

INTERNSHIP ON INTERNET SERVICE PROVIDER (ISP)

BY

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

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DAFFODIL INTERNATIONAL UNIVERSITY

DHAKA, BANGLADESH

6TH JANUARY, 2022

APPROVAL

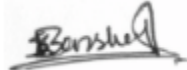
This Project/Internship titled “**INTERNSHIP ON ISP OPERATION**”, submitted by **MD Zohirul Islam, ID No 191-15-12160** to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on **06/01/2022**

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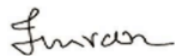
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We hereby declare that, this project has been done by us under the supervision of **Mst. Eshita khatun**, Lecturer, **Department of CSE**, Daffodil International University. We likewise announce that neither this project nor any piece of this undertaking has been submitted somewhere else for grant of any degree or diploma.

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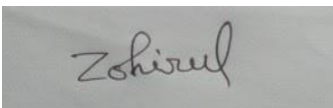
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ACKNOWLEDGEMENT

First I am express of heartiest thanks and gratefulness to almighty God for His divine blessing makes us possible to complete the final year project/internship successfully.

I'm really grateful and wish of my profound our indebtedness to **Mst. Eshita khatun** Lecturer, Department of CSE Daffodil International University, Dhaka, deep Knowledge & keen interest of our supervisor in the field of ISP “Networking” to carry out this project. His endless patience ,scholarly guidance ,continual encouragement , constant and energetic supervision, constructive criticism , valuable advice ,reading many inferior draft and correcting them at all stage have made it possible to complete this project.

I would like to express of my heartiest gratitude to **Professor Dr. Touhid Bhuiyan,** Professor, Department of CSE and Head Department of CSE, for his caring assistance to complete our venture and furthermore to other employee and the staff of CSE department of Daffodil International University.

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

At last, we should recognize with due regard the steady help and patients of our folks.

ABSTRACT

This internship represents on ISP Operation. The main reason and objective of the report is learning about Computer Networking, ISP Networking Device such as Server, Computer, Cable, Router and Switch connection by practical experience at Aamra Network Limited, Banani, Dhaka.

At Aamra Network Limited working with MIKROTIK, CISCO ,NETGEAR, WINDOWS SERVER and so on . Working with them I can gather a lot of knowledge about how the configure a network, how the troubleshoot a problem with a large network.

In my four-month internship time at Aamra Network Limited, I gain a lot of knowledge about working environment.

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CHAPTER 1

Introduction of Networking

1.1 Introduction

Externship is a kind of chance for express someone's perfect gift. We need to store some of useful information for our each and every if the education isn't over yet. The externship is for those pupil who are tone-sufficient and successful with the occasion to be validated by preceptors and administrators for the stylish future. In each case, they've achieved it despite obstacles that we cannot imagine impeccably. That's also most important matter to choose one establishment or institute for Externship, which is better than the other companies. So we can learn a lot from a good association. As a pupil of Computer Science and Engineering I joined the “Aamra Network Limited” to finish of my BSc in CSE and nurtured her desire to learn as important as I could. The point to which you read the book isn't veritably different but this is important of delicate to understood from the book how the ISP association and network is run. The languages of books aren't actually easy, but the language of internal composition. Principally it's tutored about network, configuration, server and so on related to this effects. That's also learning how people work and work overnight to support the network & also support network give. Helps to learn effects after being involved. This experience helps you do effects after being involved in a task. Global experience and achievement. I plant networking, communication, find problem and try to break this, configuration and point exploration also, server operation and others that I couldn't learn through the text. Ideal for my unborn work in network services with a network director.

1.2 Motivation

A computer network is a process of computer systems and attaches with other computer tackle. A communication network that allows a computer to transfer data one device to another bias. That's innovated connection two or numerous further than two device. That's can connect via line or wireless connection between each and other devices .However, that does not mean we're done yet, If we can connect our device physically. For setup a network which transfer data, we need to set the protocol, how data can be transmit each moment via string or wireless network system. Now a day's internet is the most popular for communication system. Network can connect

We know that Internet can connect very easily one country to another country all over the world through by powerful internet system. Internet as like as easy but it's too risky if we don't have any kinds of idea about how to secure and use network. Most of the problem with the internet is Hacker. Sometime Hacker can hack our computer or any device via internet .For this reason we need to make a strong security system for banking and office network. Office network setup system is very important nowadays, because of all kinds of office (Public or Private) all of them using internet and other networking device for their communication and maintaining the office work.

1.2 Internship Objectives

The thing of my training is achieving good work experience on this field or branch. I can use it of my future career.

But the main thing of the externship is fulfilling of the demand complete of BSc in CSE program.

There are having some other thing is-

- Gather knowledge about ISP Networking System
- Achieving knowledge about Router and Server configuration, Routing about ISP
- . - Establishing connection of entire network of fellowship
- Configuring network of entire network of association.

1.4 Introduction to the Company

If I want to complete my BSc, I need to fulfill its requirement finishes. And internship of an organization is the requirement for completing my BSc. So I can choose Aamra Network Limited, for completing my internship. Because it's the one of most popular and best Internet Provider. They are provide TR 1 and TR 2 types of service. Bangladesh Government, BCB and BFF got internet service from them .There are having multiple branches all over the country .They are independent company. And the most important thing is they teach first then they give the opportunity to internship in their company.

1.5 Report Layout

At the first cell of this report its discuss about preface of my training and briefly bandy about of my stimulant. In alternate chapter that is curtly bandy about my internship's association. It's told about part of my association, product and request place, target group, Geek analysis, association structure. In chapter three its briefly mooted about my quotidian task and what I learn from my training session. In chapter four argued about also which is I learned from institute and that is continue up to before the last chapter. In the last chapter bandy about the conclusion and about my future life on this area.

CHAPTER 2

ORGANIZATION

2.1 Introduction

As an intern I would like to affix reputed Internet Service Provider Company they supply internet and that they support the network of organizations for client. I believed that it's good on behalf of me and that I can work with them. After I resource about ISP provider company, I realize that, they doesn't teach me to the foundation. After I learn they won't teach me from the beginning, then I'm start finding which organization will teach me from the basis. Some days later I find it. I am try to join Aamra Network Limited for internship. Then, I discussed with them .I try to research about them and I found it's the largest independent ISP company. This company have much of brunch all over the countries. Its headquarter 20 Kemal Ataturk Avenue, Banani C/A, Dhaka, Bangladesh.

2.2 Product and Market Situation

In externship period I work with Cisco, Mikrotik Router, DHCP and DNS Server, TP-LINK, Cloud Network and so on.

But especially I learned about Cisco parcels. That's use for Commercial & Industrial Network Corporation. Product of cisco range are switch, router, WAN acceleration tackle, unified fabric, wireless system, storehouse networking and pall computing service.

We know that on the network field request situation is too large. All sector of any kind of association need their own network. In this business I've some good openings to make my future career.

2.3 Target Group

In my training associations target was those institutions which need to network support. My training association target them by check council, exploration about their contender also find their client, Advertisements through social media.

No association can not target their client without surveying client. If I want to start a business or association first I need to probe about my challengers and their client. How they give the service and how client treat them. Also I'll target my client my own way.

2.4 SWOT Analysis

When we got any associations design at first we need to identify its strength, weakness, openings and risks. After we figure it out we analysis about its weakness, until we plant the result of its problem.

2.5 Organizational Structure

When we picked up any partnerships design at first we need to identify its strength, weakness, openings and dangers. After we figure it out we analysis about its weakness, until we drill the result of its problem.

CHAPTER 3

BASIC NETWORKING KNOWLEDGE

3.1 Daily Work and Performances

As a intern I've a lot of work and performance every day. I've stored knowledge from my Internship Company which name is Aamra Network Limited. Every day I talk over with my squad, they tech me all the term.

3.2 First Multitudinous days they educate me about introductory knowledge

1. Knot, End artifice
- .2. Arrangements of Network
3. Network Topology
4. Kinds of transmission
5. Ethernet Cabling

3.3 Knot, End device

Laptop Computer, Desktop Computer, Mobile Phone, Scanner and any kinds of affiliated device which is able to shoot and admit data.

3.4 Network Topology

That is element of the communication network.

Types of Network Topology:

a. Mesh

b. Star

c. Bus

d. Ring and

e. Mongrel Topology

a. Mesh Topology Devoted point to point link to each several bumps. In this network with n bumps has $n(n-1)/2$ anchorages

a. Star Topology: Star network most usual network. Star network configuration, each with main network device, as like as a switch, computer, hub and so on. Main network device working as like as a server.

b. Bus Topology: Each and every node are connect with a large cable .We know that it is called Bus topology.

c. Ring Topology: Ring topology is connected with point to point (P to P) link with each side only two bumps.

d. Hybrid Network: Hybrid network is combine multiple topology. That is sharing the advantage of various topology

3.5 Categories of Network

- a. Original Area Network (LAN)
- b. Metropolitan Area Network (MAN)
- c. broad Area Network (WAN)

Local Area Network (LAN):

- a. Generally that is particular and owned.
- b. LAN Structure use for Residence, School ,College, Home and so on.
- c. There are using Ring, Bus and Star Topologies.

