INTERNSHIP IN TELECOMMUNICATION & COMPUTER NETWORKING AT BTCL

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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 Project titled "**Internship in Telecommunication and Networking At BTCL**", submitted by **Maher Akter** 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 19-01-2023.

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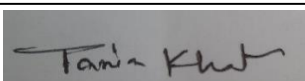Faculty of Science & Information Technology
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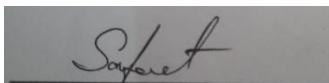Faculty of Science & Information Technology
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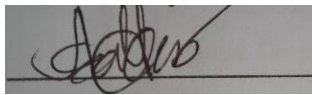**Md. Safaet Hossain**   **External Examiner**
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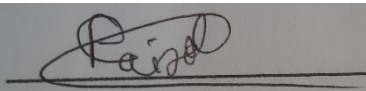City University

DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Abdus Sattar, Assistant Professor, Department of CSE** Daffodil International University and Co-supervision of **Fahad Faisal, Assistant Professor, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.
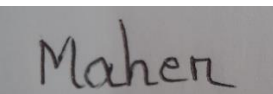
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We really grateful and wish our profound our indebtedness to **Abdus Sattar, Assistant Professor**, Department of CSE Daffodil International University and Co-supervision of **Fahad Faisal, Assistant Professor, Department of CSE** Daffodil International University, Dhaka. Deep Knowledge & keen interest of our supervisor in the field of "*Internship in Telecommunication and networking At BTCL*" 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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We would like to thank our entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, we must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

BTCL is a voice carrier, **IGW, IIG, ICX, ISP, NGN, and PSTN** operator, as well as a CC Domain Registrar (.BD). BTCL owns and operates almost all of the country's copper, fiber optic, and microwave networks. The Post and Telegraph Division of BTCL was established in 1853. BTCL is now a wholly owned government subsidiary. One of the most essential services offered by BTCL is landline telephone service. Dial-up, ADSL, high-bandwidth local and international leased lines, VPN, MPLS, country domain (.bd), co-location, and other services are all available. NGN will soon provide soft switch services as well as triple play on fiber at home. I wrote this paper after completing a four-month internship at Bangladesh Telecommunications Company Limited. This internship program provided me with the ability to learn about the day-to-day activities of a telecommunications company. The emphasis of this article is on my observations and company experience.

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CHAPTER 1

Introduction

1.1 Introduction

Telecommunication networks are structures that use electromagnetic or optical signals to convey data in analog or digital form to different locations. It is possible to send audio, video, or completely other sorts of data. both wired and wireless networks' supporting infrastructure. The internet is a type of telecommunication network, along with cable TV networks, mobile networks, landline networks, and others. BTCL is best in class. Unknown telecom firm in Bangladesh. Government-owned and publicly traded enterprise. Its different branches are dispersed around the country. BTCL region provides the town's phone and internet connections. Because I'm really interested in telecom and want to learn a lot about communication, I chose BTCL for my internship. A fantastic telecommunications company is BTCL.

1.2 Motivation

The electrical transmission of data across great distances is referred to as telecommunications. Knowledge may be sent through voice calls, data, text, photos, and video, among other methods. Utilizing telecommunications, more or less far-off computer systems are connected together to create networks for telecommunication. Additionally, networked computers that may exchange data Computer networking refers to the sharing of resources. To transmit information via physical or These networked devices employ wireless technology and a set of protocols called communications. Protocols..

As a student studying computer science, I have a keen interest in the field of networking and telecommunications. That's the reason I choose BTCL for my internship because: A well-known government-owned telecommunications firm is BTCL.

Both telecommunications and internet services are offered by BTCL.

Considering everything, I want to intern at BTCL. so that I may get knowledgeable about the crucial elements of networking and telecommunications

I will be able to significantly contribute to the creation of a "Digital Bangladesh" by studying vital information about communications and computer networking.

1.3 Internship Objective

The main goals of this report are to present knowledge and information obtained during the internship time with the organization and to fulfill the criteria of the CSE program

- I am able to learn about networking and telecommunications.
- I'd also like to learn more about growing networks, networking security, and other subjects.
- I'm interested in learning about all of the telecom company's services.
- be aware of services like IGW&ICX, domains, hosting, and others.
- be familiar with telecommunications data transmission.
- Become familiar with network topology
- Obtaining your first job experience will provide you a competitive advantage on the job market.
- In addition to my technical knowledge, I should familiarize myself with the corporate culture of the telecom business.
- Learn about the working practices and official culture of telecommunications companies.

