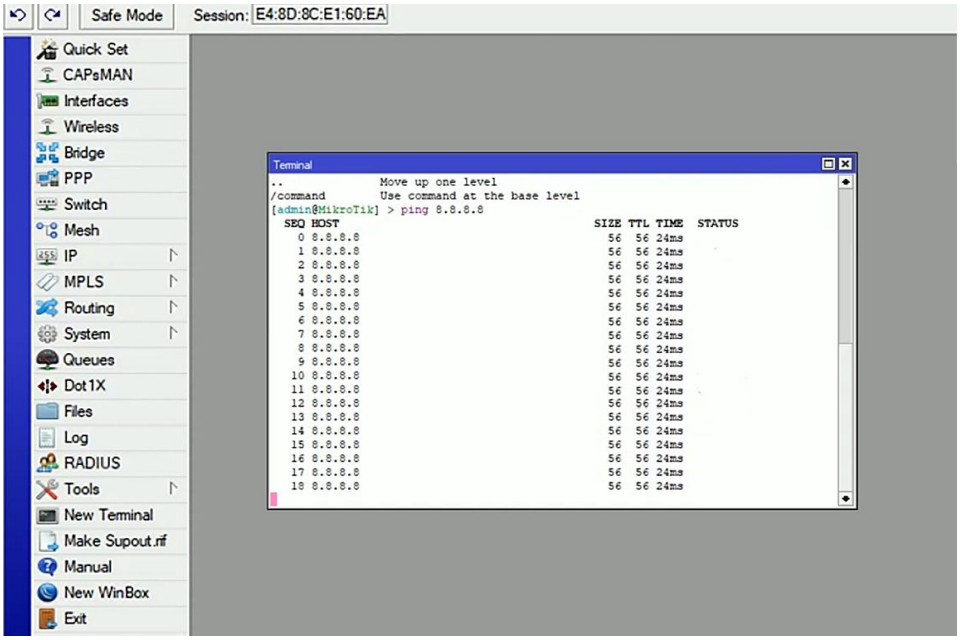

Figure 3.30 – Ping test

3.5.10 Wireless Configuration:

- Step10:
  For setup wireless go-to interface than enable the wireless option on interface. After that Click on the wireless option to open a new dialog option wireless table, then click on WIFI interface, in WIFI interface click on wireless option then it open a new dialog option interface <wlan1>. In interface <wlan1 tab change the SSID and change Mode to “ap bridge” Click on OK to apply the settings. After that set the wireless security click on the “security profile” it open a new dialog option, then change Mode “dynamic key” & select the authentication type. Than set the key, Click on OK to apply the settings. As seen in Figure 3.31, 3.32, 3.33 below.