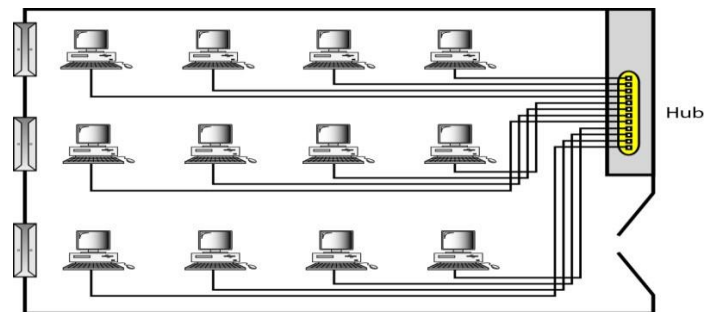


Figure 3.1: LAN

Metropolitan Area network (MAN):

- a. That is design for whole city.
- b. ISP Provider and TV Cable Network,
- c. It's can be possessed by a private or a public.

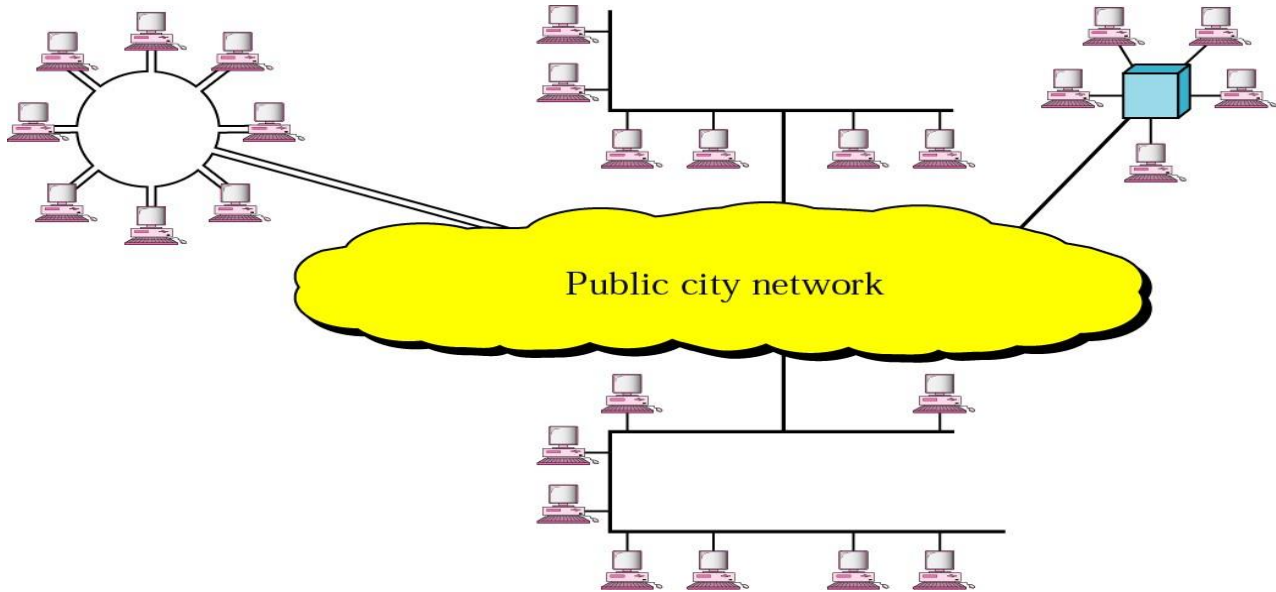


Figure3.2: Metropolitan field Network

Wide Field Network:

a. Use for lengthy length transmission.

b. WAN possessed and applied by one company.

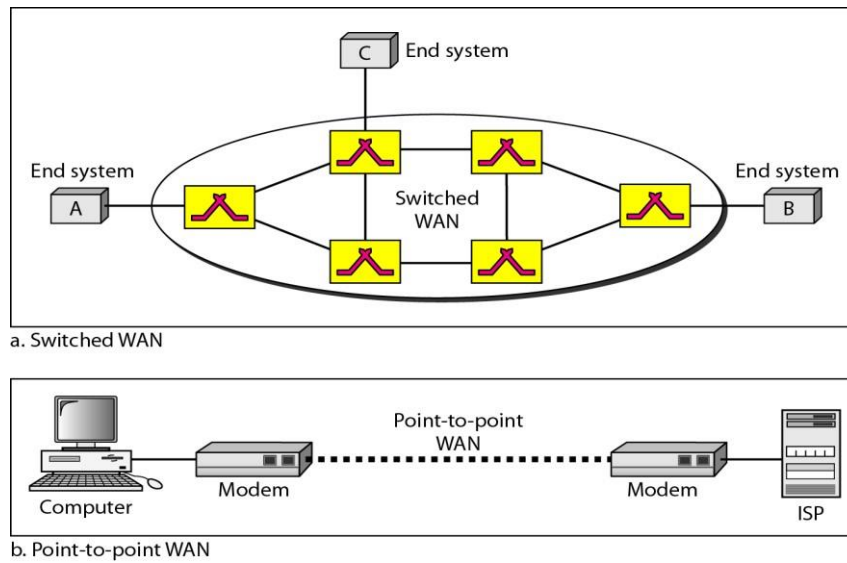


Figure 3.3: Wide field Network

3.6 Transmission Type:

- a. Unicast
- b. Multicast
- c. Broadcast

Unicast: There are one sender and one receiver over the full network.

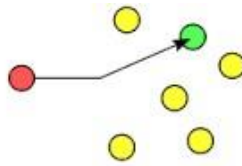


Figure 3.4: Unicast

Multicast: Multicast is message one sender to some concrete receiver over the full network.

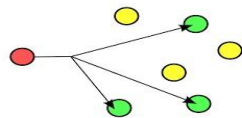


Figure 3.5: multicast

Broadcast: Broadcast is generally used for one sender to all receiver over all the net.

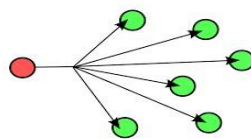


Figure 3.6: broadcast

Connector:

There are using Ethernet Cabling. We can use here RJ 45 Connection.

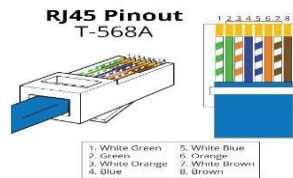


Fig 3.7: RJ-45 connector

3.7 Ethernet Cabling

1. Straight Through
2. Crossover
3. Rolled Line

When I build a network with Ethernet cabling, in this time I need to take an Ethernet cable. Which is used nowadays, the “Cat 5 Extended UTP”.

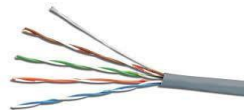


Fig 3.8: Category Enhanced UTP

Chapter 4

CISCO

4.1 IP Address

'IP' stands for 'Internet Protocol'. There are having two performances of IP that now attend in the universal Internet (IPv4) and (IPv6). It's addresses are comprised of double and it's drive to the routing of all information over the Internet. IPv4 addresses are 32 bits long on the other hand IPv6 addresses are 128 bits long.

Both of them Still there will be a transition from IPv4 to IPv6. Although these two protocols cannot interact with each other directly, "dual stack" systems provide advantages for barter data between IPv4 and IPv6. Most important things is TCP/IP on the IP Addressing. That's authored in peppered decimal cast. 4 Octet have divided by dots (192.168.10.1). All quintet carries a number between 0 to 255.

Internet Protocol are mandatory for internet communication. That maintain international protocol for Internet.

