



**Daffodil**  
*International*  
**University**

***INTERNSHIP REPORT***

***Network & IT department at InfoLink Ltd.***

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## Declaration

I am Sajid Sakib, ID: 152-35-1163, student of DIU- Daffodil International University. I am declaring that I have complete the internship in **The Network & it System of InfoLink** under the supervisor of **Syeda Sumbul Hossain**, Department of software Engineering. **The network system of InfoLink** has been prepared for the partial fulfillment of Practicum of Bachelor Software Engineering. I am also declaring that this report has not been Prepared or submitted previously for any other purpose, reward or presentation by any one rather than me. This is also declared that there is no plagiarism or data falsification and materials used in this report from various sources and site.



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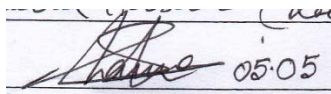
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## APPROVAL

This **Internship** titled “**Network & IT Department at InfoLink Ltd.**”, submitted by **Sajid Sakib, (ID: 152-35-1163)** to the Department of Software Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc in Software Engineering and approved as to its style and contents.

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## Acknowledgement

In the name of **ALLAH** who is the most merciful and the most graceful.

Firstly I would like to thanks my supervisor **Syeda Sumbul Hossain, Lecturer**, Department of Software Engineering. I am extremely grateful and indebted to her for his expert, sincere and valuable guidance and encouragement to me.

I would like to express my sincere thanks to **Dr. Touhid Bhuiyan**, Professor and Head of Software Engineering Department for hid constant encouragement.

I am really pleased and proud to express my feeling of gratefulness and profound respect to our respected faculties, of the Department of Software Engineering, for take this opportunity.

Finally, I wish to thank my parents who have been a great source of inspiration to me. Without their support, I would not have reached where I am today.

# LETTER OF TRANSMITTAL

April 20, 2019

To

Syeda Sumbul Hossain

Lecturer

Department of Software Engineering

Daffodil International University

**Subject: Submission of the Internship Report.**

Dear Sir,

With due respect, I would like to approach you this is a great opportunity to submit my internship report on the experience gained during my internship period in Network & IT department at Infolink. I have prepared this report in accordance with the instructions given by you and the university.

Working in Infolink, it was inspiring and a great learning experience for me. I hope this knowledge will facilitate me a lot in my future career. This period has given the enough opportunity to actualize my theoretical knowledge into practical corporate environment. I have provided my best effort to this report.

I sincerely hope that I am grateful to you if you kindly go through this report and evaluate my performance. I hope that you would appreciate the project report.

Sincerely Yours,

Sajid Sakib

ID: 152-35-1163

Department of Software Engineering

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## **Chapter 1: Introduction**

## 1.1 Introduction

Computer network plays a vital role in this digital era. Once we could not think about that there will be a device such computer which will reduce our work and will do the same work in more effective way. As same we couldn't think of that our data will be transfer using a network through a computer is a few second over a million miles distance. But all these are now true and real with the day by day development. Nothing of these came in one day. And now a day's people can't only think about the device or gadgets but also to get all the facilities of these modern devices one need to be connected with a network. And ISP organizations are those organizations who are helping to give this service towards the consumers. People are paying them as per their service. In the digital world Data are the most important and valuable things. Now a day's people are so hungry in terms of gathering information and communication.

## 1.3 Background

A computer network is a group of computer systems and other computing hardware devices. This is a telecommunications network that allows computers to exchange data. The data communications refers to the transmission of digital data between computers. The physical connection between networked computing devices is established using either cable media or wireless media.

The best known computer network is the Internet. The internet is the biggest world-wide communication network of computers. The Internet is generally defined as a global network connecting millions of computers. Corporate network IT systems are too complex. For this reason, In today's world each and every corporate network sector has been adopted the computer networking and information technology for the purpose of the smooth functionalities around the world. Computer network use different type of protocol to secure their network and all of the protocols are performing different things.

But the main problem is hacking. All of the hacker are not good and they want to earn money so they try to hack all the information. For this reason security is the most important topics. **Computer security** is the protection of computer systems and information from harm, theft and

unauthorized use. Internet security is a branch of computer security which comprises various security measures exercised for ensuring the security of transactions done online. In the process, the internet security prevents attacks targeted at browsers, network operating systems and other applications. Most of the people use wireless network so Cyber criminals can crack WEP passwords in minutes using freely available software. The hacker hack the network and enter the internal network from the outside network and collect all the information.

## **1.4 Scope of the study**

This report is based on InfoLink Ltd networking system. Along with this, the report will also partially describe the whole InfoLink Network System. This report is mainly important for the Networking related organizations to understand the network system that includes network devices, physical and wireless communication, routing protocols, network monitoring tools, network security tools and so on.

VLAN is the virtual Local Area Network that can separate each of the department from other department like Account department can make separate from the Marketing department using VLAN. If any of the department want to communicate with other department then apply inter VLAN. Using Inter VLAN if each of the department want to communicate with other department then it will be possible. ACL is the Access Control List that act as a white list & black list. If any of the network want to block any specific network or any specific host then it possible using ACL. In the organization Account department and all the file of this organization is very secure things. It need to hide from the outside network or hackers. So we apply ACL in the Account and File server to protect it.

Another security is VPN. VPN is virtual private network that make network private or more secure. When one branch office send any important file with another branch office that time it need to be secure. If we use VPN that it hide their network address when transfer the file to other office. So it will secure from the hacker. As an ISP company all networking device should be encrypted password, All the switch port should be secure and if hacker try to hack the system

using their pc add into the internal network it also should be block. So need to apply port security, MAC address binding and Encrypted password. Also all the device should be manage from anywhere.

## **1.5 The main objective of this report**

The main goals of this report are to fulfill the requirements of the BCSE program and to present the knowledge and information that has been achieved during the internship period under the organization.

The other important goals are as follows –

- To apply the ACL to the internal network for protection the Account department from the other department and also Outside Network.
- To transferring any secure information from one branch to another branch office using VPN (GRE Tunneling).
- To secure the network apply switch port security, MAC address binding, Encrypted password.
- To Redesign the network structure of infolink for efficient connectivity and load balancing.

## **1.6 Summary of report**

In first chapter of this report discuss about computer network and security, background of this report and scope of the study. In this chapter also discuss about the main objective of this project. What actually done in this report and project that is overall discuss in chapter one.

