INTERNSHIP ON NETWORKING AT BANGLADESH TELECOMMUNICATIONS COMPANY LIMITED(BTCL)

 \mathbf{BY}

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

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APPROVAL

This Project/internship titled "INTERNSHIP IN NETWORKING", submitted by Name: Emam Hossain, ID No: 201-15-13920 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 date: 19-01-2023.

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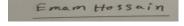
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Interior shut, I express my profound gratitude to Allah, the Majority Friendly, the Elevated

ABSTRACT

All international calls and mobile operator relationships must pass the Interconnection Exchange, following a distinct National Telecommunications Policy and International Long Remote Telecom Services Procedure (ILDTS) 2007 regulation (ICX). extra mobile drivers connected to each ICX are maintained by an international gateway (IGW). The Interconnection Exchange (ICX), which exists internationally and IGWs employ information technology, accepts local calls made by mobile or landline operators and transmits them to the destination network. The destination number was sent through ICX, according to IGWs. The following graphic displays how these interconnections are organized in various interfaces.

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CHAPTER 1

INTRODUCTION

1.1 About BTCL:

Bangladesh Telecommunication Company Limited (BTCL) ifamousular telephone com, pany. The largest telecommunication corporation within Bangladesh in these rural areas. The People's Republic of Bangladesh Telegraph and Telephone Board (BTTB) changed the name to Bangladeshi, fitting her succor ess Independence in 1971. BTTB changed ged name to BTCL on July 1, 2008, when it became Information Technology People are corporations. A corporation was the first to own many countries Power to the corporation above; the shares shall be sold as a whole as People described above this next annual. The estimated value of BTCL is Tk 1 Lakh. 15,000 crores. BTCL's Total active population is 12,636. Within Bangladesh, BTCL has traditional and internet offices, national offices, and Worldwide long-distance cries. Bangladesh authorities announced a PSTN license Confidential company in 2004 but later banned it from furnishing services at a summit. Applicable sales in the capital of Bangladesh. However, additional directors began to receive permission in 2007. Board of trustees for BTCL members Iqbal Mahmood, Chairman of a Telecommunications Subcommittee. 2)3)4) three joint secretaries from the ministries of finance, information, and telecommunication; 5) a Brigadier General from the Bangladesh Army; 6) the heads of state of the Federation of Bangladesh Chambers of Commerce and Industry (FBCCI); 7) the president of the Institute of Chartered Accountants, Bangladesh; and 8) famed creator and scientist Dr. Zafar Iqbal. 9) BTCL's managing director and board member Ashraful Alim presently is the chairman of the BTTB.

1.2 History:



Therefore, British India, apart from the cable department specific to this location, was the telegraph department Amalgamated in 1853 and later organized by 1885 as Telegraph Behave. 1962 Internally, that is used. Therefore, traditional telegraph and telephone departments favored West Pakistan, For example, Pakistan on the east-west side. By 1971, long after the independence of Bangladesh, this section was alongside the station Automation tolerance standards. The Department of Telegraphs and Telephones informs about the country. Licensed via line and the Call Up Council Decree, 1975, they were merged into one IT "Telegraphy and Called Dispatch" body. Diamond State Telegraph and Telephone Charges, renamed About the Bangladesh Telegraph and Telephone Board, approved command in 1979. Clients of Bottle of Country My, Personal Organization, buy BTCL in hours. According to a press release with the companies have successfully, the client in Dhaka called and seized the decanter in this quantity for the BTCL issue in September. BTCL keeps a dependable and continuously active red anticipated for VIPs. BATCL provides phone, data, and web hosting services and IPLC, ICX, and IGW transport billing.