4.2 IP address classes

Class	Address range
Class A	1.0.0.1 to 126.255.255.254
Class B	128.1.0.1 to 191.255.255.254
Class C	192.0.1.1 to 223.255.254.254
Class D	224.0.0.0 to 239.255.255.255

4.3 IP Subnet Class C

192.168.1.1/28

Block Size =240-256=16 Block size

$2^n=2^4=16$ Network

Host

$2^n - 2$

$2^4 - 2 = 16 - 2 = 14$

Subnet Mask: 255.255.255.240

Network	Host	B/A
192.168.1.0	1-14	15
192.168.1.16	17-30	31
192.168.1.32	33-46	47
192.168.1.48	49-62	63
192.168.1.64	65-78	79
192.168.1.80	81-94	95
192.168.1.96	97-110	111

192.168.1.112	113-126	127
192.168.1.128	129-142	14
192.168.1.144	145-158	159
192.168.1.160	161-174	175
192.168.1.176	177-190	191
192.168.1.192	193-206	207
192.168.1.208	209-222	223
192.168.1.224	225-238	239
192.168.1.240	241-254	255

192.168.1.1/29

Block Size = 248 – 256 = 8

$2^n = 2^5 = 32$ Network

Host

$2^n - 2$

$2^3 - 2 = 8 - 2 = 6$

Subnet Mask : 255 . 255 . 255 . 248

192 . 168 . 1 . 0/29

Subnet Mask: 255 . 255 . 255 . 248

$2 = 2^5 = 32$

$2^3 - 2 = 8 - 2 = 6$ Host

Block Size = 256 - 248 = 8

Network	Host	B/A
192.168.1.0	1-6	7
192.168.1.8	9-14	15
192.168.1.16	17-22	23
192.168.1.24	25-30	31

192.168.1.32	33-38	39
192.168.1.40	41-46	47
192.168.1.48	49-54	55
192.168.1.56	57-62	63
192.168.1.64	65-70	71
192.168.1.72	73-78	79
192.168.1.80	81-86	87
192.168.1.88	89-94	95
192.168.1.96	97-102	103
192.168.1.104	105-110	111
192.168.1.112	113-118	119
192.168.1.120	121-126	127
192.168.1.248	249-254	255

4.4 A-Class Subnet Mask

10.0.0.0/12

Subnet Mask = 255.240.0.0

Block Size= 256-240=16

$2^n=2^4=16$ Network

$2^{20}-2=1048576-2=1048574$ Host

Table: 4.1 Subnet Mask Class A /12

Network	Host	B/A
10.0.0.0	10.0.0.1-10.15.255.254	10.15.255.255
10.16.0.0	10.16.0.1-10.31.255.254	10.31.255.255
10.32.0.0	10.32.0.1-10.47.255.254	10.47.255.255
10.48.0.0	10.48.0.1-10.63.255.254	10.63.255.255
10.64.0.0	10.64.0.1-10.79.255.254	10.79.255.255
10.80.0.0	10.80.0.1-10.95.255.254	10.95.255.255
10.96.0.0	10.96.0.1-10.111.255.254	10.111.255.255
10.112.0.0	10.112.0.1-10.127.255.254	10.127.255.255
10.128.0.0	10.128.0.1-10.143.255.254	10.143.255.255
10.144.0.0	10.144.0.1-10.159.255.254	10.159.255.255
10.160.0.0	10.160.0.1-10.175.255.254	10.175.255.255
10.176.0.0	10.176.0.1-10.191.255.254	10.191.255.255
10.192.0.0	10.192.0.1-10.207.255.254	10.207.255.255
10.208.0.0	10.208.0.1-10.223.255.254	10.223.255.255
10.224.0.0	10.224.0.1-10.239.255.254	10.239.255.255
10.240.0.0	10.240.0.1-10.255.255.254	10.255.255.255

10.0.0.0/13

Subnet Mask = 255.240.0.0

Block Size= 256-248=8

$2^n=2^5=32$ Network

$2^{19}-2=524288-2=524286$ Host

Table: 4.2 Subnet Mask Class A /13

Network	Host	B/A
10.0.0.0	10.0.0.1-10.7.255.254	10.7.255.255
10.8.0.0	10.8.0.1-10.15.255.254	10.15.255.255
10.16.0.0	10.16.0.1-10.23.255.254	10.23.255.255
10.24.0.0	10.24.0.1-10.31.255.254	10.31.255.255
10.32.0.0	10.32.0.1-10.39.255.254	10.39.255.255
10.40.0.0	10.40.0.1-10.47.255.254	10.47.255.255
10.48.0.0	10.48.0.1-10.55.255.254	10.55.255.255
10.56.0.0	10.56.0.1-10.63.255.254	10.63.255.255
10.64.0.0	10.64.0.1-10.71.255.254	10.71.255.255
10.72.0.0	10.72.0.1-10.79.255.254	10.79.255.255
10.80.0.0	10.80.0.1-10.87.255.254	10.87.255.255
10.88.0.0	10.88.0.1-10.95.255.254	10.95.255.255
10.96.0.0	10.96.0.1-10.103.255.254	10.103.255.255
10.104.0.0	10.104.0.1-10.111.255.254	10.111.255.255
10.112.0.0	10.112.0.1-10.119.255.254	10.119.255.255
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10.136.0.0	10.136.0.1-10.143.255.254	10.143.255.255
10.144.0.0	10.144.0.1-10.151.255.254	10.151.255.255
10.152.0.0	10.152.0.1-10.159.255.254	10.159.255.255
10.160.0.0	10.160.0.1-10.167.255.254	10.167.255.255
10.168.0.0	10.176.0.1-10.175.255.254	10.175.255.255

10.176.0.0	10.176.0.1-10.183.255.254	10.183.255.255
10.184.0.0	10.184.0.1-10.191.255.254	10.191.255.255
10.192.0.0	10.192.0.1-10.199.255.254	10.199.255.255
10.200.0.0	10.200.0.1-10.207.255.254	10.207.255.255
10.208.0.0	10.208.0.1-10.215.255.254	10.215.255.255
10.216.0.0	10.216.0.1-10.223.255.254	10.223.255.255
10.224.0.0	10.224.0.1-10.231.255.254	10.199.255.255
10.232.0.0	10.232.0.1-10.239.255.254	10.1239.255.255
10.240.0.0	10.240.0.1-10.247.255.254	10.247.255.255
10.248.0.0	10.248.0.1-10.255.255.254	10.255.255.255

4.5 Sub-networking mask, B-class

172.16.0.0/19

Subnet Mask = 255.255.224.0

Block Size= 256-224=32

$2^n=2^3=8$ Network

$2^{13}-2=8192-2=8190$ Host

Table: 4.3 Subnet Mask Class B /19

Network	Host	B/A
172.16.0.0	172.16.0.1-172.16.31.254	172.16.31.255
172.16.32.0	172.16.32.1-172.16.63.254	172.16.63.255
172.16.64.0	172.16.64.1-172.16.95.254	172.16.95.255
172.16.96.0	172.16.96.1-172.16.127.254	172.16.127.255
172.16.128.0	172.16.128.1-172.16.159.254	172.16.159.255
172.16.160.0	172.16.160.1-172.16.191.254	172.16.191.255
172.16.192.0	172.16.192.1-172.16.223.254	172.16.223.255
172.16.224.0	172.16.224.1-172.16.255.254	172.16.255.255

172.16.0.0/21

Subnet Mask = 255.255.248.0

Block Size= 256-248=8

$2^n=2^5=32$ Network

$2^{11}-2=2048-2=2046$ Host

Table: 4.4 Subnet Mask Class A /21

Network	Host	B/A
172.16.0.0	172.16.0.1-172.16.7.254	172.16.7.255
172.16.8.0	172.16.8.1-172.16.15.254	172.16.15.255
172.16.16.0	172.16.16.1-172.16.23.254	172.16.23.255
172.16.24.0	172.16.24.1- 172.16.31.254	172.16.31.255
172.16.32.0	172.16.32.1-172.16.39.254	172.16.39.254
172.16.40.0	172.16.40.1-172.16.47.254	172.16.47.255
172.16.48.0	172.16.48.1-172.16.55.254	172.16.55.255
172.16.56.0	172.16.56.1-172.16.63.254	172.16.63.255
172.16.64.0	172.16.64.1-172.16.71.254	172.16.71.255
172.16.72.0	172.16.72.1-172.16.79.254	172.16.79.255
172.16.80.0	172.16.80.1-172.16.87.254	172.16.87.255
172.16.88.0	172.16.88.1-172.16.95.254	172.16.95.255
172.16.96.0	172.16.96.1-172.16.103.254	172.16.103.255
172.16.104.0	172.16.104.1-172.16.111.254	172.16.111.255
172.16.112.0	172.16.112.1-172.16.119.254	172.16.119.255
172.16.120.0	172.16.120.1-172.16.127.254	172.16.127.255
172.16.128.0	172.16.128.1-172.16.135.254	172.16.135.255
172.16.136.0	172.16.136.1-172.16.143.254	172.16.143.255
172.16.144.0	172.16.144.1-172.16.151.254	172.16.151.255
172.16.152.0	172.16.152.1-172.16.159.254	172.16.159.255
172.16.160.0	172.16.160.1-172.16.167.254	172.16.167.255
172.16.168.0	172.16.168.1-172.16.175.254	172.16.175.255
172.16.176.0	172.16.176.1-172.16.183.254	172.16.183.255