In second Chapter discuss about overview of InfoLink Limited. Discuss about their employee description and all department responsibility. In this chapter also discuss about their services and

how they give their services and manage their client, company location and other information about company.

Chapter three showing the existing network structure of InfoLink Limited. In this chapter also discuss about working procedure of existing network structure and features of existing system. Also discuss about their current equipment that they are use for giving their services and devices features.

In chapter four discuss the proposed network and proposed network structure diagram. It also discussed about which protocol suggested for proposed network with its benefit. At last discuss about benefit and features of proposed network and difference between existing network and proposed network.

In Chapter five discuss about Performance, result and discussion about this project. In Chapter six discuss about conclusion and bibliography.

## **Chapter 2: Organization Overview**

## **2.0 Organization Overview**

An ISP, or internet service provider, is a company that provides its customers access to the internet and other web services. It is the company of information communication and technology to provide the services like Rocket Speed Internet, Data Connectivity, Intranet (LAN), Camera Solution, Web Development, Ecommerce, Website Hosting, Domain, SMS Solutions, SEO Solutions, Email Service, Wi-Fi solutions, Software, Server, Co-Location, and Consultancy Etc. To maintaining a direct line to the internet, the company usually maintains web servers. Our company supplying necessary software, a password-protected user account, way to connect to the internet, ISPs offer their customers the capability to browse the web and exchange email with other people. ISP also offer additional services. ISPs can vary in size, some are operated by one individual, while others are large corporations. They may also vary in scope, some only support users in a particular city, while others have regional or national capabilities. InfoLink Limited provide both home users and for corporate users in a particular city. They also provide Domain and Hosting service, FTP service etc.

## **2.1 Company Profile**

InfoLink is a leading Nationwide Internet Service Provider and IT solution company in Bangladesh. They are a team with IT expertise with excellence in 'Customers' Need Assessment' and endeavor to fulfill as well as. InfoLink started its journey with aim of providing very high-level software and technical support. InfoLink was established with the over aching objective of keeping the customers in the information superhighway with the fastest Internet connectivity by using the most advanced and reliable equipment available. The main office in 56 Progati Sarani, Baridhara block: J and Sub office which is in Uttara, Sayadpur. At the beginning the number of clients was 100 and corporate clients were 20. But in present day the number of clients are over 1500 and corporate clients are 300 including Government Offices, Hostels, Hotels, Restaurant, Buying Houses, shops, Jamuna Future Park, Power Supply Plants like APR etc. At the beginning 10 people handle the total network. But now more then 60 persons handle the total network. First

time their bandwidth was 50Mbps. Now their bandwidth is 4Gbps. InfoLink has developed its Backbone with Undergrounded Optical Fiber in Uttara, Baridhara, Basundhara, Gulshan, Banani, Sayodpur, Dhanmondi, Mohammadpur, Nilfamari. The Company has developed a very talented force of IT experts who are creative and forward thinking in their approach. InfoLink pricing is neither cheap nor high.

## 2.2 InfoLink Limited Dept. Hierarchy

**I. Service & Customer Dept.:** A customer service representative company's customers to provide them with information, products and services. If valuable client faces any kinds of problem, they contact with support dept. And say their problem. Support dept. check client connection & fixed this problem, finally they provide solution via telephone, mail.

**II. Accounts Dept.:** An accounting department provides accounting services and financial support to the organization. This department records accounts payable, receivable, inventory, payroll, fixed assets and all other financial elements. The department's accountants department company's financial position and any changes required to run the organization cost effectively.

**III. Marketing Dept.:** The Marketing Department plays a vital role in promoting the business and organization. The department has overall responsibility for growing revenue, increasing market share and contributing to company growth. In a small business, the marketing department may just be one person. It may include a marketing director or manager plus marketing executives responsible for functions such as advertising, publications events and so on.

**IV. Network & System Dept.:** Among them the Network and System Dept. is the most significant dept. of Infolink Limited. Normally for any ISP, the responsibility of Network & System Dept. is additional. They have done the most perceptive and imperative task of the



network. There are total 1 System Admin 1 Assistant System Admin & 1 Network Admin and their tasks were different by person. Worked in Network & Customer monitoring section and experienced lots of things about the network maintenance and customer support.

**V. HR Dept.:** An HR department provides all Employees services and provides all types of letter as like as appointment letter. They maintain all the employees' requirement and increment their salary and giving their bonus. This dept giving the job circular and check the applicant CV and provide their appointment letter.

## 2.3 Services of InfoLink Ltd.

Infolink Limited assures their firm commitment to provide customer the best SERVICE in the Zone. Infolink Limited is now running its 20 years of journey, leading within the TOP ISP in Baridhara in terms of Network & Number of Customers but they are the best in terms of SERVICE.. Some of value added services are Intranet, CCTV camera solution, web development, hosting, domain registration, SMS service, wifi solution, co-location, dedicated server and lot more.

**Rocket Speed Internet:** InfoLink provide very stable connectivity within secure network. Our connection is reliable and super fast on a dedicated network. Our all connection is scalable up to 1Gbps connectivity.

**Data Connectivity:** Infolink provide Point to Point and Point to Multi Point Data connectivity. It is possible to provide data connectivity as per your required volume. Secure your business from outside attack using Internet.

**Intranet (LAN):** Local area network (LAN) is a group of devices that share a common platform to a server. We connect any company entire business computer, Server, Printer, Camera and all related device using best passive product.

**Camera Solution:** Infolink Camera solution allows authorized personnel to securely monitor their facility anytime, anywhere. Infolink gives services with maintenance, which can ensure service guarantee.

**Domain:** Using InfoLink panel anyone are able to 100% access their domain and renew, transfer or change NS whenever they want.

**Wifi Solutions:** Infolink offer full wifi hotspot solution as per customization and need. Using wifi solution, they can control user, data and payment from a single server. They provide both Dedicated server on remote location and Local service on own premises with Local BDIX Connectivity, Power Backup and direct access.

## 2.4 Connectivity of InfoLink Systems Limited

For Home Users or Single PC Connectivity:

1. Point to Point Dedicated Fiber Connectivity
2. FTTx Connectivity
3. Cable Modem Service

For Corporate Office Connectivity:

1. Local network
2. Data Connectivity
3. Jamuna Future Park whole connectivity

Infolink Data Connectivity is based on both L2 and L3 network. It is a comprehensive solution that responds to the needs of today's unique business. Infolink data Connectivity is a highly scale able up to 1Gbps Per Location and secure solution that truly allows you to communicate all of applications, end-users and support infrastructure onto a single network. Infolink offer wide range of dedicated Bandwidth options starting from 5Mbps as per customer requirement.