1.3 Structure of Telecommunication:

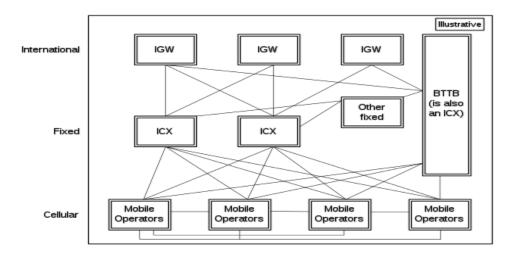


Figure 1: Structure of Telecommunication

National Telecommunications Policy and International Long Remote Telecom Services Procedure (ILDTS) 2007, two or more independent documents, all mobile operator's Relationships, and all international calls must be handled across the Interconnection Exchange (ICX). An International Gateway (IGW) for additional mobile drivers connected to each ICX. When a mobile or landline operator calls another network, as long as the call is local, fancy Word procedures are available internationally, and IGWs employ information technology. It is accepted by Interconnection Exchange (ICX) and transmitted to the destination network. The demand for IGWs has also been sent live Destination numbers through ICX. The following figure shows the structure of this interconnection between the various interfaces. The type, make, model, and manufacturer of the Telecommunications Structure, in addition to the structural design calculations, certified by a Professional Engineer licensed in the State, proving the structure's ability to safely accommodate the applicant's facilities without change or modification. If change modification of the structure is important, a complete explanation of what changes are needed, why they are needed, and who will be tasked with ensuring that they are ma

CHAPTER 2

Asymmetric Digital Subscriber Line

2.1 ADSL Speed Factor:

Speed Factor Examples from local exchanges Type and thickness of clothing used Number and type of bonds between cables Proximity of cables to ADSL, ISDN, and other cables carrying non-voice signals Proximity of cables to radio broadcasters. This D/W moves close to this line of force.

2.2 ADSL Nerwork Component:

Network Components ADSL Modem to Consumer DSL Approach Multiplexer (DSLAM) Splitter - A low-cost electromechanical device that separates analog voice or ISDN signals to ADSL DSLAM data frequency.

2.3 ADSL loop architecture:

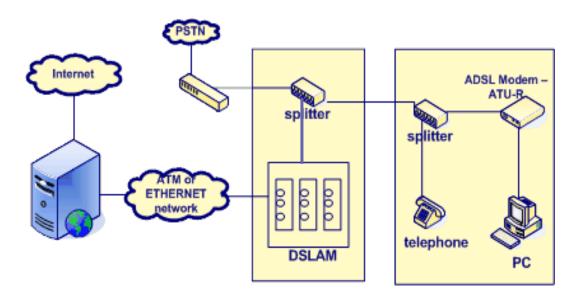


Figure 2: ADSL Loop Architecture

2.4 ADSL (Asymmetric Digital Subscriber Line):

The data communication technology known as DSL, a variation of ADSL, enables quicker data transmission across copper telephone lines. ADSL POT delivers up to 50 Mbps and supports voice, video, and data. ADSL is a popular bandwidth choice internationally with a significant market share ADSL is now available in total areas of the world.

2.ADSL Speed Comparision:

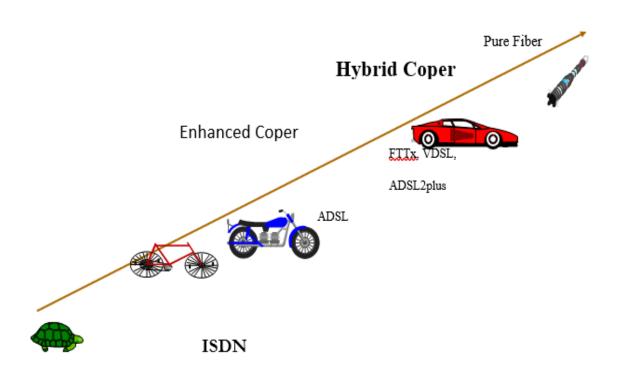


Figure 3: Asymmetric Digital Subscriber Line (ADSL)

2.6 ADSL Requirements:

Telephone border activated by your phone operative for ADSL Filter to separate phone signals from online signals

2.7 ADSL Modem:

Using wavelength division multiplexing (WDM) technology through an ISP subscription maintains ADSL PON and allows for two-way communication over a single fiber.

