

**“COMPUTER NETWORKING & SECURITY OPERATION CENTER (SOC)” IN
DHAKA BANK LTD**

BY

**AHSAN HABIB
ID: 191-15-12814**

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

Supervised By

Professor Dr. Touhid Bhuiyan
Professor & Head
Department of CSE
Daffodil International University

Co-Supervised By

Ms. Moushumi Zaman Bonny
Assistant Professor
Department of CSE
Daffodil International University



DAFFODIL INTERNATIONAL UNIVERSITY

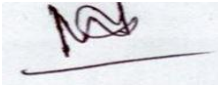
DHAKA, BANGLADESH

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APPROVAL

This Internship titled “**COMPUTER NETWORKING & SECURITY OPERATION SYSTEM (SOC)**”, submitted by Ahsan Habib 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 2nd January 2022.

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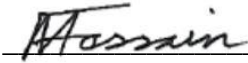


Dr. Md. Ismail Jabiullah

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Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Chairman

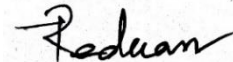


Dr. Md. Fokhray Hossain

Professor

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner



Md. Reduanul Haque

Assistant Professor

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner



Dr. Mohammad Shorif Uddin

Professor

Department of Computer Science and Engineering
Jahangirnagar University

External Examiner

DECLARATION

I hereby declare that this report has been done by me under the supervision of **Dr. Touhid Bhuiyan, Professor & Head, Department of CSE** Daffodil International University. I also declare that neither this report nor any part of this report has been submitted elsewhere for the award of any degree or diploma.

Supervised by:



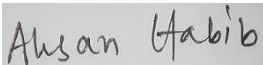
Dr. Touhid Bhuiyan
Professor & Head
Department of CSE
Daffodil International University

Co-Supervised by:



Ms. Moushumi Zaman Bonny
Assistant Professor
Department of CSE
Daffodil International University

Submitted by:



Ahsan Habib
ID: 191-15-12818
Department of CSE
Daffodil International University

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Finally, I must acknowledge with due respect the constant support and patients of my parents.

ABSTRACT

My project is “Computer networking and Security operation system (SOC) for DHAKA BANK LTD.” Including network security of a bank or any organization. I was building a network prototype of a bank in cisco packet tracer and configuring this system and I also analysis the types of attack in each of the layers of the ISO OSI model and I manage the network or security management software of a bank. I was designing a system of a bank in cisco packet tracer. Including router, switch telephone service, mail server, DNS server, CBS server, Wi-Fi router layer 3 switches, google server, ISP server for internet, ISP connection for data server for data connectivity for one branch to another branch, Wi-Fi cellphone for administrator and firewall for Network security. This management software is used for authorization person. If any unauthorized person sends malware or threat to detect to this software. We know that an organization has many systems. Every system needs security for the violation of the unauthorized person. Every portion has used a different type of software. I am used much software now I am describing the name of the software and describing the purpose use. At first, WAZU is the agent service monitoring software, CISCO Power IPS are the detection of malware, man-in-the-middle attack and many other attacks monitoring, Barracuda Networks it is used for Email Security, Manage Engine it is monitor the all application and server condition, McAfee it is used for end-to-end security, SQUID it is used for Internet uses User Monitoring, etc.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

In the modern era, computer networks play a vital role. Once upon a time, we cannot think about the computer that it was the device it works very firstly device, its calculate very easily, storage many more, and deciding a human. It worked very smoothly. In the same way, we cannot think a million data send from one end of the earth to the other in a few seconds by using a computer networking system. But now we believe that all things are true and we are connected from one end of the earth to the other. These days by day we upgraded to the new technology it is possible for the interconnects to each other by using computer networking system. Now a day, we are communicating sends the message and talk voice from one end of the earth to the other very easily. Also, we can send many more data such as pictures, data, software, etc. But all these things cannot come in one day and now day people cannot only think of devices but also have to connect to a network to get all the benefits of these modern devices. And the ISP company helps provide this service to the customers. And the human provides to pay the minimum amount of money to this service. In this modern era Data is the most important and valuable thing. Now a day's human is very hungry for collected data and communication with each other.

1.2 Motivation

We are living in the modern era. We can't imagine now that we can't communicate with anyone at any moment. Maximum time in our life we are communicating in online communication services. When we think about what the primary means of communication should be, we can easily understand that it is possible through networking. Because, we know that, the terms of 'network' means a group, chain or a collection of somethings that come together for communication to each other. A network is a group of related computers that exchange resources, files, data, images, etc. to each other.

The main objective of communication is data sharing. Computer networks mean by which computers are interconnected to share data and information, resource, file, remote login, printers, etc. Today the world is a global village for the adventure of the internet. Which the combination of a million computers interconnected to the each other for data and information sharing, file sharing, resource sharing, etc. the growth of the internet has been seen to be periodically improving because it provides helpful data and platforms for all categories of individuals, entrepreneur's, students, teacher, businessman, and every class of people and profession.

1.3 Internship Objective

The primary objective of the report is to meet the requirement of the Bachelor of Computer Science and Engineering program to present the knowledge and information that had achieved throughout the internship Session below the company.

Other important features are described below:

- Varied application of banking is providing to support.
- The bank and the bank staff are most of them connect to the most server.
- Assign data measures to servers consequently by exploiting QoS.
- Enable the secret password and apply it to the AAA model for authentication to access.
- Create tunneling because we used 6 ISP for data Connectivity but we want to safely transfer data to each other.
- We used 2 internet ISPs one is for internet use internal and the other is Wi-Fi connectivity.
- We use Mail Server for internal or external communication.
- We used DNS Server for an organization.
- To secure the switch port security, Mac address binding, Encrypted Password
- The project's main focus is on the Firewall to detect any unauthorized file, user, and data.

1.4 Introduction to the company

Bangladesh's economic system has been experiencing ascent given that the first '90s. Industrial accomplice degreed Agricultural development, worldwide trade, a waft of expatriate country worker's remittance, native and overseas funding in construction, communication, power, meals process, and restore companies ushered in a very prodigious generation of financial activities. Urbanization and manner change synchronic with the financial improvement created a requirement for banking merchandise and offerings to aid the new initiatives equally on productively channelize client investments. a bunch of terribly acclaimed businessmen of the us of a sorted on to understand this would possibly like and set up metropolis Bank limited inside the yr 1995.

Dhaka Bank has cherished and added into focal point the heritage and records of the capital of the People's Republic of Bangladesh and Bangladesh from Mughal outpost to stylish metropolis. Most of its presentation, publications, entire initiatives, transport channels, calendars, and cash manifestations undergo Bank's dedication to the cutting-edge attachment.

1.5 Report Layout

In this chapter one of this report, I will discuss the introduction of my internship status, motivation, and objectives. In the second chapter, I will discuss my internship's organization and their service and product, location, Mission, Vision, My position in this organization and the organizational structure. The chapter 3 I will discuss daily task activities, Networking Materials, Networking structure and Security event management software. In this chapter 4 I will discuss about Competencies and smart plan. The last chapter of chapter 5 I will discuss about conclusion.

CHAPTER 2

ORGANIZATION

2.1 Organizational Overview

Bangladesh's economic system has been experiencing an increase on the grounds that the first '90s. Industrial related Agricultural development, global trade, a drift of expatriate Asian united states worker's remittance, native partner degreed overseas funding in construction, communication, power, meals process, and restore corporations ushered in an wonderful technology of financial activities. Urbanization and mode change synchronic with the financial improvement created a requirement for banking merchandise and offerings to guide the new initiatives equally on fruitfully channelize consumer investments. a bunch of terribly acclaimed businessmen of the us of a sorted on to apprehend this would possibly like and mounted Dacca Bank limited at intervals the 12 months 1995. The financial institution used to be included as a Public Company Ld. beneath the organizations Act, 1994. The Bank started out its industrial operation on July 05, 1995, with the approved capital of Tk. 1,000 million and paid Capital of Tk. a hundred million. the modern licensed capital of the Bank is Tk. 10,000 million. The paid capital of the Bank stood at Tk. 7,223 million as of Gregorian calendar month 31, a strive of 017. the total fairness (capital and reserves) of the Bank as of Gregorian calendar month 31, 2017, stood at Tk. 15,828 million. As of December 2017, the Bank encompasses a hundred Branches at the aspect of two Moslem Banking Branches, three SME Service Centres, lvi ATMs, twenty ADMs, a strive of Offshore Banking Units, one closet companion degreed 6 Branches under Dhaka Bank Securities limited throughout the united states of america and an outsize community of correspondents all over the world. The Bank has plans to open extra Branches at intervals the days in advance to enlarge the carrier transport network.

Dhaka Bank is that the favoured special in banking for pleasant and customised services, the important latest technology, tailor-made options for commercial enterprise needs, worldwide attain in exchange AND commerce, and excessive yield on investments.

The Bank supply a full differ of banking and funding Service for personal related corporation clients backed with the aid of innovative science and a group of terribly pushed professionals. As an vital a section of our dedication to Excellence in Banking, Dacca Bank nowadays gives the complete range of volume on line banking offerings via its all Branches, ATMs, ADMs, and internet Banking Channels. Dhaka Bank has cherished and delivered into focal point the heritage and records of the capital of Bangladesh and Bangladesh from Mughal outpost to elegant metropolis. Most of its presentation, publications, whole initiatives, shipping channels, calendars, and financial manifestations endure Bank's dedication to the current attachment.

2.2 Service Of DBL:

2.2.1 Personal Banking: Among the private Sector Banks, capital Bank has already created its mark with the personal industry. This gives like “Boishakhi offer”, a strategic tie-up with the organization of imaginary creature International LTD, distributors of title merchandise of Samsung Company and “Freeze the Summer Campaign” a strategic tie-up with the company of Esquire physics Limited, distributor of SHARP/General agency electrical Appliance noticed capital of Bangladesh Bank journey pretty a low priced boom on the non-public enterprise enterprise in 2008.

2.2.2 Corporate Banking: Providing a tailor-made reply is that the essence of our corporation Banking services. Dhaka Bank presents a full range of tailor-made advisory, funding, and operational offerings to its enterprise consumer groups combining trade, treasury, investment, and transactional banking things to do in one package. whether or not or now not or no longer or no longer it' a Project Finance, Term Loan, Import or Export Deal, property demand, or ahead protect a a long way off Currency Transaction, our company Banking Managers presents you the proper solution. One will word top-class abilities and in-depth data of market tendencies in our company Banking Specialists, rapid approvals, and monetary methodology gratifying their desires – at the aspect of a enjoyable experience. we have received an inclination to have a tendency to be dedicated to serving to our clients to acquire their ambitions ANd fulfill their goals among the up ANd down cycles of business. Over the years we have developed the specific point of view and huge competencies to deepen consumer relationships and to assist them to begin on the top.

Our humans and subculture are essential hyperlinks to our effort to enhance consumer service. we have a tendency to have a tendency to are tried to confirm an identification for Dhaka Bank, designed on a subculture of self belief and patron excellence whereas growing the viable of our individuals, presenting aggressive and truthful compensation, and residing via frequent values. we have received an inclination to have a tendency to are focused on handing over the dad and mom and way of life by way of guaranteeing that we have a tendency to supply the merchandise the following:

- Empower and believe our human beings to act responsively and do the right thing.
- Promote a standard set of values that align with the bank’s value.
- Encourage property and transformation that have to be compelled to reflect our identity, image, subculture and through being socially relevant.end up a group that feels vicinity alongside in manage of overall performance and is coherent and united in representing Dhaka Bank to the most important regulative effect.

2.2.3 Islamic Banking: Islamic Banking & Finance has turn out to be nicely conventional by using folks and its fantastic has been rising internal the united states and

all people over the globe enormously. Moslem Banking & Finance has already been installed its importance inside the region of economic system caring for almost 30% of the enterprise quantity of the whole banking business. the rostrum is else standing at main reason by way of discharging its obligations include Social Responsibility (CSR). Highlight increased ethical standards, it builds a society with honest, responsible, caring & straightforward people. The dependent pool of Liability & exceptional merchandise supported by using Muslim jurisprudence Principles saves the banks from the fast-rising of non-performing sources AND ensures the nice of the qualities. Moslem banking pleasant merchandise ensures actual dealing instead than by myself cash transactions, the position of that' to shape positive excessive productivity, employment, etcetera Thus, it' been efficiently crossing the economic disaster increase out in all places the globe following the latest monetary depression. Currently, Muslim Banking & Finance is properly able to fulfill the rising demand of those who have a hobby in Riba free banking and else have to be compelled to manipulate their belongings by way of this holistic system. capital of East Pakistan Bank has been imparting Islamic Banking offerings via its a mix of (two) branches adhering to Moslem values & Integrity. Our preliminary Muslim Banking Branch, Motijheel, capital of East Pakistan used to be inaugurated on photovoltaic calendar month 02, 2003, and moreover the 2d one, Islamic Banking Branch, Muradpur, the city used to be opened on may also 22, 2004.

