

**TELECOMMUNICATION & NETWORKING SERVICE MANAGEMENT OF
BANGLADESH TELECOMMUNICATION COMPANY LTD, (BTCL).**

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 Project titled “**Telecommunication & Networking Service Management of Bangladesh Telecommunication Company Ltd. BTCL**)” submitted by Md. Zihad Hossain ID No: 201-15-14269 to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfilment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation was held on date: 19-01-2023.

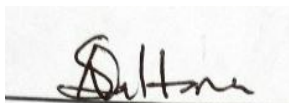
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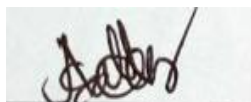
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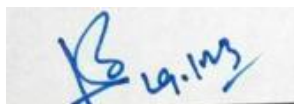
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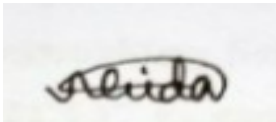
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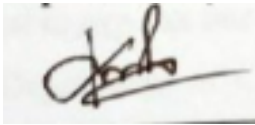
I hereby declare that, this internship has been done by me, Md. Zihad Hossain, ID No: 201-15-14269 to the Department of Computer Science and Engineering, Daffodil International University, under the supervision of **Ms. Chowdhury Abida Anjum Era, Lecturer.** Department of CSE Daffodil International University and Co-supervision of **Mr. Krishno Dey, Lecturer.** Department of CSE Daffodil International University. I also declare that neither this internship report nor any part of this report has been submitted elsewhere for the award of any degree or diploma.

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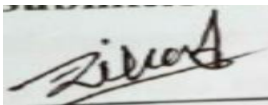
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ABSTRACT

To complete the BSc undergraduate program, we need to do a minimum of three months of internship from any reputed institute to complete the internship work successfully. My internship is a four (04) month program. During these four months, I have gained valuable experience and knowledge of my life. I am fortunate that I could intern at Bangladesh Telecommunications Company Ltd. (BTCL). This internship has tried to highlight the structure and design of Bangladesh Telecommunications Company Ltd. (BTCL). Phase 1 and Phase 2 internship programs of these two courses have helped me learn about telecommunication companies. Bangladesh Telecommunications Company Ltd. (BTCL) provides essential telecommunication services in our country. BTCL is a voice carrier, IGW, IIG, ICX, ISP, NGN, and PSTN operator, as well as a CC Domain Registrar (.BD) and (. Bangla). BTCL owns and operates almost all of the country's copper, optical fiber, 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 essential services offered by BTCL is the landline telephone service. Dial-up, ADSL and GPON, high-bandwidth local and international leased lines, VPN, MPLS, country domain (.bd) and (. Bangla), co-location, and other services are all available. NGN will soon provide soft switch services and triple play on fiber at home.

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CHAPTER 1

Introduction

1.1 Introduction

A computer network is a network that allows computers to transfer data. In computer networks, networks are computer plans that exchange data with each other. Data is sent in packets. Networks between nodes are made using either media or wireless media. Computer networks vary in the transmission media rummage-sale to carry their signals, the communications protocols to establish network traffic, the network`s size, and organizational intent.

1.2 Motivation

Telecommunications is outlined as the electronic transfer of data over lengthy ways. Voice telephone requests, data, textbooks, filmland, and video may all be used to convey information. Telecommunications are being exercised to connect more or less distant computer systems to form telecommunications networks. An Interconnected computing outfit that may exchange data and allotment coffers is applied to computer networking. These networked biases use a set of rules known as dispatch protocols to send data across physical or wireless technologies. As a Computer Science student, I'm interested in telecommunications and computer networking. That's why I am taking BTCL for my externship causes of BTCL is a Well reputed government-commanded telecommunication company. BTCL provides Both Telecommunication and Internet Services. All effects called; I passed off to go an externship at BTCL. So that I can learn about the essential Effects in the field of telecommunication and networking, by getting important information about telecommunication and computer networking, I'll be suitable to make a meaningful donation to making "Digital Bangladesh."

1.3 Objective

The main goals of this report are to demonstrate the knowledge and information gained throughout the organization's internship time and to meet the standards of the CSE program. The internship helps you learn and develop your skills. I'll use my technical and managerial abilities to meet the goal and provide the best performance. That is why I decided to do an internship before starting my career.

I can gain knowledge about networking and telecommunication.

- I'd also like to learn more about growing networks, networking security, and other subjects.
- I'm interested in learning about the telecom company's services.
- Be familiar with services like ADSL/GPON, IGW&ICX, domains, hosting, and others.
- know about Data Transmission of telecommunication.
- Become familiar with network topology.
- Study on Submarine cable in BTCL.
- Gain a competitive advantage in the job market by gaining first work experience.
- Apart from technical skills, familiarize me with the Telecommunication\other company's corporate culture.
- Know about the official culture of the Telecommunication company and their working procedure.

1.4 Introduction to the Company

Bangladesh Telecommunication Company Limited (BTCL) is a big telecommunication company in Bangladesh. This company offers many services. It has extensive internet and landline services such as ADSL, GPON IIG, NIX, IGW, ICX, ISP, NIX, NTTN, PSTN Operator, and 2 type domain services (.bd), and (. Bangla). So, there are substantial server rooms and divisions for controlling these. There is the latest technology for network service. BTCL gives dial-up and internet access in each of the 64 districts of Bangladesh.

1.5 Internship Outcome

Internships are advantageous for both the company and the intern. By incorporating them into regular education, an intern can acquire real-world skills, and an employer can hire people for little or no money. There are, however, some additional benefits:

- An internship gives a student their first professional experience.
- Internships help an intern advance their career by allowing them to get fundamental work experience.
- Internships allow students to gain experience in a real-world setting.
- A student might learn from his mistakes while on internship.
- Internships might also assist in choosing the right professional path.
- A variety of persons can be encountered by an intern during their internship, allowing him to increase his social encounters.

1.6 Report Layout:

In my report, I have discussed the intern's inspiration, the entry-level objective, and the introduction to BTCL. In this report, I have written about the daily tasks and activities of the internship. In this report, I discussed competence and an intelligent plan. I discuss the conclusion and future career in information technology. On the last page have added all the references and appendices.

CHAPTER 2

ORGANISATION

2.1 Introduction

To provide high-level Telephone and high-speed Internet (ADSL / GPON) connection of customer service, Bangladesh Telecommunication Company Limited (BTCL) Company relies on world-class. Government institutions donate telephone and internet services. Which provides customer-level B2C service, and B2B national level ISP provides broadband internet. They also provide services such as domain, IP address, IPLC IGW, ICX, IP call, etc.



Figure 2.1: BTCL logo

2.2 Background History

The Posts and Telegraph Department was formed in British India in 1853. In 1885, the Telegraph Act of 1885 was passed. In 1933, the Wireless Act 1933 was passed. 1962 saw a name change for the Pakistan Telegraph and Telephone Department. Telegraph & Telephone Company of Bangladesh in 1971, the Ministry renamed the Department Bangladesh Telegraph & Telephone Department. Postal and Telecommunications Department It was decided to pass the 1975 Telegraph and Telephone Board Ordinance. Established in 1979, the Bangladesh Telegraph and Telephone Board (BTTB) is charged with granting telecommunications and wireless service licenses. Telecommunications policy in 1998. On July 1, 2008, BTTB (Bangladesh Telecommunications Company Limited) officially launched its operations. The Bangladeshi government owns every share of BTCL.