## **2.5 Broadband Internet through Fiber Network**

Infolink Limited gives Internet through the fiber network. The features of the bandwidth are-

- Point to Point Fiber Optic Connection.
- Backup Connection for any fiber casualties.
- Dedicated Bandwidth monitoring through MRTG curve.
- Same Upload Bandwidth.
- Increased Upload Bandwidth (as client's requirement) for any specific time period.  
Several Real IP's.
- Dedicated Account Manager (Technical Engineer) for solving any kinds of service and technical issue.
- Redundant back up connectivity (on demand).

## **2.6 Networking Solutions and supports for Corporate Offices**

InfoLink Limited provides corporate networking solution through Optical fiber, Wireless media to office, organizations. So that employees within the organization can share, access the whole office network from a point. Classified data, information with interdepartmental communications can be checked for security and in confidence. Internal sharing thus, through networking, allows this unique amenity. At InfoLink Limited, customers are their top priority. In InfoLink Customer Support 24 hours a day. No matter where the customers are, or what they need, their service representatives are ready to help. Their talented commitment to working closely with customer and to solve any kind of problem. InfoLink Corporate Broadband Access uses proven technology to deliver high-speed, dedicated broadband connectivity directly to your business. Infolink maintains connections to multiple upstream providers to provide redundancy and reliability for your connection to the internet.

## **2.7 The Vision**

We are providing internet services, software & systems integration services. We ensure that our customers are successful by understanding and being responsive to their needs, as well as working collaboratively with them to provide one-stop faster, cost-competitive and scalable services that create competitive advantages in the world of electronic communication. Infolink Limited to make a high-class Customer Care Department to response within a MINUTE against any complaint & it will close the day with Zero complaint. The company will reach to their customer beyond their expectations & they will proactively find out any issue regarding Service for extra care.

## **2.8 The Mission**

The mission of Infolink Limited is to ensure & provide high level of quality Service with the limited number of Customers. They do not believe in grabbing lots of customers rather they would like to make long time bondage with their existing customers with high level of satisfaction of unparalleled services. The company can assure their Customers that no one can match their level of service & caring to their valued Customers. It is a Family with all the Customers & dedicated Personnel of Infolink Limited. The company would like to make stronger the bondage with their Customers day by day. Each of our activities must benefit and add value to the common wealth of our society. We firmly believe that, in the final analysis we are accountable to each of the constituents with whom we interact; namely: our employees, our customers and our fellow citizens.

## **2.9 Values**

We believe that how we do business is paramount to our success. Our commitment is exemplified by "The Infolink Way" a core value statement which highlights the importance of Customer and Market Focus, High Performance, Integrity and Respect, Spirit, Collaboration and People Development. Our employees are the key to living these values and we are committed to provide a work environment for our employees that foster The Infolink way. We are extremely proud of our employees, who take seriously their responsibility to embody these values in their relationships with each other, and with our customers, suppliers, and community. We also are extremely proud of our commitment to the communities where our employees live and work. We

believe that being part of the community includes a responsibility to contribute more than just jobs.

## **2.10 Specialties of InfoLink Limited**

- NO COMPROMISE regarding commitment of Bandwidth – to be provided at actual.
- They ensure customer DEDICATED Bandwidth (speed) on demand.
- Unlimited Net surfing for 24 hours – no download limitations.
- Quick customer support – response time less than one hour
- 24/7 Help Desk – 9.00am to 10.00pm customer-end support
- They maintain quality but they are competitive in terms of price

## **Chapter 3: Activity**

### **3.0 Activities**

the company of information communication and technology to provide the services like Rocket Speed Internet, Data Connectivity, Intranet (LAN), Camera Solution, Web Development, Ecommerce, Website Hosting, Domain, SMS Solutions, SEO Solutions, Email Service, Wi-Fi solutions, Software, Server, Co-Location, and Consultancy Etc. To maintaining a direct line to the internet, the company usually maintains web servers. Our company supplying necessary software, a password-protected user account, way to connect to the internet, ISPs offer their customers the capability to browse the web and exchange email with other people. ISP also offer additional services. ISPs can vary in size, some are operated by one individual, while others are large corporations. They may also vary in scope, some only support users in a particular city, while others have regional or national capabilities. InfoLink Limited provide both home users and for corporate users in a particular city. They also provide Domain and Hosting service, FTP service etc.

### **3.1 Work Load**

As an intern of Networking team my important responsibility was to understand the systems of the organization. They provided necessary document to get the overview of the system and team discussions. They assist me to understand all the terms and topic of the system.

My task was configuring configuring Routers, switches, Site Survey in Clients end. In the later portion of my internship I was also involved in Research and Development with particular topic.

My another responsibility was to monitor daily operational performance. I configured Router in the organization. I installed of software such as, anti-virus, Microsoft office, Corel draw and many other utility applications for clients. I Fix hardware issues such as, replacing bad keyboards, replacing broken screens, replacing damaged hard drives, replacing random access memory (RAM) and so many other hardware issues.

I also Attend to internet issues such as, distributing of patch cords, re-crimping of damaged (RJ-45), replacement of internet cards on clients systems, replacement of damaged switches.

## 3.2 Organization Wide

### **DHCP SERVER :**

DHCP (Dynamic Host Configuration Protocol) is a network management protocol used to dynamically assign an Internet Protocol (IP) address to any device, or node, on a network so they can communicate using IP. DHCP automates and centrally manages these configurations rather than requiring network administrators to manually assign IP addresses to all network devices. DHCP can be implemented on small local networks as well as large enterprise networks.

DHCPv4 assigns IPv4 addresses and other network configuration information dynamically. Because desktop clients typically make up the bulk of network nodes, DHCPv4 is an extremely useful and timesaving tool for network administrators. The DHCPv4 server dynamically assigns, or leases, an IPv4 address from a pool of addresses for a limited period of time chosen by the server, or until the client no longer needs the address. Clients lease the information from the server for an administratively defined period. Administrators configure DHCPv4 servers to set the leases to time out at different intervals.