2.2.4 Capital Market Services: Capital Market operation without funding in treasury bills, prize bonds, and completely distinctive Government Securities characterize the funding basket of capital of Bangladesh Bank agency cost per unit reduce on financial institution deposits and authorities financial savings contraptions has contributed to an huge surge inside the inventory exchanges inside the 1/2 of 2004, that makes possibilities for the Bank in phrases of capital market operations. The Bank ought to additionally be a member of Dhaka inventory market Ltd. Capital Market Division conducts a complete exchange of tk. 2,045 million in opposition to tk. 1,164 million in 2005. Gross running have the advantage of capital market carrier division is tk. 39.80 million in opposition to tk. 5 million in 2005.

2.2.5 ATM Card Services Features: Cash withdrawal up to tk. one animal cloth per day, utility repayments T&T, Mobile phones, DESA, so on Multi-account Access, fund transfers, mini-statements, PIN exchange.

2.2.6 Credit Card Services: Dhaka bank LTD brings every day Mastercard at intervals the shortest feasible time. we've got acquired a tendency inclination to renowned that you simply actually want your card each day. that' why we've got developed approaches to make certain transport of your card in barely seven days when you practice for a very secured card; for accomplice unsecured card, it's going to be geared up in simply

ten days. Otherwise, we will furnish you with the cardboard free, the subscription rate is absolutely waived.

2.2.7 Locker Services: A purchaser may use the locker provider of capital of Bangladesh Bank LTD and then have the decision of overlaying your precious towards any unlucky incident. DBL presents safety to our locker provider as afforded to Bank' property at a very aggressive value.

2.2.8 Online Banking Services: Dhaka bank business enterprise delivered internet banking and intends to remain the lead with raised amenities thru this media. A customer can get get right of entry to to duration account information thru the internet. Transfer cash from his/her account, utility consignment payment, and more. Through on line banking services, a consumer will savings to and withdraw from his/her account command with a particular department up to a restriction of taka: 10,000.00 via any department of Dhaka Bank LTD.

2.2.9 Other Special Services:

- Student Ledger
- Home Loan
- Car Loan
- Edu Saving plan
- Kotipoti Deposit Scheme
- Lakhpoti Deposit Scheme
- Fixed Deposit Receipt
- Gift cheque
- Dhaka Bank GO
- Dhaka Bank C-solution
- Bkash
- Dhaka Bank Direct
- Tuition Fee Solution
- Bangladesh Bank App
- EZY Bank

2.3 Location

HEAD OFFICE OF DHAKA BANK

- Plot: CWS (C)-10, Bir Uttam A K Khandakar Road, Gulshan-01, Ward-19, Dhaka North City Corporation, Dhaka-1212.
Phone: +8802 5831 4424 (Hunting number),
+8802 5831 4425-31, 5831 4624-8
Fax: +8802 5831 4419
Email: info@dhakabank.com.bd
Swift: DHBLBDDH

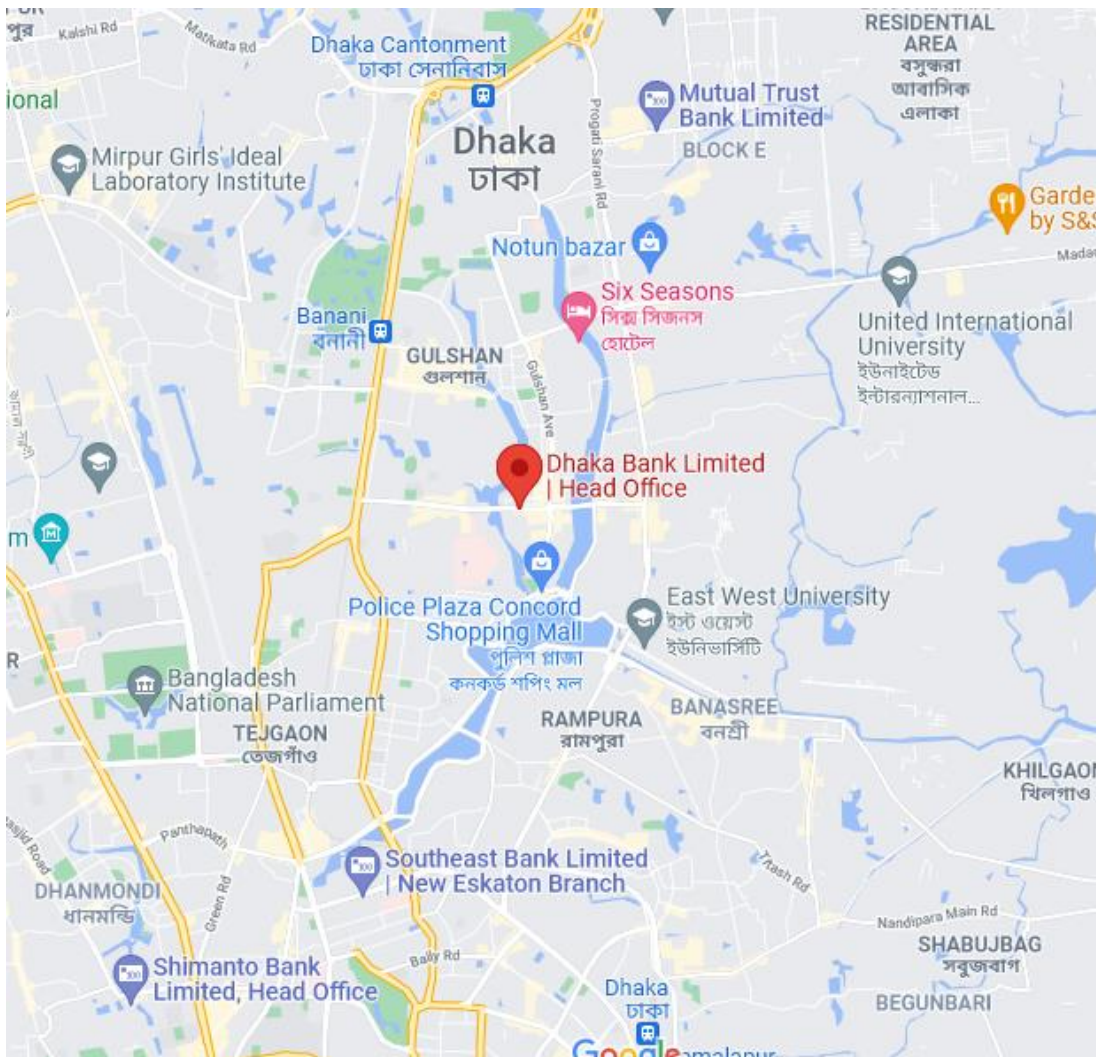


Fig 2.1: Location of Dhaka Bank Head office

2.4 The Mission: The mission is to be the premier institution interior the us of a offering superb merchandise and offerings backed by way of the most important latest technological know-how and a crew of very supposed human beings to supply excellence in Banking.

2.5 The Visions: The vision at capital Bank we have a bent to draw our concept from far-off stars. Our crew is dedicated to guarantee a day by day that produces each banking dealings an exciting experience. we have a tendency to endeavour to supply your razor-sharp sparkle thru accuracy, dependable cape well timed delivery, modern day technology, and tailor-made decision for enterprise needs, world attain in change and commerce, and excessive yield on your investment. Our people, products, and methods are aligned to fulfill the demand of our discerning customers. Our intention is to recognize a difference comparable to the luminaries at intervals the sky.

2.6 My position in this Organization: I am an intern at this organization. I am guided by a supervisor in this organization. He is very Helpful, Attractive Teaching, and informative. I learn a lot from him. He was a very interesting and mind-blowing man. I completed my project at this time. It was only possible by the guidance of my supervisor. It is also a big experience to maintain the office time for me. I also maintain the other rules of this organization. I am really happy to work with this office. It's made me prepare for the beginning of my career.

2.7 Organizational Structure

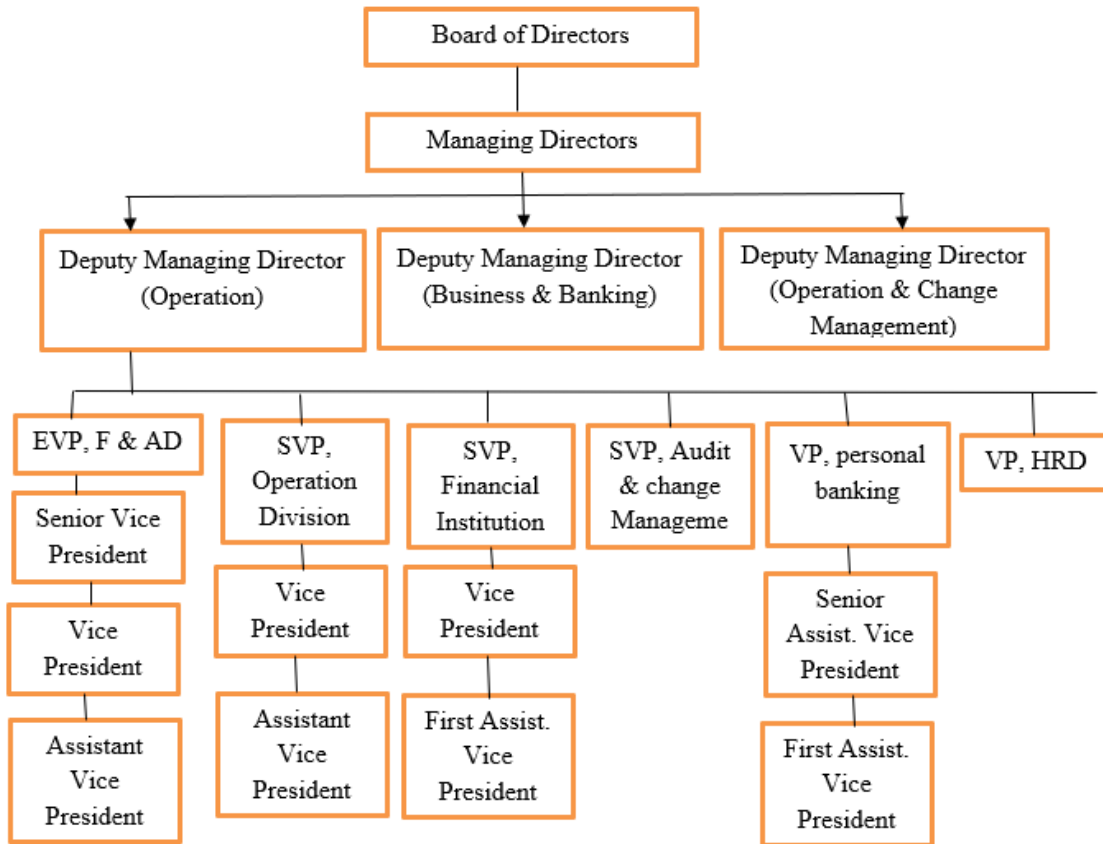


Fig 2.2: Organizational Structure

CHAPTER 3

TASK, PROJECT INTRODUCTION & ACTIVITIES

3.1 Activities

The company of a banking system. They provide many services of banking system Islamic banking, digital banking, personal banking, corporate banking, Locker service, Debit and credit card service, student leaguer, Car loan, home loan, etc. This is many large systems. This system contains web service, app service, networking, database service, etc. All media technology needs a banking system. When Imagination a banking system then we think of security and networking because without these no banking system can be developed. The banking system mainly runs on his networking system for communication to each other of the banking system. Otherwise, we know that we are saving money on the banking system. So, this money needs to be a security for everyone. Now a day, we are banking with the online service. This situation must be needed for the security of any banking system data. Otherwise, the system was gone to steal. And Money is related to this system so money has been stolen. In a banking system, there are many teams in the banking system example, networking, database, web service, security, electrical, IP phone, email service, repair section, other banking supported the team. They are providing the best system for a client. They are also providing to ensure the security of this system.

3.2 Daily Task and Activities

As an intern of the Networking and Security operation center team, my important responsibility was to understand the system and monitor the security operation system management software. They provide the necessary documentation to get the monitoring of the system. They assist me to understand all the terms and conditions of the system.

