INTERNSHIP ON FUNCTIONAL ANALYSIS 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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APPROVAL

This Internship titled **"INTERNSHIP ON ISP OPERATION"**, submitted by **Fatema Jahan Khan Shammi, ID No 191-15-12190** 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 **04/01/2022**

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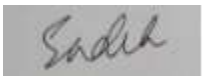

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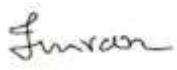

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Nishat Sultana, 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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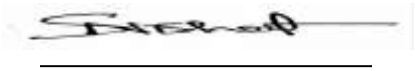

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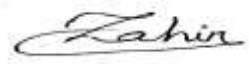

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I'm really grateful and wish of my profound our indebtedness to **Nishat Sultana,Lecturer**, Department of CSE Daffodil International University, Dhaka, deep Knowledge & keen interest of our supervisor in the field of ISP "Networking" to carry out 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.

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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 troubleshot 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

Internship is one form of possibility for explicit a persons' ideal talent.We want to keep a number of beneficial records for our every and each if the schooling isn't over yet. The internship is for the ones pupil who're self-enough and a hit with the possibility to be verified via way of means of instructors and supervisors for the first-rate destiny. In every case, they have got accomplished it regardless of limitations that we can't believe perfectly. That is likewise maximum essential matter to select one organization or institute for Internship, that is higher than the opposite companies. So we are able to analyze plenty from a terrific agency. As a pupil of Computer Science and Engineering I joined the "Aamra Network Limited" to complete of my BSc in CSE and nurtured her choice to analyze as an awful lot as I could. The factor to that you study the ee-e book isn't very distinct however that is an awful lot of tough to understood from the ee-e book how the ISP agency and community is run. The languages of books aren't surely easy, however the language of inner composition. Basically it's far taught approximately community, configuration, server and so forth associated with this matters. That is likewise studying how human beings paintings and paintings in a single day to assist the community & additionally assist community provide. Helps to analyze matters after being worried. This enjoy allows you do matters after being worried in a task. Global enjoy and achievement. I determined networking, communication, locate trouble and try and clear up this, configuration and placement studies additionally, server control and others that I couldn't analyze via the textbook. Ideal for my destiny paintings in community offerings with a community administrator.

1.2 Motivation

A laptop community is a system of laptop structures and attaches with different laptop hardware. A communique community that permits a laptop to switch information one tool to some other devices. That is based connection or many greater than tool. That is can join thru cord or wi-fi connection among every and different devices. If we are able to join our tool physically, that doesn't imply we're accomplished yet. For setup a community which switch information, we want to set the protocol, how information may be transmit every second thru cable or wi-fi

community gadget. Now a day's net is the maximum famous for communique gadget. Network can join globally in a single community. We realize that Internet can join very without difficulty one usa to some other usa all around the international thru through effective net gadget. Internet as like as clean however it's too volatile if we don't have any types of concept about a way to steady and use community. Most of the trouble with the net is Hacker. Sometime Hacker can hack our laptop or any tool thru net .For this motive we want to make a robust protection gadget for banking and workplace community. Office community setup gadget may be very vital nowadays, due to all types of workplace (Public or Private) they all the usage of net and different networking tool for his or her communique and preserving the workplace work.

1.3 Internship Objectives:

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

But the main goal of the internship is fulfilling of the requirement complete of BSc in CSE program.

There are having some other goal is-

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

1.4 Introduction to The company

If I need to finish my BSc, I want to satisfy its requirement finishes. And internship of an business enterprise is the requirement for finishing my BSc. So I can pick Aamra Network Limited, for finishing my internship. Because it's the only of maximum famous and nice Internet Provider. They are offer TR 1 and TR 2 sorts of provider. Bangladesh Government, BCB and BFF were given net provider from them .There are having more than one branches everywhere in

the country .They are impartial company. And the maximum vital component is that they train first then they supply the possibility to internship of their company.

1.5 Report Layout

At the first chapter of this report its discus about introduction of my internship and briefly discuss about of my motivation. In second chapter that is briefly discuss about my internship ‘s organization. It’s told about role of my organization, product and market place, target group, SWOT analysis, organization structure. In chapter three its briefly discussed about my daily task and what I learn from my internship session. In chapter four discussed about similarly which is I learned from institute and that is continue up to before the last chapter. In the last chapter discuss about the conclusion and about my future life on this area.

CHAPTER 2
ORGANIZATION

2.1 Introduction

As an intern I want to join reputed Internet Service Provider company they provide internet and they support the network of organizations for client. I thought that it is good for me and I can work with them. When I resource about ISP provider company, I realize that, they doesn't teach me to the root. After I find out they won't teach me from the start, then I'm start finding which organization will teach me from the root. A few 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 internship period I work with Cisco, Mikrotik Router, DHCP and DNS Server, TP-LINK, Cloud Network and so on.

But especially I learned about Cisco properties. That is use for Commercial & Industrial Network Corporation. Product of cisco range are switch, router, WAN acceleration hardware, unified fabric, wireless system, storage networking and cloud computing service.

We know that on the network field market situation is too large. All sector of any kind of organization need their own network. In this marketplace I have some good opportunities to make my future career.

2.3 Target Group

In my internship businesses goal become the ones businesses which want to community support. My internship company goal them with the aid of using survey company, studies approximately their competitor then locate their patron, Ads thru social media.

No company can't goal their patron with out surveying patron. If I need to begin a enterprise or company first I want to investigate approximately my competition and their patron. How the offer the carrier and the way patron deal with them. Then I will goal my patron my very own way.

2.4 SWOT Analysis

When we were given any corporations assignment at the beginning we want to become aware of its strength, weakness, possibilities and threats. After we determine it out we evaluation approximately its weakness, till we discovered the answer of its problem.