1.4 Introduction to the company

- Bangladesh Telecommunication Company Limited, sometimes known as BTCL, is a business that was formed in pursuance of the Companies Act of 1994.
- It is a publicly held firm that is owned by the federal government.
- Certified professional members and government officials make up the majority of the appointments is a Director on the Board of Directors.
- The government has the option to transfer a sizable portion of BTCL's share to the Public.
- In urban areas, BTCL offers both telephone and internet service.
- BTCL employs over 13,000 people and has a net worth of Rs 15,000 crore.

- In Bangladesh, BTCL is a well-known government-owned telecommunications company.
- It manages distance calls as well as telephone and internet services.

1.5 Report layout

In this report the report layout organized as follow Chapter:

Chapter:1- Introduction, Motivation, Objective, Introduction to the company, Page layout.

Chapter:2- Organization Introduction, History, Services of Company, SWOT Analysis, Organizational Structure.

Chapter:3- Daily Task Activities, Project Task and Activities, Challenges.

Chapter:4- Telecommunication network, Public Switched Telephone Network (PSTN), Asynchronous Digital Subscriber Line (ADSL), Gigabit Passive Optical Network (GPON),Optical Fiber ,Call Flow, Switch Room.

Chapter:-5 Conclusion Of The Discussion, possibilities For a Future Career

CHAPTER 2

ORGANIZATION

2.1 History and services

In British India, the Posts and Telegraph Department was established in 1853. The Telegraph Act of 1885 was enacted in 1885. The Wireless Act of 1933 was enacted in 1933. Pakistan Telegraph and Telephone Department was renamed in 1962. Bangladesh Telegraph & Telephone Department was renamed Bangladesh Telegraph & Telephone Department under Ministry in 1971.Department of Posts and Telecommunications. The Telegraph and Telephone Board Ordinance of 1975 was enacted. The Bangladesh Telegraph and Telephone Board (BTTB) was established in 1979 with the authority to award licenses for telecommunications and wireless services. Policy on Telecommunications in 1998. On July 1, 2008, BTTB (Bangladesh Telecommunications Company Limited) formally began business. The Bangladeshi government owns every share of BTCL. Shares will eventually be offered for bond formation. 2009 A law modifying the Bangladesh Telegraph and Telephone Board is recognized as the Bangladesh Telegraph and Telephone Board (Amendment) Act, 2009.

Figure 2.1 BTCL Logo

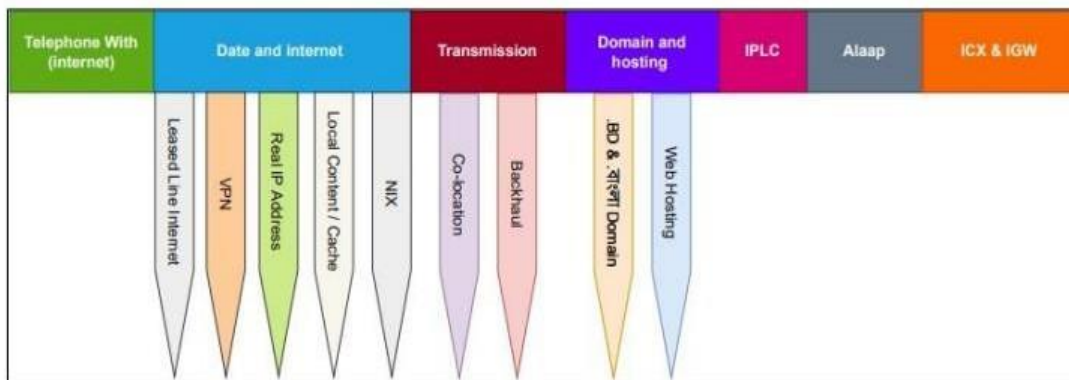Figure 2.2 BTTB Logo

2.2 BTCL services

Figure 2.3 BTTB services

2.3 SWOT Analysis

I try to uncover the Fortes Weaknesses during my internship.

Organization

- Bangladesh's biggest Telecommunication
- This government-owned telecommunications company has the backing of the Bangladeshi government at all times.
- Provide internet and telephone lines to homes, businesses, government agencies, and private offices, among other services.
- It has several locations around the nation.
- Maintaining a large number of employees,
- as well as equipment, and having highly skilled workers.