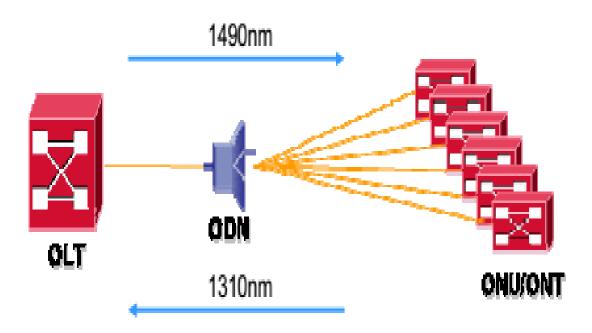


Figure5: ADSL modem

The purpose of GPON is to divide the upstream and downstream signals from several users on a single fiber.

2.8 Gigabit Passive Optical Network (GPON):

Recently a passive optical network standard known as GPON has been published by ITU-TGPON Identify the optical medium and a hardware requirement used for admission and Defines how Ethernet-based frames are converted to optical signals, as far as growth time is concerned as parameters of that signal. Individual connectivity areas within that LTO More operators may split the signal twice, which is once external to eight and Additional down the line again. The maximum distance between the central office and the site Can be 20 km, but operators usually limit it to 16 km. High level of service Unlike ADSL technology, which degrades as the distance between the central office and Family growth, with severe signal loss from the third km, will be able to enjoy all the house High-speed world wide web number one thread optical pressure within sixteen kilometers status.

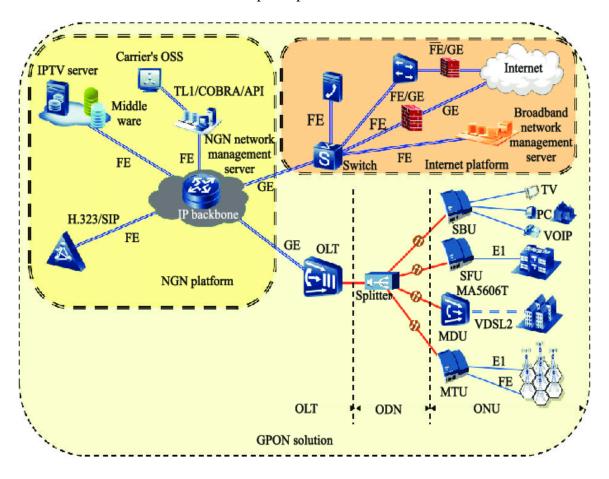


Figure6: Gigabit Passive Optical Network (GPON)

2.9 Main Distribution Frame (MDF):

A central distribution frame (MDF) is a signal splitter or cable rack used to construct telephony and manage communications wires between itself and any number of support telephone networks. The MDF telecommunications facility connects the equipment through contributing courier cables. Local updates are sent to the equipment inside the MDF via the Applies cables connected to consumer phone lines that end there. It will resemble yesterday's telephone market in general operation, where operators placed Sweatshirt cables into the grid of sockets on the patch panel to connect faucets.

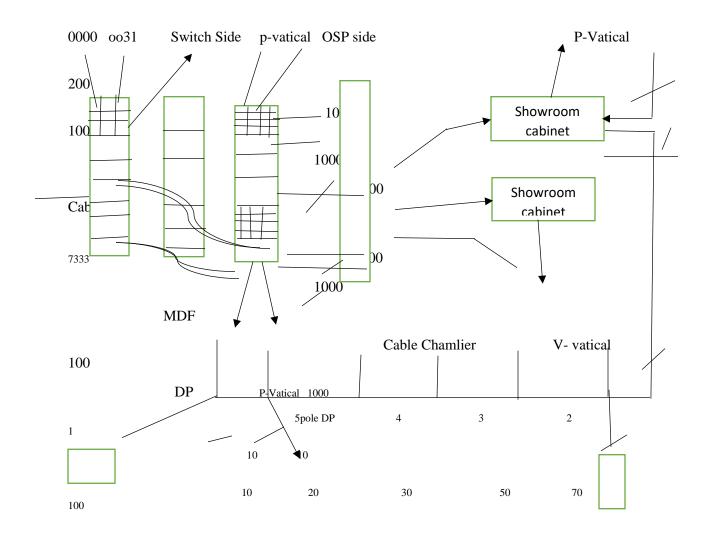


Figure7: Main Distribution Frame (MDF)