2.5 Organizational Structure

When I join as an intern I have no idea about New Horizons CLC's organizational structure. After a few days I understand they maintain a chain to connected each other. They come together and work step by step, they achieve their goal. Working with them, I also learn their rules. They were all very sociable, I was able to mix with them in a short time. Working with our leader was too enjoyable.

CHAPTER 3

BASIC NETWORKING KNOWLEDGE

3.1 Daily Work and Performances

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

3.2 First few days they teach me about basic knowledge

1. Node, End device

2. Categories of Network

3. Network Topology

4. Types of transmission

5. Ethernet Cabling

3.3 Node, End device

Laptop Computer, Desktop Computer, Mobile Phone ,Scanner and any kinds of related device which is capable to send and receive 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. Hybrid Topology

a. Mesh Topology: Dedicated point to point link to each several nodes. In this network with n nodes has n (n-1)/2 ports

b. 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.

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

d. **Ring Topology:** Ring topology is connected with point to point (P to P) link with each side only two nodes.

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

3.5 Categories of Network

a. Local Area Network (LAN)

b. Metropolitan Area Network (MAN)

c. Wide 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.

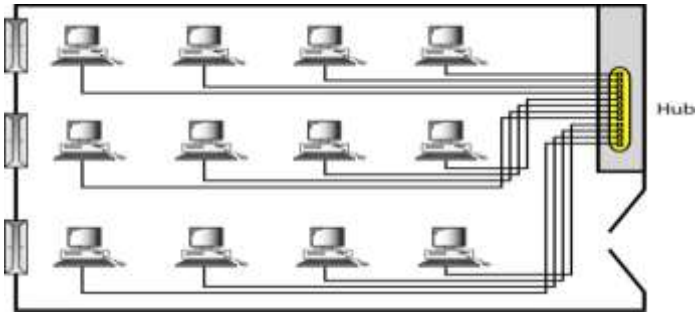

Figure 3.1: LAN

Metropolitan Area network (MAN):

a. That is design for whole city.

b. ISP Provider and TV Cable Network,

c. It is can be owned by a private or a public.

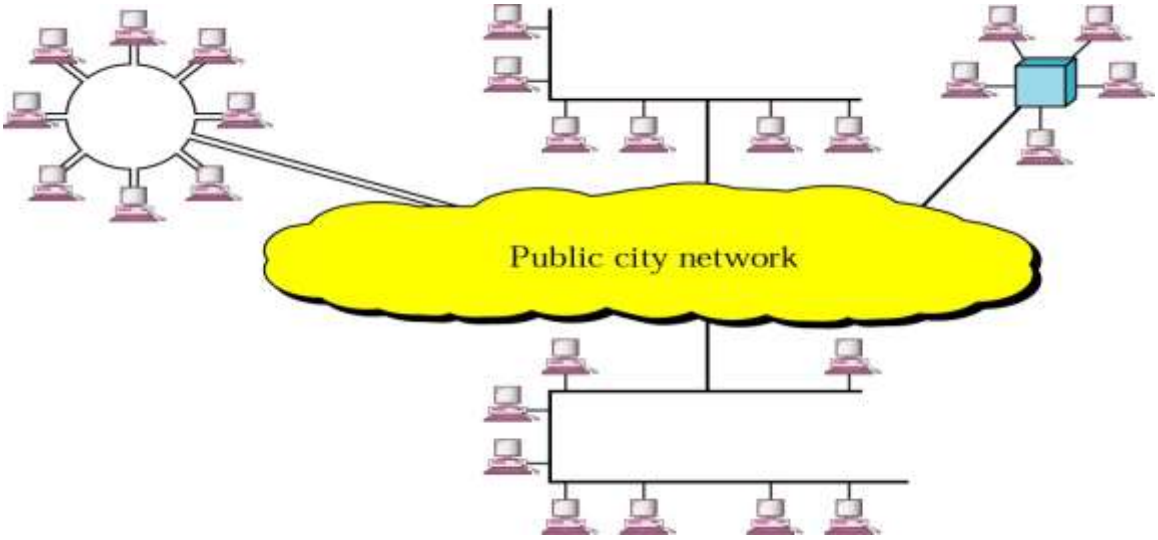

Figure3.2: Metropolitan Area Network

Wide Area Network:

a. Use for long distance transmission.

b. WAN owned and used by one company.

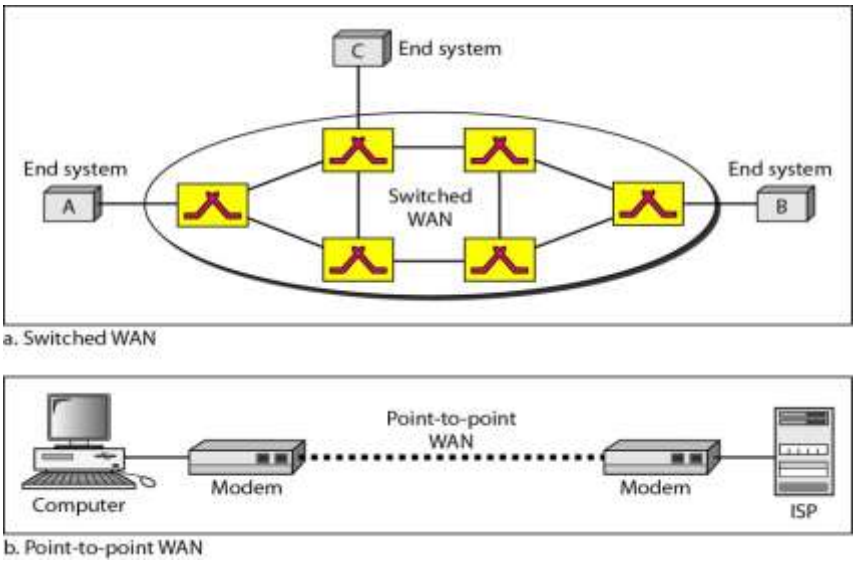

Figure 3.3: Wide Area Network

3.6 Transmission Type:

a. Unicast
b. Multicast
c. Broadcast

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

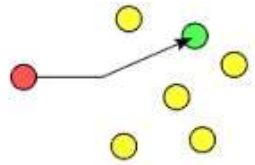

Figure 3.4: Unicast

Multicast: Multicast is communication one sender to some specific receiver over the full network.