Fig 2.2: Old logo of BTTB

2.3 Services of the Company

- Telephone (with internet)
- Data & Internet
- Transmission
- Domain & Hosting
- IPLC
- Alaap (IP Call)
- ICX & IGW

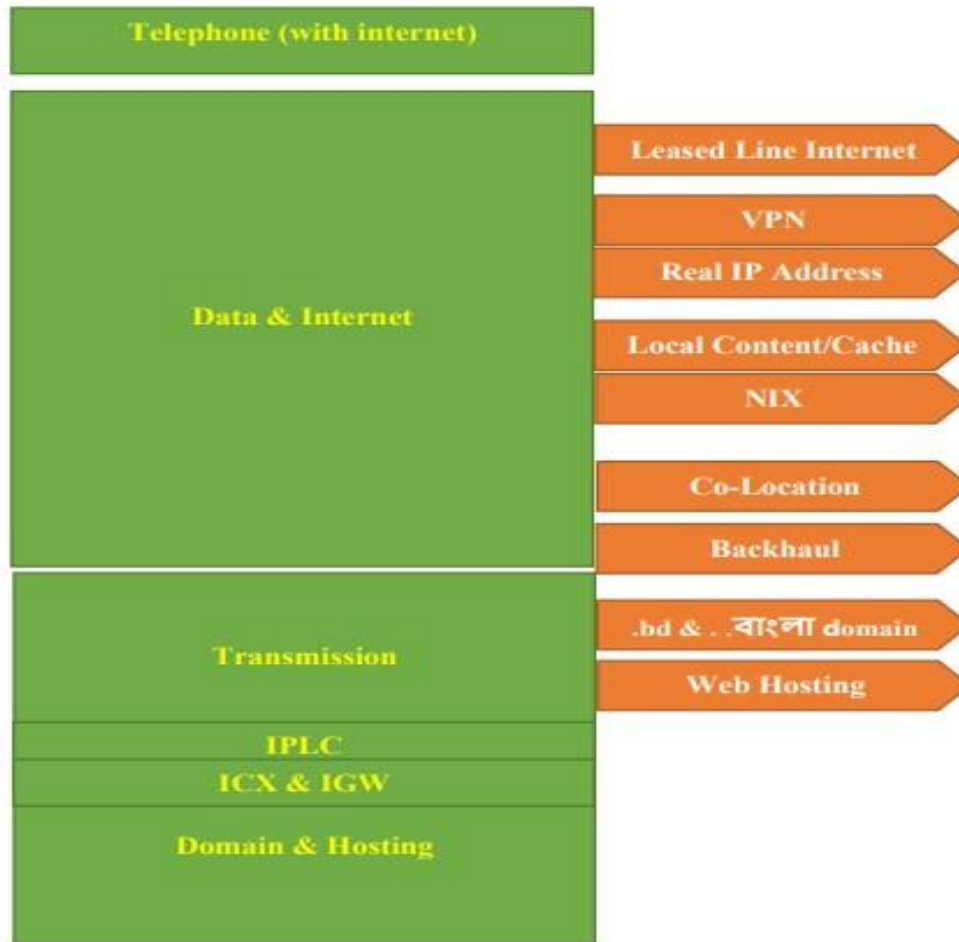


Fig 2.3: Services of BTCL Company

2.4 Telephone service

Use BTCL Landline Telephone, the most dependable form of communication at home and work, to stay in touch with your family and friends.

- Low Call rate.
- Crystal Clear Voice
- No hassle of charging
- Environment-friendly
- Hygienic

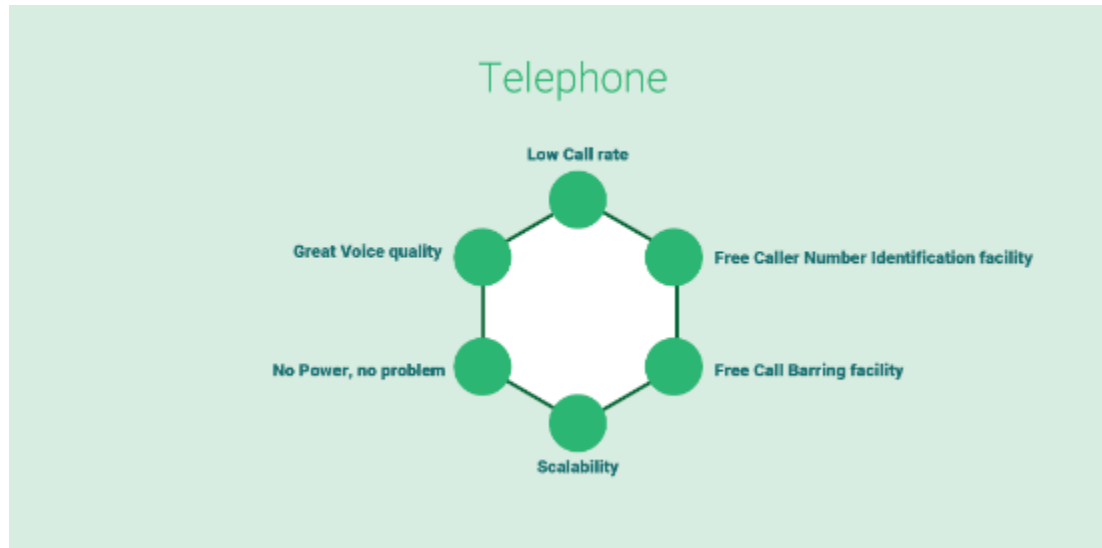


Fig: 2.4 Telephone service

2.5 Data & Internet

BTCL owns the largest LLI (Leased Line Internet) and VPN (Virtual Private Network) infrastructure in the country and includes an optical fiber network with high-capacity routers and switches (up to union level). Essential features of this service include the following:

- Leased Line internet.
- VPN
- Real IP Address
- Local Content/Cache
- NIX

2.5.1 Leased Line internet

- 24x7 NOC Support.
- Country's largest infrastructure.
- Optical fiber network with high-capacity routers and switches across the country.
- Connected with global upstream through SEA-ME-WE4, SEA-ME-WE5 and ITC.

2.5.2 Virtual Private Network Service (VPN)

Customers can establish secure private network connections over a public network using a virtual private network (VPN), a technology. Through BTCL's VPN service, ISP / IIG operators can offer high-speed data-internet services to remote areas at the lowest costs, various corporate entities can conduct video conferences inside of their branch offices with the least amount of latency, and various organizations, including banks, can use this service to establish secure communication between their data center and branch offices.



Fig: 2.5 VPN

- More than 1200 POP
- Provides Layer 2 (V2VPN) or Layer 3 (L3VPN) VPN
- All the Divisions, Districts, most of the Upazillas, and more than 1,200 Unions are connected
- Point & point to multi-point connection is provided

2.6 Service Feature

- **Leased Line internet (LLI):** LLI service of BTCL is a premium Internet service provided by optical fiber. The connection is dedicated, full duplex, connected by an actual IP address, and has minimum latency
- **Public Ip Address-** BTCL leases dedicated real IP addresses for its existing LLI customers (both ipv4 and ipv6). IP blocks are given on per yearly basis and need to renew each year by customers.
- **NIX Service:** BTC has a National Internet Exchange (NIX) Service whose primary purpose is to facilitate the exchange of domestic Internet traffic among the peering ISP members. This enables more efficient use of international bandwidth and improves the Quality of Services for the customers of member ISPs, by unnecessarily traversing multiple international hops.
- **Cache Service:** BTCL has Google, Facebook, Akamai, and JagoBD cache servers. It enables end users to access services like YouTube, Facebook, and others at high scalable speed from the BTCL cache server. The connection bandwidth of the ISP should be greater than 100Mbps. Cache bandwidth will be at least 50% of your internet bandwidth.

2.7 Transmission Service



Fig: 2.7 Transmission Service

2.7.1 Backhaul

BTCL has a strong backbone transmission network with all kinds of transmission bandwidth services. It has PDH services (E1, E3 etc.), SDH services (STM1, STM4, STM16, STM64 etc.) and also has DWDM services.

- 33,000 Kilometer optical fiber network all over Bangladesh
- Ring protection
- Quick restoration facility
- Coverage area includes all the districts, most of the Upazillas, and more than 1,200 Unions are connected.

2.7.2 Co-location Service

Renting of buildings, floors, racks, optical fiber, cooling, power, bandwidth, and physical security are all services offered by BTCL. The type of equipment, power usage, floor loading, and other technical viability factors are considered while providing this facility. IGW, ICX, IIG, ITC, DDCSP, NTTN IPTSP, ISP, Mobile Operators, etc., represent our clientele.

2.7.3 Domain & Hosting

- bd and. বাংলা Domain
- Web Hosting সেবা

2.7.3.1 .bd and .বাংলা Domain

.bd and. বাংলা is a Country Code Top Level Domain (ccTLD) on the Internet. It is the address of Bangladesh in the internet world.

- .bd and. বাংলা represent Bangladeshi flag
- Secured and stable
- Easy management

2.7.3.2 Web Hosting সেবা

Organizations can use this Service to host their web pages on BTCL servers. Different packages have been created to satisfy the needs of various user groups.

- Linux or Windows Hosting Platform
- cPanel Access

2.8 IPLC (International Private Leased Circuit)

BTCL provides IPLC service, which can be used for internet access, business data exchange, video conferencing, and types of communication. An organization uses an IPLC (International Private Leased Circuit), a point-to-point private line, to connect geographically dispersed offices.

- Voice or data at 64 kbps, nX64 kbps, E1, E3, STM-1, STM-4 etc.
- International Bilateral Voice Carrier Service etc.
- Worldwide Stop Service Partnership.