P.T.O

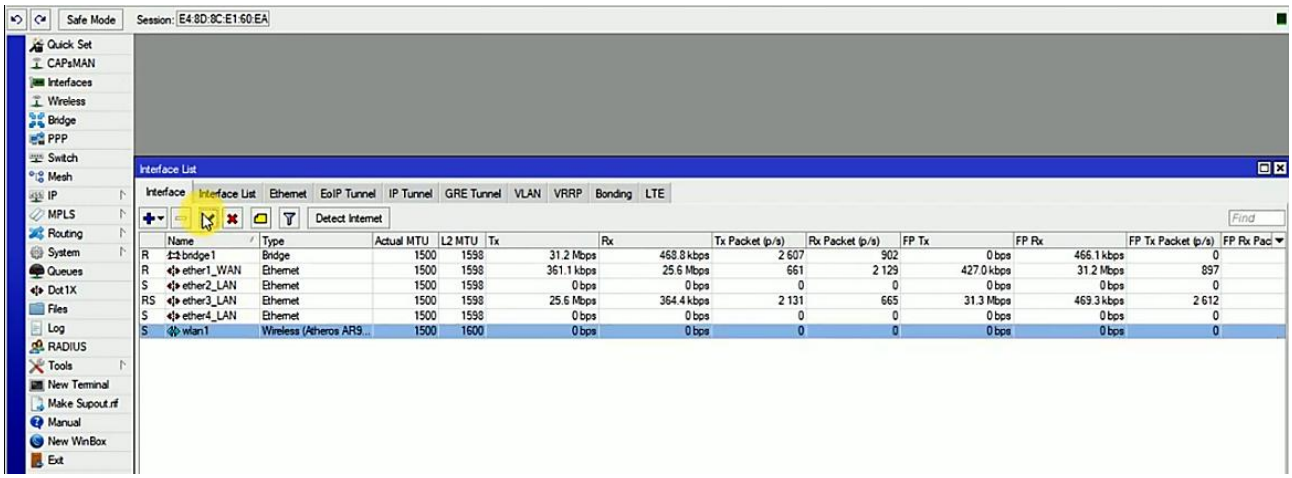

Figure 3.31 – Add wireless interface

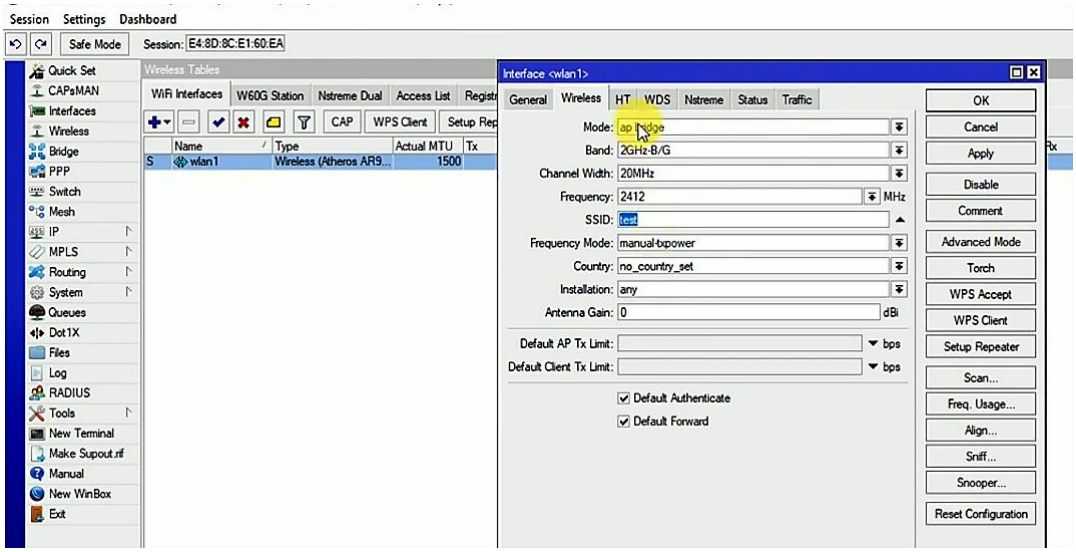

Figure 3.32 – Setup wireless SSID

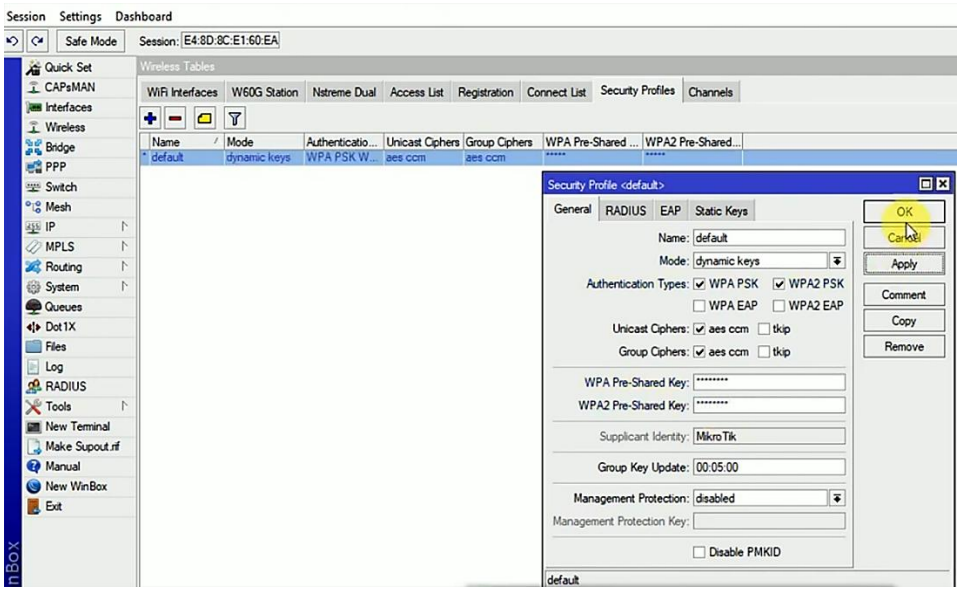

Figure 3.33 – Setup wireless security

3.5.11 Bandwidth Control:

- Step11:
  For control the user bandwidth click on the “Queues” option. Then it open a new dialog option “Queues list”. After that select the “Queues Type” and click on the "+" button to open a new dialog option “New Queues Type”. In New Queues Type change the kind option and select “pcq” and set Queues size for upload. The follow the same process for download. Click on OK to apply the settings. As seen in Figure 3.34 below.