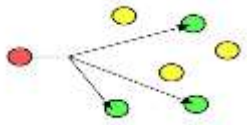

Figure 3.5: multicast

Broadcast: Broadcast is commonly used for one sender to all receiver over entire the network.

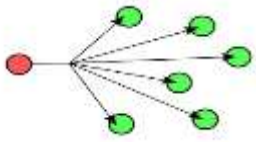

Figure 3.6: broadcast

Connector:

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

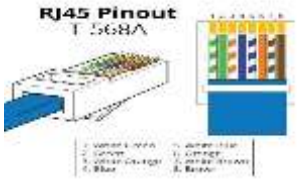

Fig 3.7: RJ-45 connector

3.7 Ethernet Cabling:

1. Straight Through
2. Crossover
3. Rolled Wire

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 5 Enhanced UTP

Chapter 4

CISCO

4.1 IP Address

'IP' stands for 'Internet Protocol'. There are having two versions of IP that now coexist in the universal Internet (IPv4) and (IPv6). It is addresses are made up of binary and it is drive to the routing of all data 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 is written in dotted decimal form. 4 Octet are divided by dots (192.168.10.1). All octet 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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10.128.0.0	10.128.0.1-10.135.255.254	10.135.255.255
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 musk, 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	**172.16.0.1-172.16.0127.254**	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.