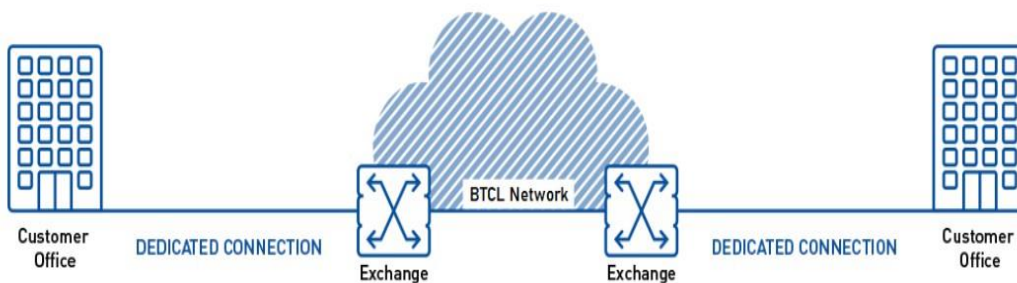


Fig: 2.8 IPLC

2.9 Our One-Stop Service Partners



Fig: 2.9 Our One-Stop Service Partners

2.10 Alaap App



Fig: 2.10 Alaap

Alaap is an instant communication mobile app in Bangladesh. On the occasion of the 50th anniversary of Bangladesh's independence and the Mujib Year, Bangladesh Telecommunications Company Limited (BTCL) has created this app. This program guarantees an internet connection and offers free audio calls, video call recording, and audio and video conference message exchange. Also introduced a cheap mobile calling service (BTCL).

2.10.1 Features of the Alaap App

- call recording with chat/ video calling
- low data usage
- provides a beautiful, unique number in the app
- audio & video conference
- instant bill payment
- referral (refer friends & earn)
- live stream
- instant messaging and group chat.

- voice messages, photos, videos, and document sharing
- alaap web & desktop
- end-to-end encryption
- call app to mobile/landline

2.10.2 Advantages and Disadvantages of Talk App

- The most significant advantage of the Alaap app is that you can talk at a low rate of 30 paise per minute.
- If you register Alaap app you will get a beautiful, unique number 09696 xxxxxxxx
- Call forwarding can be done.
- The most different advantage of Alaap is number IP number, or talk to Alaap for free.
- Can make audio and video calls.
- Call can be recorded.
- Message can be sent. And any number can be blocked.

2.11 BTCL ICX & IGW

BTCL provides services to all Mobile operators, all IOS operators, and all major IPTSP/PSTN operators. We offer route or switching facilities for domestic inter-operator voice calls and international incoming, outgoing, and roaming calls between Access Network Service Operators and International Voice Gateways. Connected to all mobile phone operators and Call centers.

- Connected to significant ISPs, Cable Operators and IPTSPs
- Connected to all IGWs of the country

2.12 Structure of Telecommunications

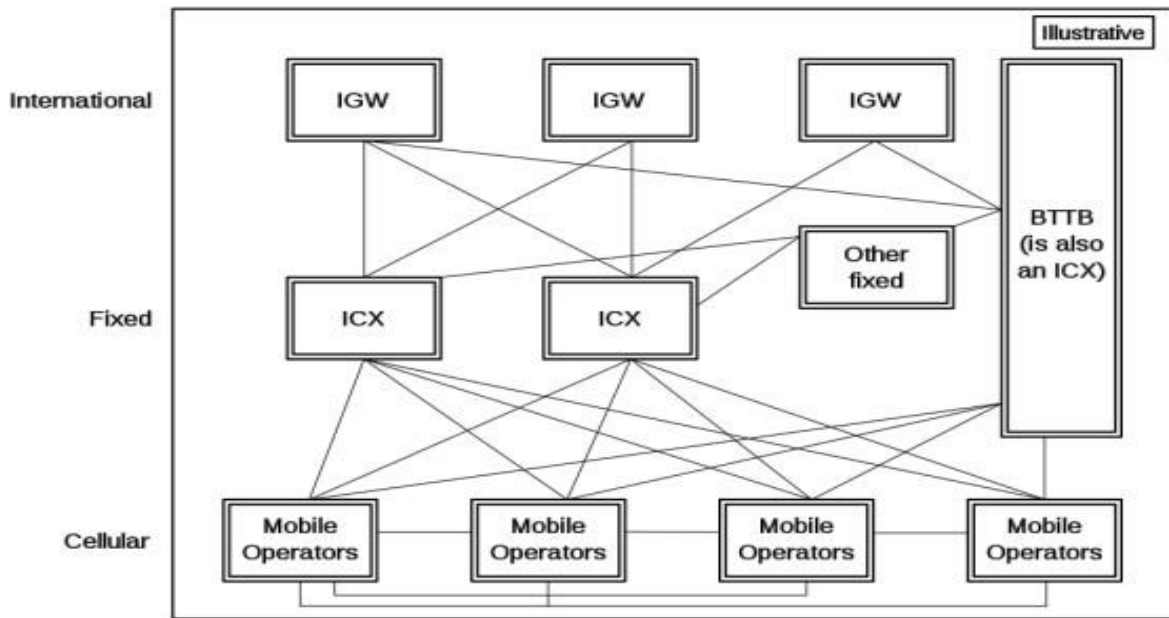


Fig: 2.12 Structure of Telecommunications

All mobile drivers must interconnect via Interconnection Exchanges (ICXs), and all international calls must be handled by an International Gateway (IGW) connected to both mobile and fixed drivers via ICXs, by the National Telecommunications Policy of 1998 and the International Long-Distance Telecommunications Services (ILDTS) Policy of 2007.

If a mobile or fixed motorist places an initial call to another network, the Interconnection Exchange (ICX) receives the call and forwards it to the intended network.

It is received by the IGWs and is international. IGW calls will continue and be forwarded by ICX to the destination number.

The development of linkages between vibrant interfaces is seen in the diagram below.

CHAPTER 03

BROADBAND SERVICES ADSL OF BTCL

3.1 ADSL (Asymmetric Digital Subscriber Line)

Asymmetric Digital Subscriber Line (ADSL) is a technology that enables high-bandwidth, quick data transmission to homes and businesses over already-existing copper wire telephone lines.

- ADSL is a type of DSL which allows for quicker data transmission over copper telephone lines.
- ADSL has worldwide popularity and has a sizable market share for broadband networks.
- ADSL is now available in every region of the world.

3.2 ADSL That's Mean

- **Asymmetric** - The data can flow faster in one direction than the other. Data transmission has faster downstream to the subscriber than upstream.
- **Digital** - No type of communication is transferred in an analog method. All data is purely digital (0,1), and only at the end, modulated to be carried over the line.
- **Subscriber Line** - The data is carried over a single twisted pair copper loop to the subscriber premises.

3.3 ADSL Standards:

Standard name	Common name	Downstream rate	Upstream rate
ITU G.992.1	ADSL (G.DMT)	8 Mbit/s	1.0 Mbit/s
ITU G.992.2	ADSL Lite (G. Lite)	1.5 Mbit/s	0.5 Mbit/s
ITU G.992.3/4	ADSL2	12 Mbit/s	1.0 Mbit/s
ITU G.992.3/4 Annex J	ADSL2	12 Mbit/s	3.5 Mbit/s
ITU G.992.3/4 Annex L	RE-ADSL2	5 Mbit/s	0.8 Mbit/s
ITU G.992.5	ADSL2+	24 Mbit/s	1.0 Mbit/s
ITU G.992.5 Annex L	RE-ADSL2+	24 Mbit/s	1.0 Mbit/s
ITU G.992.5 Annex M	ADSL2+	28 Mbit/s	3.5 Mbit/s

Fig: 3.1 ADSL Standards

3.4 ADSL Speed Factors

- The distance from the local exchange
- The kind and gauge of wires employed
- The number and type of joins in the wire
- The wire's closeness to other lines carrying non-voice communications such as ADSL, ISDN, and others
- The wires' proximity to radio transmitters.
- The D/W passes near the electric line.

3.5 ADSL Network Components

- The ADSL modem at the customer premises)
- DSL access multiplexer (DSLAM)
- Broadband Access Server (BAS)/ B-RAS
- Splitter: an electrical low-pass filter that divides the ADSL data frequencies from the analogue voice or ISDN signal. DSLAM.