My Task was configuring Routers, switches, servers, email servers, DNS servers, IP Phone Tunnel, HSRP, Wireless Router, Wireless phone, layer 3 switches, Firewall, Broadband, etc. on cisco packet tracer. I am also involved in Security Operation Centre with particular topics.

Another responsibility was to monitor daily Security Operation Centre Management software and note all of the events. I was monitoring all security events day by day. Always also manage this software and any issue information to the Supervisor. I fix the issue of security events supported by the IT Officers.

3.3 Background Information On TCP/IP

3.3.1 The Internet Protocol (IP) Address

The internet protocol methods IP scientific discipline address is IPv4 thirty {two} bits of numbers. it's divided into two parts one could be a network address another is a host address. The name of the division is termed subnet mask. The Subnet mask we outline once (/+number) loves this IP address 192.168.1.0/24 that has the subnet mask is (/24). once we modification the subnet mask from decimals to binary numbers it'll become 11111111.11111111.11111111. 00000000. the quantity "1" s within the previous example is 24. This process is called a subnet mask as a result of the subnet mask identifies the network address on the web protocol (IP) address. The network address is containing a pair of bits one is "0" another is "1" The network bit is classification by "1" s and also the host bits are classification by "0" s. the primary Bit "0" address isn't used for the host address as a result of it's reserved for the network address and the last bit 255 is not used because it is the printed address. Below I will be able to describe Subnet. Also, i will be able to describe DHCP.

3.3.2 DHCP SERVER

DHCP (Dynamic Host Configuration Protocol) can be a community administration protocol responsive to high-power distribution a internet Protocol (IP) tackle to any device, or node, on a community for that reason they may talk victimization data science. DHCP automates and centrally manages these configurations instead than requiring community directors to manually assign records processing addresses to any or all community devices. DHCP is carried out on solely a few native networks likewise as massive corporation networks.

DHCPv4 assigns IPv4 addresses and entirely completely different network configuration information dynamically. As a results of desktop purchasers generally forming up the majority of network nodes, DHCPv4 could be a notably useful Associate in Nursing time-saving tool for network directors. The DHCPv4 server dynamically assigns, or leases, associate IPv4 address from a pool of addresses for a restricted amount of some time chosen by the server, or till the consumer doesn't want the address. purchasers lease the info from the server for an administratively made public period. directors piece DHCPv4 servers to line the leases to an outing in the least entirely completely different intervals.

3.3.3 Static IP Address Assign

The second thanks to a configuration information science address on a pc, router, and different devices or device is thru static addressing. this kind of appointed IP address is constant or static. this implies that the IP address is outlined by the Administrator. This address has ne'er modified the user. once a computer assigns a static IP address that this address is about permanently. If the pc is hopped-up off or Sleep mode that the IP address isn't offered for use.

3.3.4 Classes of IP Address

The ip address may be classified as classes. The IP address defines four octets. the primary octet defines the category of associate degree IP address. the subsequent Table Shows the vary of IP classes.

TABLE 3.1: Range of IP Address of classes

Class	Range
Class A	0-126
Class B	128-191
Class C	192-223
Class D	224-239
Class E	240-255

N.B that 127 is missing from the table as a result of that's class of variety however it's reserved for the loopback address. The loopback address is employed to check the native NIC cards. This loopback address was designed by IANA in 1981 once the utilization of information science addressing was in infancy. Unfortunately, IAN's call to order class A because the wasted loopback address is 16,777,214 on the network of 127. however the IPv6 loopback addressing wasted solely compone it is::1.

The category was determinative the amount of hosts. Flowing the table summarizes the networks and hosts for the classes:

TABLE 3.2: Public IP Addressing in each class

Class	Range		Subnets
Class A	0.0.0.0	127.0.0.0	255.0.0.0
Class B	128.0.0.0	191.0.0.0	255.255.0.0
Class C	192.0.0.0	223.0.0.0	255.255.255.0
Class D	224.0.0.0	239.0.0.0	Reserved
Class E	240.0.0.0	255.0.0.0	Reserved

TABLE 3.3: Assign the Private IP address of each class

Class	Networks	Host	Private Address Range
Class A	126	16777214	10.0.0.0 -10.255.255.255
Class B	16384	65534	172.16.0.0-172.31.255.255
Class C	2097152	254	192.168.0.0-192.168.255.255
Class D	-	-	Not Applicable
Class E	-	-	Not Applicable

Class A, B, and C addresses are ordinarily used however D and E don't seem to be commonly used. as a result of D is for multicasting (Distribution one supply to several receivers like [Cable TV] or many sources to many receivers such as [group collaboration] and therefore the class E reserved for analysis or GOVT. Use.

on top of the table, class A has few ranges of networks and an oversized number of hosts. Otherwise, category C encompasses a little number of hosts and a large number of networks. and sophistication B is that the middle of these two. Approximately, a similar number of networks and hosts.

3.3.5 Subnet Masking and/Variable Length Subnet Masking

A subnet masks is regularly a range that distinguishes the network address AND in addition the host address at intervals partner diploma science address. A subnet moreover is additionally a smaller community amongst a community that desires a subnet mask.

Subnetting is that the tactic of dividing a community into two or loads of subnets. Its main function is to shape the routing of information internal community hundreds of low-priced and secure. Subnetting additionally helps make greater use of IPv4 addresses.

once you join a device to a network, the community assigns an IP tackle to the device. That IP tackle consists of two parts: the community element AND in addition the host portion. The community element of the science tackle identifies the community whereas the host component identifies the device.

The community tackle companion degreed host tackle contained in an IP tackle are indistinguishable from one any other whereas no longer a subnet mask. The subnet masks approve community site visitors to be aware of IP addresses with the aid of splitting them into the community and host addresses.

IP The IP address is 192.168.10.0/26 subnet masking this network.

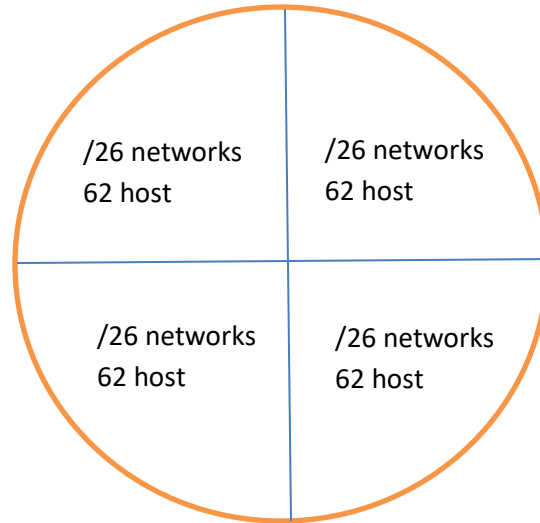


Fig 3.1: Subnet Masking Network

This is a class C address

Here, we use subnet mask = 11000000 or 192 or /26

Number of subnets = $2^2 = 4$ (Since 2 network bits)

Number of hosts per subnet = $2^6 - 2 = 64 - 2 = 62$ (Since 6 host bits)

TABLE 3.4: Subnetting

Network	Subnet Address	First Host	Last Host	Broadcast Address	Address Range
A	<u>0</u> 0000000 or 0	1	62	63	00000000-00111111 or 0-62
B	<u>01</u> 000000 or 64	65	126	127	01000000-01111111 or 64-127
C	<u>10</u> 000000 or 128	129	190	191	10000000-10111111 Or 128-191
D	<u>11</u> 000000 or 192	193	254	255	11000000-11111111 or 192-255

Here it is most important that subnet mask and VLSM is the same technique but Subnet mask is variable is fixed that means all networks are host is same also means in an IP address use the same subnet mask. But otherwise, VLSM is used in an IP address for different types of subnet masks. Example: 0, 128, 192, 224, 240, 248, 252.

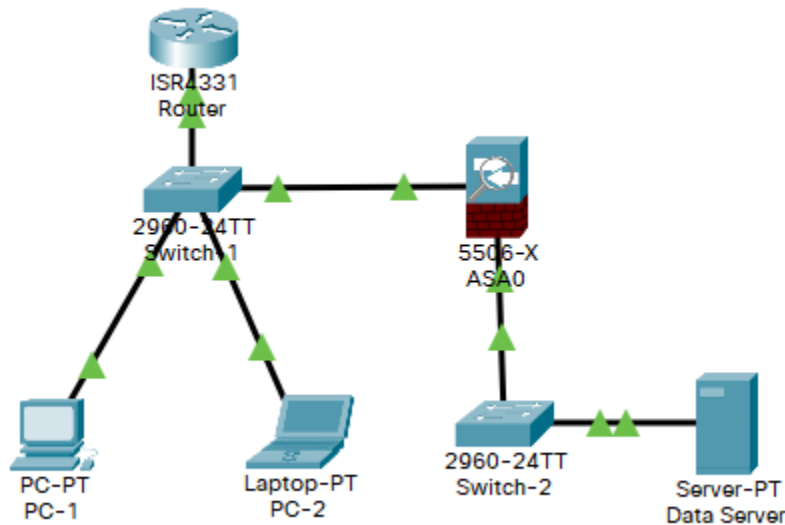


Fig: 3.2 Basic Configuration Router, Switch, PC, Server, Firewall

3.4 Implementation

Personal Computer: Personal may be a portable computer (PC) is additionally a multi-purpose computer whose size, capabilities, associated value manufacture it accomplishable for individual use. Personal computers are purported to be operated directly by an end-user, instead of by a knowledgeable or technician. not like large, pricey minicomputers and mainframes, time-sharing by many of us at an analogous time isn't used with personal computers.

Routers: A router might be a networking device that Forwards the data packets between a try of or heaps of computers. The router logically chooses the foremost effective path for transferring data packets to their destination path. A router is thinking that the officer is at a busy intersection. take into account a router as a policeman at a busy intersection. This traffic cop makes determinations on it vehicle get through; that vehicles don't seem to be permissible on the path and therefore the destination that the vehicles may take. the foremost effective quiet router for this endeavor is made by Cisco24 because of its high standards of responsibility and technical support. Since the projected network got to connect many computers to several switches, the router might be a really vital a part of the network.

Switch: A switch could be a tool that connects all totally different devices and manages node-to-node communication within a network, guaranteeing data packets reach their final destination. Whereas a router sends knowledge between networks, a switch sends info between nodes throughout one network. Once discussing personal computer networks, 'switching' refers to however data is transferred between devices in an exceedingly very network.

Firewall: A firewall could also be a network security tool that monitors incoming and outgoing network traffic and determines whether or not or not or to not enable or block definite traffic supported by an outlined assortment of security rules.

the first purpose is to vary non-threatening traffic and avoid malicious or unwanted data traffic for shielding the system from viruses and attacks. A firewall may be a cybersecurity device that filters network traffic and supports users to dam malicious packages from making Infobahn in infected computers.

Software vs Hardware Firewalls: Firewalls are commonly hardware or software. Additionally, to minimize get entry to to a blanketed system and network, a firewall will chunk all visitors returning into or effort an net and deal with far off get right of entry to to a personal community by means of tightly closed authentication certificates and logins.

Hardware firewalls: These firewalls are launched both as a standalone product for enterprise use or, masses of frequently, as companion diploma accomplice intrinsic a section of a router or different networking devices. They're considered a huge phase of any historic protection machine and community setup.

Software firewalls: These are place in on a tool or supported by a software package package or network device manufacturer. They'll be made-to-order and support a smaller level of management over functions and defensive features. it'll defend a system from customary management and access makes an effort however have a haul with plenty of refined network breaches.

Server: A server may even be a portable computer designed to technique requests associate degreed deliver information to a definite laptop over the net or a an area network. a large known reasonably servers may be an internet server wherever a web page is sometimes accessed over information superhighway through a consumer variety of an internet browser. However, there are styles of servers, in addition as local ones like file servers that store knowledge inside a computer network. different varieties are Server Mail Server and DNS server.

3.5 Routing

Network routing is that the approach of deciding on a route throughout one or in addition internetworks. The ideas of routing will follow to any shape of the internetwork, from smartphone networks to public transportation. In packet-switching networks, like the web, routing selects the methods that inside which for internet Protocol (IP) packets to tour from their starting place to their destination. These net routing preferences are created through specialised matters of community hardware referred to as routers.

Static Routing

The routing method that wishes a guide configuration is static routing. Most community directors have faith perceptive static routing. The utilization of this routing is excessive inside the locations that observe steady parameters in-network and environment.

In big difference to dynamic routing, the static routes are installed & do not amendment if the community takes place or is reconfigured. It' used on a router to maximise the routing efficiency & to produce backup if diverse data fails to be changed.