2.10 Copper Cable Network Basic Diagram:

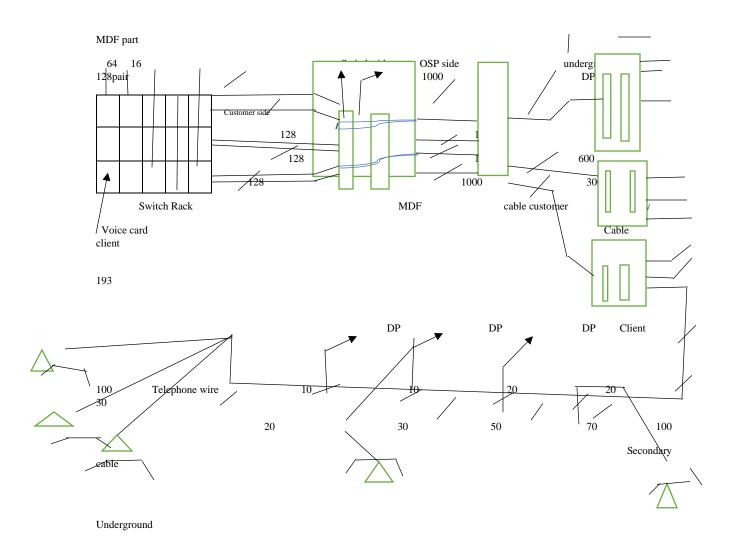


Figure8: Copper Cable Network Basic Diagram

Most of the copper mined in the Roman Empire in antiquity originated from Cyprus, and later, it was termed, giving rise to the contemporary name copper. We will discuss the advantages of selecting copper cable for your network and the differences between copper and thread cables because it is currently one of the most electrically conductive minerals. Because of its abundance, it served as the element that connected the world's telecommunications. Connections and damaged cables can cause data corruption and loss

of connectivity. Copper is the best conductor and is hence efficient, so no. All base metals except for aluminum and copper have 100% electrical conductivity. The capacity of Siemens to charge electricity is a crucial indicator of electrical conductivity. For instance, only 61% of the derris's conductivity is possessive. Copper is pliable. Building wire made of copper is particularly simple due to its inherent strength, hardness, and ductility. It does not spoil someone about you, although having some freedom. Rigidity It exhibits no cracking or brittleness when bent since it is not brittle. In terms of safety, melting a copper wire requires much time. Copper desires to be one of your top choices. It cannot melt or burn even if an overload or power is applied to the line. This implies that the likelihood of starting a fire due to an unresolved electricity issue has dramatically decreased. One of your better possibilities should be copper. It cannot melt or burn even if an overload or power is applied to the line. This implies a massive decrease in the likelihood of starting a fire due to an unresolved electricity issue. Copper traces. It can be harmful when materials other than copper are utilized in the wire stuff since they occasionally split where they link and come loose. This is the phrase used while discussing electrical wiring. Category cable connections are recommended since compromised cables can cause data corruption and severance. Not good. Future compatibility issues could result from negative copper wiring. For instance, most manufacturers of electrical and electronic devices request copper wire. Their justifications are all contemporary. Copper cabling is composed of insulated copper conductors which use electrical currents and voltages to transmit signals. Coaxial cabling, such as t thicket, that is used often in large factories, or twisted-pair cabling, that is utilized more commonly, can be applied as copper cabling. Unshielded twisted-pair (UTP) cabling, which would be frequently used in Ethernet or Fast Ethernet environments, and shielded twisted-pair (STP) cabling, that is less popular, are the 2 types of twisted-pair cabling present (employed for token ring networks and sometimes for Gigabit Ethernet installations). The preponderance of shorter cable runs, like those between wiring closets and wall plates in work areas, patch cables, and equipment connections, are handled using copper cabling.