Weaknesses:

- Personnel are hard to come by.
- The wage structure is insufficient, as well as the employees lack motivation.
- Marketing is poor in relation to the private industry.
- Inadequate Resources
- A lack of adequate education for the workforce

Opportunities:

- Increase business workflow's level of automation.
- Cellphone Connection
- Online services
- High speed data transmission
- Extremely quick internet access
- and reasonably priced Internet and phone line

Threats:

- Assault by hackers.
- Oftentimes, clients are not reliable.
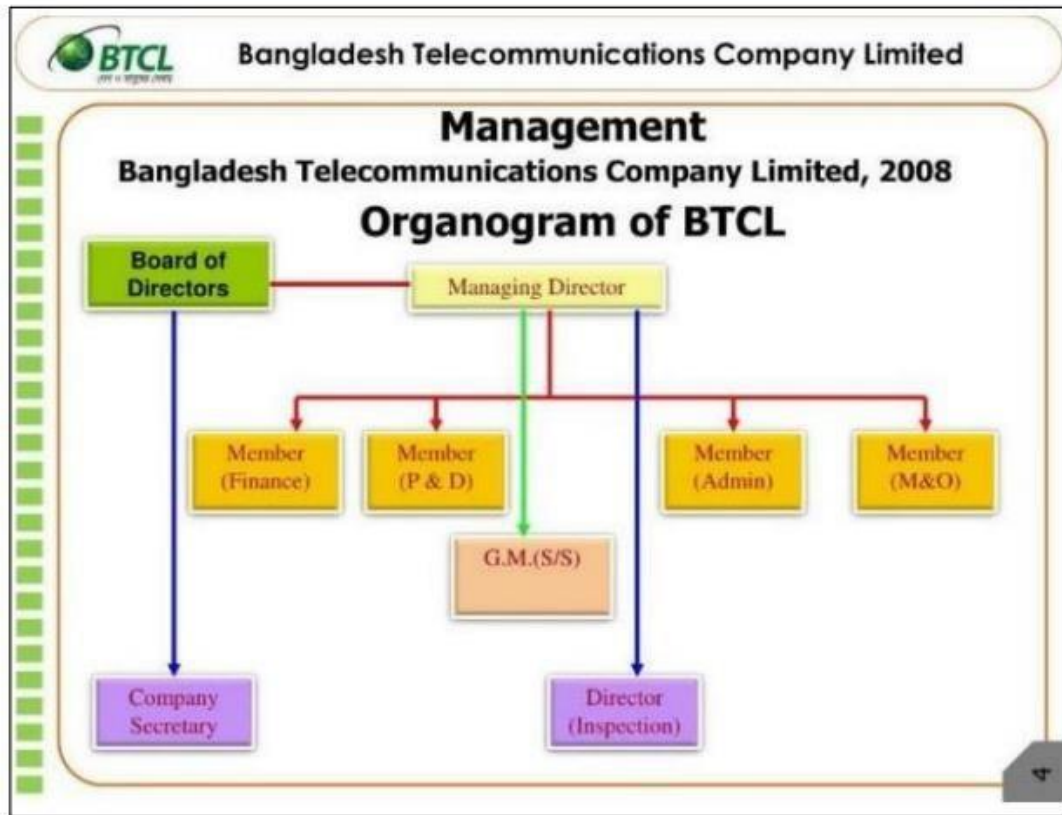- Insufficient bandwidth

2.4 Organizational Structure

Figure: 2.4: Organogram of BTCL

CHAPTER 3

TASK, PROJECT AND ACTIVITIES

3.1 Daily Task and Activities

In the switch room and the output plant, I worked during my internship (OSP).

Daily Task in Switch Room

I would collect client applications for phone and internet lines, update them on BTCL's own Web portal, and assist customers with a variety of inquiries. This included allocating numbers to customers ' preferences and creating user IDs. In this, my instructor has been of great assistance. I've attempted to solve a variety of issues that I've faced at various times. I have completed a number of duties in the switch room in this way.