### **VLAN:**

A virtual local area network (VLAN) is a logical group of workstations, servers and network that appear to be on the same LAN despite their geographical distribution. A VLAN allows network of computers and users to communicate in a simulated environment as if they exist in a single LAN and are sharing a single broadcast and multicast domain. VLANs are implemented to achieve scalability, security and ease of network management and can quickly adapt to change in network requirements and relocation of workstations and server nodes. Higher-end switches



allow the functionality and implementation of VLANs. The purpose of implementing a VLAN is to improve the performance of a network or apply appropriate security.

## **Advantages of VLAN**

VLAN provides following advantages:-

- Solve broadcast problem
- Reduce cost
- Better performance
- Improved IT staff efficiency
- Reduce the size of broadcast domains
- Allow us to add additional layer of security
- Make device management easier
- Allow us to implement the logical grouping of devices by function instead of location.

## **SECURITY OF THE NETWORK:**

### **Access Control List (ACL)**

An access control list (ACL) is a table that tells a computer operating system which access rights each user has to a particular system object, such as a file directory or individual file. Each object has a security attribute that identifies its access control list. A *network access control list (ACL)* is an optional layer of security for your VPC that acts as a firewall for controlling traffic in and out of one or more subnets. ACLs are used to filter traffic based on the set of rules defined for the incoming or outgoing of the network. There are two main different types of Access-list.

1. **Standard Access-list** – These are the Access-list which are made using the source IP address only. These ACLs permit or deny the entire protocol suite. They don't distinguish between the IP traffic such as TCP, UDP and Https etc. By using numbers 1-99 or 1300-

1999, router will understand it as a standard ACL and the specified address as source IP address.

2. **Extended Access-list** – These are the ACL which uses both source and destination IP address. In this type of ACL, we can also mention which IP traffic should be allowed or denied.

#### **ACL features –**

1. The set of rules defined are matched serial wise i.e. matching starts with the first line, then 2nd, then 3rd and so on.
2. The packets are matched only until it matches the rule. Once a rule is matched then no further comparison takes place and that rule will be performed.
3. There is an implicit deny at the end of every ACL, i.e., if no condition or rule matches then the packet will be discarded.

#### **Advantages of ACL**

- Improve network performance.
- Provides security as administrator can configure the access list according to the needs and deny the unwanted packets from entering the network.
- Provides control over the traffic as it can permit or deny according to the need of network.

#### **VPN:**

A virtual private network, or VPN, is an encrypted connection over the Internet from a device to a network. The encrypted connection helps ensure that sensitive data is safely transmitted. It prevents unauthorized people from eavesdropping on the traffic and allows the user to conduct work remotely. VPN technology is widely used in corporate environments. A VPN extends a corporate network through encrypted connections made over the Internet. Because the traffic is encrypted between the device and the network, traffic remains private as it travels. An employee

can work outside the office and still securely connect to the corporate network. Even Smartphone's and tablets can connect through a VPN.

A site-to-site VPN connects the corporate office to branch offices over the internet. Site-to-site VPN are used when distance make it impractical to have direct network connections between these offices. Dedicated equipment is used to establish and maintain a connection.

A VPN works by using the shared public infrastructure while maintaining privacy through A remote access VPN securely connects a device outside the corporate office. These devices are known as endpoints and may be laptops, tablets, Smartphone's etc. Advantages in VPN technology have allowed security checks to be conducted on endpoints to make sure they meet a certain posture before connecting.

## **SECURITY OF THE NETWORK:**

### **MAC Address Binding**

In computer networking, MAC Filtering refers to a security access control method whereby the MAC address assigned to each network card is used to determine access to the network. MAC addresses are uniquely assigned to each card, so using MAC filtering on a network permits and denies network access to specific devices through the use of blacklists and whitelists. While the restriction of network access through the use of lists is straightforward, an individual person is not identified by a MAC address, rather a device only, so an authorized person will need to have a white list entry for each device that he or she would use to access the network.

### **Advantages of MAC Address Binding**

- Prevent unwanted connections
- Not very hard to configure if you don't have a lot of devices
- Lightweight security feature

- Cost (No need to buy a a dedicate firewall to do MAC filter)

### **3.4 Other Relevant Activities**

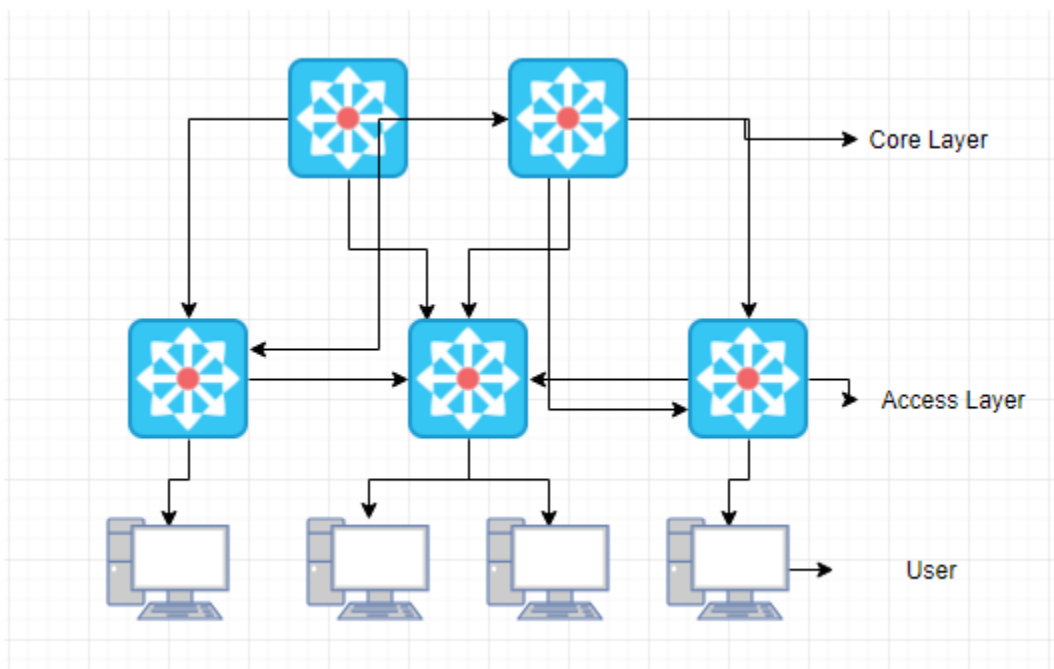
Even though I was assigned to Networking team to have a clear understanding of the IT department a week long rotation program was arranged. In this rotation period I had the opportunity to sit with every other team. This enabled me to gain the knowledge how every single team is supporting the whole IT department. I also learned about the functionality, working procedures and systems used by these teams. I enjoyed this opportunity of being able to learn the ways every team worked; admittedly I was surprised by the fact how vital every team operation is.