2.11 Telephone Line:

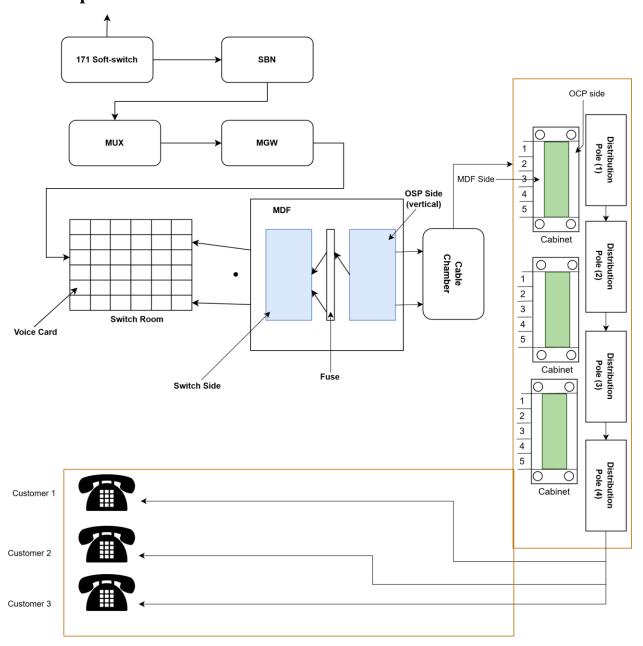


Figure9: Telephone Line

Students must transmit messages across a live telephone line in this game. One of the most accessible appliances to have in your house is a phone. In reality, the telephone has stayed the same in how you connect to the world for almost a century. It would simply function better if you had a vintage phone from the 1920s that you could plug into a wall outlet in

your home. Only calls have two main parts: the microphone (into which you speak) and the speaker. Inside the microphone is a thin piece of metal called a diaphragm. It vibrates when your voice Swing hits it. Once the sheet is vibrated, it displaces a magnet as far as the current imparts. Cable A speaker at the other end. A public address system is a permanent magnet, and a. Although the impulse of the electric current flows through the electromagnet, it moves forward, attracted, and repelled by permanent magnets. It forms a membrane base for vibration. An intrusion of Tiny type imperfections causes noise in carrying wires' electric pulse. In other words, the telephone system converts acoustic energy (sound) into electrical energy. Electrical energy travels along the faucet wire and is converted back into acoustic energy Received at the end. Modern lines could be underground and carry analog or digital signals to the exchange. These could also incorporate a device that converts an analogue - to - digital signal for transmission on a carrier system. The telephone company end of that wire pair is normally linked to a telephone hybrid, while a customer end is usually connected to a data access arrangement. Usually, two copper wires (tip and ring) being run from a home or other small building to a local telephone exchange for each telephone line. The wires that connect to the telephone jacks placed throughout the building and the wires that go to the exchange meet in the building's central junction box, where they are connected in a variety of ways based on the subscribed telephone service. The network of wires leading to an exchange is known as the access network, and the wires from the junction box to the exchange are known as the local loop. In the vast majority of American houses, copper cables are used to link 6-position modular jacks with four conductors (6P4C) to the junction box. The local telephone exchange may employ the copper to refer back to two telephone overhead lines, making those plugs RJ14 jacks. Usually commonly, only two wires are connected to the exchange as one telephone line, and the additional wires are left unconnected.

CHAPTER 3

Fundamentals of Telecommunication

3.1 Electronic component exchange fundamentals:

Quartet Fundamental Phone System Circle-Lower Circuits. To turn on a lamp or activate a self-locking relay known as a drop, a call-up signaling method called call lower is delivered through the phone line. Alternatively, Automatic signals by dialing an image, using manual action called depressed Control or pulsed alternating current (AC) signals, are sent until specified lines are entered. It pleases this work with or without a running phone change in the bottle. Read about a drop switchboard designated with numbers when a greed generator was integrated into a ring or installed in a wired phone kiosk Active. This was the line to which the alternator-phone instrument was linked. A central operator controls the human switch. The ideal signal type for human communication is analog. It could be more practical and robust in terms of recovery. An amplifier was used. Local loops, swimming trunks, and switches communicate each modification in digital signals utilizing palpitate cipher modulation (using a repeater). The type of end-user equipment impacts the nature of electrical signals in customers and switches. In-band (DTMF) and out-of-band (BRI) communication between the user and network. Diverse, sensitive to a wide range of signal content Telecom network east contagion bottle. Impressive enough Several services have been established. Excellent radio receiver network Telegram system Telex machine system.