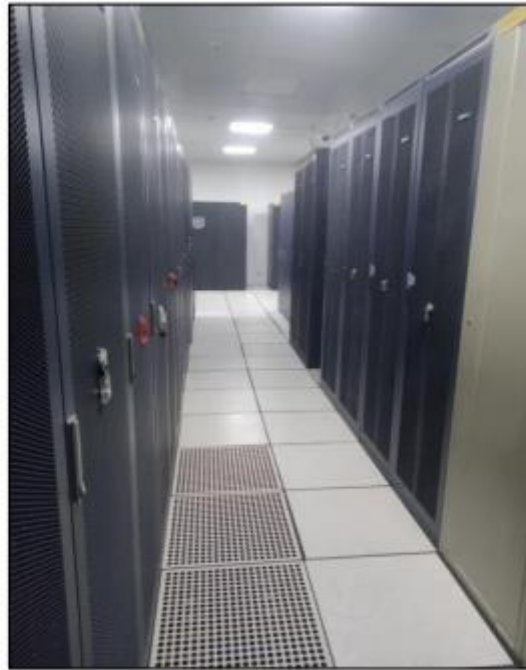Fig3.1: Working at Switch Room with my Group Member

Fig3.2: Switch Room

3.2 Project Task and Activities

On the official BTCL website, I used to routinely examine the requests for internet and phone lines that were sent to a Swiss room. Creating a new user ID for the client and emailing it to BTCL Shere-Bangla Nagar was a common practice for me. Work

3.3 Challenges

Although it is impossible to understand everything about the telecommunications sector or take appropriate action within such a short amount of time, I will done my best. Since I was employed by BTCL, I spent the most of my time in the Switch room, where I observed those tasks. I've finished the work I was given, however when working on OSP, I've run into a number of issues. And I've attempted to find solutions. I've worked with MDF and know a little bit about it. I'm making every effort to apply those lessons in the past.

Fig 3.3 Fiber Cable Network

CHAPTER 4

TELECOMMUNICATION NETWORK

4.1 Public switched telephone network

Even though many of us absolutely takes it for casually, the telephone you use at home is one of the most amazing things ever invented. To talk with somebody, just pick up the phone and dial a few digits. You are immediately connected to the that individual and may begin a two-way discussion without them.

You can get in touch with practically everyone on the earth because to the telephony network's global reach. When you consider the state of the world 100 years ago, when it may have taken several weeks to send a one-way written message to anyone, you realize how amazing the phone is.

Surprisingly, the phone is one of the most fundamental gadgets in your home. The fact that your home's telephone connection hasn't changed in over a decade accounts for its simplicity. A ancient phone from the 1920s might be connected to your house's wall socket and work just fine! This article will talk about the telephone equipment you have at home and the phone network it links to so you may make calls. Begin on the pages after this one.

4.2 ADSL

Asymmetric Digital Subscriber Line (ADSL) technology offers homes quick voice and video transmission speeds over conventional copper telephone connections. The places with the lowest prices are the ones where cable TV is not frequently used.

4.3 ADSL Working Principle

In order to enable simultaneous usage of the landline and the ADSL modem, ADSL operates on pre-existing wire telephone service by separating the bands with higher frequencies using a DSL filter, also known as a splitter. The voice signal is separated from the phone network by a second splitter at the central office DSL accessing splitter (DSLAM) of the telephone exchange, where the connection terminates. The one-waynature 1 of most multimedia communication, in which a sizable amount of information travels toward the user and only a little amount of interactive

control information is returned, was taken advantage of when ADSL was established. It is a more affordable alternative to a typical dial-up link for faster internet connectivity..

4.4 ADSL Speed Factors

- The separation from the neighborhood market

- The and so kind gauge of the wire employed

- The string's connects' quantity and kind

- The wire's closeness to other wires carrying quasi data such as ADSL, ISDN, and others

- The cables' closeness to transmitters.