172.16.184.0	172.16.184.1-172.16.191.254	172.16.191.255
172.16.192.0	172.16.192.1-172.16.199.254	172.16.199.255
172.16.200.0	172.16.200.1-172.16.207.254	172.16.207.255
172.16.208.0	172.16.208.1-172.16.215.254	172.16.215.255
172.16.216.0	172.16.216.1-172.16.223.254	172.16.223.255
172.16.224.0	172.16.224.1-172.16.231.254	172.16.231.255
172.16.232.0	172.16.232.1-172.16.239.254	172.16.239.255
172.16.240.0	172.16.240.1-172.16.247.254	172.16.247.255
172.16.248.0	172.16.248.1-172.16.255.254	172.16.255.255

172.16.0.0/17

Subnet Mask = 255.255.128.0

Block Size= 256-128=128

$2^1=2^1=2$ Network

$2^{15}-2=32768-2=32766$ Host

Table: 4.5 Subnet Mask Class B /17

Network	Host	B/A
172.16.0.0	172.16.0.1-172.16.0.127.254	172.16.127.255
172.16.128.0	172.16.128.1-172.16.255.254	172.16.255.255

4.6 Routing Protocol

1. Distance vector routing protocol Used bellman ford algorithm RIP V-1
2. Link state OSPF, IS-IS
3. Hybrid EIGP RIP V-2

Link state Routing Protocol

A, Neighbor Table

B. Topology Table Neighbor information

C. Routing SPF

4.7 Administrative Distance

Connected	0
Static	0/1
EIGRP	90
EIGRP	100
OSPF	110
RIP	120
EIGRP EX	170



Figure 4.1 : IP Related

4.8 Routing Information Protocol Basic

1. Distance vector routing protocol
2. Bellman ford Algorithm
3. Local Broadcast to share routing information
4. Class full routing protocol
5. Broadcast update 30 sec
6. Hold down Timer 180 Sec
7. Flash Timer 240 sec
8. Uses Hop count as Metric
9. Maximum hop count 15
10. Four equal cost load Balance.

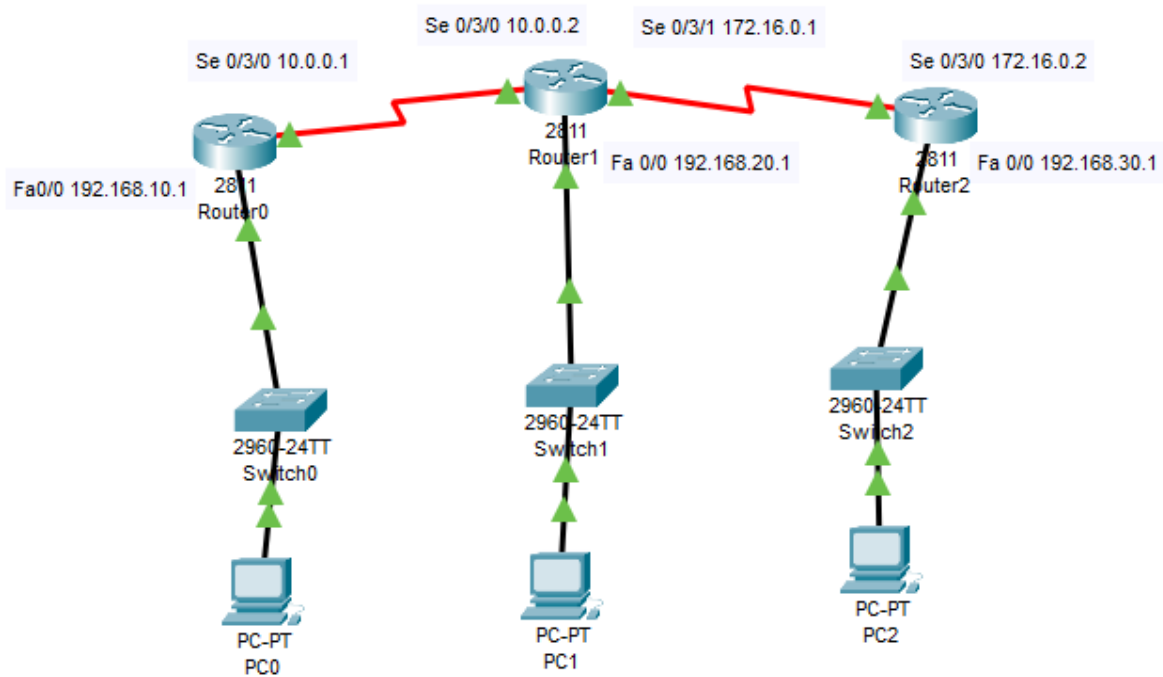


Figure 4.2: RIP V-1

RIP Version-1 Configuration Output

```
router1#show ip route
```

Gateway of last resort is not set

```
C 10.0.0.0/8 is directly connected, Serial0/3/0
R 172.16.0.0/16 [120/1] via 10.0.0.2, 00:00:14, Serial0/3/0
C 192.168.10.0/24 is directly connected, FastEthernet0/0
R 192.168.20.0/24 [120/1] via 10.0.0.2, 00:00:14, Serial0/3/0
R 192.168.30.0/24 [120/2] via 10.0.0.2, 00:00:14, Serial0/3/0
```

```
router2#show ip route
```

Gateway of last resort is not set

```
C 10.0.0.0/8 is directly connected, Serial0/3/0
C 172.16.0.0/16 is directly connected, Serial0/3/1
R 192.168.10.0/24 [120/1] via 10.0.0.1, 00:00:15, Serial0/3/0
C 192.168.20.0/24 is directly connected, FastEthernet0/0
R 192.168.30.0/24 [120/1] via 172.16.0.2, 00:00:01, Serial0/3/1
```

4.9 RIP V-2

1. Hybrid routing Protocol
2. Based on rip V1
3. Multicasts to disseminate routing information 224.0.0.9
4. Supports triggered update.
5. Supports VLSM
6. Others are same to rip V1

4.9.1 Rip V2 Configure

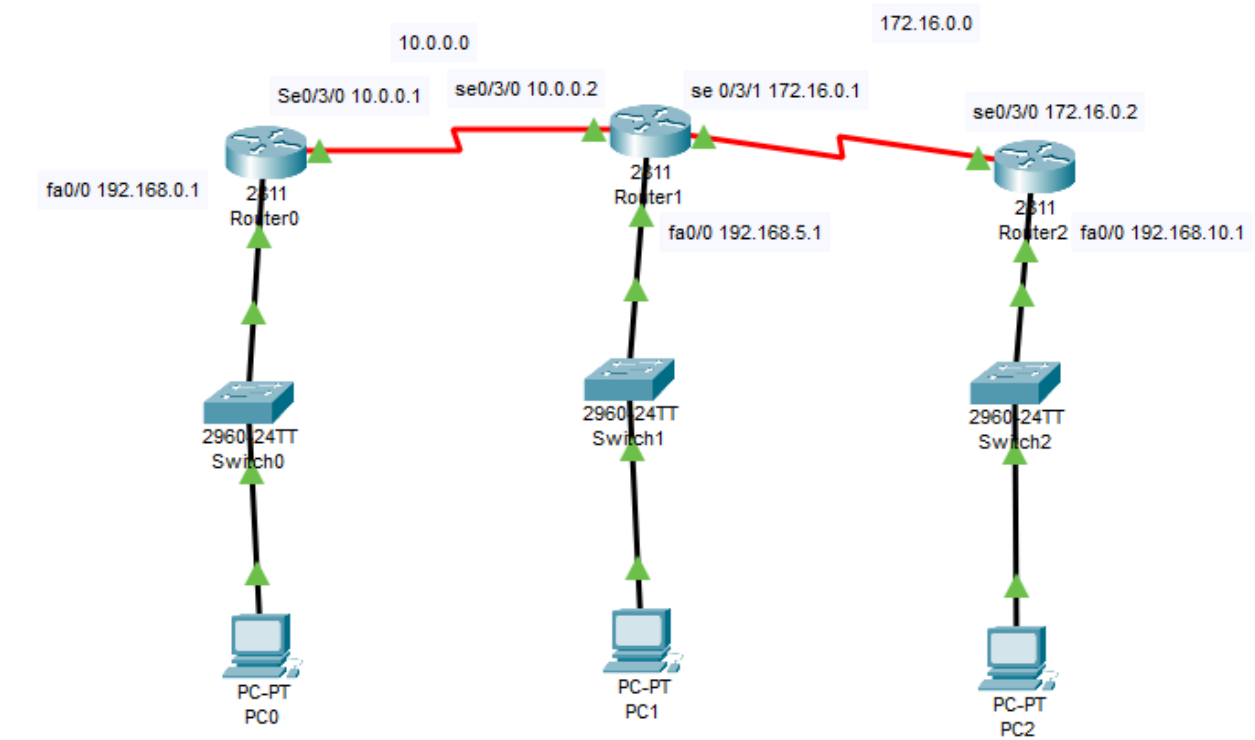


Figure: 4.3 RIP V-2

RIP V2 Configuration Output

[OK]