3.2 Components of the switching system:

Network switch: It links the so-called band and the scream Command Alternate- Storage. It is a crucial component of the switching system that effectively recognizes receiving and production lines and interprets signals to switch paths for the information gathered on these lines. This control subsystem discovers this signal transfer to the line And Gives relationships and endings. The control option device sends a signal Sentiment in favor of customers and other exchanges attached to outgoing bits.

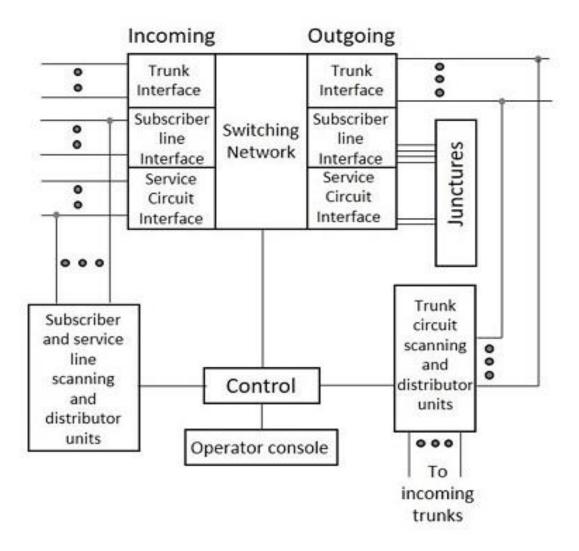


Figure 10: Elements of the switching system

Signaling: Signaling format and requirements for customers, trunks, bathing suits, and subsystems are depicted. Three different types of essentials allow a switching system on the handle side condition. Subscriber loop signal relationship signal Switch or register signaling This material is a switching method of exchange, check and sign fashion.

Trunk: Represents the location of the trunk line that connects the switching systems. Here is the High port contribution. The system's connection to the trunk line is made using the trunk interface.

Endorser Line Interface: Customers are connected to the switching system by the customer line. This comes to an end in the terminal. The device's subscriber line display is located at the subscriber line interface. The line survey system holds and receives signaling information from your different lines. Connect parentage inspection unit. The control subsystem uses the data gathered from this conflict to identify and receive items. The processing unit must transmit this data to the leading site regarding the conveyance band appointment object sending or sending the information reported on specific lines. Operative Console: Enables administrative and maintenance connected with the operator

Splice: A guest is a building that serves as a splice link for utility circuits and nearby consumers. Trunk lines are not used, and the calling subscribers are local when a crooked link facility joins a local connection. An electronic component network is an assembly of networks connected to power. Increased widespread use. The switching system is an essential electronic component procedure. Possibilities can connect to the other side respectively by switching stations. A communications network, this switching network will be fashionable. The lines that link switching systems are known as trunks. The line connecting the subscriber sulfur site to the rest of the Scuttle is composed of the subscriber form.

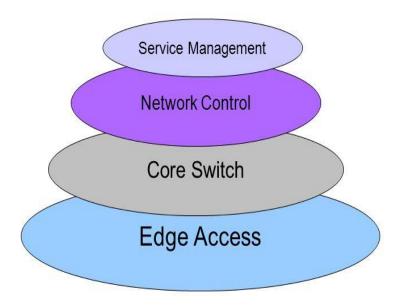
CHAPTER 4

Next Generation Network

4.1 NGN (Next Generation Network): Using different high-speed, enabling transport technologies, the Next Generation Network (NGN), a packet-based network, can provide the same type of network as in telecommunications. Diehards Moved users are given restricted access to a wide range of service providers when features connected through Office are separated from the technology that supports them. Lawyer General's adaptability enables clients to acquire services simply and reliably.



NGN LAYER ARCHITECTURE



3

Figure 10: Next Generation Network (NGN)

Based on a quartet-grade overlaid architecture, the NGN framework. Considerations include secondary access, core switching, interlock checks, and service management. Works for different levels: Edge Entry: Related to network players and terminals. Knowledge is translated into Exchange in additional formats before delivery. Core Switch: Whirligigs and Coat triple switches are used in the above spinal cord system and fellows. Fashion is the primary arbiter level. It uses packet switching and gives scientific members access to a shared and connected data transport network with high capacity, service quality, and dependability. Network management Complete the lattice and cover the edict using real-time moment calls and relationship representation using smooth or soft switching engineering. Service administration is the grade of service management that provides value-added services and organizational support.