3.6 ADSL Requirements

- Phone line that your phone provider has activated for ADSL
- Separating the Internet signal from the phone signal with a filter
- ADSL modem.
- Membership with an ISP that accepts ADSL

3.7 ADSL Loop Architecture

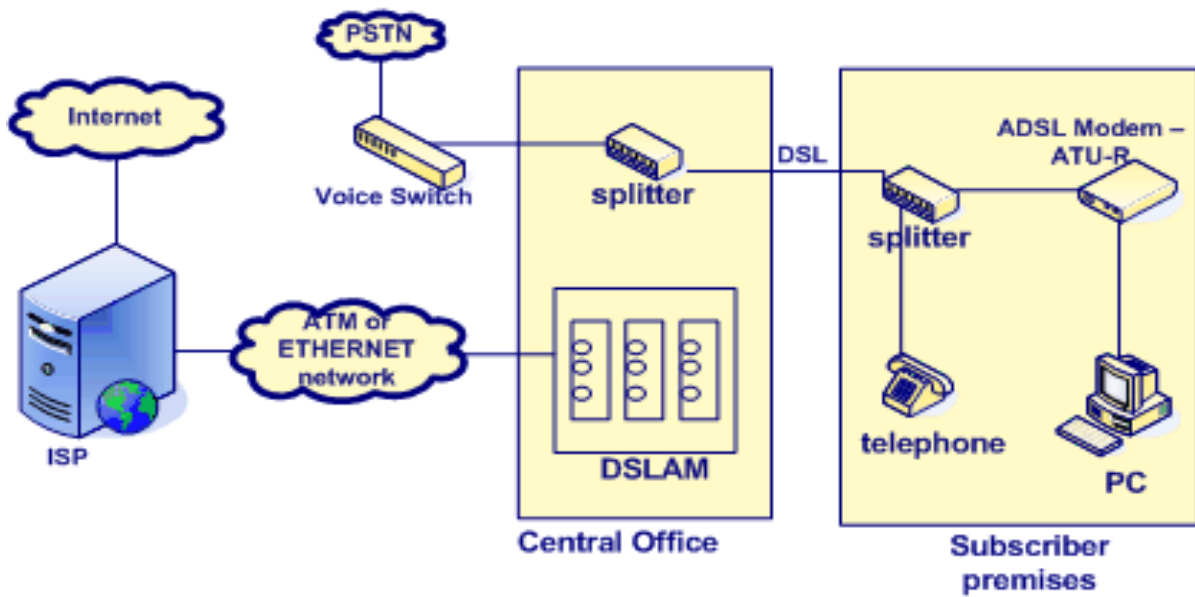


Fig: 3.2 ADSL Loop Architecture

3.8 PRESENT CONNECTION OF ADSL

Area Code	Phone Number
Dhaka (02)	5838
Chittagong (Chittagong) (031)	823
Rajshahi (Rajshahi) (0721)	721
khulna(khulna) (041)	540
Jessore (0421)	524
Rangpur (Rangpur) (0521)	511
Pabna (0731)	410
Barisal (0431)	425
Dinajpur (0531)	372

3.9 PRESENT CONNECTION OF ADSL

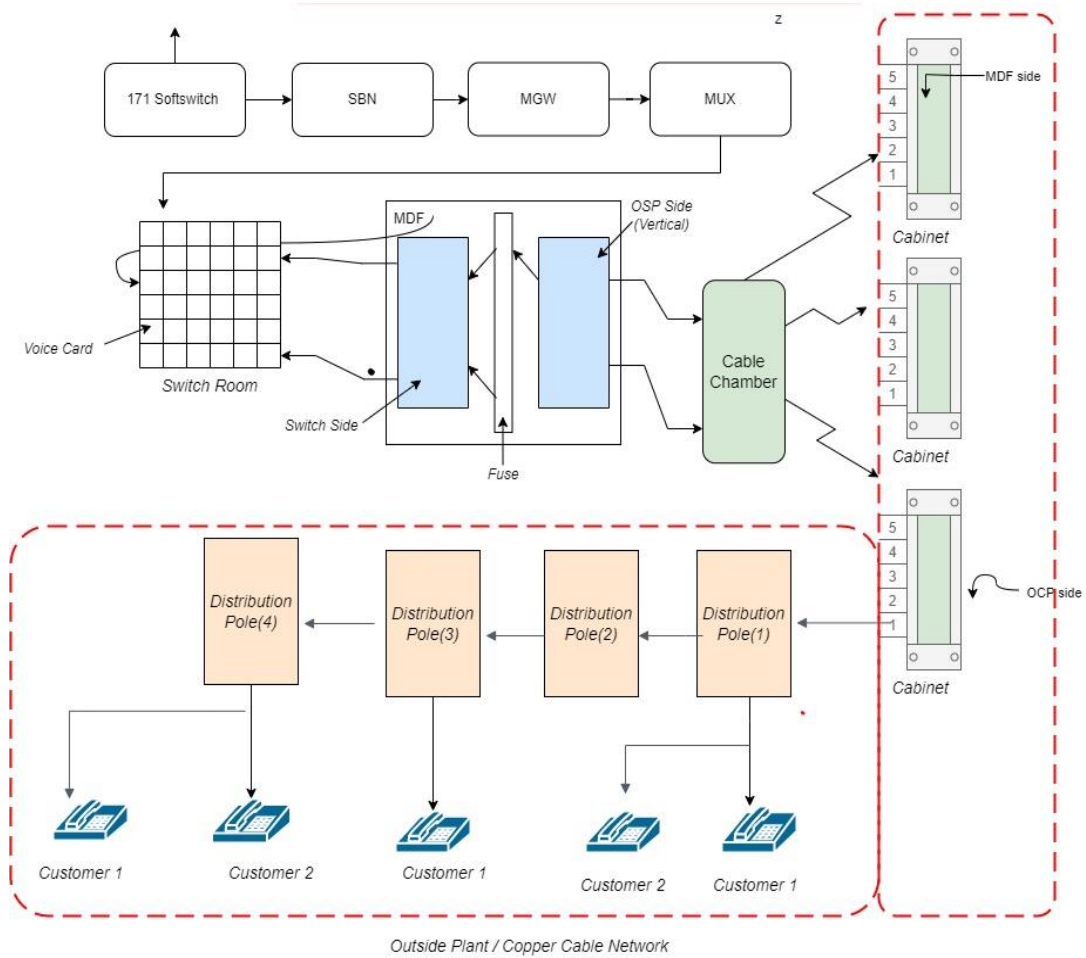


Fig 3.9: present connection of ADSL

CHAPTER 04

BROADBAND SERVICES GPON OF BTCL

4.1 GPON (Gigabit-capable Passive Optical Network)

PON is a point-to-multi-point (P2MP) passive optical network. GPON stands for Gigabit Passive Optical Network. ITU-T Recommendation G. 984. x defines GPON. GPON can transport Ethernet, ATM, and TDM (PSTN, ISDN, E1 and E3) traffic. GPON network consists of mainly two active transmission equipment, namely- Optical Line Termination (OLT) and Optical Network Unit (ONU) or Optical Network Termination (ONT). GPON supports triple-play services, high bandwidth, long reach (up to 20km), etc.

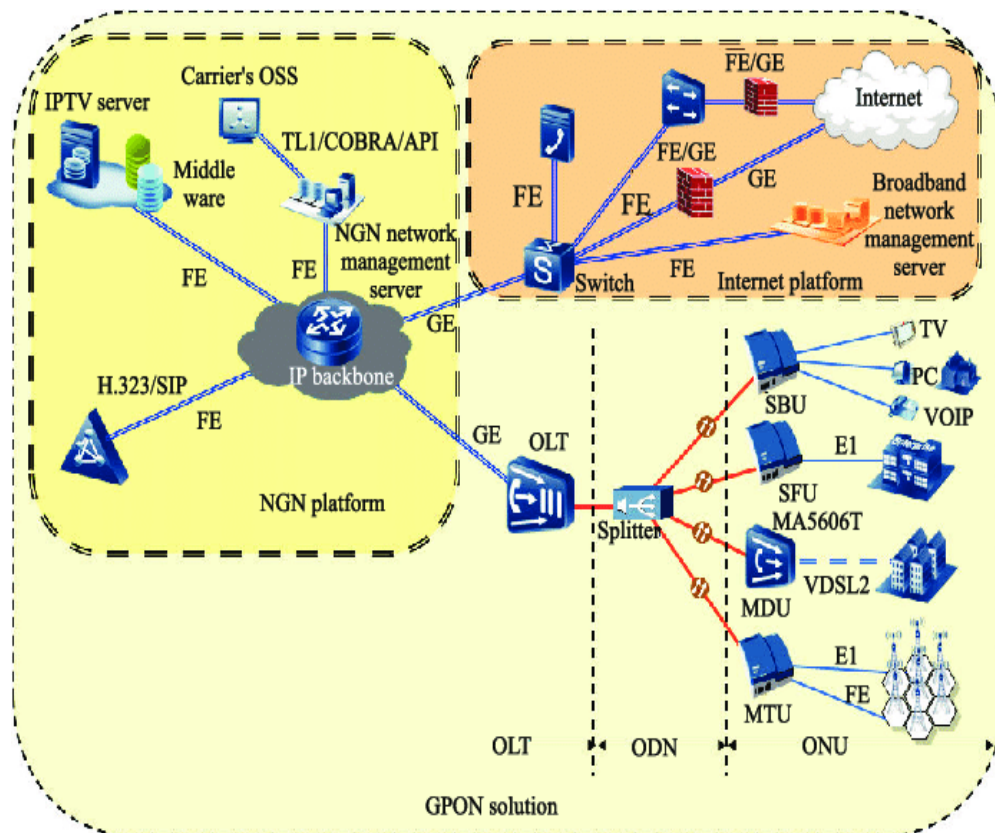


Fig: 4.1 GPON

Note:

IF GPON: GPON Interface

SNI: Service Node Interface

UNI: User-to-Network Interface

CPE: Customer Premises Equipment

The optical line terminal (OLT) is an aggregation device for ending the central office (CO) PON protocol.