Router show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, Serial0/3/0

C 172.16.0.0/16 is directly connected, Serial0/3/1

R 192.168.0.0/24 [120/1] via 10.0.0.1, 00:00:17, Serial0/3/0

C 192.168.5.0/24 is directly connected, FastEthernet0/0

R 192.168.10.0/24 [120/1] via 172.16.0.2, 00:00:00, Serial0/3/1

Router# show ip route

Gateway of last resort is not set

R 10.0.0.0/8 [120/1] via 172.16.0.1, 00:00:24, Serial0/3/0

C 172.16.0.0/16 is directly connected, Serial0/3/0

R 192.168.0.0/24 [120/2] via 172.16.0.1, 00:00:24, Serial0/3/0

R 192.168.5.0/24 [120/1] via 172.16.0.1, 00:00:24, Serial0/3/0

C 192.168.10.0/24 is directly connected, FastEthernet0/0

4.10 EIGRP

1. Enhanced interior gateway routing protocol
2. Based on IGRP
3. Cisco proprietary
4. Hybrid routing protocol
5. Fast convergence
6. Support VLSM
7. Support IP, AppleTalk
8. Communication among the EIGRP routers are handled by RTP reliable transport protocol.
9. The best path is selected using DUAL (Diffusing update algorithm).
10. That is loop free topology
11. Manually and automatic route summarization by default auto summarization
12. The metric used bandwidth, delay, load and reliability MTU.
13. Multicast and incremental update multicast address.

4.10.1 Three table are maintained by EIGRP.

1. Neighbor table.
2. Hello Message after 5 sec
3. K Values (Means Metric)

4.10.2 Troubleshooting Command

Given in Appendix

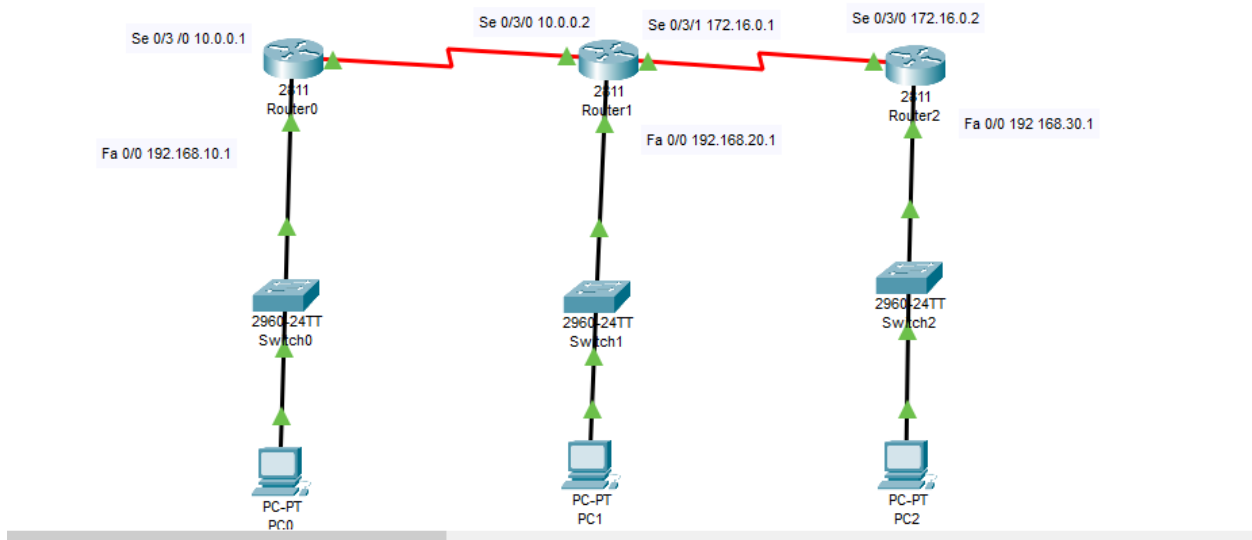


Figure 4.4 : EIGRP

EIGRP Configuration Output

Router0#show ip route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, Serial0/3/0
D 172.16.0.0/16 [90/2681856] via 10.0.0.2, 00:07:26, Serial0/3/0
C 192.168.10.0/24 is directly connected, FastEthernet0/0
D 192.168.20.0/24 [90/2172416] via 10.0.0.2, 00:06:48, Serial0/3/0
D 192.168.30.0/24 [90/2684416] via 10.0.0.2, 00:04:11, Serial0/3/0

Router1#show ip route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, Serial0/3/0
C 172.16.0.0/16 is directly connected, Serial0/3/1
D 192.168.10.0/24 [90/2172416] via 10.0.0.1, 00:14:37, Serial0/3/0
C 192.168.20.0/24 is directly connected, FastEthernet0/0
D 192.168.30.0/24 [90/2172416] via 172.16.0.2, 00:10:59, Serial0/3/1

Router2#show ip route

Gateway of last resort is not set

D 10.0.0.0/8 [90/2681856] via 172.16.0.1, 00:14:10, Serial0/3/0
C 172.16.0.0/16 is directly connected, Serial0/3/0
D 192.168.10.0/24 [90/2684416] via 172.16.0.1, 00:14:10, Serial0/3/0
D 192.168.20.0/24 [90/2172416] via 172.16.0.1, 00:14:10, Serial0/3/0
C 192.168.30.0/24 is directly connected, FastEthernet0/0

4.11 Static Routing Configuration Guide

Static routing is the most safety way of routing. It decreases overload from network field. This type of routing generally add routes in routing table. It is useful where numbers of route are limited. Like other routing methods static routing also has its pros and cons.

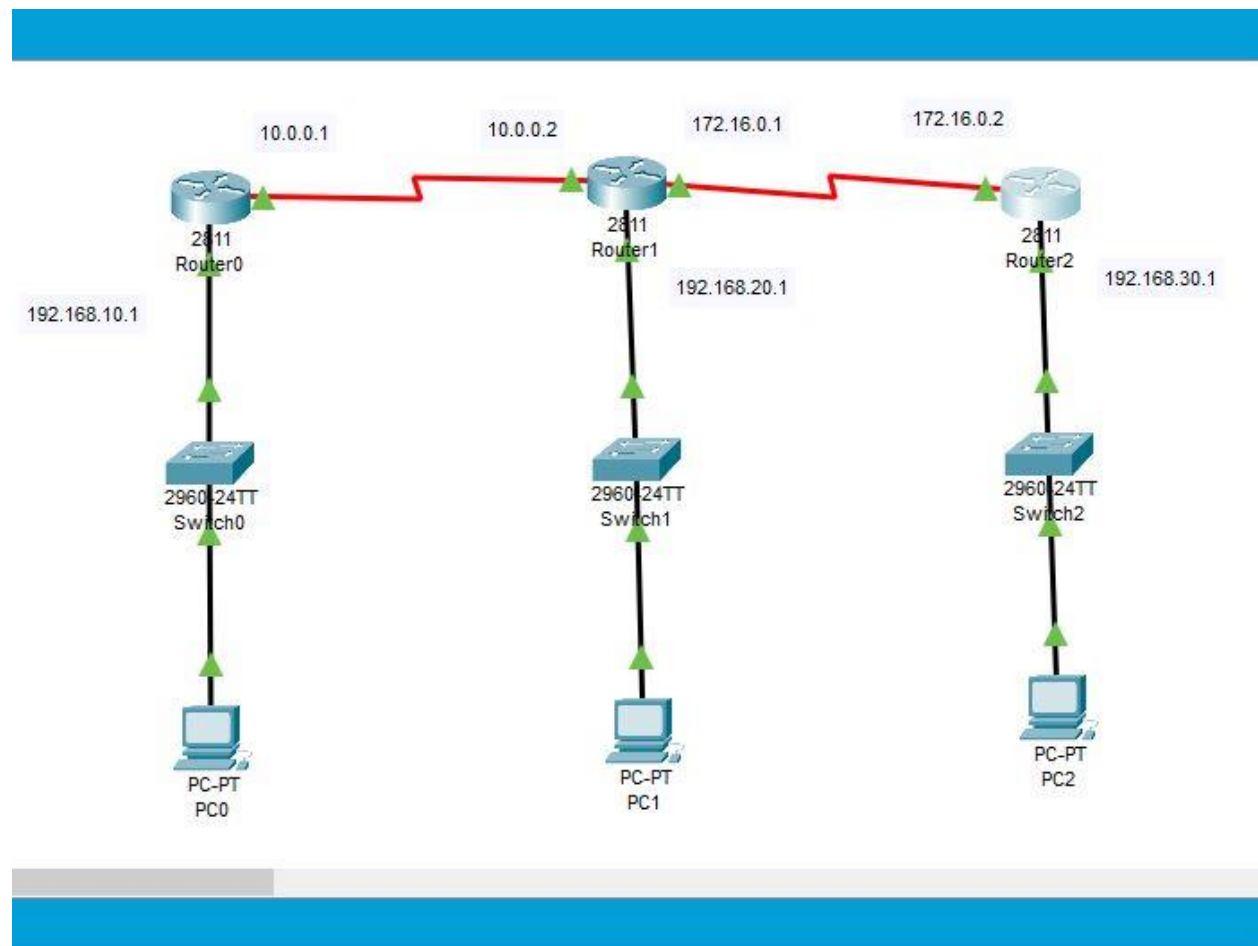


Figure 4.5: Static Routing

Static Routing Configuration Output

Router0#

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, Serial0/3/0
C 172.16.0.0/16 is directly connected, Serial0/3/1
S 192.168.10.0/24 [1/0] via 10.0.0.1
C 192.168.20.0/24 is directly connected, FastEthernet0/0
S 192.168.30.0/24 [1/0] via 172.16.0.2