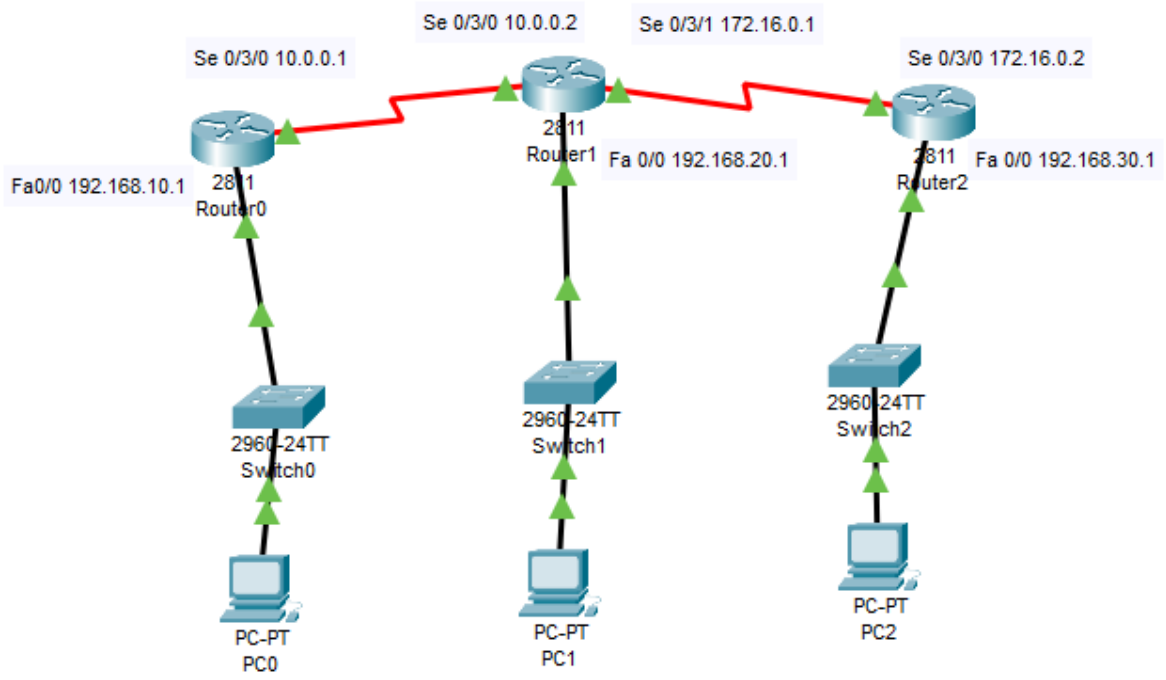


Figure 4.2: RIP V-1

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

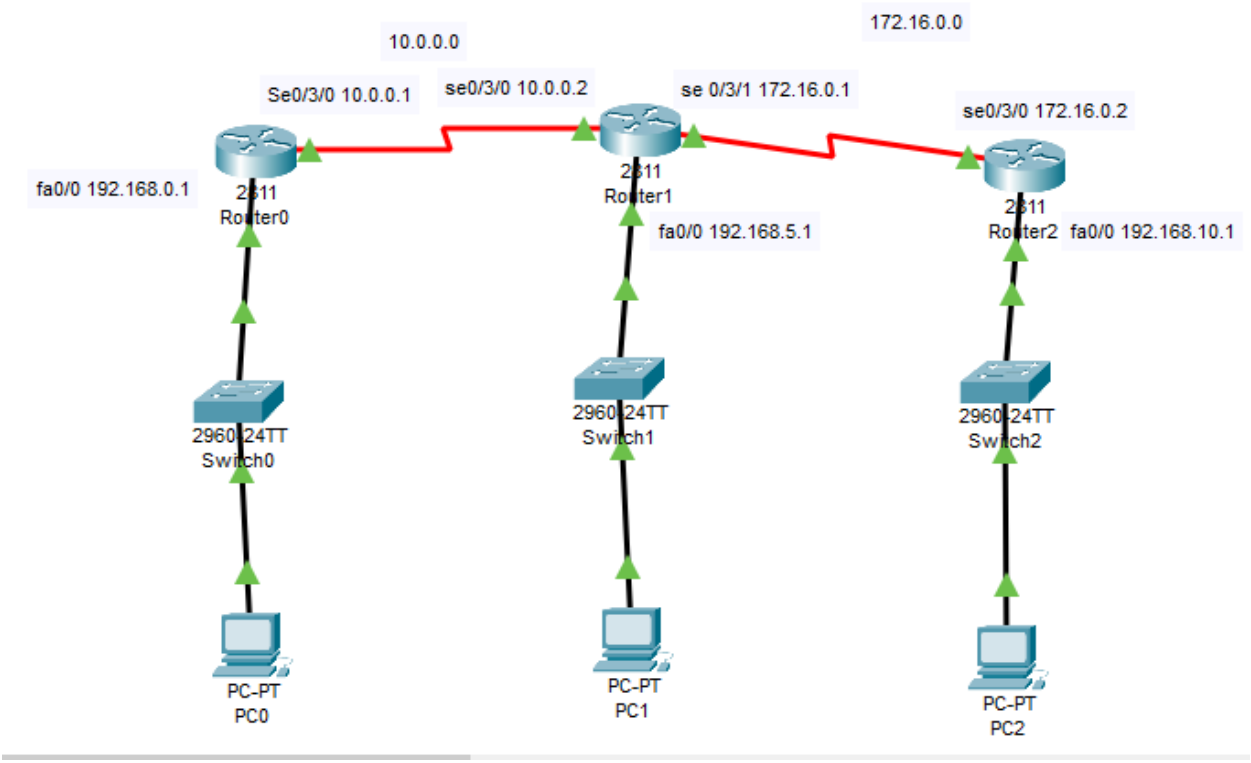


Figure: 4.3 RIP V-2

RIP V2 Configaration 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 EIGRP
3. Cisco proprietary
4. Hybrid routing protocol
5. Fast convergence
6. Support VLSM
7. Support IP, AppleTalk
8. Communication among the EIGRP routers are handed by RTP reliable transport protocol.
9. EIGRP is the best path are selected using dual (Diffusing update algorithm.
10. That is loop free topology
11. Manually and automatic route summarization by default auto summarization
12. Here is 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. Hallow Message after 5 sec
3. K Values (Means Metric)

4.10.2 Troubleshooting Command

Given in Appendix

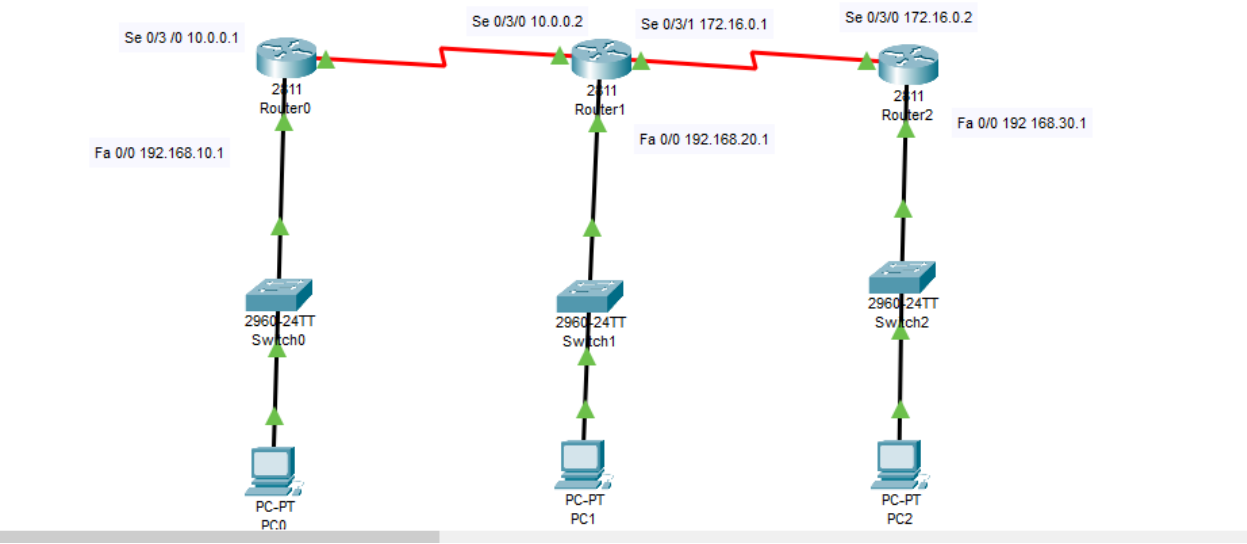


Figure 4.4 : EIGRP

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.