On the user side, optical network units (ONUs) and optical network terminals (ONTs) are situated and offer a variety of ports for user terminal connections. An optical distribution network (ODN) is used to communicate and connect between both the OLT and ONUs.

4.2 GPON Supports:

- Triple-play VoIP, broadband, and IPTV services provide cost-effective all-services solutions.
- high data rates and data transmission
- Long-reach coverage.
- More secure data encryption (supports block lengths of 128 bits and key lengths of 128, 192, and 256 bits).
- All types of Ethernet protocols.

4.3 Policy GPON Transmission

There are two types of Transmission.

- GPON Downstream Transmission
- GPON Upstream Transmission

4.4. GPON Downstream Transmission

All data is broadcast to all ONUs from the OLT. The ONUs then select and receive their respective data and discard the other data. Figure 4.2 shows the details.

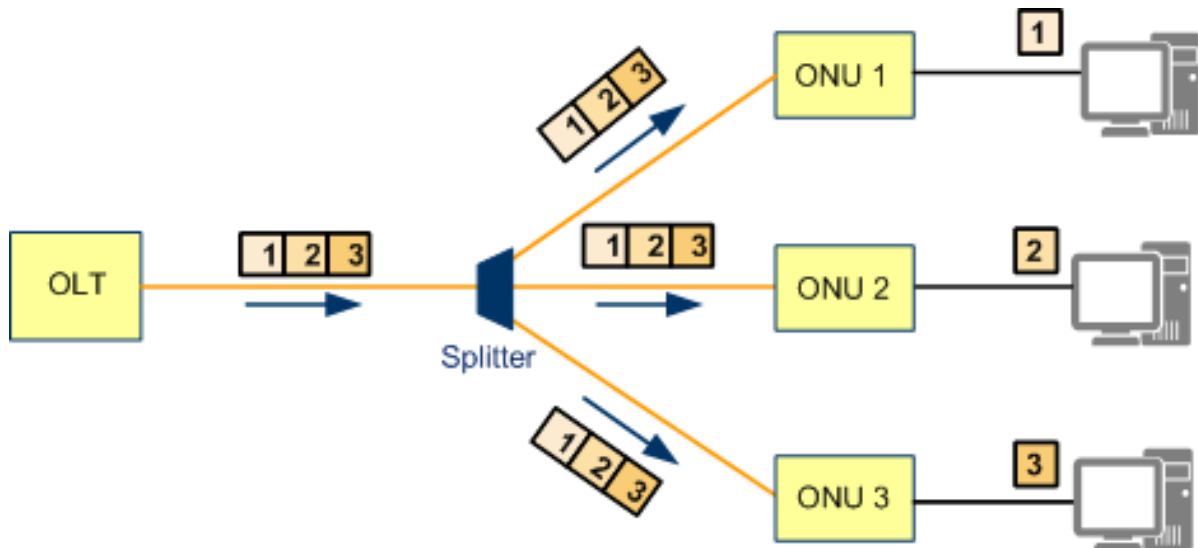


Fig: 4.2 GPON Downstream Transmission

4.4.1 Main Features

- Supports point-to-multipoint (P2MP) multicast transmission.
- ONU data is differentiated from GONU data by GEM port ID, and the identification data is sent to all ONUs. EM port ID and comparable data are sent to all ONUs.
- Allows an ONU to receive the desired data by ONU ID.

Upstream and downstream data packets in a GPON network are sent at wavelengths around 1290 and 1330 nm and 1480 and 1500 nm, respectively. In transmit multiple wavelengths in both the upstream and downstream directions on the same ODN network, the GPON system employs wavelength division multiplexing (WDM) technology. In other words, a single fiber can concurrently transmit data at several wavelengths in the upstream and downstream directions.

4.4.2 GPON Upstream Transmission

Each ONU can only send data to the OLT in the upstream direction during the timeslots that the OLT has approved and assigned. This prevents upstream data conflicts by ensuring that each ONU provides data sequentially. Figure 4.3 shows the details.

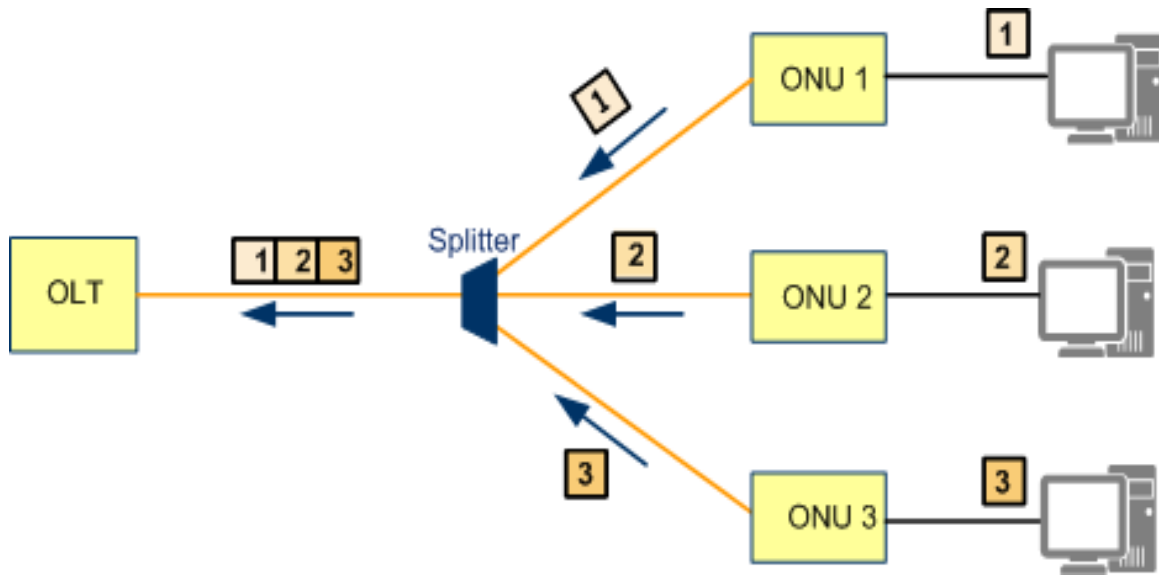


Fig: 4.4 GPON Upstream Transmission

4.4.2.1 Main Features:

- Supports time division multiple access (TDMA).
- Data transits on a reserved time slot.
- Couples' optical signals on an optical splitter.
- Uses range to find collisions and stop them.

Data from various ONUs is transported upstream through the appropriate branch optical fibers during GPON upstream transmission. Following the excerpt via optical splitters, the data is converged. To transfer data, time-division multiplexing (TDM) is employed upstream. There are various time slots allocated to the upstream link. The OLT centrally organizes and approves the timeslot during which each ONU is allowed to send data.