Router2#show ip route

Gateway of last resort is not set

S 10.0.0.0/8 [1/0] via 172.16.0.1
C 172.16.0.0/16 is directly connected, Serial0/3/0
S 192.168.10.0/24 [1/0] via 172.16.0.1
S 192.168.20.0/24 [1/0] via 172.16.0.1
C 192.168.30.0/24 is directly connected, FastEthernet0/0

4.12 Default Routing:

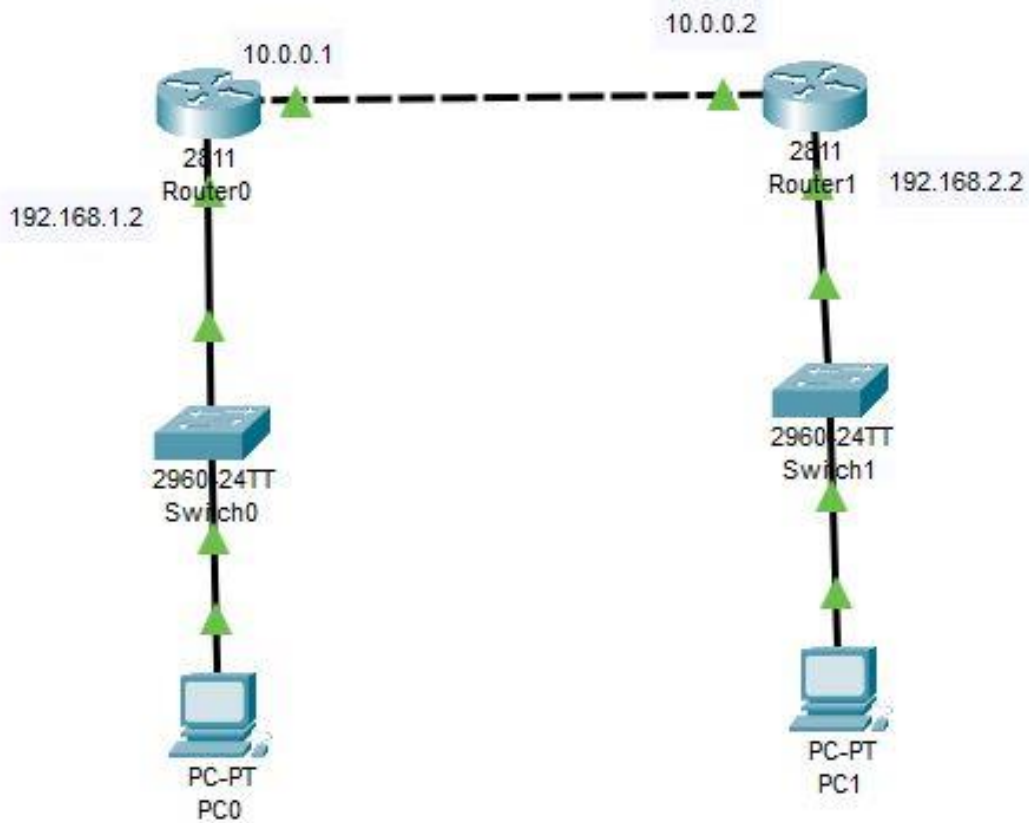


Figure 4.6:Default Routing

Default Routing configuration Output

Router0(config)#do show ip route

Gateway of last resort is 10.0.0.2 to network 0.0.0.0

C 10.0.0.0/8 is directly connected, FastEthernet0/0

C 192.168.1.0/24 is directly connected, FastEthernet0/1

S* 0.0.0.0/0 [1/0] via 10.0.0.2

Router 1

--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no

CHAPTER 5

MikroTik Router

5.1 Definition of Mikrotik Router

MikroTik is a branding router. That is Linux type router. It was founded in 1996 to develop routers and wireless ISP systems. Now they give services about hardware and software.

That is well suited for any kinds of size. Customers that require a router which is in expensive and it's provides all of the features their network administrators necessity to secure and the monitor also. I have not found a model which is comes with an ADSL model, and I would not consider them for such network connections.

5.2 Router Setup Steps

Step 1: At first take Decide to where places the router

Step 2: Now, Connect with the network.

Step 3: Configure the wireless router gateway

Step 4: Connect with gateway to the router.

Step 5: App or web dashboard using here.

Step 6: Make a username and set up password

5.3 MikroTik Router Features

- a. Hardware Device Support
- b. Installation
- c. Configuration
- d. Backup or Restart devices
- e. Firewall Control
- f. Routing Related Device
- g. MPLS
- h. VPN
- i. Wireless
- j. DHCP Server

- k. Using Hot sopt
- l. Q o S
- m. Tools
- n. Proxy and
- o. All kinds of other feature

5.4 MikroTik Router Interface

MikroTik Router Operator System supports many kinds of network interface cards which is virtual interfaces . There are Bridge Interface, VLAN , Bonding and so on. There are having own of them sub menu . All interfaces can be configured and read in the general interfaces menu , all of them common quality properties .

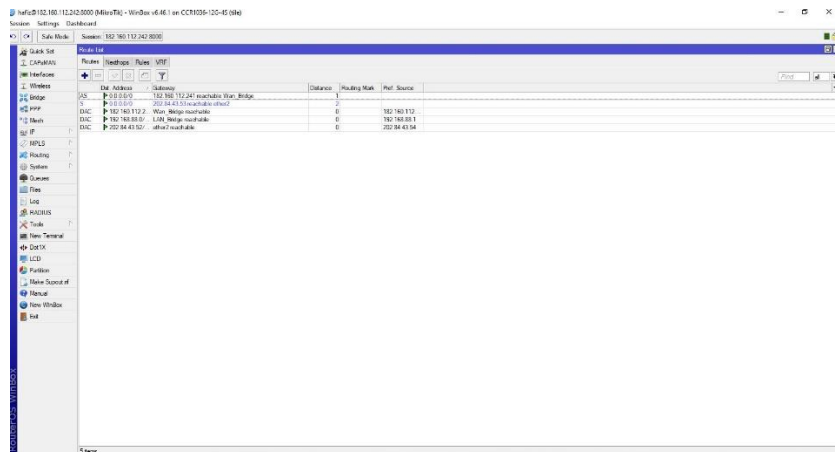


Figure 5.1: Mikrotik Interface

5.5 Bridge Interface

Bridge Interface accommodates diverse interfaces only one virtual interface and the bridge those interface. That is a function. Every accommodated interfaces connected to a physical segment. This segment is controlled as a one segment.

We can add an interface to a bridge. At first we will open a network setting system and then attach a new interface, which is types of bridge. Then attach a new bridge connection .After all this operation select the address of MAC .Now MAC address of the device add to the bridge.

Name	Type	Actual MTU	L2 MTU	Tx	Rx	Tx Packets (p/s)	Rx Packets (p/s)	P/P Tx	P/P Rx	P/P Tx Packets (p/s)	P/P Rx Packets (p/s)
VLAN1	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN2	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN3	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN4	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN5	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN6	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN7	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN8	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN9	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN10	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN11	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN12	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN13	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN14	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN15	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN16	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN17	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN18	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN19	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN20	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN21	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN22	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN23	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN24	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN25	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN26	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN27	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN28	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN29	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN30	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN31	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN32	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN33	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN34	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN35	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN36	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN37	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN38	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN39	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN40	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN41	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN42	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN43	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN44	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN45	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN46	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN47	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN48	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN49	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0
VLAN50	VLAN	1500	1500	0/0	0/0	0	0	0	0	0	0

Figure 5.2: Bridge Interface

5.6 Concept of Bandwidth Control

B/W Control stand for Bandwidth Control. We know that is much of important peculiarity of MikroTik router. When provide the fixed Bandwidth service form ISP and distribution Local area Network (LAN) sites. If we accept or provide 50 MBPS Bandwidth form ISP and I have 20 personal computers, then how can I will provide Bandwidth into all PC. For this reason B/W maintaining device is too much important and this is necessity for data distribution all over the PC.