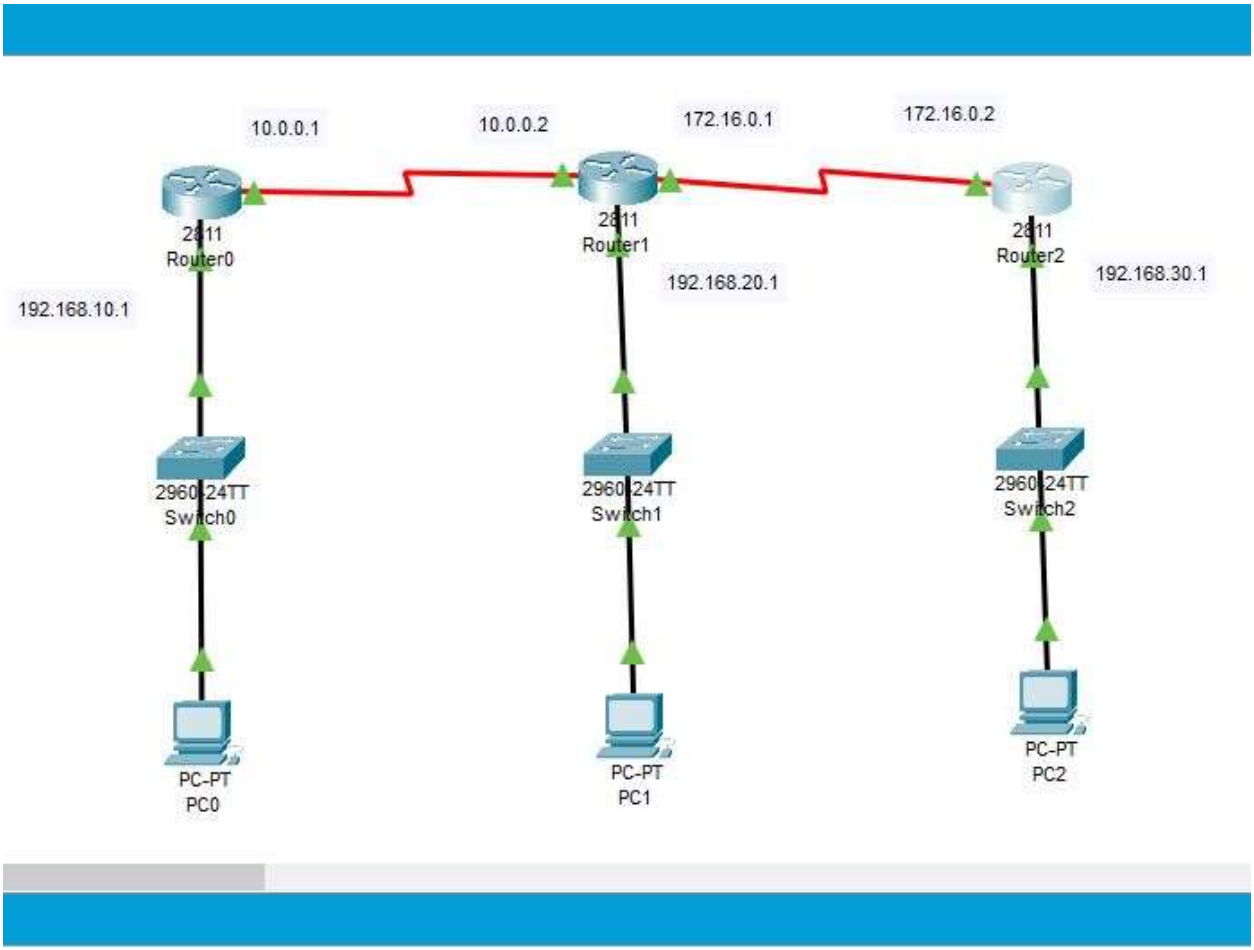


Figure 4.5: Static Routing

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:

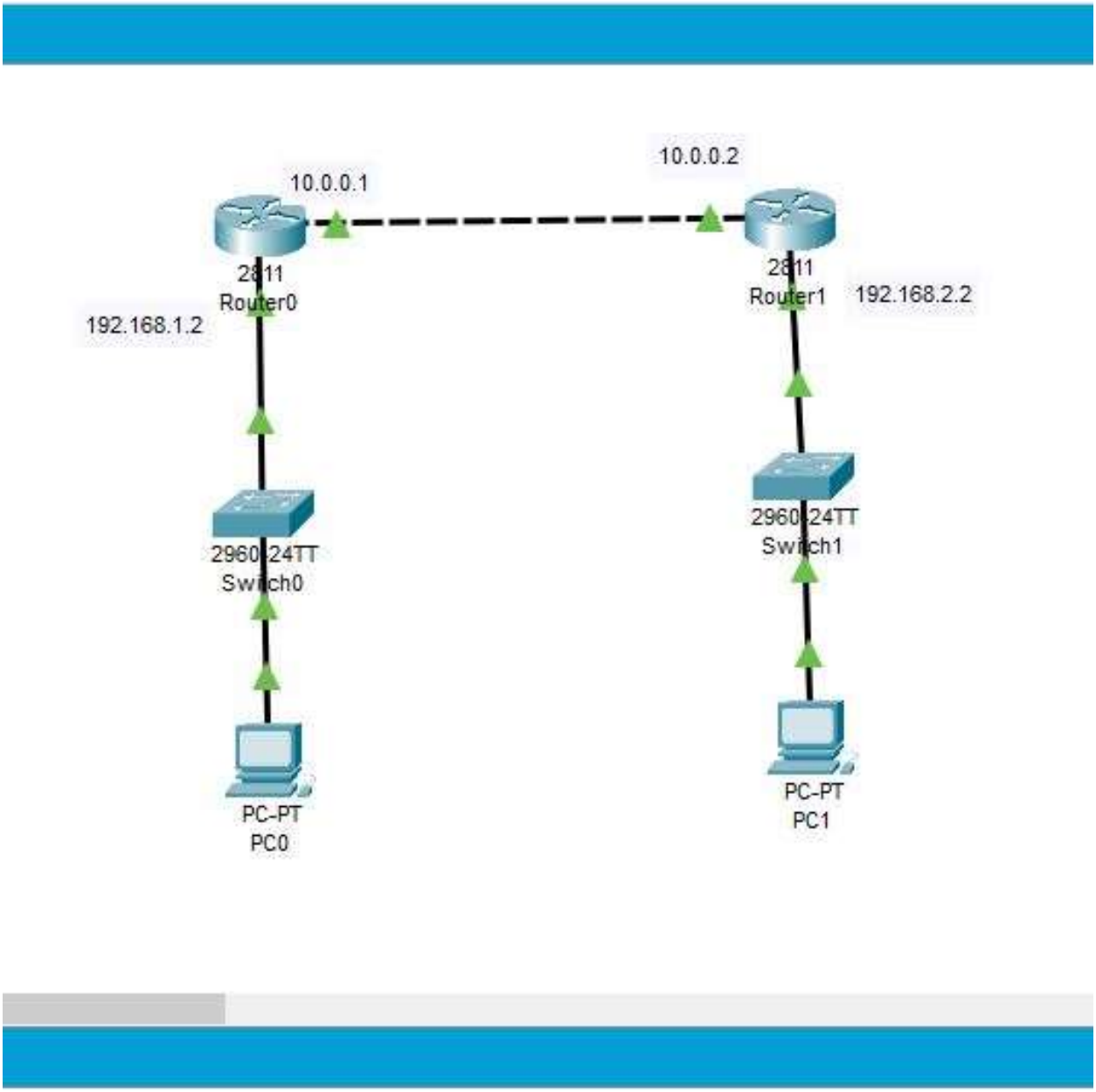


Figure 4.6:Defult Routing

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 properly desirable for any forms of size. Customers that require a router that's in luxurious and it's offers all the functions their community directors necessity to steady and the reveal also. I actually have now no longer discovered a version that's comes with an ADSL version, and I could now no longer don't forget them for such community 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 .

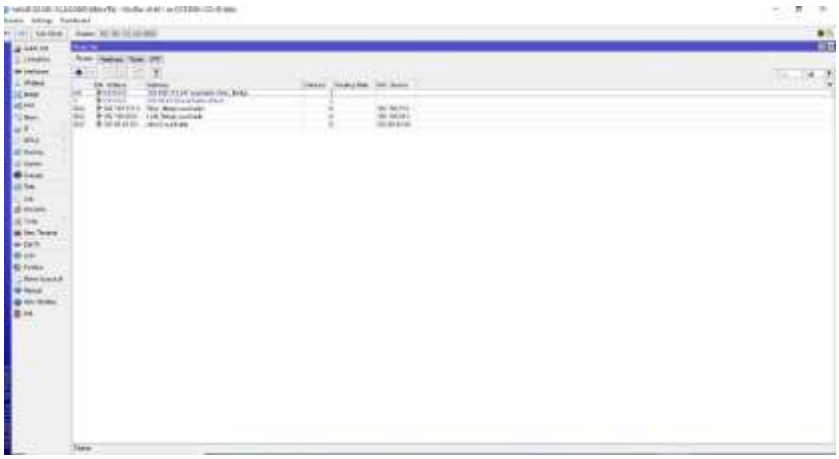


Figure 5.1: Mikrotik Interface

5.5 Bridge Interface

Bridge Interface incorporates numerous interfaces handiest one digital interface and the bridge the ones interface. That is a function. Every accommodated interfaces related to a bodily section. This section is managed as a one section.

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.