## **Chapter 4: Existing Network Structure of InfoLink Limited**

In this following chapter the core network of InfoLink will be discussed, where network diagram will take place and some hardware equipment will be showed. Benefits of the system and the devices information also included here

## 4.1 Existing System of InfoLink Limited

InfoLink Limited existing network follows the two Tier layers network model that consists of two layers: the Core layer and the Access layer. Two Tier-Layer network model is the preferred approach to network design. Figure 3.1 shows the existing network. In the figure, Fiber@Home and Earth communication are providing the bandwidth to organization. Fiber@Home communication works as main line and Earth communication works as backup line. If the main connection line is down then other line will be used to running the whole network. The main line speed is 3Gbps and the backup line is 1Gbps. These both are considered as the outbound connection. These lines are connected to the Mikrotik cloud core router with optical Fiber line.



**Fig 4.1: Two tier Architecture Model of InfoLink**

### **4.1.1 Core Layer**

Core Layer consists of biggest, fastest, and most expensive routers with the highest model numbers and Core Layer is considered as the back bone of networks. Core Layer routers are used to merge geographically separated networks. The Core Layer routers move information on the network as fast as possible. The switches operating at core layer switches packets as fast as possible. The core should be highly available and redundant. The core aggregates the traffic from all the distribution layer devices, so it must be capable of forwarding large amounts of data quickly.

Considerations at the core layer include

- Providing high-speed switching ( fast transport)
- Providing reliability and fault tolerance
- Scaling by using faster, and not more, equipment
- Avoiding CPU-intensive packet manipulation caused by security, inspection, quality of service (QoS) classification, or other processes

### **4.1.2 Access layer**

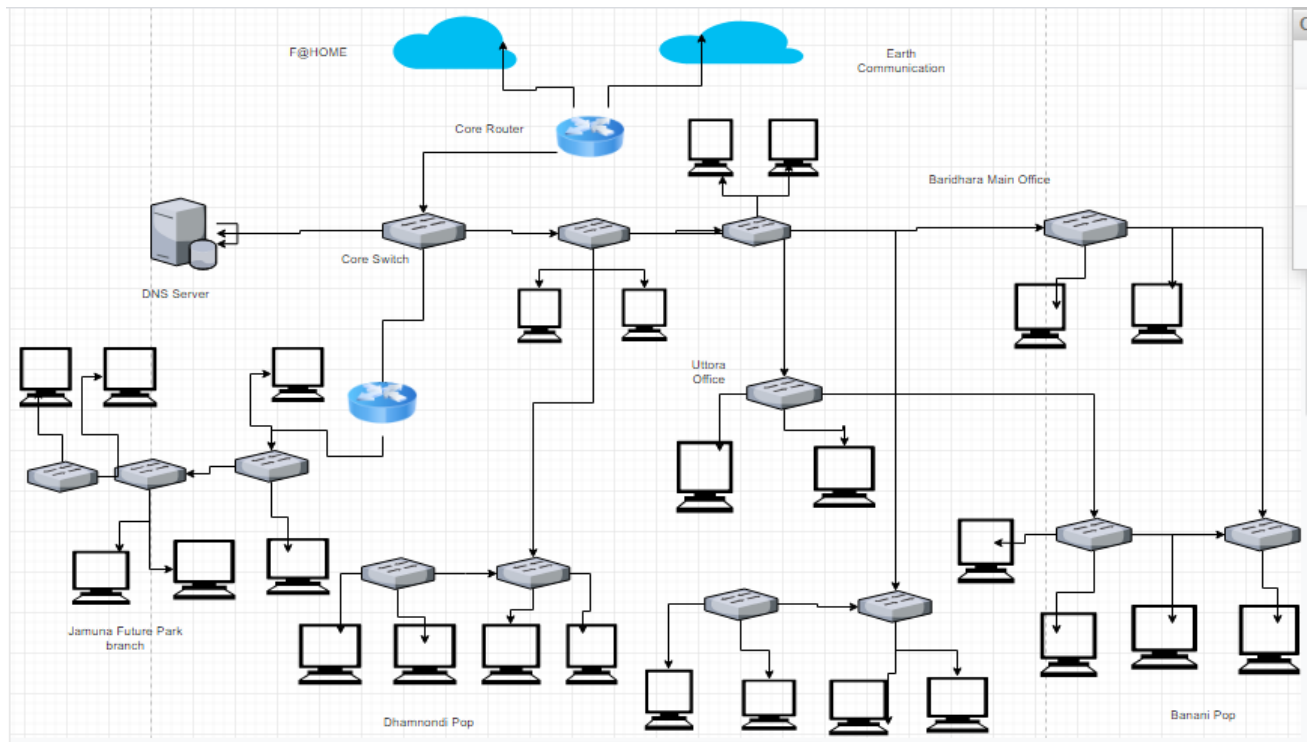
Access layer includes access switches which are connected to the end devices (Computers, Printers, and Servers etc.). Access layer switches ensures that packets are delivered to the end devices. The access layer serves a number of functions, including

- Layer 2 switching
- High availability
- Port security
- QoS classification and marking and trust boundaries
- Address Resolution Protocol (ARP) inspection
- Virtual access control lists (VACLs)

- Spanning tree
- Power over Ethernet (PoE) and auxiliary VLANs for VoIP

## 4.2 Existing Network Structure of Infolink Limited

In the Baridhara, Infolink limited has three offices and every office has its own IT division and other manpower. The running System has some benefits and limitations at the same time. Because of some limitations the company paying a lot than in general and there is a possibility in hacking. In this chapter the existing system will be showed and also discuss about their network fault and features of existing system.