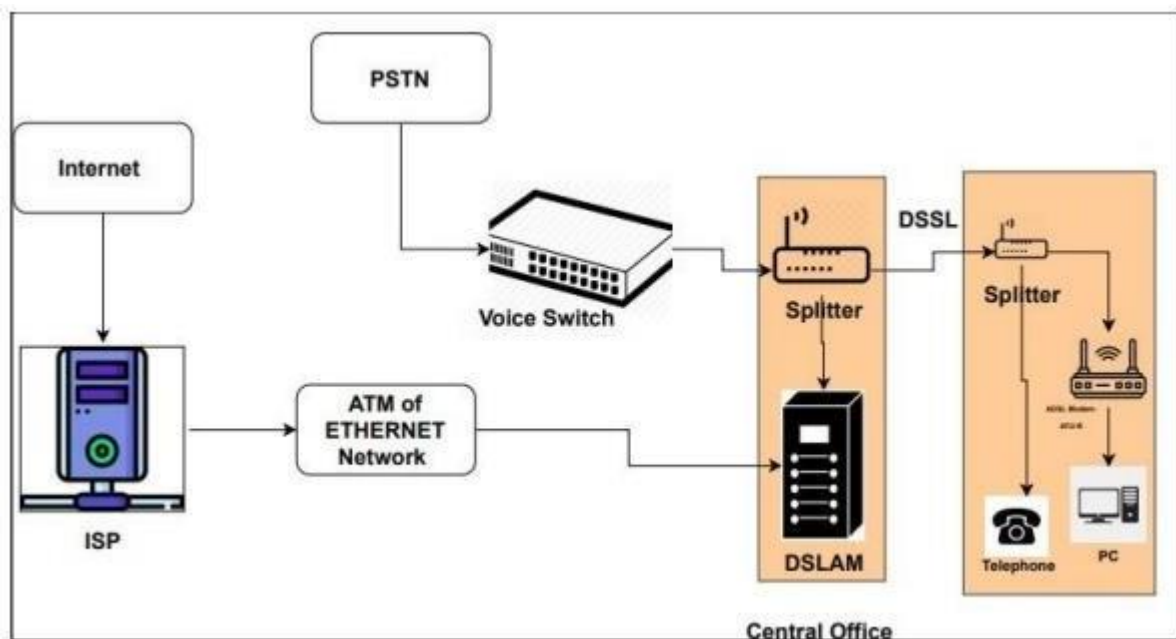- The D/W travels close to an electric line.

Figure 4.1 ADSL Loop Architecture

4.5 ADSL Range

- Without a booster, the maximum distance for DSL is typically 5.5 km.
- As you get closer to the phone company headquarters, the data rate rises.

Data Rate	Wire Gauge	Wire size	Distance
1.5 or 2 MBps	24 AWG	0.5 mm	5.5 km
1.5 or 2 MBps	26 AWG	0.4 mm	4.6 km
6.1 MBps	24 AWG	0.5 mm	3.7 km
1.5 or 2 MBps	26 AWG	0.4 mm	2.7 km

4.6 GPON

Both the high-speed Gigabit Passive Optical Network (GPON) connection and prepaid phone services are now available thanks to Bangladesh Telecommunication Co. Ltd. (BTCL).

A glass-and-plastic fiber-optic cable that terminates in a passive optical splitter receives photons from the central office via injection from a laser in the OLT. The central office's 1 single signal is separated into numerous signals that can then be sent to up to 64 clients by the splitter. What are the three key GPON components? The three essential parts of GPON are an optical line terminal (OLT), an optical network unit (ONU), and a passive splitter
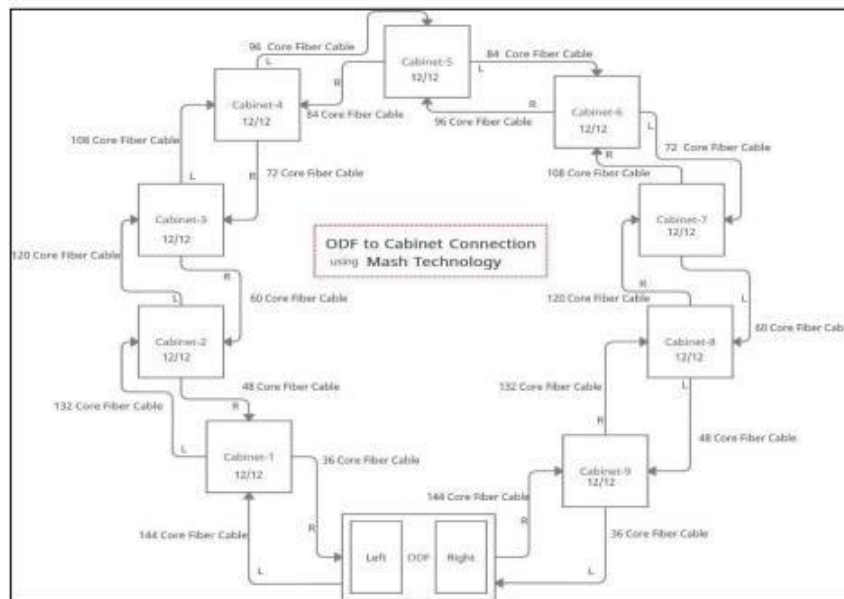