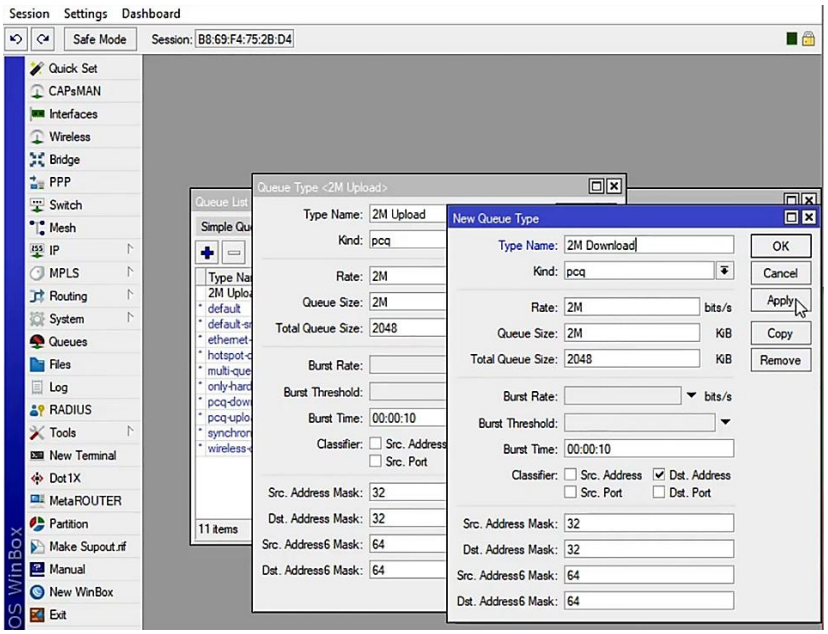

Figure 3.34 – Set the upload and download Bandwidth Limit.

Now select the Simple Queues option on Queues list. Then click on the "+" button to open a new dialog option “New Simple Queues” in New Simple Queues select General option, then set Name and target IP address. After that select Advanced option then change Queues Type: 2M upload and 2M download. Click on OK to apply the settings. Here we can see the user Bandwidth limit, As seen in Figure 3.35, 3.36 & 3.37 below.

P.T.O

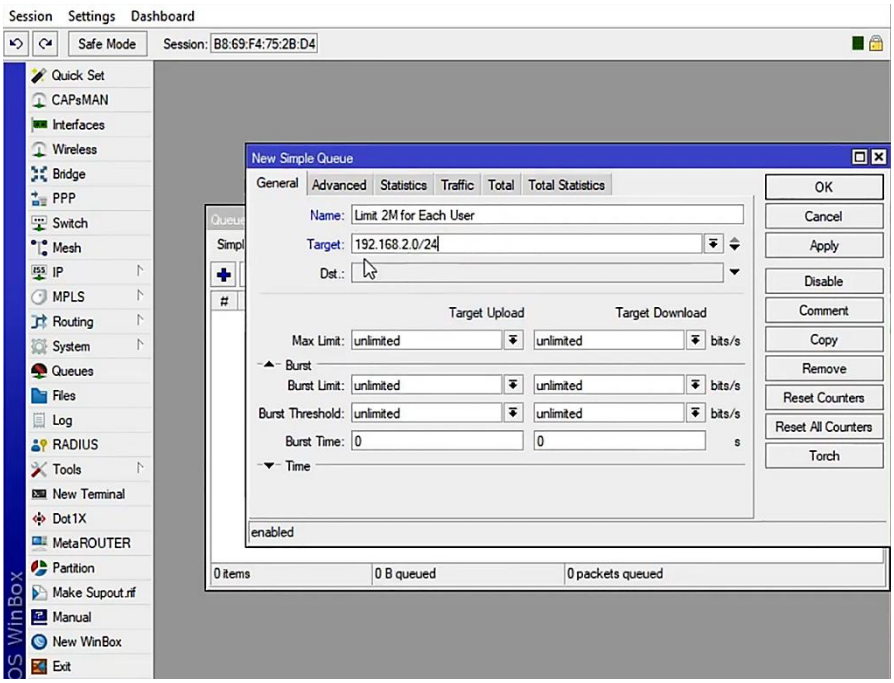

Figure 3.35 – Set limit for each user.