MikroTik router is a powerful and excellent B/W monitoring device. If we contemplate that, there are large of workers in an office and every person need internet Bandwidth but some person don't need all time Bandwidth and some person every time need Bandwidth as per his official work. Consider this matter then fix Bandwidth. We can get 20 MB Bandwidth form ISP and distribute it 20 PC. Each Computer ret 1024 kbps.

Some of them cannot use proper Bandwidth. Even that, some user have no bandwidth for this reason B/W control is needed. So we will show MikroTik router configure step by step now.

5.7 Configuration

Step 1:

At first on the win box software > Queues > simple Queues > click plus >

Name = queue1 > Target Address = 192.168.10.1

Target upload, Max Limit = 1024kbps, Target Download

Max Limit = 1024kbps > Apply > Okay

Step2:

Again on win box > Queues > simple Queues > click plus >

Name = queue 2 > Target Address = 192.168.10.2

Target upload, Max Limit = 1024k, Target Download,

Max Limit = 1024 k > Apply > Okay

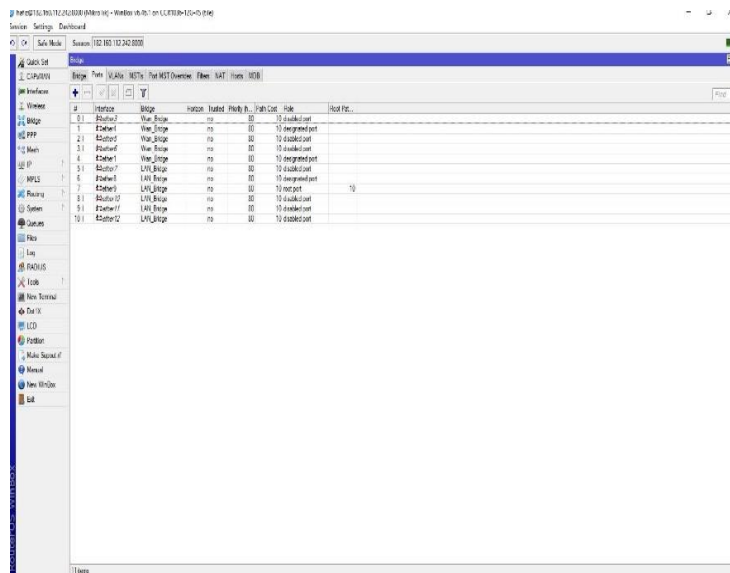


Figure 5.3: B/W Control

5.8 DHCP Server on MikroTik Router Basic :

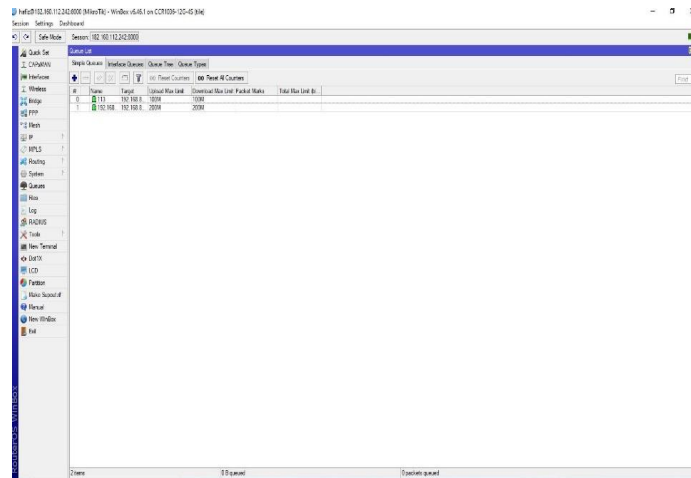


Figure 5.4: DHCP Server Configuration

5.8.1 DHCP Server

DHCP full name Dynamic Host Configuration Protocol. It is a network server. That is automatically provides and set IP. Penury root and that other network parameters to customers devices. That is confide on the valuable protocol, which is a DHCP to respond to broadcast queries by the customers.

We know that DHCP server transmits necessary parameters for customers to correctly communicate on the network automatically. Without it, the network administrator has to manually set up for each and every client that joins the network, which can be difficult, specially in a big network. Generally that is engages each and every client with a dynamic IP address, it is changes when the IP address has expired.

5.8.2 DHCP Server Configuration

- At first go to the IP > DHCP server menu from the win box. Then DHCP server window will present.
- Now DHCP Server window, then touch on the DHCP Setup button and choose the interface which is necessary for setup DHCP server from same quality server. Drop down the interface and then click the next button.
- LAN and close the DHCP address Space on the input box. Now click on the next step button. Client got IP address.
- Choose gateway address for the given network in gateway for DHCP Network input box and then click the next button.
- Give IP range from the DHCP client or LAN user will be get IP address to provide outside input box and now click on the next button.
- Give DNS server IP and then click Next button.
- IP lease time. Now click on the up next button. Default lease time is 3 days, which is automatically setup.
- DHCP setup is complete now and this is successful message will be shown here. Now connect any IP device as like Laptop, Desktop, Smartphone and so on to the network.

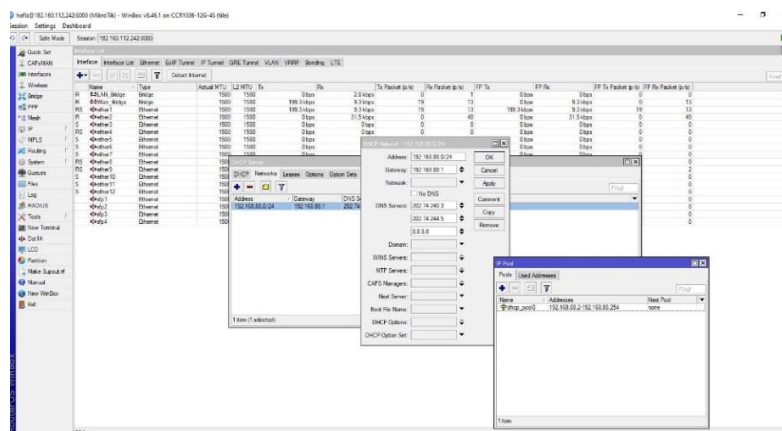


Figure 5.5: DHCP Server Configuration

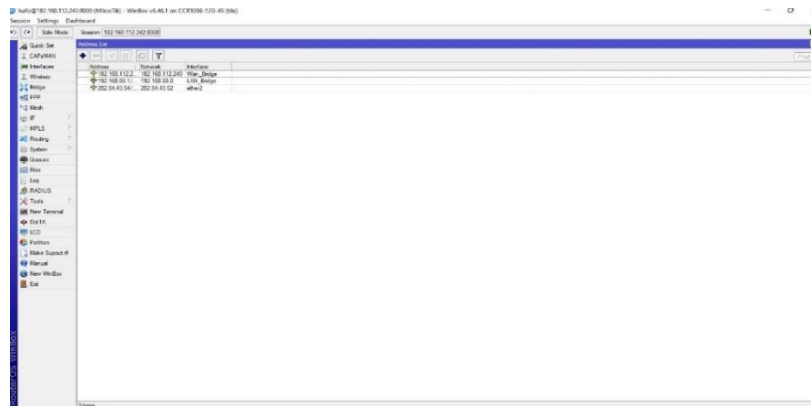


Figure 5.6 : IP Address Assigned

5.9 NAT

Network Address Translation. That is system for more than one map which is local and private addresses to a public one before the transferred the data and information also. Want to much devices to work a single IP address use Network Addresses Translation. As like as maximum are same to home or personal routers.