4.5 GPON Basic Concepts

GEM Frame

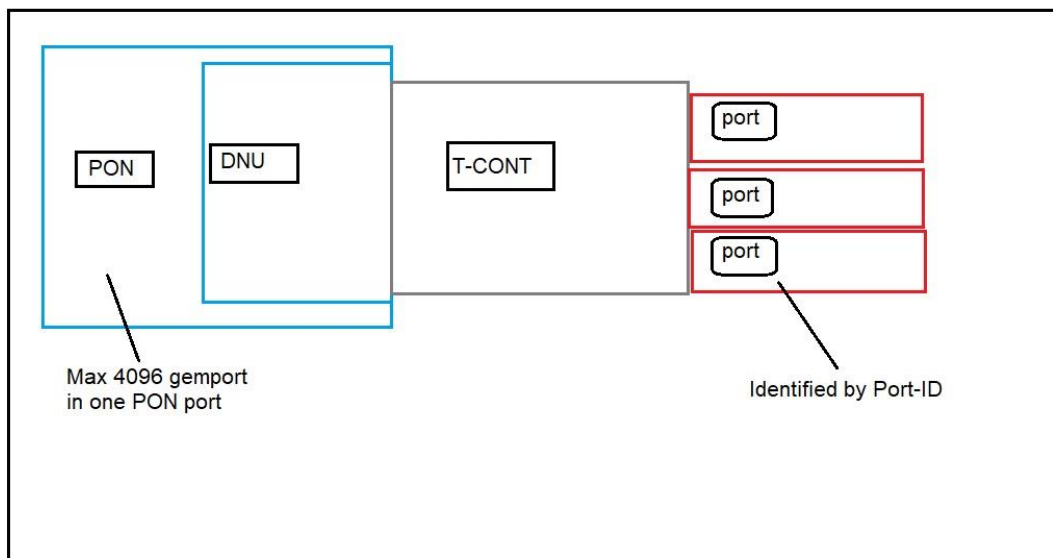


Fig.4.5.1: GEM Frame

In the gigabit-capable passive optical network (GPON) system, a GPON encapsulation mode (GEM) frame is the smallest service-carrying unit and the basic encapsulation structure. All service streams are encapsulated into the GEM frame and transmitted over GPON lines. GEM ports identify the service streams, and a unique port ID identifies each GEM port. The OLT globally allocates the port ID. Therefore, the ONUs connected to the same OLT cannot use GEM ports with the same port ID. A GEM port is used to identify the virtual service channel that carries the service stream between the OLT and the ONU. It is similar to the virtual path identifier (VPI)/virtual channel identifier (VCI) of the asynchronous transfer mode (ATM) virtual connection. Figure 5 shows the GEM frame structure.

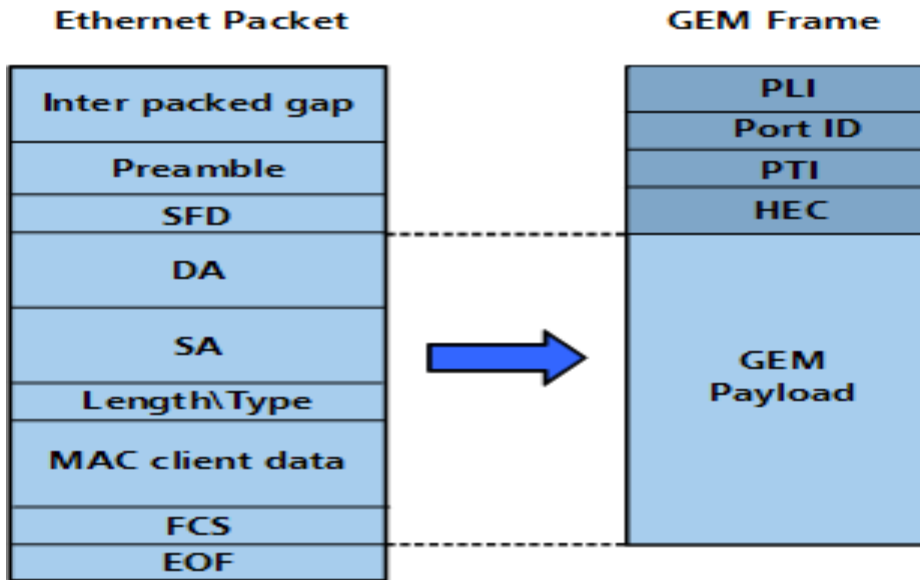


Fig:4.5.2 GEM frame structure.

The GEM header, which is used to distinguish among data from various GEM ports, is composed of PLI, Port ID, PTI, and header error check (HEC). PLI: indicates the length of the data payload.

- Port ID: uniquely identifies a GEM port.
- PTI: indicates the payload type: The GEM header, which is used to distinguish among data from various GEM ports, is composed of PLI, Port ID, PTI, and header error check (HEC).
- It determines the type of data being transferred and its state, such as whether the operation, administration, and maintenance (OAM) messages are sent or data transmission is ended.
- HEC: ensures the forward error correction (FEC) function and transmission quality.
- Fragment payload: indicates the frame fragment.
- Parsing Ethernet frames and converting data into GEM payloads for transmission is performed more by the GPON system.
- GEM frames automatically enclose header information.
- The mapping format has excellent compatibility and clarity.

4.6 Composition of GPON Network

A GPON system consists of the Optical Line Outstation (OLT), Optical Network Unit (ONU), and optic Distribution Network (ODN). Generally, OLTs are placed in a CO staff room and are substantially used to collect optic signals from ONUs. Depending on the access script, ONUs can be fixed in corridors and roadsides to hand prismatic access interfaces, similar to POTS interfaces for telephone services and GE/ FE interfaces for Internet access services. An ODN comprises unresistant optic factors similar to optic filaments and one or other unresistant optic splitters. An ODN provides an optic communication channel between OLTs and ON. In a GPON network, OLTs are service-side bumps of the access network and are connected to service knot bias through service knot interfaces (SNIs) to enable service access. The ON Us are stoner-side access impulse which enters client demesne outfit (CPE) through stoner-to-network

4.7 Commander in Chief: OLT

An OLT is a core factor of an optic access network. It's original to the L2 switch or L3 router in a traditional communication network and functions as a multi-service platform. On the one hand, it converges signals that carry colourful services at the CO side, sends them to the access network, and transmits them to subscribers. On the other hand, it sends the signals entered from subscribers to colourful service networks based on service types. One OLT can connect multiple ONUs through optic splitters to control, manage, and range ONUs. Like a commander in chief, the OLT instructs each ONU to give cost-effective, high-speed communication services, connecting druggies nearly through light signals. An optic line terminal (OLT) is the endpoint tackle device in an unresistant optic network (PON).

4.7.1 OLT has two primary functions

- Converting the standard signals a FiOS benevolence provider uses to the frequency. And framing used by the PON complex.
- Conciliating the multiplexing between the transformation bone on the optic network outstations (ONTs) located on the accounts' ground.

4.7.2 OLT consists of layers.

- Core layer: provides functions for service processing, aggregation, distribution, and ODN modification.
- Service layer: Provides service interfaces to support various services.
- Common layer: Provides DC power supply and maintenance functions.

4.8 Application of OLT

The OLT device works with various ONUs to make different access networks, such as FTTC, FTTH, FTTO, FTTM, etc. Various deployment methods are based on varying services, customer requests, and locations.

4.9 ONU (Optical Network Unit)

An ONU is located at the subscriber side and works with the OLT to implement layers 2 and 3 Ethernet functions and provide subscribers voice, data, and multimedia services.



Fig:4.9: ONU

4.9.1 ONU (Optical Network Unit)

- Choose to receive broadcast data sent by the OLT.
- Respond to the ranging and power control commands sent by the OLT, and make corresponding adjustments;
- Cache the user's Ethernet data and send it in the uplink direction through the transmission window allocated by the OLT;
- Fully compliant with IEEE 802.3 / 802.3ah;
- Deliver up to -25.5dBm Receive sensitivity;
- Provide up to -1 to + 4dBm Transmit power;
- Realize "triple-play" applications by offering data, voice (to use an IAD, an Integrated Access Device), or IPTV (interactive network television) service;
- Deliver the highest rate PON: symmetrical 10Gb / s data uplink and downlink, VoIP voice and IP video services;
- Provide Plug and Play" based on auto-discovery and configuration;
- Deliver the Rich remote management capabilities supported by OAM functions;
- Provide High sensitivity light reception and low input optical power consumption;
- Support the Dying Gasp function.

4.10 Types of ONU

There are two types of ONU

- Active ONU
- Passive ONU

4.10.1 Active ONU

The Active optic network unit is mainly used in triadic play, which integrates the brimming range of CATV RF output. It provides high-class VOIP audio, three routing modes, a wireless case, and other berths. It's easy to enter tripartite- play terminal stuff.

4.10.2 Passive ONU

The Passive Optical Network Unit is a doper-hand device of the GPON (Gigabit Passive Optical Network) system. It terminates the marketplace communicated from the OLT (Optical Line Terminal) through PON (Passive Optical Network).

4.11 Optical Distribution Network: ODN

The ODN is an optic string network checking of PON bent. It establishes an optic data transmission channel to transmit and classify data between the OLT and ONUs. The ODN can be divided by 2 points into 3 parts from the CO to the subscriber's hand. The 2 points bear the optic distribution and case points. The 3 sections bear confluent optic cords, distribution optic lines, and optic drop laces. You might be interested in Access Network work. You can check the charge of the Huawei Access Network.