**Fig 4.2: Existing Network Structure of InfoLink**

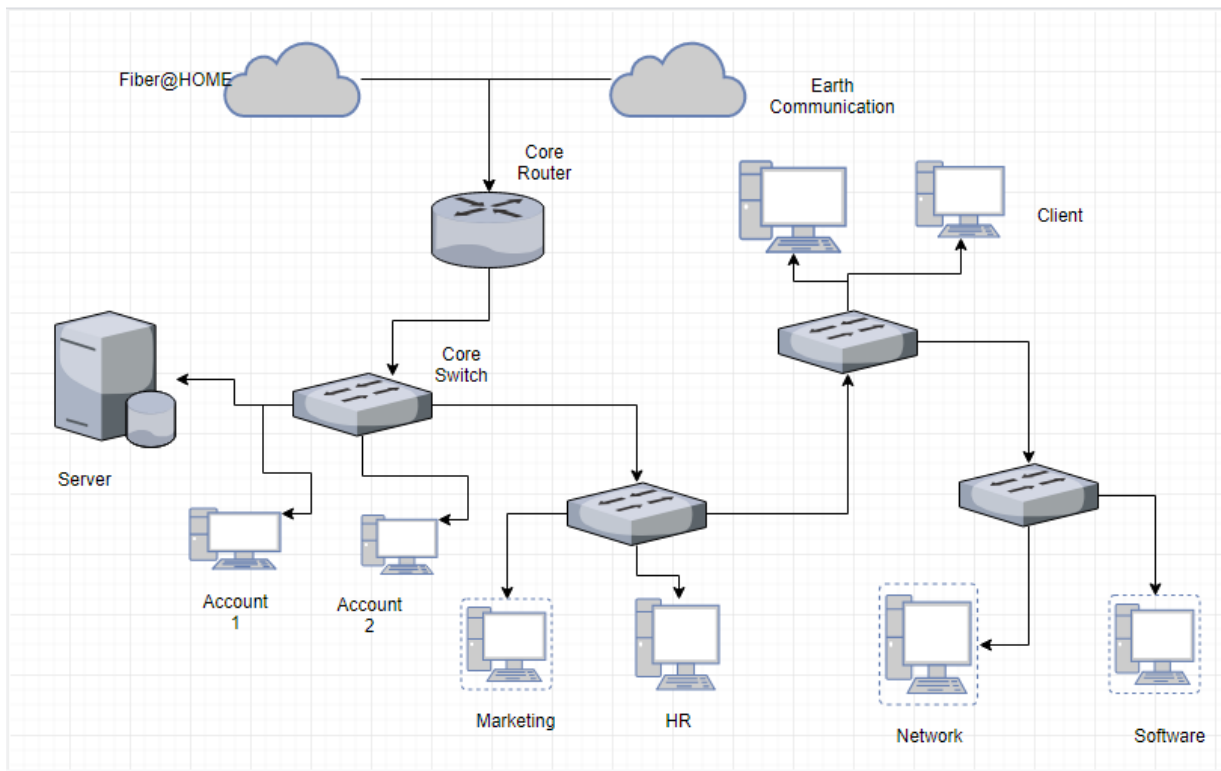
Infolink Limited existing network follows the two tier layers network model. Figure 3.2 shows the existing network structure. In the figure, F@HOME communication and Earth



communication are providing the bandwidth to organization. F@HOME communication works as main line and Earth communication works as backup line. If the main connection line is down then other line will be used to running the whole network. These lines are connected to the Mikrotik cloud core router with optical Fiber line.

### 4.3 Existing Network Structure working Procedure

In the existing system, the main office at baridhara there are total five departments that are Account, Marketing, HR, Software, Networking. Each of the department are same VLAN number. In this office Account department store account information but there are no security for Account department. Anyone or any department can communicate with account department. In their office network VLAN no is 314 and all the department transfer data within same VLAN.

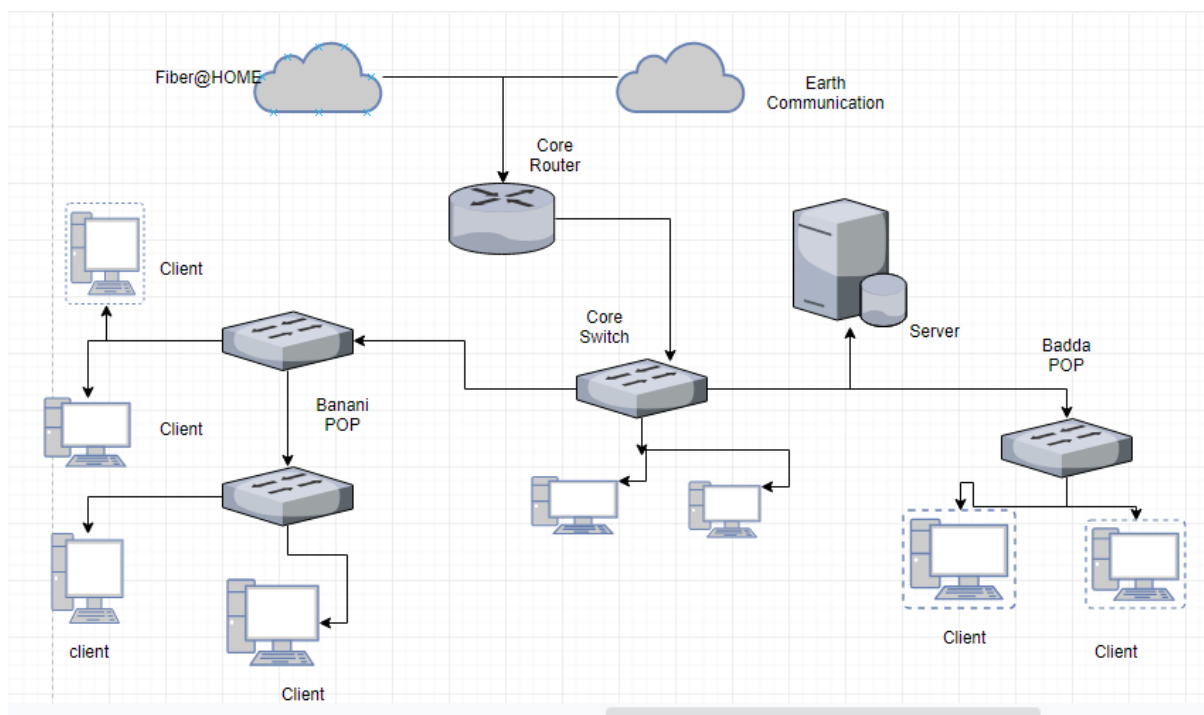


**Fig 4.3: Head Office of Infolink Limited**

Another problem is their uplink from the F@Home is connected in only 1 core router. But from my perspective if the core router is damaged then their whole network will be damaged. Their back Uplink Earth communication is also connected in the same core router. All the pressure is in this core router. If the load is high for the core router there is a possibility to damage it. So if it happened the total network of infolink will be down.