4.2 NGN Concept:

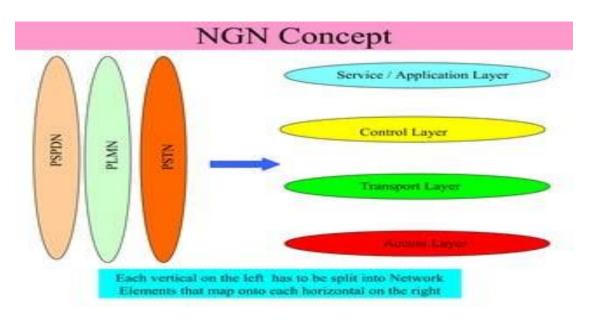


Figure 11: NGN Concept

Provides entry-level substructure, for example, in an access network end consumers and transport networks. Such as, the gateway network can be wireless and fixed, And this can be done based on different fashions about transportation and The media.

The transport layer captures concerns about transport between individual nodes (points). The system that comes to connect the gateway network:

- It connects physical elements that are absorbed individual level.
- It enables various modes of transportation Exchange, media (characters, interactive data, real-time video, the voice in formation, etc.)
- Accountable to the world/institution, Control and delete the multimedia session.
- It additionally provides for asset verification, Depending on the service requirements. That is one of the basic morals of NGN Separation of control logic from switching hardware Serving grade provides essential services function, which can be used to create other responsibilities Complex and modern services e application.
- Control the progress of established services in their logic.

4.3 NGN Software-Based Architecture:

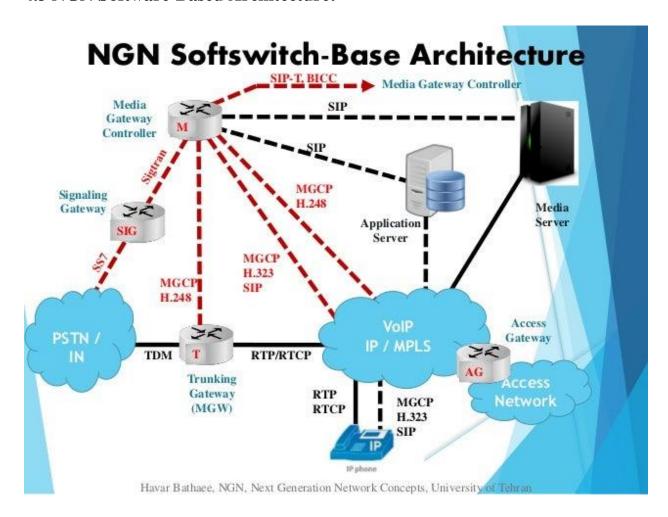


Figure 12: NGN Software-Based Architecture

Media Gateway: operating within that transport coat, executing all work related to material media Convey between different networks, media processing functions (transcoding, echo cancellation, jitter administration), stable processing and administration of information road.

Media Server: States practicality Contact between this phone and this application Using the aforementioned last device. It provides press Resource responsibilities (stable detection, speech Union and recognition, compressions, media mixing, etc.) and news check responsibilities – Manage hypermedia functions (play utter communications. Management, conference, bridge, fax, messages government, etc.)