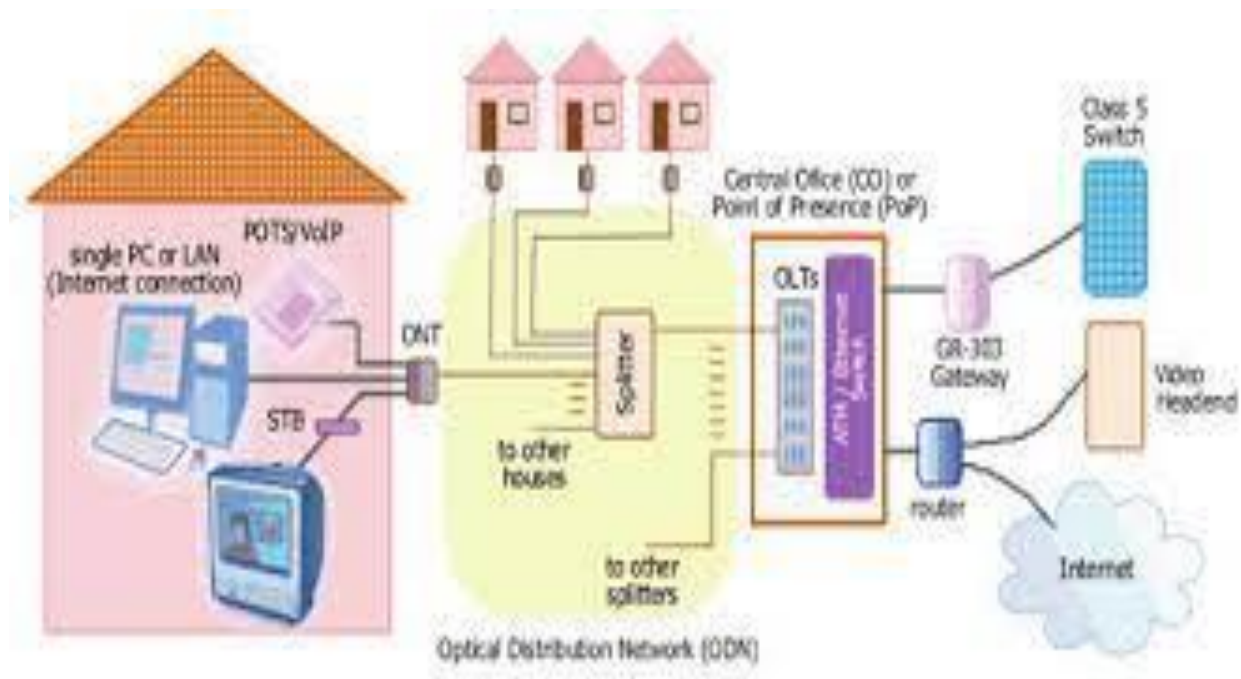


Fig: 4.11. Optical Distribution Network

CHAPTER 05

TASKS, PROJECTS, AND ACTIVITIES

5.1 Daily Tasks and Activities

I am working in the SOFT SWITCH, SWITCHES & PHONES-1 department at BTCL's Sher Bangla Nagar West Divisional Exchange Office for four months internship. My working hours are five days a week, starting at 10:30 am and ending at 3:00 pm.

5.2 Switching System Inlets and Outlets

The configuration of information and yield circuits, referred to as inlets and outlets, is one of the critical components of a switching system or exchange. A switching system's primary ability is to create an electrical path between a specific inlet-outlet pair. The exchanging lattice or exchanging organization is the tool used to establish such an alliance. A switching network model is shown in Figure.

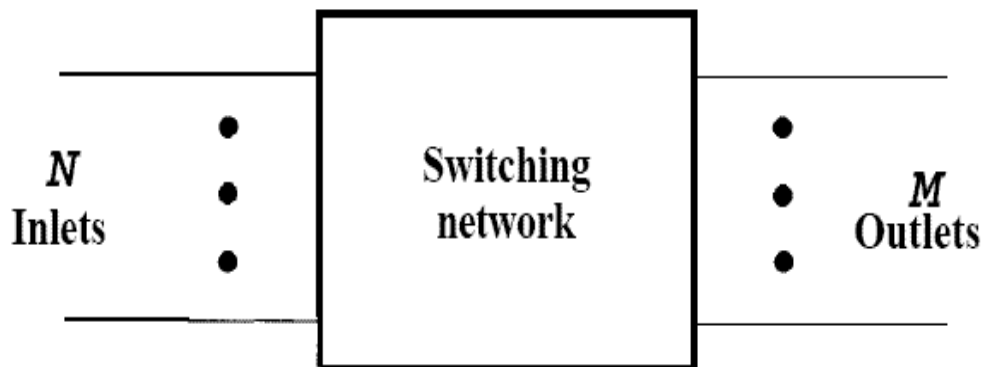


Fig: 5.2 Switching Network

5.3 Connection Type

Four Types of connections in a telecommunication network

- Connection of the local call to two subscribers.
- Call connection between an outgoing trunk and a subscriber.
- Relationship between someone inbound call and a local connection.
- Connection of the transit call to an incoming and an outgoing trunk

5.4 Main Distribution Frame (MDF)

The MDF is a location inside the neighboring telephone exchange where jumper wires connect the termination of the nearby circle and exchange equipment. MDF was connected to the line and the user inside a communications facility. Each link that attaches to a customer's phone line arrives at an MDF before being disseminated.



Fig: 5.4 Main Distribution Frame

5.5 Daily Task in Switch Room

I will collect applications for telephone lines and internet lines from customers and update them later on BTCL's web portal and assist customers in various inquiries. Allotment of numbers.

To create customer preferences and user IDs. My trainer helped me a lot in this regard. I have faced various problems and tried to solve them later. In this way, I have switch rooms perform various functions.



Fig 5.5: Working time in the switch room

5.6 Project Task and Activities

Every day, I updated telephone and internet lines applications that used to come to the Swiss room daily on BTCL's web portal. And I used to create a new user ID for the customer and send it by mail to BTCL Sher-e-Bangla Nagar. This is how I completed my daily work.

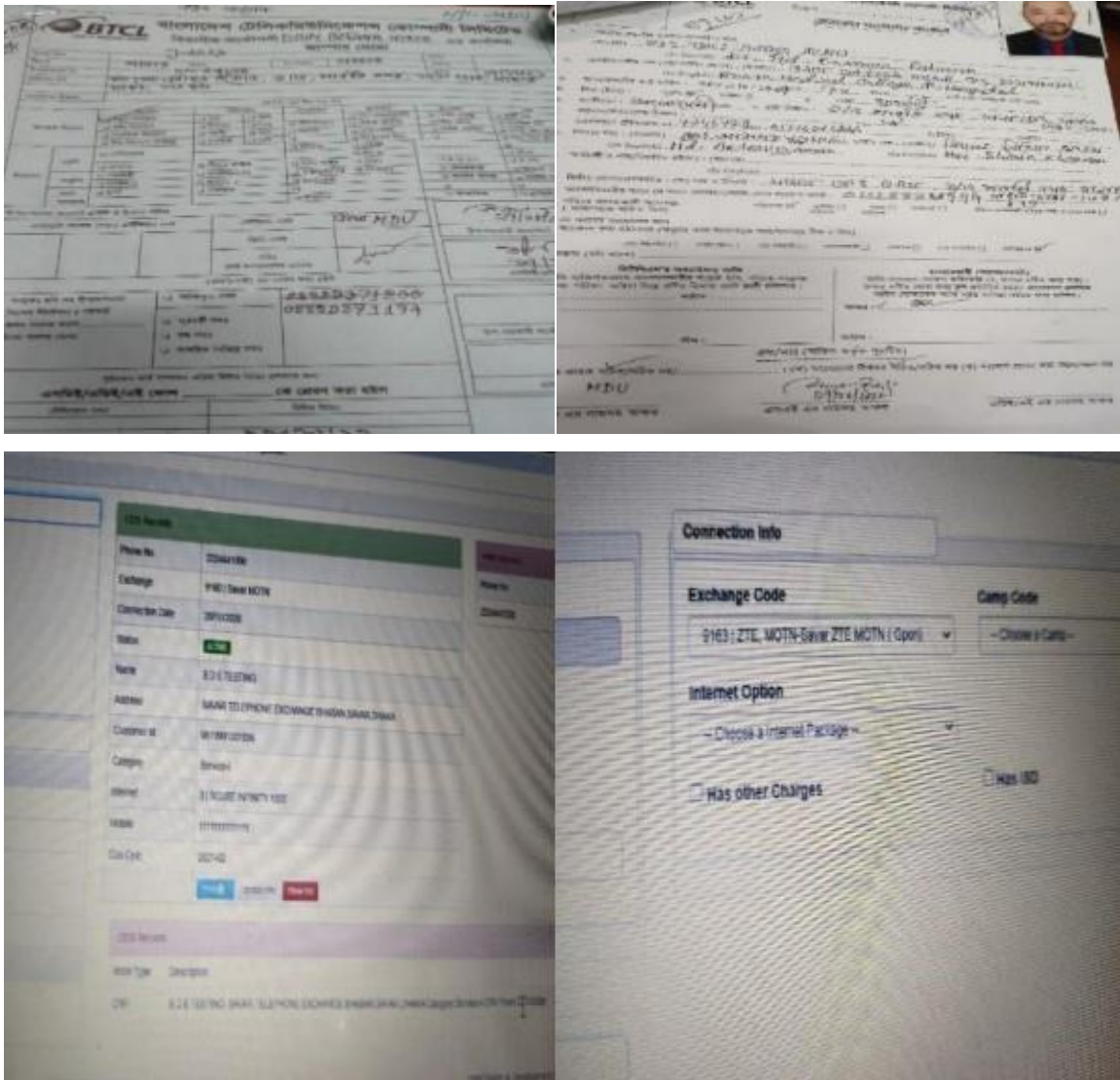


Figure 5.6: Task & Activities

5.7 Challenges

The telecommunications sector consists of many things that cannot be known or acted upon quickly, yet I have tried my best. When working at BTCL, I often witnessed those jobs in the Switch room. I have completed what I have received and encountered various problems while working at OSP. And I have tried to solve them. I have worked on MDF and gained a fair knowledge of it. I am trying my best to use these experiences in the future.