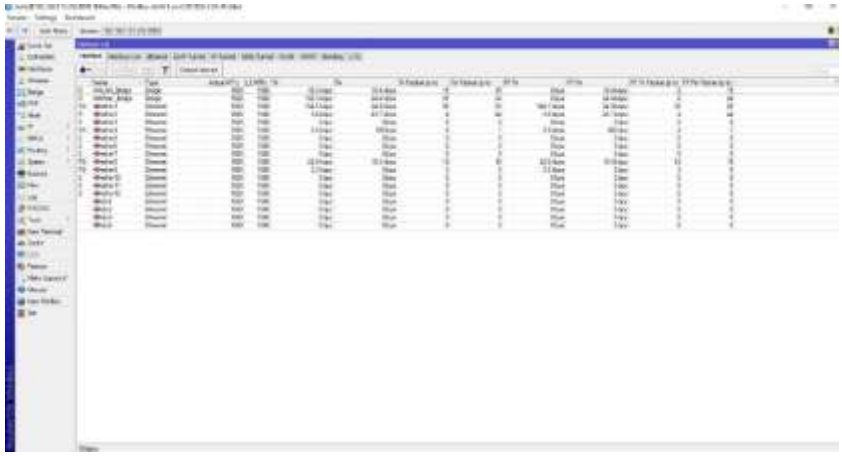


Figure 5.2: Bridge Interface

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

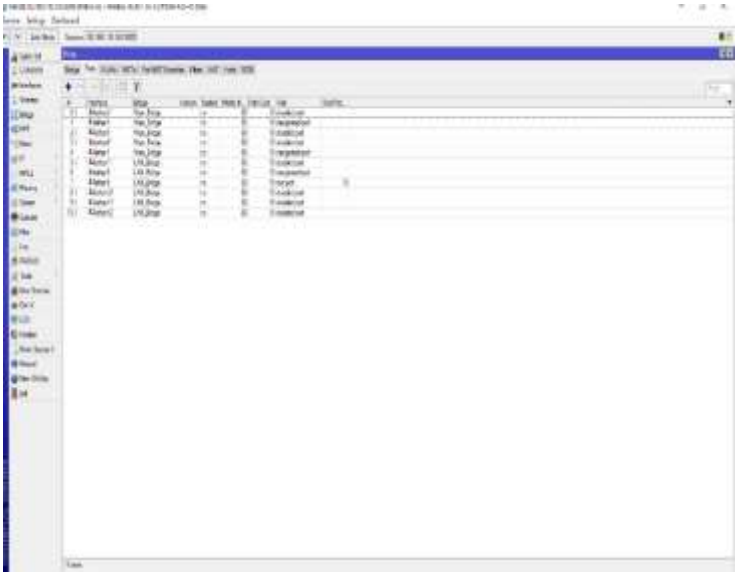


Figure 5.3: B/W Control

5.8 DHCP Server on MikroTik Router Basic :

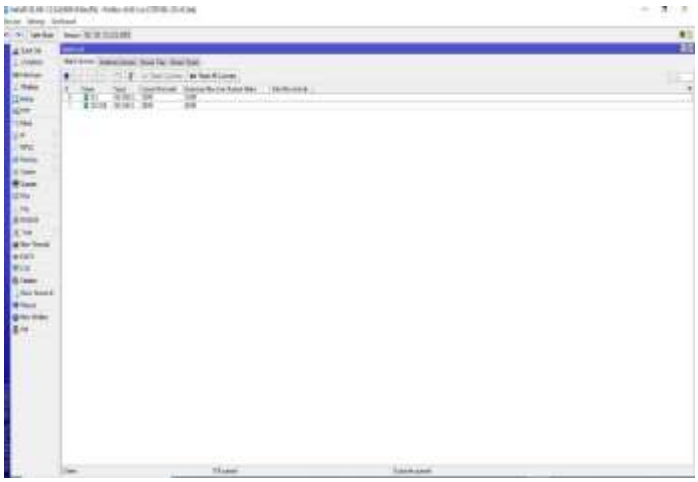


Figure 5.4: DHCP Server Configuration

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

a. At first go to the IP > DHCP server menu from the win box. Then DHCP server window will present.

b. Now DHCP Server window, then touch on the DHCP Setup button and choose the interface which is necessity for setup DHCP server from same quality server. Drop down the interface and then click the next button.

c. LAN and close the DHCP address Space on the input box. Now click on the next step button. Client got IP address.
d. Choose gateway address for the given network in gateway for DHCP Network input box and then click the next button.
e. 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.
f. Give DNS server IP and then click Next button.
g. IP lease time. Now click on the up next button. Default lease time is 3 days, which is automatically setup.
h. 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.

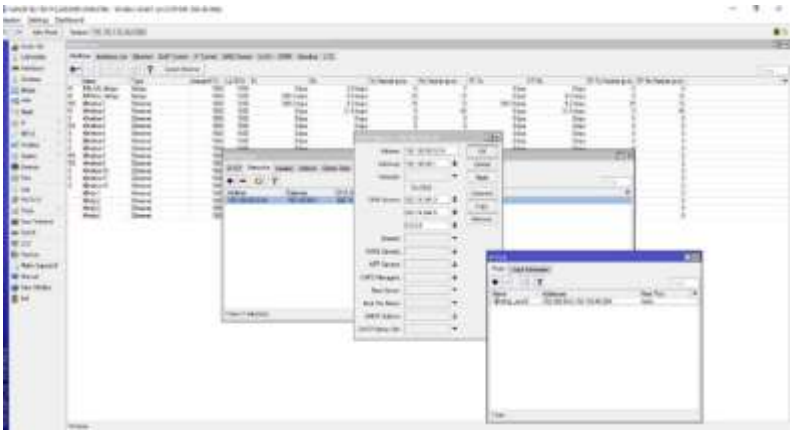


Figure 5.5: DHCP Server Configuration

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.

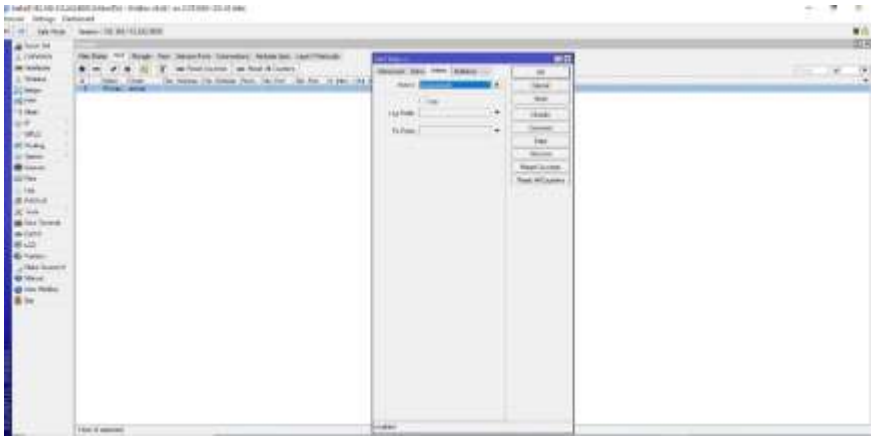


Figure 5.7: NAT Routing

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 .