4.4 NGN Network Architecture:

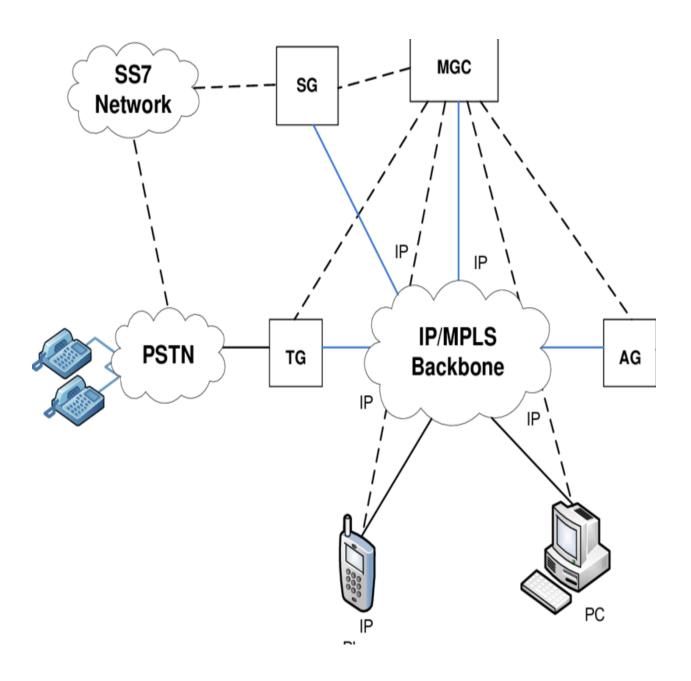


Figure 13: NGN network Architecture

- For influential services and consumers that require carrier-grade service, business continuity is crucial.
- flexibility to adjust rapidly and use existing services that are modern, which appear in real-time (the main advantage of IP mode)
- Profitability allows one to make the greatest possible return on investment—for example, employ market value you sent Survival rates from failures and external cases, license service assurance, unexpected event
- Quality of service as long as a guarantee from the service level agreement A mix of transactions, conditions, and additional burdens.
- Network redundancy for the license of finish-to-end services for flows throughout many networks' domains

CHAPTER 5

CONCULATION AND FUTUTRE CAREER

5.1 Conclusion of the conversation:

Telecommunication operations research and discovery management work are major, competitive, effective, and time-consuming. It calls for keen observation abilities, quick learning skills, better analytical skills, and more. Enjoy a positive atmosphere in this public subject from communication. Therefore, I am pleased and relieved to finish and record my internship. My success resulted from God's favor, some of my excellent academic performance at Daffodil International Institute, and the Sher-e-Bangla Exchange Switch Division's doctrine standards. My love for my friends and family is finally connected to my finest efforts and helpful job. I'll be happy to complete my internship at BTCL if I can demonstrate my sanctity and morality. The media above outreach efforts were warmly and favorably accepted. However, it was unquestionably a fantastic learning opportunity during my internship. The absence of time was another major issue. Another reason was that it was against the company's code of ethics for staff to give me more detailed information. To maintain security and trade secrets, they were cut off. Be aware that working for a media corporation requires not only commonality with farm employees but also familiarity with the technologies utilized by the organization in its online operations. Some employees can meet these requirements and have extensive training experience in the department that deals with electrical components. You were all so generous to pay me in cash. Controlling robotics systems provided helpful training. Though there were just a few, by the time I finished my internship, information technology had greatly improved my comprehension of system leadership.

5.2: Possibilities for a possible occupation My internship in Bangladesh:

Telecommunication Company Limited was excellent. It is enriching and beneficial for me as a student pursuing a bachelor of science in data Learning processors Science and Engineering Science, which empowers me to engage in innovation. When critical practical work, I Make great use of my theoretical skills. Daffodil International University, my favorite educational institution, has exceptional talent and values. My excellent trainer, who was previously stated, really assisted me in overcoming all the difficulties I encountered during my research apprenticeship. Therefore, I am grateful to my eminent teacher and Bangladesh Telecommunication Company Limited (BTCL) for providing a realistic environment to reduce my telecommunication skills. As it's a mystery, I love to observe this internship as a play transformer of My professional development points.

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media and plastic substrate interface," IEEE Transl. J. Magn. Japan, vol. 2, pp. 740–741, August 1987.

Conference/Journal Papers:

[1] Author1, Author2, and Author3, "Paper Title", Conference/Journal, Volume, page number, Month and

year.

[1] Y. Yorozu, M. Hirano, K. Oka, and Y. Tagawa, "Electron spectroscopy studies on magneto-optical

media and plastic substrate interface," IEEE Transl. J. Magn. Japan, vol. 2, pp. 740–741, August 1987.

Books:

[2] Author, Book Title, Edition/Volume, Publisher, Year, Page number

[2] T. H. Cormen, C. E. Leiserson, R. L. Rivest, C. Stein, Introduction to Algorithms, 3 rd Edition, The MIT

Press, 2009, pp. 120-122.

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