Dynamic Routing

Dynamic Routing is moreover a community routing manner that allows the routers to select partner ranges pick out the routing approaches in which all through which hopping on the community structure's logical modifications in real-time. this can be frequently contrary to the general of partner decrescent static community routing. this is regularly an automated routing approach that desires very much less administration and supervision. various protocols used during this routing methodology are Open Shortest Path first (OSPF), Routing info Protocol (RIP), Border Gateway Protocol (BGP), and inflated Interior Entrance Routing Protocol (EIGRP).

3.6 Access Control List (ACL)

A network Access control List (ACL) could be an assortment of rules that, supported explicit requirements, allow or deny access to incoming and outgoing traffic.

The requirements, for example, are perhaps obsessed with the source, destination, system, particular protocol, etc. that attempts to access the network. It will be a long job to bring on a Network Access control list. Nevertheless, it's vital for the device yet as network protection. Rather than specifying every individual user's access policy, organize the staff into positions based on their job functions. Also, once building the NAC list, use the conception of Least Privilege (POLP). POLP offers users only the levels of access they have to try and do their work.

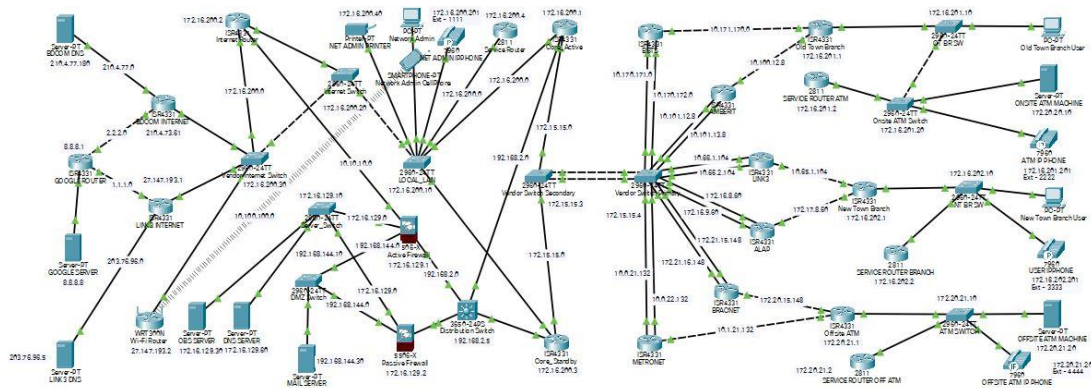


Fig 3.3: Existing Networking Prototype of Dhaka Bank LTD

3.7 Existing Network System of DHAKA BANK LTD.

Dhaka Bank limited existing network follows the 2-tier layer model that consists of two layers one in all its core layers Associate in Nursing another is an Access layer. Two-tier – layer network model is that the most popular approach to network design. Fig 4.1 shows that the present network of national capital Bank Ltd. during this layer variety of six ISP provided knowledge property to the Bank. and a number of other two ISP provided net connectivity to the bank. each ISP is taken into account because of the departing connection. These lines are connected to the CISCO core router.

3.7.1 Core Layer

This core layer has two parts. one amongst Core Active any other is Core Standby. This router conjointly connects to the six ISP for facts connectivity. If one router is damaged any other router is active. These two routers are singly connecting to the ISP. The layer consists of the biggest, quickest, and most expensive routers with the principal high-quality mannequin numbers, and Core Layer is taken into consideration as a end result of the spine of networks. Core Layer routers are accustomed merge geographically separated networks. The Core Layer routers pass records on the community as rapidly as possible. The switches operative at the core layer switches packets as rapidly as possible. The core wishes to be very available and redundant. The core aggregates the visitors from all the distribution layer devices; thus, it desires to be successful of forwarding large quantities of information quickly. issues at the core layer embody Providing a high-speed switch (fast transport)

- Providing reliable Ness and fault tolerance
- Scaling through victimization faster and no more instrumentation
- Avoid intensive processing of CPU packets due to security, inspection, quality of service (QoS) or alternative processes

3.7.2 Access Layer

The access layer consists of get entry to switches that are linked to the tip gadgets (Computers, Printers, and Servers, etc.). Access stage switches make positive that packets are delivered to end devices. The get entry to layer serves a unfold of functions, together.

- Layer-2 and 3 switches
- High connectivity
- Switch Ports Securities'
- Trusted place and securities boundaries.
- ARP Protocol Inspection
- Virtual LAN Access list

3.7.3 Network Admin Part

In this portion, the Network admin control all the network-based system. Admin lives to control the Core site and virtually connect the other branch inside or outside. Admin also controls the Firewall. Finally, we say that the Network admin control all the system of these networks.

3.7.4 ISP Part

The banks need to help the ISP because of data connectivity and Internet Service. The Bank has no ISP server. The Bank used the data passing helped by ISP. The Bank also used the internet service from the ISP. Here used 6 ISPs for Data Connectivity and 2 ISPs used for internet Service.

3.7.5 Outside Branch Part

The bank has many branches outside of the head office. So need connectivity for data passing. In this portion, the Bank server connects to the outside server by using ISP data connectivity. The Outside branch is connected to the main branch by using the ISP data connectivity medium.

3.7.6 Server Part

The server is one of the computers. Its serves to connect all computers and networks. Here used many server examples as Mail Server, DNS Server, CBS server, Google server, Internet Broadband server, etc. The server mainly services his client's Computer.

3.7.7 Firewall Part

Firewall mainly detects data of harmful for this system. The firewall utilizes incoming traffic based on pre-established rules. Also, check the data coming source authentic or unauthorized data to detect prevent attacks. Firewall guard traffic from the entry of the system. It detects and checks the data send user port.

3.8 Existing Network Structure working Procedure

In the system, the existing networking connectivity model of Dhaka bank Ltd. In this networking prototype, I want to try to show the core networking part of Dhaka Bank. In this model, there have two Core routers one is Core Active and another is Core standby. It means at a time if one router has been damaged another router is automatically active. It is the main reason for setting up the system that doesn't idle any time. The core router connects a LOCAL Lan Switch. Then the networking system monitoring upgrading, analysis, controlling, and modification needs. So here is the creation portion of networking administration. This portion network engineer always takes care of this network. In a bank need to use the internet so I can set up an internet switch and internet router This Internet switch and Internet router also connect a vendor switch. The Vendor switch connects to the internet service provider router. The internet service provider router connects to the Google server. Every internet service provider connects to his server. The Core router also connects a layer 3 switch the layer 3 switch connects the firewall connects to the DMZ switch and server switch these switches connect the firewall to the CBS server, DNS Server, and the mail server. The firewall protects all unsecured data and unauthorized persons. If the outside of the core part wants to send or receive data must be faced on the firewall. This network prototype's main focus is on the Firewall to ensure network security. These networks another part is the outside data connectivity from the main branch. The two Core Router connect to a vendor secondary switch. The vendor secondary switch connects a vendor primary switch by ether channel. The vendor primary switch connects the ISP for data Connectivity. All core router connects the ISP for each cable to data connectivity. Here the Core Active and Core Standby connect to each ISP by his cable. Here, Routing the path to each other core Router. These ISP routers also connect to the other branch router. These other branch routers connect to the core router by tunneling. Tunneling is a data send process only source and destination know this but ISP don't know about this data. All branch routers connected their other device, ATM, and other service router and Telephone. The office system communicates to each other By telephone. This Vendor internet switch also connects a wireless router. This wireless router services the internet for all in a bank. The wireless router also connects to a wireless phone these wireless phones used Network admin. This system also creates the access-list access-list defines that who is accessible and who isn't access. This is the existing system of Dhaka Bank Ltd.

3.9 Network Layer Based Cyber Attack

OSI model would possibly be a reference mannequin to apprehend the thanks to talk and function pc networks. sample this ISO standard, Organizations will apprehend the place community vulnerabilities should exist with their network infrastructure and observe it to manipulate their device Properly. OSI is that the stratified mannequin that helps

appreciation on the other hand packets fashion the community and consequently the manner assaults and may disrupt can appear at any level.

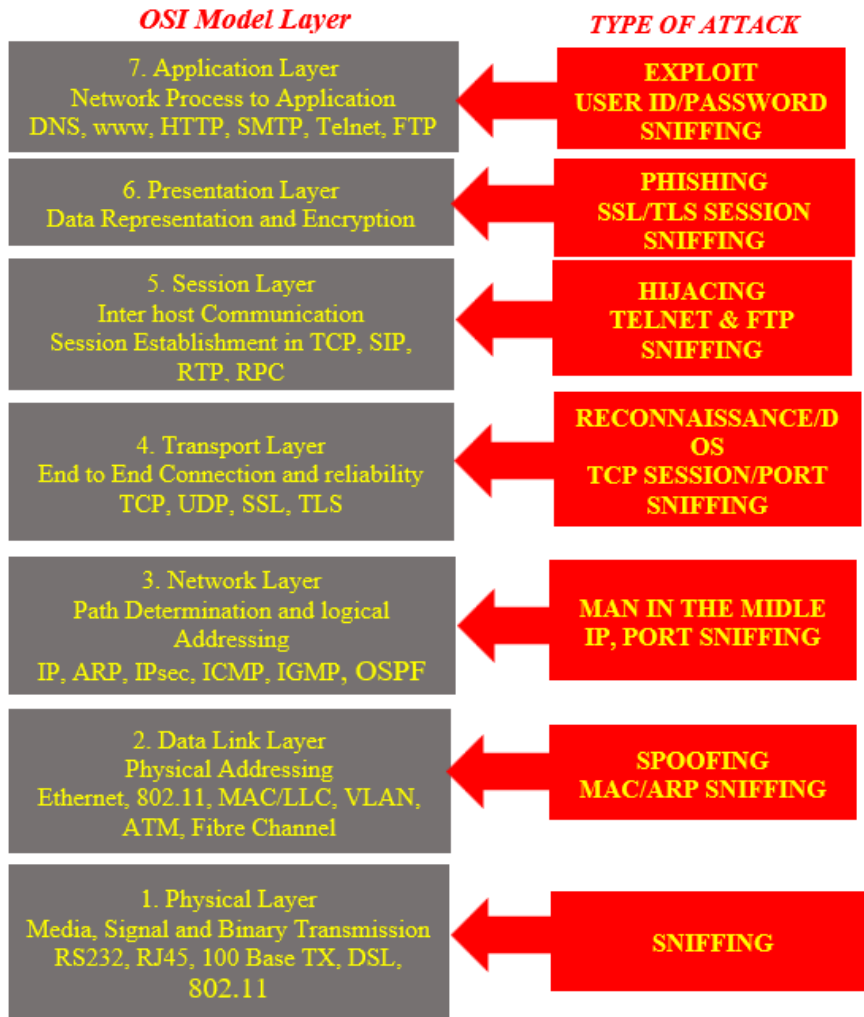


Fig 3.4: Layer Based Protocol and attack type

The below table listed the OSI layer-supported protocols network vulnerabilities related to the various layer.

TABLE 3.5: Layer Based protocol, example & impact attack

LAYER	PROTOCOL DATA UNIT	DESCRIPTION	PROTOCOL SUPPORTED	EXAMPLE OF ATTACK	IMPACT OF ATTACK
Application	Data	End-user Protocol	FTP, HTTP, POP3 and SMTP	HTTP GET & HTTP POST	During an Attack, No access user to a network resource.
Presentation	Data	Encrypt and Decrypt data format at both ends.	Protocols Compression & Encryption	An attacker uses SSL to tunnel HTTP attacks to target the server.	Affected systems stop accepting SSL connections or automatically restart
Session	Data	Establishment termination and sync of session	PAP, NetBIOS, L2TP, L2F, PPTP, RPC	Telnet DDoS Attacker	Disable Management operations.
Transport	Segment	Error-free and reliable transmission between host	TCP & UDP	SYN flood, Smurf Attack	Connection limit of hosts
Network	Packet	Routing and switching information to different network	IP, ICMP, ARP, AND routing protocol	Layer 3 infrastructure DDoS attack	Effect on network bandwidth and impose extra load on the firewall
Data Link	Frame	Handles how the transfer is accomplished over the physical layer	ATM, CDP, Ethernet, FDDI, Frame Relay, HDLC, IEEE 802, IEEE 802.11, PPP, MPLS, UDLD	MAC flooding	Disrupts the sender to receiver flow of data flooding across all ports.
Physical	Bit	Limited to cables, jacks, & RJ-45 Jacks.	100 Base-T & 1000 base-X, Hubs, Patch panels & RJ45 Jacks	Alter Data bits	Data Destroyed

Why we need security at OSI Model at each Layer:

- The community requires safety from attackers, and hackers protect the confidentiality, integrity and comfort of data.
- Network Security consists of two fundamentals i.e., facts & laptop Security.