Another problem in the existing system is there is only 2 router and they don't use any routing protocol like RIP, EIGRP or OSPF they just did EBGp that is very simple routing protocol. So the routing or data passing time need more it is one kind of major problem of network design.

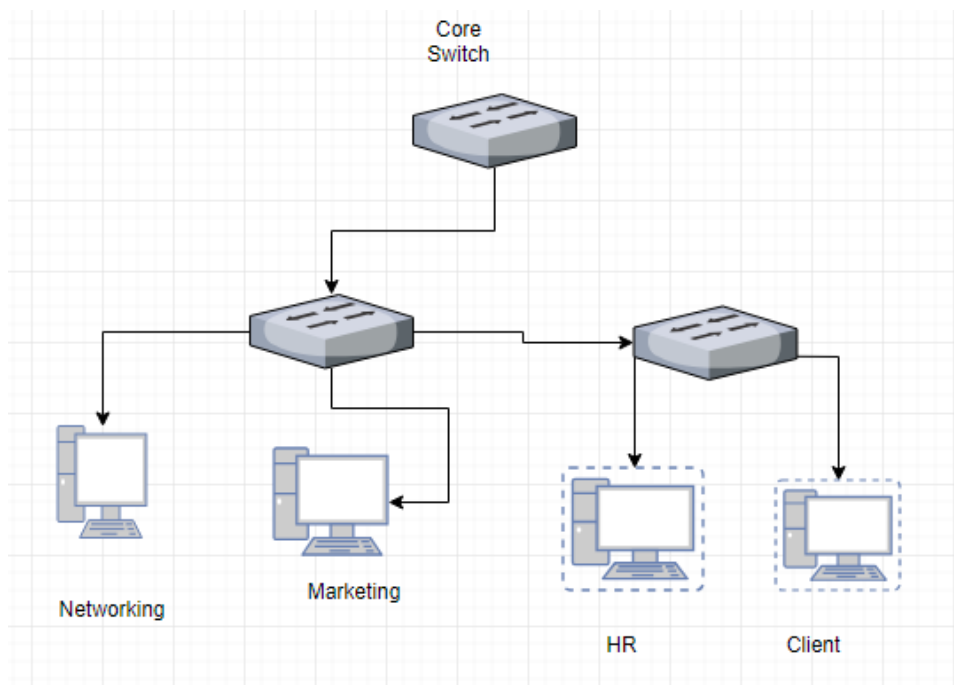
In their existing system their no port security or MAC binding system. So if any hacker can enter their network they can do anything what they want. They can set their Pc or Laptor in their internal network and there is no Mac binding or port security and all internal VLAN is same. So this is very easy to get all the data about their client and another inportant file is very esay.



**Fig 4.3.2: PoP link status of InfoLink**

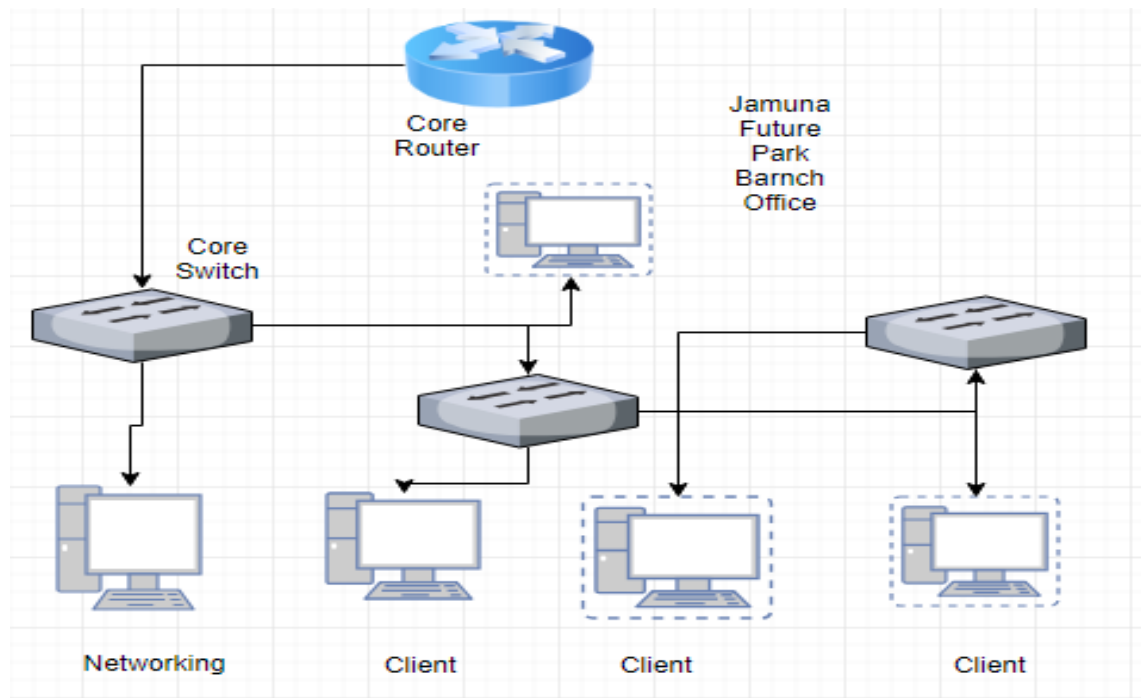
In this organization there are total 8 PoP. But for limitation I just Shows 2 pop one is in Banani another one is in Badda. The proble is Banani pop uplink is from main office baridhara and Gulsan pop uplink is from Main office. So when any fiber problem happened the total connection will be down and all the client will not get any bandwidth.same thngs in the Badda Pop. There is no backup link in their Pop. So there is a possibility to down their any of the PoP.

Here is also same problem that they are facing in their head office. In this branch office there is no router.



**Fig 4.3.3: Uttara Branch office**

So the total network up on EBGp that is very simple routing protocol. In this branch office their no backup line so if any reason fiber is cut so whole Uttara will be damage. In this branch office they are also using only one VLAN for whole office that is not secure. Account department has not any extra security. Anyone can access their file server. There is no port security or any other security. So I think overall some problem in their existing system.