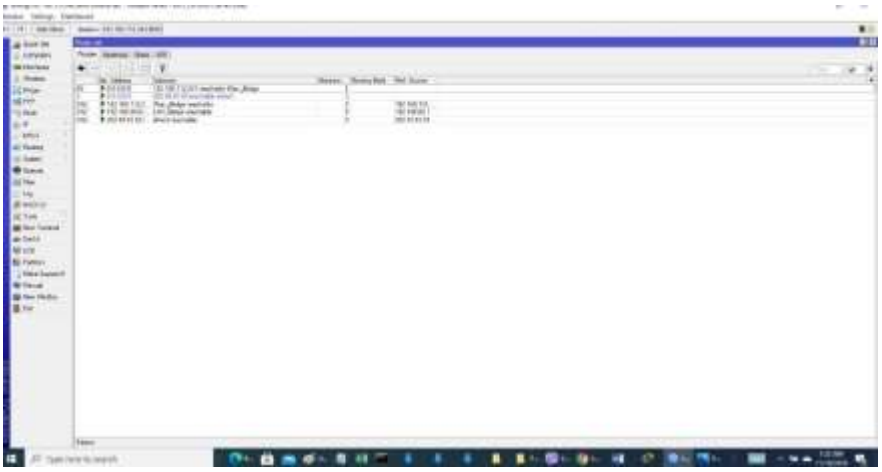
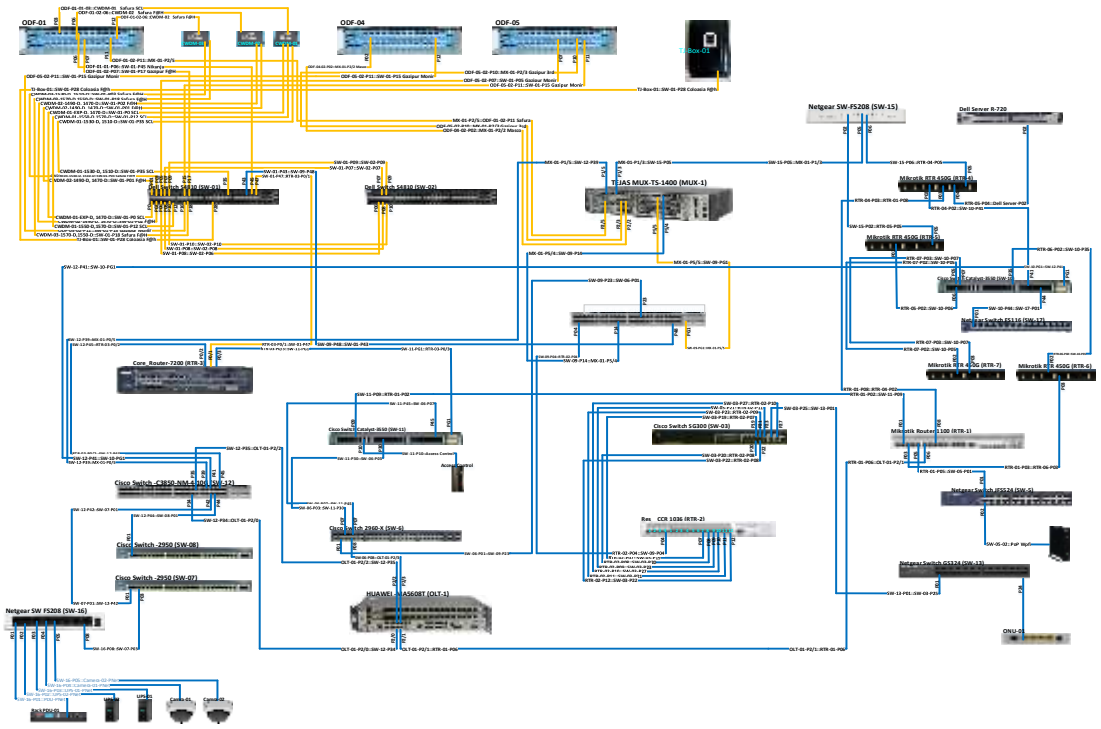


Figure 5.8: NAT Routing Configuration

ISP Network Diagram

IPS Network Diagram



CHAPTER 6

Conclusions

I were given a good deal of possibility to paintings at the Aamra Network Limited. There are many approaches and collected a number of enjoy at some stage in the complete internship session. There turned into a scope withinside the area of laptop workplace community making plans and designing, operating in this area. Data and net connectivity, making sure community security, special varieties of software configuration, and maintenance. In this report, I actually have defined my reports with Office Network Setup, Designing and Optimization additionally. I actually have observed a good deal of big strategies from my supervisors and finished a number of obligations on an everyday foundation all through my whole Internship period and in the end found out the self belief to cope with challenge myself. I suppose that some distance an remarkable opportunity to use the information and abilties that I had received from them. I additionally found out the manner to attend to critical faults and were given new mind each day. Doing this type of paintings is absolutely beneficial for my destiny career and I am looking to this shape of artwork as soon as more.

Actual learning comes at the end of the operating period whilst I used to take delivery of the opportunity to keep in mind what I noticed and what I professional in experimental coaching and internship session. I take advantage of the right commercial enterprise etiquette to have a look at with the useful resource of looking at customers and expert etiquette and learning the manner to speak with professional caregivers and every other organization of workers, in addition to an professional inside the discipline. I’m enforcing the strategic imaginative and prescient of a corporation, how to connect with colleagues, a manner to percentage assets, the way to arrange, the way to make choices, some technical cognizance’s of the commercial enterprise enterprise's surroundings, and the organization's duty and responsiveness. The internship experience on the duvet of my internship supervisor through an evaluation and character conferences gives a opportunity of trying to find an professional opinion. I assume that, this internship will assist me of my destiny career. That is found out me that how manner operating with different crew contributors and the way manner deal with to all of different 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

Types of Company: Tr 1 and Tr 2

Website : www.aamranetworks.com

Employees : More than 500+

References:

[1] Learn about ANL, available at <<https://www.aamranetworks.com />> last accessed on 01-12-2021 at 1.30 PM

[2] Learn about IP addressing available at <<https://www.cisco.com/c/en/us/support/docs/ip/routing-information-rip/13788-3html/>>, last accessed on 10-11-2021 at 4PM

[3] Learn about Subneting ,available at<<https:www.techopedia.com/definition/28328/subneting/>>,last accessed on 12-12-2021 at 2PM

[4]Learn about public and private ip address,available at<<https://www.geeksforgeeks.org/difference-between-private-public-ip-addresses/>>,last accessed on 22-10-2021 at 1PM

[5] Learn about RIP,available at <<https:www.geeksforgeeks.org/routing-information-protocol-rip/>>, last accessed on 07-10-2021 at 3.30PM

ISP

ORIGINALITY REPORT

29%	28%	5%	14%
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