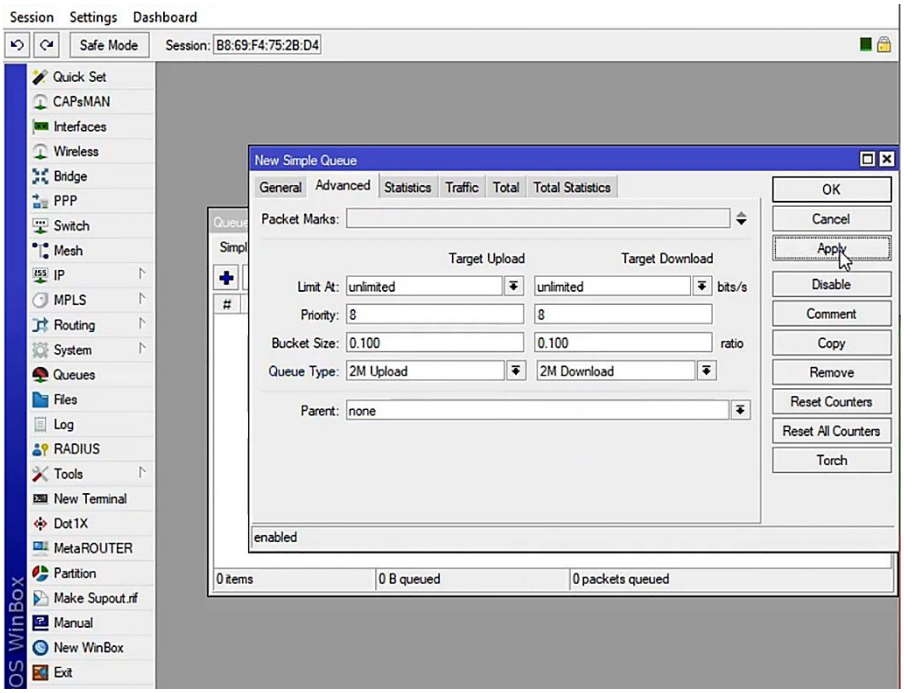

Figure 3.36 – Set upload and download Bandwidth Limit for each user.

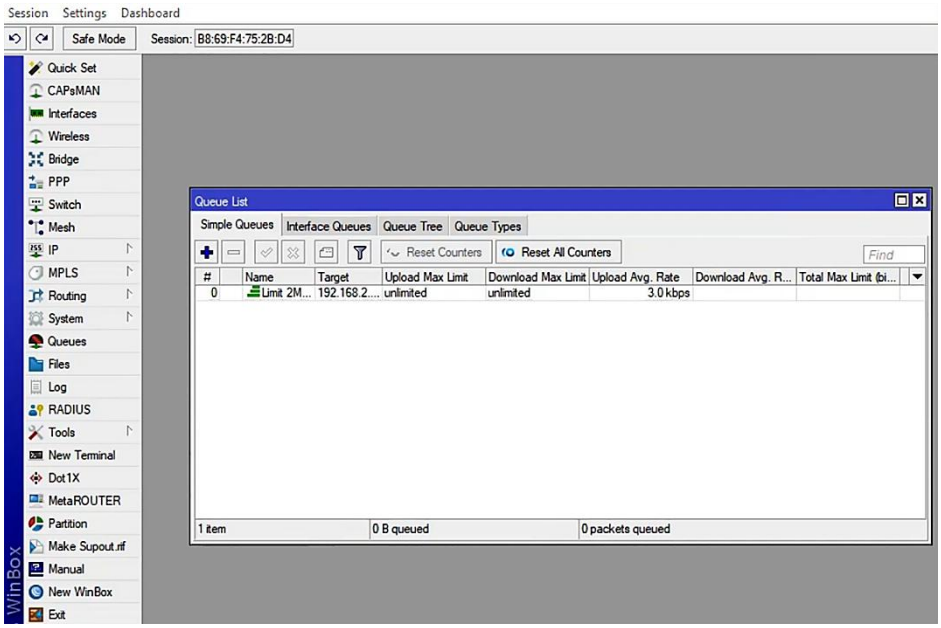

Figure 3.37 – User Bandwidth Queues Lists.