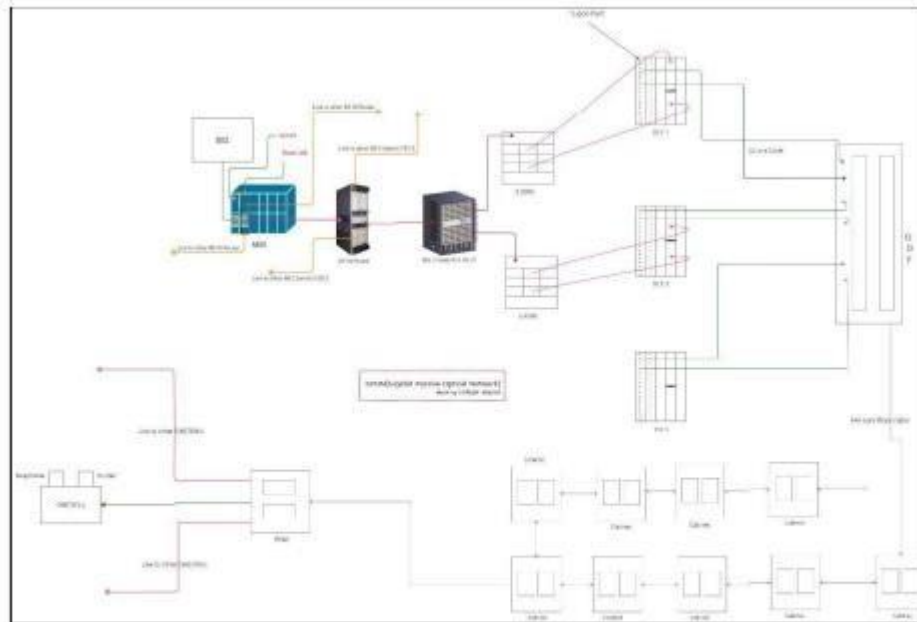Figure :4.2 The connection diagram for GPON & ODF to cabinet

Figure :4.3 GEPON

The advantages of GPON technology include a longer transmission distance. increased speed One advantage of GPON is that it can transmit data over longer distances than conventional cable networks. Compared to other cable networks, GPON is renowned for its faster speeds. Because it is more diverse, takes up less space, is less expensive, and is environmentally friendly
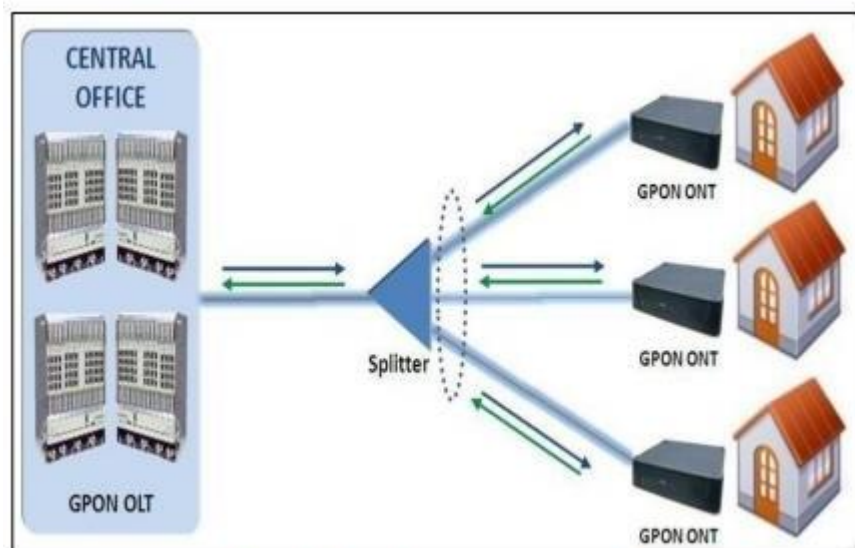

Figure :4.4GPON Principle Data Multiplexing

4.7 Optical fiber

A transparent, thin, elastic fiber known as an optical fiber serves as a waveguide or "light pipe" to transport light among its two ends. Due to the extensive use of optical fibers, fiberoptic communications can transfer across longer distances and at higher bandwidths (data rates) than previous communication methods. Since they offer reduced power loss and are resistant to electronic radiation, fiber are used instead of metal wires.