- Required firewall for safeguarding systems.

Top Network Security threats or Vulnerabilities:

- Privilege Escalation
- Worm
- Virus
- Trojan Horses
- Spyware
- Spam
- Botnet
- Logic Bomb

Top Five common Breaches of Data in cyber-Security:

- Social Engineering
- Unauthorized Access
- Spyware
- Malicious Insiders
- Ransomware

Layer 1: Physical Layer Security

Layer one refers to the bodily issue of networking profession it equal the service, specifically ensuing in Denial-of-Service (DoS) Attacks. Network threats that appear at this stage are following:

➤ **Access Control:**

- Permits solely approved person.
- Physical security protects against unauthorized persons.
- limiting access to servers, used critically.

➤ **Damage Data Bits.**

➤ **Environmental issues.**

- Fire, smoke and water hit the physical layer.
- Less management over environmental factors i.e., temperature, dust, humidity, and ventilation.

➤ **Disconnection of physical Links.**

➤ **Backup.**

Layer 2: Data Link Layer Security (Switch Security)

Layer a attempt of the OSI mannequin is that the circuit layer and centered on the methods of handing over the frame. Normally, this consists of change making use of protocols similar to the Spanning tree protocol (STP) and moreover the Dynamic

Host Configuration Protocol (DHCP). Switch supplying LAN property and additionally the majority of threats come again from inside LAN-ARPs/ARP

Spoofting

- ARP spoofing ambitions to the reprobate change to forwarding packet to absolutely a number of VLAN
- Security tournament Vulnerabilities take place the decrease degree of the Open Systems Interconnection mannequin then again affected the greater level.
- To forestall these attacks, the configuration is performed to ignore idle creative persons.
- Personal VLAN differentiation and creative person read to mitigate the identify threat.
- **Mac Flooding**
 - It attacks on the networking switch.
 - It's occurred once the waterproof table of the switch reaches it' capability then flood.
 - Malicious users will sniff the floods traffic to assemble network-sensitive information.
 - Confirm the protection of the switch.
 - Authenticate with AAA Server.
- **Spanning Tree Attack**
 - Occurs as soon as partner awful individual inserts itself into an records circulation and motives a DoS attack.
 - STP assault starts with a bodily assault by means of a malicious person who inserts an unauthorized switch. culprit assigns a decrease root priority. distribution the decrease root precedence motives the community affiliation between a pair of switches to be dropped. The assailant's change thereby turns into the premise switch, and conjointly the attacker receives full administration of statistics transmitted between all switches.
 - How of mitigating this draw returned is configuring a network' root change with Root precedence = zero
- **Private VLAN Attack.**
- **Multicast brute force attack.**
- **Random frame stress attack.**

Layer 3: Network Layer Security (Router Security)

Layer three of the OSI mannequin is Network Layer, that makes use of a couple of frequent protocols to function routing on the network. Network layer protocol assaults embody the on line Protocol (IP), packet-sniffing, and DoS assaults i.e., ICMP Attacks or ping of death.

These sorts of assaults is carried out remotely. to chop lower back the risk of these kinds of attacks, packet filtering controls have to be compelled to be used.

- **IP addressing spoofing**
- **Routing attacks**
- **Back hole / selective forwarding**
- **IP Addressing Spoofing.**
 - Scientific self-discipline addressing spoofing is in addition noted as science tackle forgery or range hijack. this would possibly be mitigated by way of deploying packet filtering to seem at inconsistencies.
- **Back Hole**
 - In this assault malicious node pretends kind of a popular node and ahead packet however selectively drops some packets.
 - A malicious node acts kind of a black hole, it discards all the packets passing thru it.

Layer 4: Transport Layer Security

OSI model layer 4 is Transport Layer and makes use of transport protocol to trade community communication. This layer includes the Transport administration Protocol (TCP) and person datagram protocol (UDP). Port Scanning is additionally a approach to discover susceptible or open community ports.

- **SYN Flood**
 - Also referred to as a half-open assault or transmission manipulate protocol synchronize flood.
 - It consists of a DDoS assault on the server.
 - The assault entails having a client over and over ship SYN (synchronization) packet to each and every port on a server, sample idle scientific self-discipline addresses to make it over bump off and unresponsive.
 - Exploit TCP many-sided acknowledgment.
- **Smurf Attack:**
 - A smurf assault should be a DoS assault inside which a machine is flooded with spoofed ping messages.
 - The attacker generates hundreds of thousands of ICMP packets with the goal victim's IP tackle and proclaims these packets. As a result, the essential system in the community responds.

Layer 5: Session Layer Security

- **Session Hijacking**

- Security assault on a person session. A session hijacking assault works as soon as it compromises the token via guessing what the authentic Associate in Nursing token session might also be, then exploits unauthorized get entry to to the net server.
- **MITM Attack**
- Common approaches in which of session Hijacking are packet sniffers and cross-site Scripting (XSS attack).

Layer 6: Presentation Layer Security

- **SSL Hijacking**
- Super fish makes use of a way mentioned as SSL hijacking to result in users' encrypted data. as soon as the internet browser connects to the machine-readable textual content switch protocol (insecure) site, the HTTP server redirects to the HTTPS (Secure) version. HTTPS server gives a certificate, this certificate presents AN identification to the person to urge in and get admission to the server. The affiliation is achieved at present.

Layer 7: Physical Layer Security

There Are different attacks on the application layer and some of them are: -

- **Virus**
- **Worm**
- **Phishing**
- **Key logger**
- **Backdoors**
- **Program Logic Flow**
- **Bugs**
- **Trojan Horse**

Conclusion

OSI model is high to appreciation however networks talk from the wire via to the application. this textual content has temporarily tested the OSI model, additionally due to the fact the protocols and assaults that are used at every layer.

3.10 Security Operation System

A Security Operation Center (SOC) is moreover centralized function at intervals an enterprise victimization people, processes, AND science to without end reveal partner degreed enhance an organization' safety posture whereas preventing, detecting, analyzing, and responding to cybersecurity incidents.

A SOC acts variety of like the hub or central command post, taking in measuring from throughout an organization' IT infrastructure, in addition as its networks, devices, appliances, and facts stores, the place these belongings reside. The proliferation of superior threats locations a top rate on aggregation context from a variety of sources. Essentially, the SOC is that the correlation reason for every match logged amongst the employer that' being monitored. for each one amongst these events, the SOC received to figure out then again they're progressing to be managed and acted upon.

3.10.1 How many modules are there in SOC Lab?

- WAZUH
- CISCO POWER IPS
- McAfee
- SQUID
- QUALYS
- BARRACUDA NETWORKS
- MANAGE ENGINE

WAZUH (SEIM/FIM)

WAZUH may well be a free, open-source, and enterprise-ready security observance resolution for threat detection, integrity observation, incident response, and compliance. WAZUH may be a module computer code its monitors all the events of the system monitoring system. All security event shows during this module. it's one among the simplest monitoring systems for the protection Operation Center (SOC).

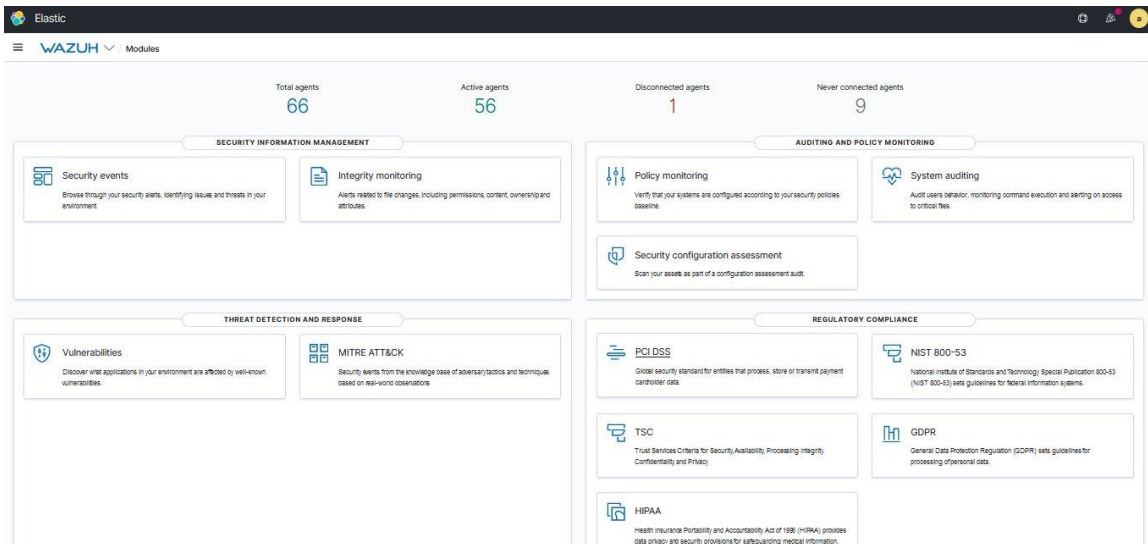


Fig 3.5: WAZUH 1

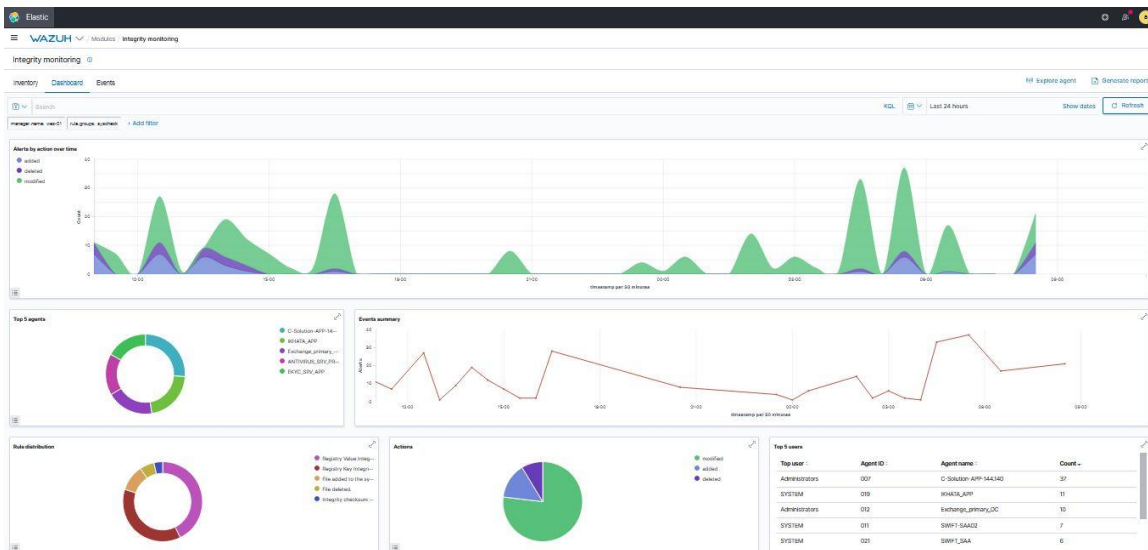


Fig 3.6: WAZUH 2

CISCO POWER IPS

Cisco intrusion detection systems (IDS) and intrusion interference systems (IPS) are many systems used as a vicinity of a defense-in-depth approach to protective the network against malicious traffic. Cisco power informaticsS is one in all the observation systems. It's Monitor the cybercriminal what percentage makes an attempt to access the system. Its collected information from Firewall. what percentage attempts produce to access the system shown during this software. Also, show a supply IP address and destination IP address.