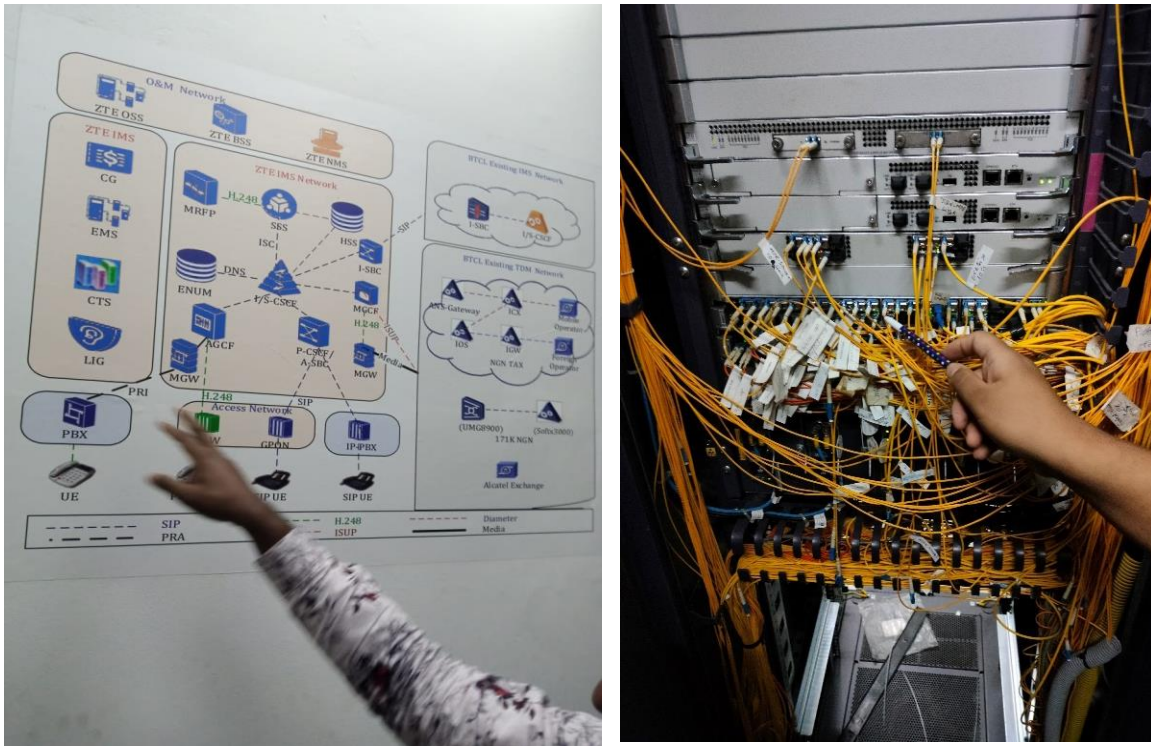


Fig.:5.7: Modern Main Distribution Frame

CHAPTER 6

CONCLUSION AND FUTURE CAREER

6.1 Conclusions of the Discussion

My internship still needs to be completed. When I want to supplement my internship, I experience the things discussed in the previous chapter and learn on the job. The goal of the proposed system was to create an internship through which the networking system could be automated. This internship allowed me to test the help that I can do professionally. These internships provide an opportunity to test interest in a particular career before committing to permanent responsibilities.

6.2 Possibilities for a Future Career

My internship at Bangladesh Telecommunication Company Limited has been incredibly enriching and beneficial for me as a student studying a highly regarded degree in Computer Science and Engineering, allowing me to put my theoretical skills to good use and engage in critical and resourceful practical work. My favorite educational institution, Daffodil International University, has talented and respected faculty members. My esteemed instructor, in particular, helped me overcome any difficulties I faced during my internship. Consequently, I am grateful to my eminent teachers and Bangladesh Telecommunication Company Limited (BTCL) for providing a realistic setting to enhance my telecommunication skills. As a result, I am happy to consider this internship a turning point in my professional development.

APPENDIX

Company Details

Name:	Bangladesh Telecommunication Company Limited (BTCL).
Address:	Head office 37/E, Telejogajog Bhaban, Eskaton Garden Dhaka.
Tel:	+880248311500
Email:	md@btcl.gov.bd
Call Center:	16402
Website:	http://www.btcl.gov.bd/

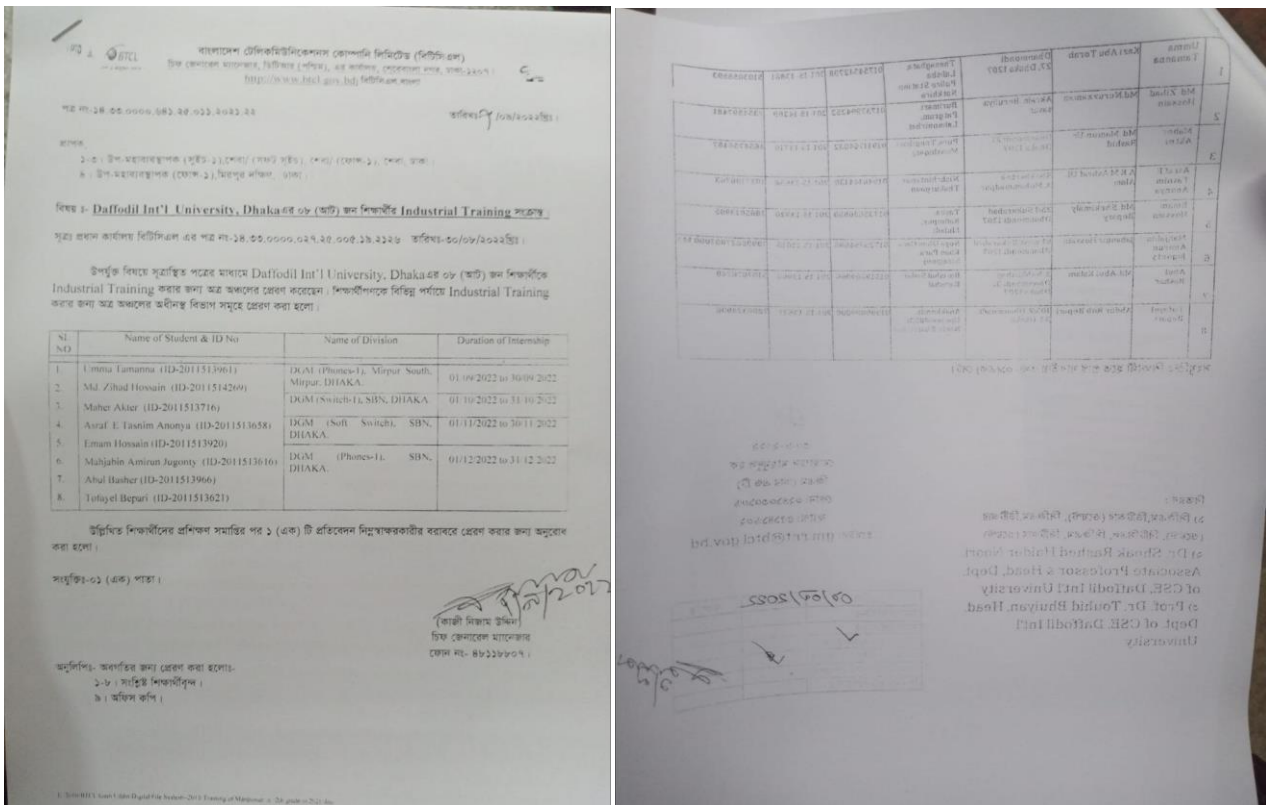


Fig: Work Permit Letter

REFERENCE

Website:

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