4.8 History of Optical fiber

Fabrics have been made of glass that since Roman times. But it took the French Chapple siblings until the 1790s to develop the first "optical telephone." It was a technique whereby operator would use a network of lights put on towers to send a message from one tower to the next. The following century saw considerable developments in optics research

- Two scientists, Daniel Collodon and Jacques Babinet, demonstrated how light might be directed via water jets for fountain displays in the 1840s. John Tyndall, a 1 British physicist, demonstrated in 1854 that an optical signal could be twisted by demonstrating how light could pass through a curved stream of water. By creating a water tank with a hose coming out of one side, he demonstrated this. He shone a light into the tank and into the pipe's flowing stream. The light dropped with the water in an arc.
- In 1880, Alexander Graham Bell was granted a patent for his optical telephone system, the photophone. But his previous invention, the telephone, proved to be more practical. The home's interior was illuminated by William Wheeler's invention of a system of light pipes with a highly reflective coating, which were used to focus light from such an electric arc lamp situated in the basement.
- In order to light body cavities, Viennan doctors Roth and Reuss used bent glass rods in 1888. The mechanism of bent glass rods was created by French engineer Henry Saint-Rene six years later in an early attempt at television. The dental illumination that American David Smith proposed for a provisional patent in 1898 made use of a curved glass rod.
- In the 1920s, John Logie Baird and Clarence W. Hansell both submitted patent applications for the idea of delivering television pictures via a system of translucent rod arrays. Heinrich Lamm, however, was the first to transmit a picture across a network of optical fibers in 1930. It was a representation of a lamp's filaments. Lamm, a Jew, was compelled to leave Germany and give up his dream of becoming a medical professor in order to immigrate to America, but his objective was to see inside unreachable portions of the body.
- In 1954, Charles Townes and several of his Columbia University colleagues invented the "maser." Maser stands for "Microwave amplification by stimulated emission of radiation."
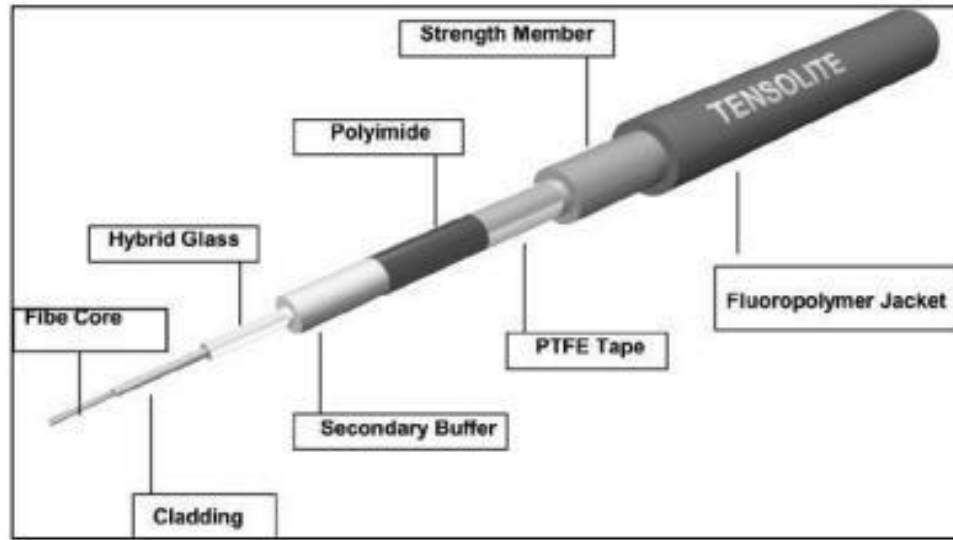
Figure: 4.5 Design of Optical Fiber.

4.9 Fiber Optic Cable

The configuration known as a fiber-optic cable, also known as an optical-fiber cable, is comparable to an electrical cable but also includes one or more optical fibers that are used to carry light.