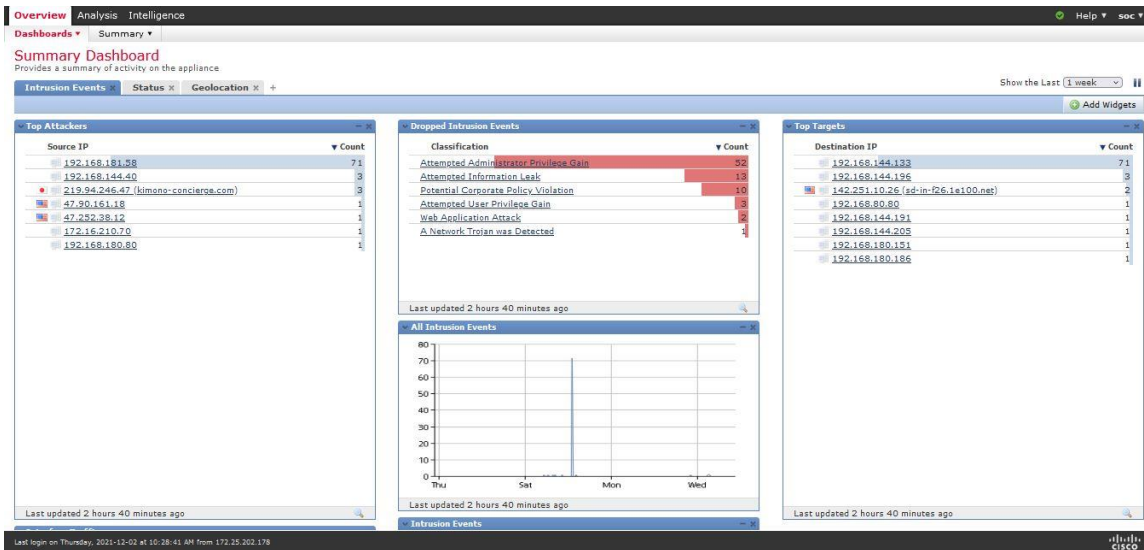


Fig 3.7: CISCO POWER IPS 1

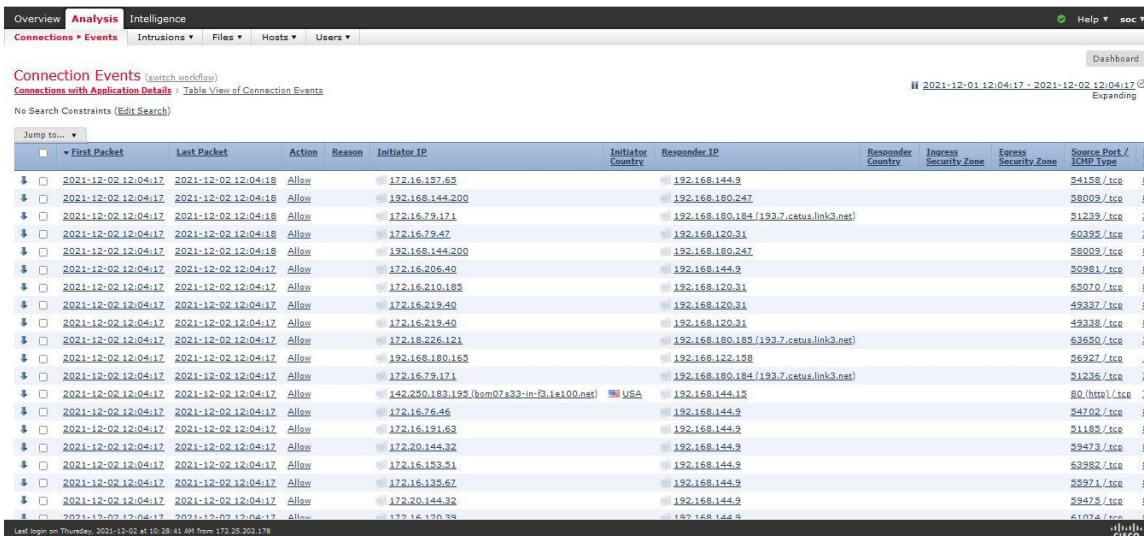


Fig 3.8: CISCO POWER IPS 2

McAfee

McAfee is taken into account in every of the most effective antivirus tools by security consultants and users alike. it's wonderful malware detection rates, a lot of additional options sort of a password manager and a VPN, and useful client support. Also, it's very easy to line up and use.

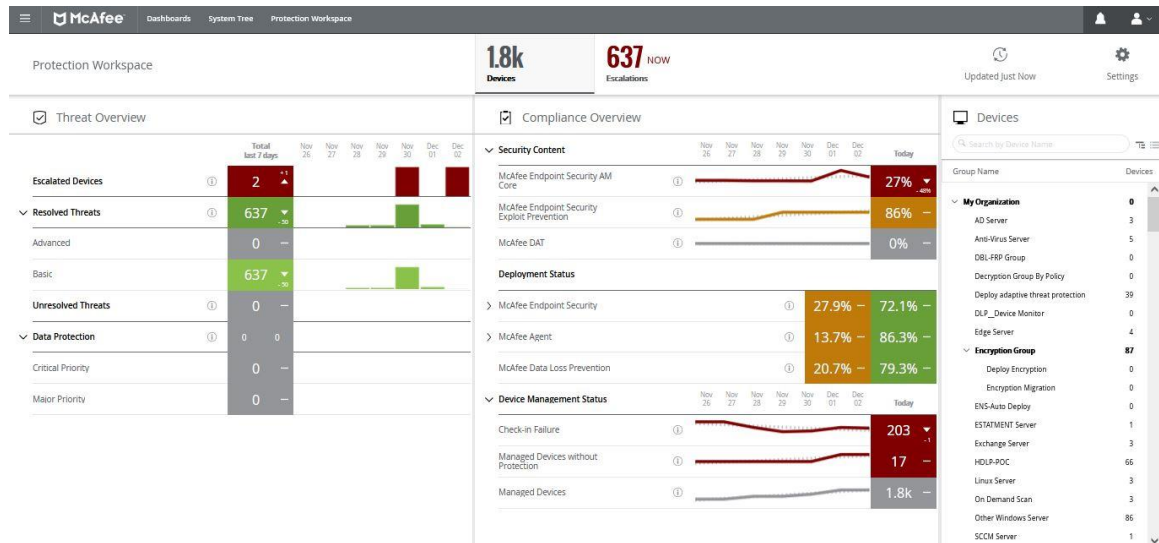


Fig 3.9: McAfee 1

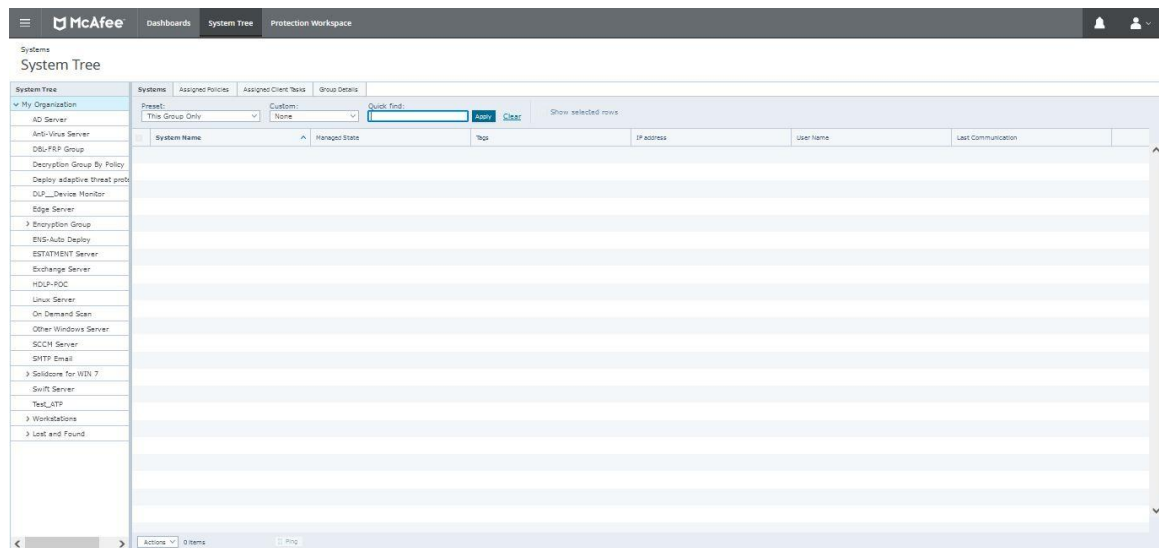


Fig 3.10: McAfee 2

SQUID:

SQUID is a proxy server. It can show the user's internet access report. Squid is a full-featured web cache proxy server. That provides the cache of HTTP, FTP, and the others Networking protocols. Squid also secured SSL, DNS requests, and caching lookups, also perform transparent caching. Also caching ICP, HTCP, CARP, and WCCP.



DHAKA BANK INTERNET USER ACCESS REPORTS

FILE/PERIOD	CREATION DATE	USERS	BYTES	AVERAGE
28Nov2021-02Dec2021	Thu 02 Dec 2021 06:09:52 AM +06	1239	210.36G	169.78M
28Nov2021-01Dec2021	Wed 01 Dec 2021 06:09:50 PM +06	1239	203.40G	164.17M
28Nov2021-30Nov2021	Tue 30 Nov 2021 06:07:11 PM +06	1223	140.25G	114.67M
28Nov2021-29Nov2021	Mon 29 Nov 2021 06:04:43 PM +06	1199	95.84G	79.93M
28Nov2021-28Nov2021	Sun 28 Nov 2021 06:01:52 PM +06	1119	42.51G	37.99M
21Nov2021-28Nov2021	Sun 28 Nov 2021 12:14:16 AM +06	1242	277.87G	223.73M
21Nov2021-27Nov2021	Sat 27 Nov 2021 06:14:02 PM +06	1242	277.51G	223.44M
21Nov2021-26Nov2021	Fri 26 Nov 2021 06:13:57 PM +06	1242	275.28G	221.64M
21Nov2021-25Nov2021	Thu 25 Nov 2021 06:13:21 PM +06	1242	267.73G	215.56M
21Nov2021-24Nov2021	Wed 24 Nov 2021 06:09:11 PM +06	1229	208.53G	169.67M
21Nov2021-23Nov2021	Tue 23 Nov 2021 06:06:47 PM +06	1209	163.42G	135.17M
21Nov2021-22Nov2021	Mon 22 Nov 2021 06:04:16 PM +06	1176	108.78G	92.50M
21Nov2021-21Nov2021	Sun 21 Nov 2021 06:01:59 PM +06	1100	46.38G	42.17M
14Nov2021-21Nov2021	Sun 21 Nov 2021 12:22:36 AM +06	1238	291.29G	235.29M
14Nov2021-20Nov2021	Sat 20 Nov 2021 06:22:33 PM +06	1238	290.84G	234.93M
14Nov2021-19Nov2021	Fri 19 Nov 2021 06:22:28 PM +06	1238	288.12G	232.73M
14Nov2021-18Nov2021	Thu 18 Nov 2021 06:24:23 PM +06	1238	281.41G	227.31M
14Nov2021-17Nov2021	Wed 17 Nov 2021 06:13:21 PM +06	1216	201.57G	165.77M
14Nov2021-16Nov2021	Tue 16 Nov 2021 06:10:21 PM +06	1194	147.18G	123.27M
14Nov2021-15Nov2021	Mon 15 Nov 2021 06:07:26 PM +06	1158	103.24G	89.15M
14Nov2021-14Nov2021	Sun 14 Nov 2021 06:03:50 PM +06	1083	47.31G	43.68M
07Nov2021-14Nov2021	Sun 14 Nov 2021 12:12:56 AM +06	1222	288.76G	236.30M
07Nov2021-13Nov2021	Sat 13 Nov 2021 06:13:17 PM +06	1222	288.48G	236.07M
07Nov2021-12Nov2021	Fri 12 Nov 2021 06:12:48 PM +06	1222	286.62G	234.55M
07Nov2021-11Nov2021	Thu 11 Nov 2021 06:12:55 PM +06	1222	280.52G	229.56M
07Nov2021-10Nov2021	Wed 10 Nov 2021 06:10:19 PM +06	1212	228.25G	188.32M
07Nov2021-09Nov2021	Tue 09 Nov 2021 06:07:05 PM +06	1200	159.04G	132.54M
07Nov2021-08Nov2021	Mon 08 Nov 2021 06:04:18 PM +06	1179	113.43G	96.21M
07Nov2021-07Nov2021	Sun 07 Nov 2021 06:02:03 PM +06	1119	59.33G	53.02M
31Oct2021-07Nov2021	Sun 07 Nov 2021 12:12:27 AM +06	1244	294.95G	237.09M
31Oct2021-06Nov2021	Sat 06 Nov 2021 06:12:35 PM +06	1244	294.53G	236.76M
31Oct2021-05Nov2021	Fri 05 Nov 2021 06:12:35 PM +06	1244	292.83G	235.39M
31Oct2021-04Nov2021	Thu 04 Nov 2021 06:12:10 PM +06	1244	286.45G	230.26M
31Oct2021-03Nov2021	Wed 03 Nov 2021 06:09:48 PM +06	1229	232.62G	189.28M