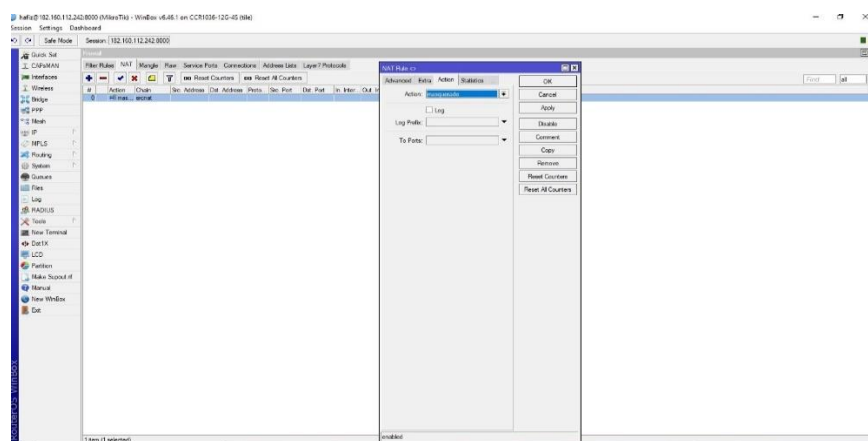


Figure 5.7: NAT Routing

5.9.1 Working Procedure of NAT

It allows single types devices. As like as router to act as an leader between the internet. On the other hand we can say that public network and local network. That is means only a single unique IP address is required to represent an all over the group computers for any kinds of outside for their own network .

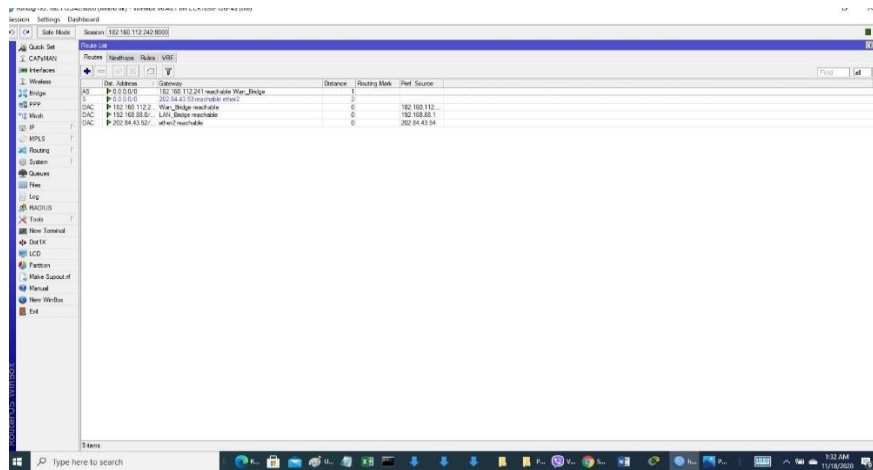
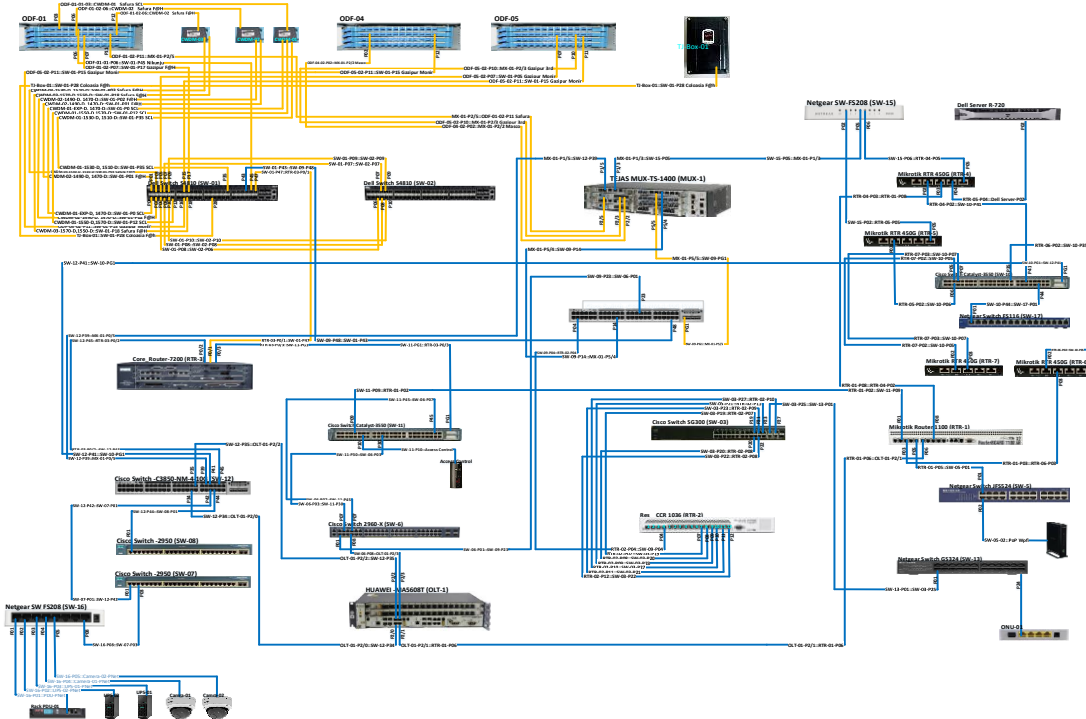


Figure 5.8: NAT Routing Configuration

ISP Network Diagram

ISP Network Diagram



CHAPTER 6

Conclusions

I got much of opportunity to work on the Aamra Network Limited. There are many ways and gathered a lot of experience throughout the entire training session. There was a scope in the field of computer office network planning and designing, working on this field. Data and internet connectivity, ensuring network security, different types of application configuration, and maintenance. In this report, I have explained my experiences with Office Network Setup, Designing and Optimization also. I have discovered much of good sized processes from my supervisors and carried out some of duties on an ordinary basis during my complete Internship duration and ultimately learned the confidence to address venture myself. I think that far an excellent possibility to apply the knowledge and skills that I had acquired from them. I also learned the way to take care of essential faults and got new thoughts every day. Doing this sort of work is virtually useful for my future profession and I am trying to this form of paintings once more.

Actual getting to know comes on the cease of the working length while I used to be given the possibility to consider what I saw and what I skilled in experimental teaching and internship session. I exploit the proper business etiquette to study with the aid of gazing clients and professional etiquette and gaining knowledge of the way to communicate with expert caregivers and another group of workers, as well as an expert within the discipline. I'm imposing the strategic vision of a corporation, how to connect to colleagues, a way to proportion assets, how to arrange, how to make choices, a few technical cognizance's of the business enterprise's surroundings, and the organization's responsibility and responsiveness. The externship carouse in on the spread of my externship director via an assessment and individual meetings offers a possibility of searching for an expert opinion. I suppose that, this externship will help me of my future career. That's taught me that how way working with other platoon members and how way treat to all of other them.

Future Outcome:

I achieve a lot of knowledge about the network through by in this internship. It was helpful for myself. May it will be help me for my future life and professional career also.

- a. For this internship experience help me for got a good job.
- b. I can start a ISP business.n
- c. I gather knowledge about this field, so that I can try work on this area such as a skilled.
- d. This internship can may help for Bank Job.
- e. I can take preparation for CCNA Exam.
- f. Help me for make a network design.

Appendixes

Appendix A: Internship Reflection

The true knowledge is that I have put an end to the length of the work. Used to give compliments to the consider what I saw and what gifts I gave Search guidance and internship. I abuse that the proper trade behavior. Think with the help of clients and efficient behavior and picking Ways to communicate with the master caregiver and another. A bunch of experts, as well as a master within the teacher. I'm pressing the key. An entrepreneurial approach, how to engage with colleagues, ways to increase resources, some special knowledge work on how to orchestrate, how to make choices. The environment of trade enterprise, and the duties of the organization and Feedback Internship Glad knitting by my internship director. An evaluation medium and offers an indulgence to look for individual assemblies Guess a master.

Appendix B: Company Details

Name : Aamra Networks Limited
Address : Safura Tower (9,12 and 15th floor), 20 Kemal
Ataturk Avenue, Banani, Dhaka-1213, Bangladesh
Telephone: 88 022222 81100
E-mail : info.networks@aamra.com.bd
Website : www.aamranetworks.com
Types of Company: Tr 1 and Tr 2
Employees : More than 500+

References:

Todd Lammle,

Cisco Certified Network Associate Sixth Edition,

1. Wiley publishing 2007, Page, 113-135, 383-398, 417-438. uses are given below-

4.1 IP address, 4.2 IP address classes, 4.4 A class subnet mask, 4.8 routing information protocol (RIP version1) etc

2. Manual:IP/DHCP Server https://wiki.mikrotik.com/wiki/Manual:IP/DHCP_Server 12-4-2021 4:30PM .uses are given below-

5.4 Mikrotik Router interface, 5.5 Bridge interface, 5.8.1 DHCP Server, 5.8.2 DHCP Server configuration

3. Manual:IP/Firewall/NAT <https://wiki.mikrotik.com/wiki/Manual:IP/Firewall/NAT> 12-4-2021 3:30PM. uses are given below-

5.9 NAT , 5.9.1 Working procedure of NAT,

4. Manual:IP/DNS <https://wiki.mikrotik.com/wiki/Manual:IP/DNS> 11-4-2021 12:00PM

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