Figure :4.6 Fiber Optic Cable

4.10 Call flow

Customer service call flow was intended to assist contact center staff in resolving issues. This is something that new hires at your call center should pay close attention to because it will help them formulate the best questions to ask in order to solve problems as quickly as possible.
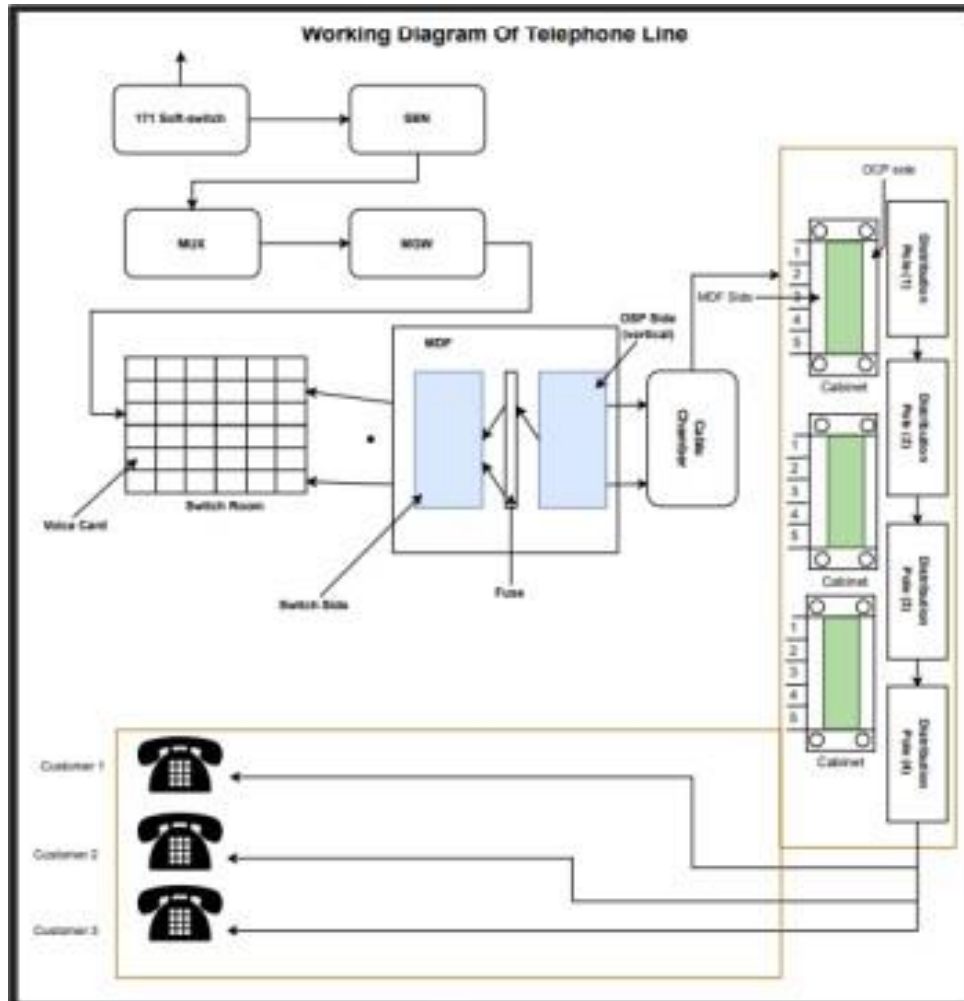

Figure :4.7 Call flow

4.11 Switch room

The proposal must include the necessary electrical and cooling components for the Switch to operate. The infrastructure for the power stations are listed below. BTCL uses electricity in two distinct way.

4.12 Air-Condition

The winning proposal must also feature OMC rooms and a trade air conditioner. The bidders must provide with their offer a comprehensive specification document for the cooling system. Using the characteristics listed below, the current power demand of an air conditioner is determined. All crucial air conditioning system monitoring and control tasks must be handled by a single control module. The capacity to show and hear alarms, as well as the required alarm loops, must be present on the control panel in order to transfer OMM.

Fig: 4.8 Air Condition

CHAPTER 5

CONCLUSION AND FURURE CAREER

5.1 Conclusions of the Discussion

An enormous, challenging, specialized, and time-consuming task, implementing research and innovation on telecommunications operations, a dynamic and essential component of the telecom market, necessitates, among other things, excellent analytical abilities, strong learning abilities, and powerful observational skills. As a result, I am happy and delighted to have completed and documented my internship experience in this recognized field of communications in a welcoming environment. God's grace, the wisdom of my esteemed lecturers at Daffodil International University, and the direction of the BTCLSavar Exchange Telecom Division all contributed to my success. I work hard and put in my best effort, and I also get love from my family and friends

Given my dedication and sincerity, I would have appreciated it if this internship thesis had been accepted

5.2 Advantages

As a young person trying to pursue a widely respected degree in Computer Science and Engineering, my internship at Bangladesh Telecommunications Company Limited has been extremely beneficial and enriching for me. It has given me the opportunity to engage in challenging practical activities while applying my theoretical concepts. The faculty of Daffodil International University, my preferred educational institution, is exceptionally competent and well-regarded. Any challenges I've faced during my internship have primarily been helped by my outstanding Instructor. I am thankful for the fact that my esteemed professors and Bangladesh Telecommunications Company Limited (BTCL) gave me a practical environment with which to perfect my communication abilities. I am happy to say that I now see this internship as a turning point in life

Reference:

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