Fig 3.11: SQUID 1

DHAKA BANK INTERNET USER ACCESS REPORTS

Period: 28 Nov 2021–02 Dec 2021

Sort: bytes, reverse

Top users

Top sites

Sites & Users

Downloads

Denied accesses

NUM		USERID	CONNECT	BYTES	%BYTES	IN-CACHE-OUT	ELAPSED TIME	MILLISEC	%TIME
1		172.25.200.99	40.32K	6.19G	2.95%	99.70% 0.30%	337:07:58	1,213,678,140	0.73%
2		172.25.200.66	48.44K	5.33G	2.53%	99.19% 0.81%	1145:10:49	4,122,649,145	2.49%
3		172.25.200.132	19.15K	5.17G	2.46%	99.83% 0.17%	222:14:26	800,066,508	0.48%
4		172.25.202.114	12.94K	4.91G	2.34%	99.76% 0.24%	185:43:56	668,636,249	0.40%
5		172.25.200.149	43.58K	4.86G	2.31%	98.58% 1.42%	1603:15:20	5,771,720,246	3.49%
6		172.16.149.101	56.57K	4.59G	2.18%	3.76% 96.24%	62:31:01	225,061,139	0.14%
7		172.16.150.109	37.24K	4.55G	2.17%	2.95% 97.05%	57:31:37	207,097,281	0.13%
8		172.16.79.52	31.73K	4.43G	2.11%	5.57% 94.43%	80:26:40	289,600,202	0.18%
9		172.16.203.57	49.15K	4.38G	2.09%	2.70% 97.30%	39:41:37	142,897,684	0.09%
10		172.16.153.201	32.14K	3.98G	1.89%	53.28% 46.72%	237:05:36	853,536,470	0.52%
11		172.20.144.161	5.50K	3.09G	1.47%	5.86% 94.14%	18:20:35	66,035,993	0.04%
12		172.16.130.224	32.37K	3.00G	1.43%	2.87% 97.13%	65:35:39	236,139,510	0.14%
13		172.25.202.158	14.50K	2.84G	1.35%	99.97% 0.03%	272:45:31	981,931,034	0.59%
14		172.25.202.120	28.67K	2.84G	1.35%	99.14% 0.86%	437:39:25	1,575,565,238	0.95%
15		172.16.193.102	8.70K	2.78G	1.32%	5.77% 94.23%	74:54:11	269,651,664	0.16%
16		172.25.202.150	19.88K	2.67G	1.27%	99.47% 0.53%	322:33:17	1,161,197,943	0.70%
17		172.25.202.226	6.09K	2.31G	1.10%	96.14% 3.86%	165:54:17	597,257,952	0.36%
18		172.25.200.147	36.30K	2.20G	1.05%	99.25% 0.75%	569:35:38	2,050,538,639	1.24%
19		172.16.153.200	19.92K	2.03G	0.97%	44.51% 55.49%	274:32:18	988,338,360	0.60%
20		172.16.210.138	4.24K	1.99G	0.95%	2.87% 97.13%	34:21:09	123,669,112	0.07%
21		172.25.202.128	17.56K	1.83G	0.87%	97.44% 2.56%	315:43:53	1,136,633,586	0.69%
22		172.16.95.201	9.43K	1.60G	0.76%	99.96% 0.04%	292:31:06	1,053,066,078	0.64%
23		172.25.200.130	34.98K	1.51G	0.72%	98.99% 1.01%	64:35:36	232,536,298	0.14%
24		172.25.202.104	6.52K	1.48G	0.70%	99.94% 0.06%	210:18:25	757,105,783	0.46%

Fig 3.12: SQUID 2

QUALYS

QUALYS is network management software. It identifies all known and unknown assets on hybrid-IT-- endpoints, clouds, containers, mobile, OT, and IoT—for a complete, categories inventory, enriched with details similar to merchant lifecycle info and far more.

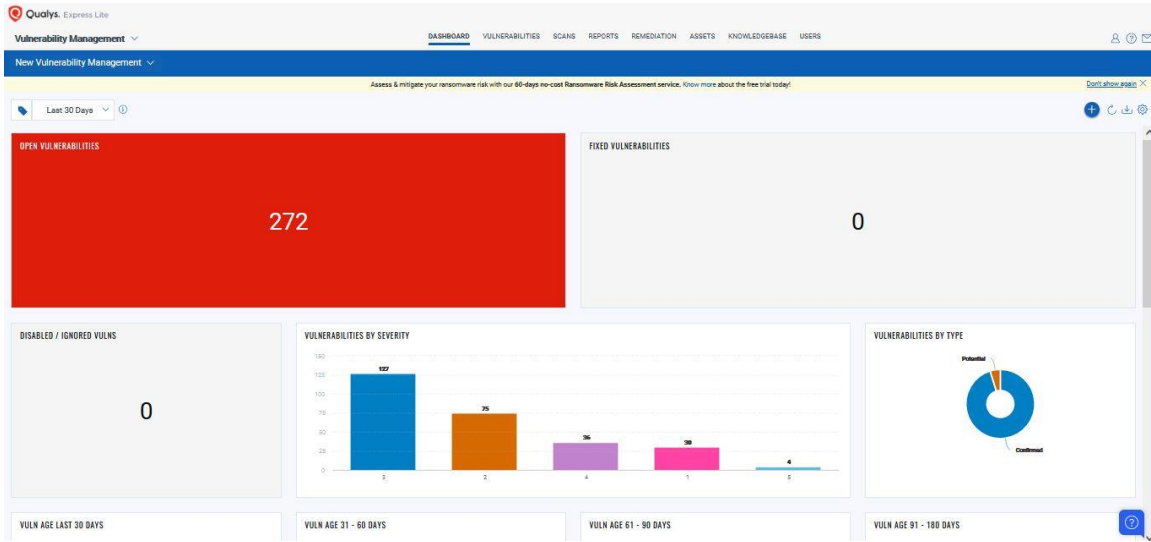


Fig 3.13: QUALYS 1

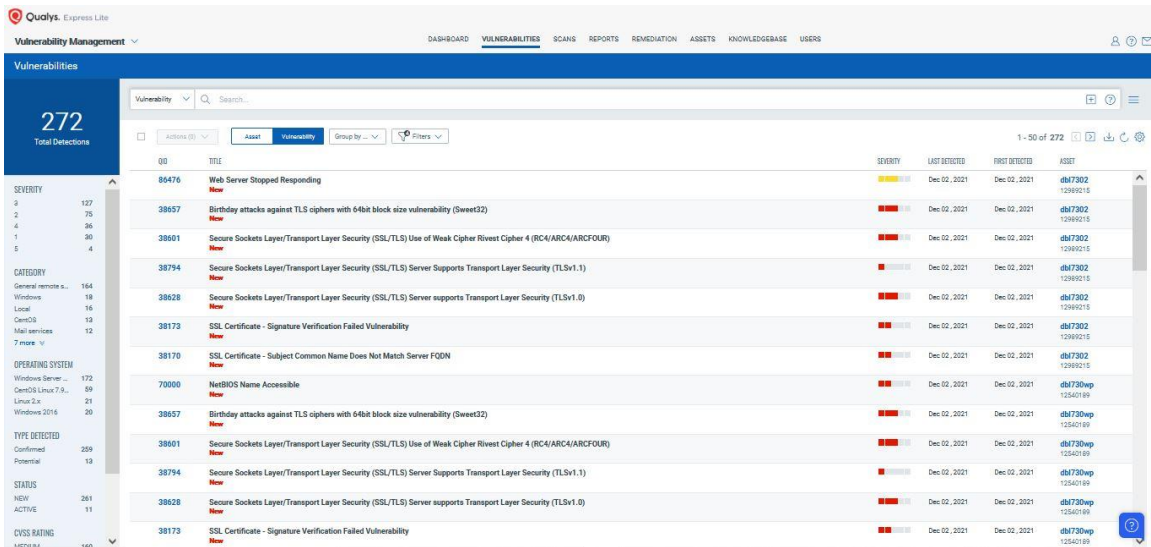


Fig 3.14: QUALYS 2

Barracuda Networks

Barracuda network is a World-Famous email security protection. It also provides APP and cloud security, Network Security, and Data Protection.

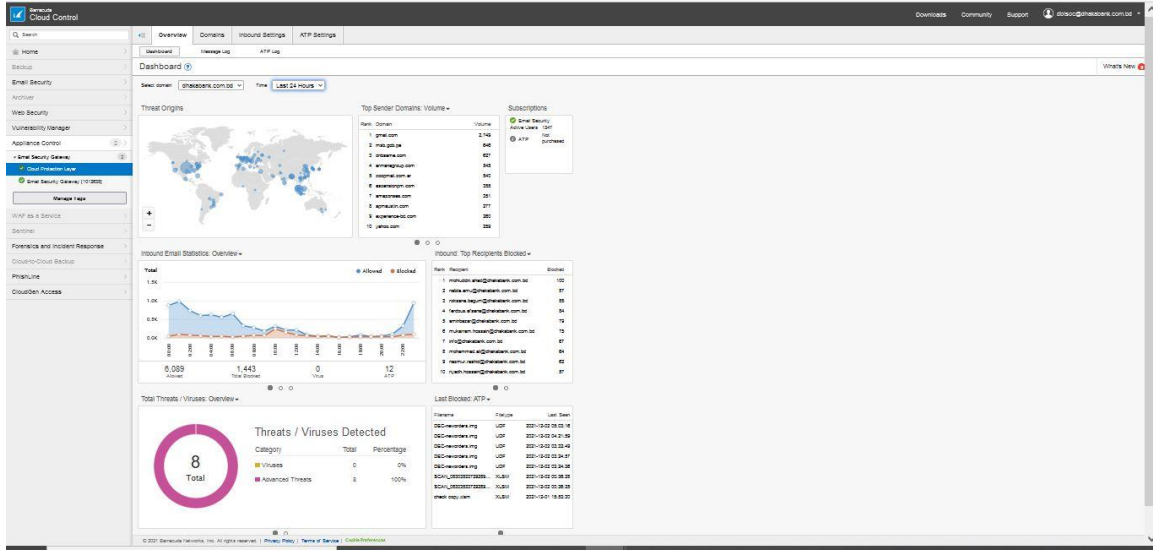


Fig 3.15: Barracuda Networks 1

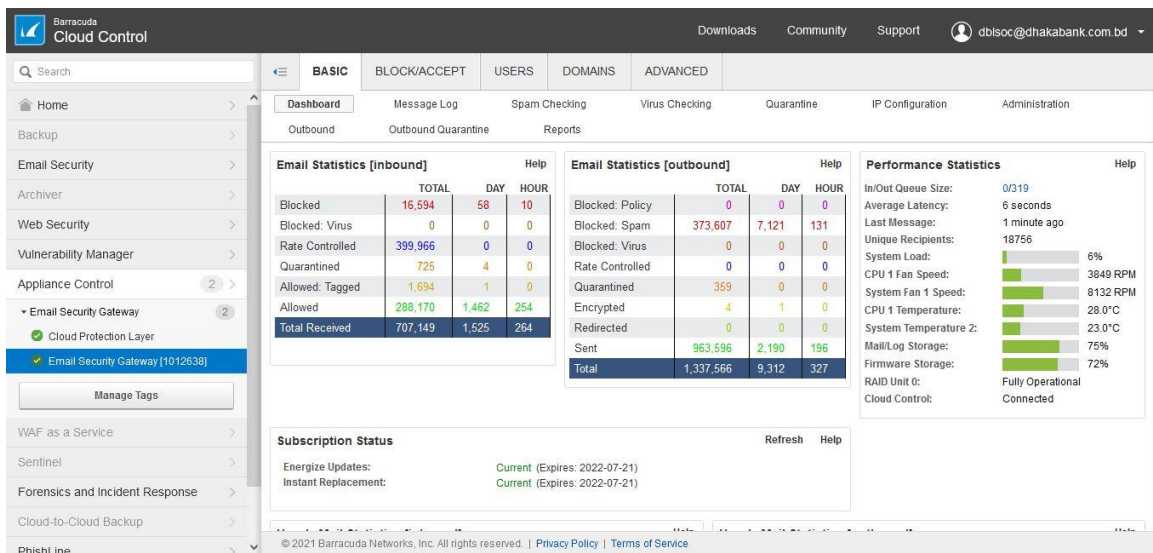


Fig 3.16: Barracuda Networks 2

Manage Engine:

Manage engine has various application tools that are used for a corporate company. It is used for managing Applications and other Services.