**Fig 4.4.4: Jamuna Future Park Branch office**

This is the Jamuna future park of branch office branch office of InfoLink. In this branch Office there is a router that is connected with main office core switch. There is no routing protocol they use EBGP that is very simple network and One way connection so if any problem the whole connection is damage. Another problem is if one branch office is want to send any file to another branch office they need to send it manually because their security system is very week.

#### **4.4 Features of Existing Network**

- Advance recourse sharing among all departments inside each branch office.
- Limited Professional Manpower.
- No recourse sharing option with other Branches with security.
- No advance security feature
- Transfer the data using same VLAN each branch office
- Costly in terms of maintenance

- Needs more man power to share recourses in other branches
- Time consuming to communicate with other branches
- Network fall possibility is very high.

## 4.5 Current equipment's of Infolink Limited

- **Router**

1. Mikrotik CCR1036-8G-2S+
2. Mikrotik CCR1036-12G
3. Mikrotik RB1100AH

- **OLT**

1. BDCOM P3310B
2. GLCOM
3. VSOL

- **Switch**

1. Cisco Catalyst 2970G
- 2 BDCOM S2928C
3. Cisco Catalyst 2950
4. Cisco Catalyst 3560
5. Cisco Catalyst 3550
6. Cisco Catalyst 2950G
7. Cisco small Business

Also other equipment are iSEVEN RI7 Rack, Media Converter, UTP Cable (CAT 6, CAT6e), Connector RJ-45, Wireless router, IP camera, Optical Fiber, Patch cot & Onu.

## **Chapter 5: Constrains/Challenges**

## **5.0 Challenges**

I couldn't have asked for a better internship experience. Working in Infolink helped me explore the real job life and how a multinational company operates. This has been by far the most interesting and cherish worthy experience of my life. Yet there were some issues and problems encountered and identified while the internship program.

### **5.1 Observed in the organization**

The major constraint of the study was the collection of information, because most of the information was classified and confidential. To maintain its organizational privacy InfoLink cannot disclose all information's related to the report. For that reason it became difficult to me to collect the original data for this report.

In addition employees of different departments were not entirely known about the overall charging and billing process which made the information collection process more difficult.

Time restriction was also a principal dispute for preparing the report.

### **5.2 Academic Preparation**

Obviously the academic theoretical knowledge was helpful to understand IT architecture and Operation. But for the task I was assigned required some advanced knowledge on Networking.

### **5.3 Skills**

#### **Technical Skills:**

This internship program I learn some advance knowledge on Computer Networks and Security. Working on organization helped to use OLT, router, switch and other networking devices. I was

not familiar with these physical devices before. Working on the organization and using these devices helped to gain practical experience, how to network is monitored in corporate level.

The internship program also helped me to enhance my technical skills through the intense use of MS Excel. I knew excel has many applications and can be used for various purposes but never got the opportunity to learn the real life use of it. So this internship helped me get exposed to the real life use of excel at corporate level. Now I am aware that excel can be used to ease our work by using pivot table to illustrate data in a meaningful way, by using filter and sort for finding and organizing the data quickly and by using formulas for doing lengthy calculations in a blink of an eye.

### **Interpersonal Skills:**

My communication skills were furnished while I got the chance to work with people of different people backgrounds. Through my interactions with my supervisor and other senior employees my interpersonal skills were enhanced. I learned to communicate with supervisors and seniors managers during my internship period.



## **Chapter 6: Acquired Knowledge**

## 6.0 Acquired Knowledge

When I started my internship in Infolink, I was totally new to the environment. But I was always enthusiastic to learn about new things. As a fresher, I felt challenges how this huge amount of data is monitored and kept on running. But day by day, I was habituated and felt self-confident. Therefore, it was hard and challenging for me to adapt with this daily routine. Although it is always difficult and challenging to learn new things but I think that, I was able to cope with these challenges.

As an intern, my goal was to find out if there was any problematic case with data of any kind. If there was such case I tried to do some background check if any other data is missing. Sometimes I tried to come up with suggestions with existing system and its improvement. As there were large data set it was not always easy to come up with a shorter way to solve the problems.

## **Chapter 7: Conclusion**

## 7.0 Summary

Infolink is providing internet services, software & systems integration services. They ensure that our customers are successful by understanding and being responsive to their needs. In this chapter I would like give an overall summery of the whole report. In my internship I have got a chance to work on an ISP name Infolink Limited. They are quite known now-a-days and they are spreading their service day by day. While I was started working under their office circumstances I found they have most advance things. In this practicum period I have learned some new aspects and some practical knowledge how design and configure a simple but efficient network. I have also learned some physical connection, remotely computer manage for VLAN, Router Configure, Switch configure, AP configuration, Nanostration and how to improve the connectivity for smoothly running the network which I didn't know before. I tried to my level best to minimize the errors as far as possible and successful in every step. I hope this project serve well to its benefactor.

On my internship phase I have to find a problem and then I will give a proposed idea which will solve the problem. On this phase I tried to find a problem in my organization. When I got a problem I tried to breakdown the problem and tried to know how I can solve this. I searched in goggle and gather some knowledge about the specific problem solution. I followed the method step by step and using the information to solve that problem in simulation. I have found that the problem can be solving using that redundancy path. Before implementing the proposed idea through the simulation I can see that is the path broken then the data travel will be stop until that path fixed by the ISP physically. So it would be a negative side for the organization as we know and organization has to give much better service as much they can. After implementing the proposed idea through the simulation we can see that if the path broken somehow after just waiting a few moment clients can send and receive their data using that backup path. So it will be a positive approach from the organization towards the clients.

## 7.1 Limitation of this report

To prepare the report on the achieved practical experience in a short duration i.e. only three months is not an easy task. Specially the IT field of corporate network sector is a huge area of knowledge and technology. So, this is a very short time to achieve all the relevant information and knowledge about corporate network information technology. In preparing this report some problems and limitations have encountered which are as follows:

In this report some problems and limitations have encountered which are as follows:

- The main constraint of the study is insufficiently of current information, relevant to the study.
- All required information was not allowed to utilize of the company and there are also limited opportunity to visit more than one branch.
- Due to time limitations many of the aspects could not be discussed in the present report.
- This suffers from a narrow data range for analysis.
- Lack of experience in practicum report writing.

Another limitation was to implement the proposal to a large company.

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