This is the full complete process of setup the Mikrotik Router.

3.7 Challenges

I won't face any challenges if I do not try. I've encountered many obstacles during my internship which I was able to overcome. Despite the fact that my job involves high expectations I can state confidently that I expand personally every day in several ways. I had no previous working experience with handling a crowd of such magnitude of knowledge. Arriving in Indonesia I found it hard for me to effectively talk to everyone using English only. An understanding of the work environment helps you to order with clients in a way that you understand them. Start a new job. The fastest way of tackling issues that are related to the clients.

CHAPTER 4

COMPETENCIES & SMART PLAN

4.1 Competencies Earned

However, there are lots of possibilities in the job market at the moment if one wants to get new experiences. Through temporary employment, the knowledge of the subjects enrolled in my certificate can be assumed; moreover, some skills that can be advantageous in my intended career. It helps me stay calm when the pressure at workplace is really intense. I can be able to have a calm mind when the pressure of the job is on. I thus got an opportunity to present and design switches, configure DHCP, NAT and VLAN in this entry-level job.

The work I done:

- Setup of MikroTik Router
- Troubleshooting issues with systems and networks at the client's location.
- Monitoring both the company's backbone network and the customer network.
- Communicating with clients regarding their concerns, either over the phone or in person.
- Configuring the Customer Router and various other network devices.
- Installing and setting up different types of Wi-Fi routers for customers.
- New user line up. Etc.….

4.2 Smart Plan

It is through accomplishing this temporary job application that my knowledge about system administration has expand widely, and this has worked a lot in enhancing my confidence that I can venture in this field, awareness of the basics of these disciplines will help when looking for a job in the future. It will be beneficial to me a lot once I learned previously will help me a lot when I explore more into arranging from now on. I was able to decide to organize it since it appears as a frequency adverb during this time in various countries including in Bangladesh. Further on I would like to enhance my career as the organizational engineer.

4.3 Reflections

Offices can really control their bandwidth using Mikrotik. Many sites have Mikrotik routers in important locations. Although the network divides the bandwidth at the same time, we can still use the original bandwidth of WAN to connect to the computer. Neighbors cannot prevent network administrators from using their computers to connect to the MikroTik Education Router. MikroTik Operator uses the bandwidth micro-splitter for office bandwidth management. The commercial hub is ideal for Internet Service Providers in the information technology sector. Therefore, I need to advance my career in that field and implement a new system to enhance my profession.

CHAPTER 5

CONCLISIONS & FUTURE CAREER

5.1 Conclusion & Discussion

I came to have knowledge of careers in IT engineering after completing my internship program. There are different types of devices which I was informed about while being there. I was able to enhance my knowledge about what IT professionals do which in turn helps me improve my performance in future for me to be a responsible and innovative specialist. While on the training phase of my internship, I gained high skill levels in mikrotik and cisco switches as well as ample experience. So, with my foresight, I can help and work with any organization oriented on ISPs. I would again like to participate in this type of work since it is very useful for me personally as a professional.

5.2 Scope for Further Career

The primary focus of my internship was to put the knowledge I had gathered into practice in a real-world setting. Throughout my time there, I discovered a wealth of information about network design models and principles that I believe will foster collaboration in the future. The MikroTik Router OS offers a comprehensive array of features that can cater to various types of networks. Throughout my internship, I focused on configuring and implementing all the firewall functionalities of MikroTik. As a result, I will have the ability to design and efficiently oversee a network using MikroTik equipment. I gained experience in setting up different types of devices.

APPENDIX

Appendix A: Reflection on Internship

I got useful knowledge in interacting with clients, establishing relationships with the corporate purchasers, and greeting clients with customers in a friendly way. I understand how to recognize their requirements, detect the problems they face and solve these problems together with my colleagues, make successful outcomes. I also read policies at the workplace. I understand working in a corporate environment and can configure different sorts of Wi-Fi routers as well as MikroTik routers. I learn about issues and how to solve them.

Appendix B: Company Details

- Four branches
- 20 or more years of experience
- More than 500 job placements
- More than 500 graduates
- Over 5000+ Companies Provide Services
- 200000+ users all over Bangladesh.

Name : DTech Online Ltd.

Address :

Corporate Office: House-73 (3rd Floor), Road-13A, Block-D, Banani, Dhaka-1213.

NOC Office: House-59 (1st Floor), Road-04, Block-C, Banani, Dhaka-1213.