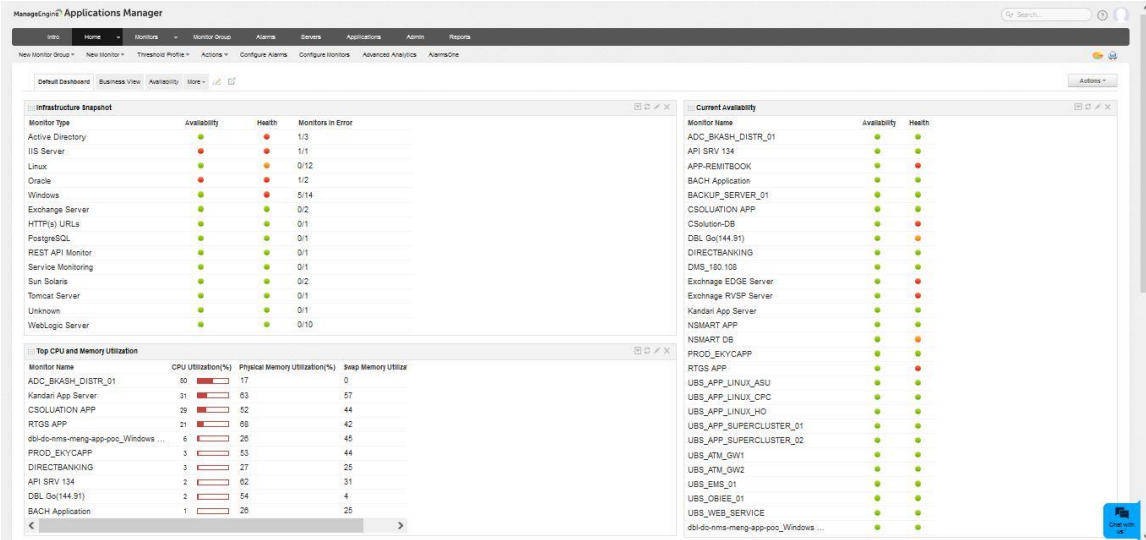


Fig 3.17: Manage Engine 1

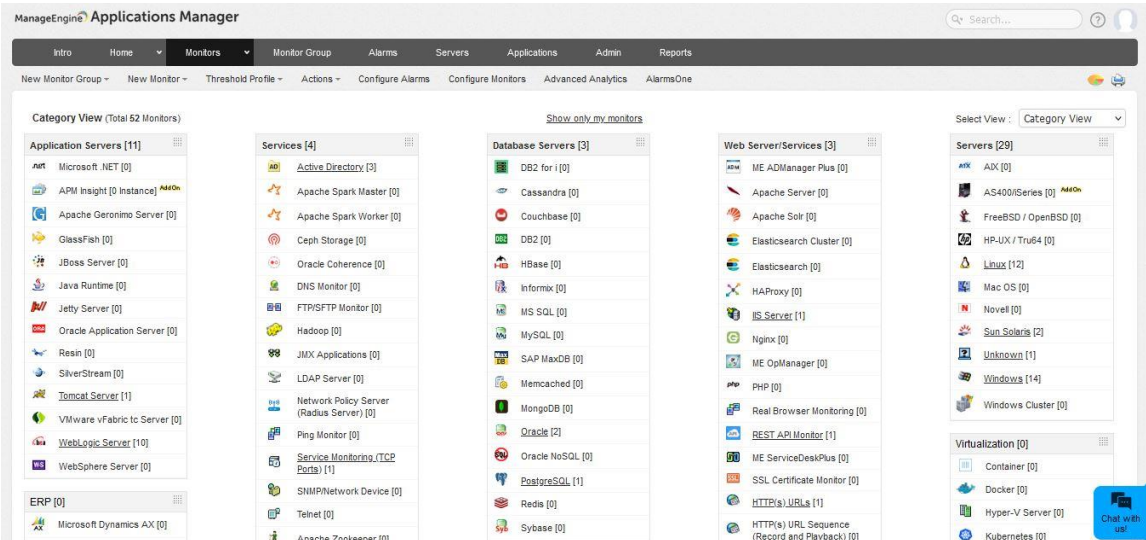


Fig 3.18: Manage Engine 2

CHAPTER 4

COMPETENCIES AND SMART PLAN

4.1 Competencies Earned

At first thanks to DHAKA BANK LTD. To give me a chance to an internship at this company. It's the first corporate experience in my life. They are given me 3 months to an internship in this company. There is a very good environment for work. Great work experience in a real-world project. There all employees are very helpful and very kind in any situation. They help me always how to work in a corporate office. They are always to help anything of this office and personal life. I also gain Technical Skills and Internal Skills.

Now I describe below:

Technical Skill:

In this internship, I gain some advanced data on pc Networks and Security. acting on this organization helped me to the way to use a router, switch, and Networking Devices. i used to be not aware of this device before. operating with this company and victimization these sorts of devices helped to realize sensible experience, how to network is monitored at the company level.

This, internship program conjointly helped me to boost my technical skills through the extraordinary use of MS Excel. I knew surpass has several applications and may be used for numerous functions however ne'er got the chance to find out the real-life use of it. thus this situation helped Pine Tree State get exposed to the real-life use of surpass the company level. Now, i'm aware that excel are often accustomed ease our work by victimization filters and short for locating and organizing the information quickly and by using formulas for doing the extended calculation in a very blink of an eye fixed.

Interpersonal Skill:

My communication skills were furnished with whereas I got an opportunity to figure with differing kinds of individuals and different types of backgrounds. Through my interactions with my supervisor and different senior employees, my social skills return enhanced. I find out how to speak with supervisors and Senior managers throughout my spot amount.

4.2 Smart Plan

This internship developed my technical and interpersonal skills. Now I believe in myself that I can work in any networking sector. We are learning theoretical knowledge but the maximum time we ignore practical Knowledge. But practical knowledge is very important.

After joining the internship, I know to work practical life. What is the gap in skills? I am trying to cover this gap and recover my mind system. After completing the basics of networking, the IT manager gives me another opportunity to learn Security Operation Centre. Now I want to learn Security Operation System management. My plan is I want to be a Cyber-Security expert.

CHAPTER 5

CONCLUSION

5.1 Preface

Today is the age of modern science and information and online communication, which is critical to the development of a more effective operational and management process. To provide better and uninterrupted service to the employee of Dhaka Bank LTD. A group of Network specialists working together to keep the service all time. I was fortunate and blessed to get this lucky break to work with some of these efficient hardworking friendly engineers. My earnest thanks, gratitude, and salutations to these wonderful people from deep down inside my heart.

5.2 Practicum and its Value

To me, practicum can be a transition from engineering college study life to a real-world workplace through hands-on experience of engineering practices. There are several major advantages for students completing a guided practicum: Development of deeper skills in the selected research area.

- Increase employability
- Development of practical application skill
- It is the gateway to professional life, a bridge between theoretical and practical knowledge.

Now, these days, engineering job requirements no longer consider high grades; rather they value the practical working experiences, for which practicum proves to be a vantage for the fresh entry-level engineers in the job market.

Meeting with different types of people and encountering situations gives practically oriented to life. There are many more upright issues of practicum, which only the person experiencing it can sense and believe.

In our career development as with most life issues, there is a direct relationship between effort and reward. To me, practicum can be a transition from engineering college study life to a real-world workplace through hands-on experience of engineering practices.

The four years of undergraduate engineering studies give a student theoretical and practical knowledge. Using that Knowledge and observing live operational system, the practicum program clarifies those subjects matters to another level blessed with practical working skills. Considering this fact, it gives us immense pleasure to say that my practicum was a successful event.

Practical work expertise doesn't have the other alternatives. Before entering into the duty student ought to have real-world work experience terribly} major field of study. these days recruiters now not take into account simply high grades, sensible communication skills, part-time work experiences.

DHAKA BANK LTD. Gives me the probability of working in a expert working environment. During the internship period, I have tried my degree satisfactory to make my device efficient. I observed the lessons, methods, tools, and methods that I have realized at some stage in my find out about duration at DIU. Successful Network Engineer is a combination of trendy community design practices, suited theoretical knowledge, and the design's creativity.

Students of Daffodil International University (DIU) go for this practicum program carrying 6 credits hours' weight, which goes for a semester-long and usually after the completion of the course work.

5.3 The Experience

It is a great experience to work for a real-world project in an established bank like DHAKA BANK LTD. During working on this project, I have to face a lot of antagonistic factors due to the knowledge gap, which I had to overcome simultaneously. I believe this overcoming will help to courage to discover new technologies and work as a big asset in future life.

The following will indicate my learning from this project-

- Basic Configure
- Configure Router & delete or erase Router
- Static Routing
- Dynamic Routing (OSPF, Eigrp, BGP, etc.)
- VLAN
- Spanning tree Protocol (STP)
- Access List
- Tunneling
- Firewall
- Mail Server configure on Packet tracer
- DNS Server configure on Packet tracer
- CBS Server configure on Packet tracer
- Designing network system.
- Analysis and security ensure.
- Layer Based Attack from cybercriminal
- Maintaining Management System Vulnerabilities Monitoring System.

5.4 Future Plan

- More than Router Security and Switch Security.
- Live Monitoring system and problem-solving system.
- Ensure better Security for this System.
- Add many security Devices and Security Management Software.

5.5 Limitation of this Report

To prepare the report on the achieved sensible experience in {a very} short amount i.e. solely three months isn't related to a straightforward task. particularly the IT field of company network sector may be a massive house of {information} and technology. So, this is often a very short time to attain all the relevant information and knowledge regarding company network data technology. In preparing for this report some problems and limitations are encountered that are as follows:

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

- The most constraint of the study is insufficient current information, relevant to the study.
- Due to time limitations, several of the aspects couldn't be mentioned within the present report.
- Lack of expertise in practicum report writing.
- We will no longer be capable to get to the bottom of troubles from any of subsequent with the aid of victimization this Network:
- Any unreported/ unobserved Bugs in conventional software's, or tools
- Any adjustments in Application software program bundle selections
- Older variations are incompatible with cutting-edge choices
- The hire line volume relies upon on a precise Service Provider.
- This Network is restrained by way of the kingdom of technological know-how and utility of software program bundle equipment or merchandise deployed.
- Third-party IOS integration goes to be utilized on a best-effort basis.
- All hardware units upgrades, hardware re-deployments, and coverage modifications shall be carried out as soon as the mutual consent of the customer, supported the have an impact on it might decline the closing protection country of affairs and overall performance of the network.
- Security is now and again enforced in an noticeably very greater manner.

5.6 Conclusion

The biggest experience working at DHAKA BANK LTD. Indeed, is being a part of designing and maintaining the system.

Our most experience was around the designing issue. We have learned a lot of new things which were so much unknown to us. We have also learned some technical issues which help to do better in future life. The following indicator will indicate some of our technical issues which help to do better in future life. The following indicator will indicate some of our technical issues which have been learned and implemented from this project.

- The design strategy of a network-based project
- The analyzing strategy of a network-based project. New Environment connectivity.
- Developing a project existing network Pattern of Dhaka Bank LTD.
- How to connect through the ISP from one branch to another branch.
- Configure Firewall security.
- Learn organization Security Management Systems Software.

During matters amount, I even have tried my bounds to shape my machine efficient. I observed the lessons, methods, tools, and strategies that I even have realized at some point of my find out about period. made Network fashion should be a combine of ordinary improvement Practice, right theoretical knowledge, and developer creativity. Therefore, Government ought to take acceptable steps to unfold beneficial facts regarding the internet gadget to the country' human beings.

APPENDIX

Appendix A: Internship Reflection

We are knowing that an internship is a learning experience. It will provide our practical knowledge. How to work with the job field and how to communicate the corporate system. After joining the internship, I am experienced concerning the rules regarding the protocol, hierarchy, and communicating with my supervisor and other officers. How to decorate my desk impact its day-by-day operation. Dresses are one of the most important issues of any corporate company. And the other Diversity, Social Conscience, Source of Funding does the organization utilize to maintain operations, Location, Community, events, Mission, etc.

Appendix B: Company Details



DHAKA BANK LIMITED

HEAD OFFICE

Plot: CWS (C)-10, Bir Uttam A K Khandakar Road, Gulshan-01,
Ward-19, Dhaka North City Corporation, Dhaka-1212.

Phone: +8802 5831 4424 (Hunting number),
+8802 5831 4425-31, 5831 4624-8

Fax: +8802 5831 4419

Email: info@dhakabank.com.bd

Swift: DHBLBDDH

CORPORATE HEAD OFFICE

Branch Name	Kakrail Branch
Address	Holding No. 71, Road 13 (36 Old), Kakrail, Paltan, Dhaka 1000
Fax	02 58314543
E-mail	kakrail@dhakabank.com.bd
Routing Number:	085273373
District	Dhaka
Date of Opening	5 July 2015
Working Days	Sunday - Thursday (10:00 AM-6:00 PM)

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