NOC Office: Palashy Apartment, Plot 30/A, Rood-4, Sector-3, Uttara, Dhaka -1230.

NOC Office: House- 154-B, Road- 22, Mohakhali DOHS Dhaka-1206

Phone Number - +88 01715959805 / IP Phone: +8809611677179

E-mail : zaman@dtechonline.net

Email: support@dtechonline.net

Web : www.dtechonline.net

Since 2003
Dtech ONLINE

Microsoft Cloud Solution Provider | Google Cloud Partner

Date : 01-07-2024

To

Mr. Narayan Ranjan Chakraborty

Associate Professor & Associate Head

Department of CSE, FSIT

Daffodil International University

Daffodil Smart City, Ashulia, Dhaka, Bangladesh.

Subject: Confirmation of Industrial training for 3 months at DTech Online Ltd.

Dear Sir,

It is our pleasure to confirm you that Md. Abdus Salam bearing ID 221-15-5690 student of Computer Science and Engineering (CSE) in your University will work with our company as an "Industrial Trainee" for the period of three months from 01/07/2024 to 31/10/2024. During his training time our team will help him to learn about our business.

The supervisor and management will view his performance continuously during the period of his training. Also will evaluate and record on the record sheet of his performance. If the management of the company found satisfactory and outstanding, management can decide to retain him as a permanent employee of the organization. We hope the same co-operation in future.

Thanks & Regards.

Md. Kamruzzaman
Deputy General Manager
DTech Online Ltd.
Phone Number - +88 01715959805 / IP Phone: +8809611677179
E-mail : zaman@dtechonline.net
Web : www.dtechonline.net

20 August 2024

To
Md. Kamruzzaman
Deputy General Manager
DTech Online Ltd
Phone Number: +8801715959805/IP Phone: +8809611677179
Email: Zaman@dtechhonline.net
Subject: **Request for placement in Internship**

Dear Sir,
It gives me immense pleasure to let you know that Daffodil International University is offering 4-year Bachelor of Science in Computer Science and Engineering (B.Sc. in CSE) program. At present, there are over 1000 students in our program. We are committed to provide quality education to the students so that the employers can get competent and efficient engineer to meet their demand. The requirement for the degree of B.Sc. in CSE, that the students need to do a research project or to remain attached with some organization as an intern to get the practical experience in the field of engineering. It is important that they use their theoretical knowledge with the practical field to increase their experience in engineering job and also to enhance their ability and ultimately to prepare themselves to meet the need of the job market. During their internship, they will follow the rules and regulations of the organization they are attach with. After the completion of the internship, they will be required to submit a report on their assigned tasks, which will be kept confidential and will be used for academic purpose only. Duration of the Internship program will be 3-4 months. It may be mentioned here that the medium of instruction of the program is English.

To fulfill our commitment to the nation we need your help and cooperation. We would highly appreciate if you could provide the internship opportunity to our following student(s):

Sl	ID	Name of the students
1	221-15-5690	Md. Abdus Salam

With thanks and best regards,

Sincerely Yours

20.08.2024

Professor Dr. Sheak Rashed Haider Noori
Head
Department of CSE
Daffodil International University

.....
Dr. Sheak Rashed Haider Noori
Professor and Head
Department of Computer Science and Engineering
Daffodil International University
Cell: 01847140176
E-mail: headcse@daffodilvarsity.edu.bd

REFERENCES

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4. [4] Learn about Cisco Packet tracer: https://www.geeksforgeeks.org/implementation-of-static-routing-in-cisco-2-router-connections/
5. [5] Get more information on the MikroTik Router: https://mikrotik.com
6. [6The MikroTik Router is now available for online purchase: https://mikrotik.com/training/about
7. [7] A history of MikroTik releases can now be accessed online: https://en.wikipedia.org/wiki/MikroTik
8. [8] Comprehensive configuration for MikroTik is available here: https://help.mikrotik.com/docs/display/ROS/First+Time+Configuration
9. [9] Find out more about the Bridge: https://mkcontroller.com/mikrotik-bridge-everything-you-need-to-know/
10. [10] Information on the DHCP Server is now available online: https://mkcontroller.com/configuring-dhcp-server-on-mikrotik-a-complete-beginners-guide-detailed-step-by-step/
11. Request and Acceptance Letter: https://drive.google.com/drive/folders/1g1TqsEJyI9Bs2KwXaxhauTGlBVFHpC7i?usp=sharing

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