



University of San Carlos-Talamban Campus
Cebu, City



Providing Scalable and Reliable Network Connectivity: JBC Corporation Structure Cabling Plan

SD 107- Networking Fundamentals
1st Semester Final Project

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December 6, 2021

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CHAPTER 1

Introduction

Today's circumstances almost depend on networks. Education, communication, politics, Health, projects, and even business transactions and many more. Current trends and ongoing cost reductions in the construction of network infrastructure enables you to create smarter networks in your homes and organizations.

The purpose of this study entitled, "Providing Scalable and Reliable Network Connectivity: JBC Corporation Structured Cabling plan", is to develop or implement a scalable and reliable computer network to the new manufactured internet cafe in JBC Corp. JBC Corporation wants to construct an Internet Cafe within the three branches located in Luzon (Don Hernandez Street Pasay, 1300 Metro Manila, Philippines), Visayas (Sanciangko Street Cebu City) and Mindanao (Matina Davao City 8000).

This study was implemented also to serve as the foundation for investors if he chose to construct this network. It will be a model solution that will inform investors about the financial requirements, while satisfying the project's essentials, and the technical background of a given project.

When processing a specific proposal, The Researchers will start with the theoretical aspect and then go on to the analytical. The Researchers choose the active elements, cabling, VLSM (Variable length Subnet Mask) computation for the IP addresses and route design depending on this challenge. The proposed cost budget along with the holistic view of the overall structure, both physical and logical view through packet tracer created topology will also be included in the job solutions, as well as the provision of understandable documentation. This proposal is effective when the approval of the project has been updated.

A network like this enables users to take full use of today's cutting-edge technology as well as a slew of other advantages. Any business organization such as Internet Cafe can be served by a well built network. Turn it into a smart one, make life much easier with intelligent costing analysis and the life term of the whole cabling structure. This structured cabling plan proposal should be finished on **December 6, 2021**.

CHAPTER II

Related Literature

Based on the study entitled “Scalability and accuracy in a large-scale network emulator”, it states that a scalable Internet emulation environment enables researchers to deploy unmodified software prototypes in a configurable Internet-like environment and subject them to faults and varying network conditions (Amin Vahdat, et al.).

The star and extended star are the most popular topologies for Ethernet networks. This type network is easy to set up, relatively inexpensive, and provides more redundancy than other topologies. The star topology is configured by connecting all of the nodes on the network to the central device. The central connection allows the network to continue functioning even if a single node or cable fails. The major drawback to this topology is that if the central device fails, then the network will become unstable or cease to function. The star topology is most suitable for small, centralized networks. The extended star topology adds sub-central devices that are connected to the central device. This type of topology is advantageous for large networks and provides functionality for the organization and subnetting of the IP address allocation within the network. The extended star topology is most suitable for large networks that may span an entire building.

Based on the study entitled “StarNet: Pedestrian Trajectory Prediction using Deep Neural Network in Star Topology”, it states that StarNet has a star topology which includes a unique hub network and multiple host networks. The hub network takes observed trajectories of all pedestrians to produce a comprehensive description of the interpersonal interactions. Then the host networks, each of which corresponds to one pedestrian, consult the description and predict future trajectories. The star topology gives StarNet two advantages over conventional models. First, StarNet is able to consider the collective influence among all pedestrians in the hub network, making more accurate predictions. Second, StarNet is computationally efficient since the number of host networks is linear to the number of pedestrians.(Yanliang Zhu, et. al.).

Based on the study entitled “**Modeling discrete event scalable network systems**”, states **that a** scalability in simulation tools is one of the most important traits to measure performance of software. The reason is that today’s Internet is the main instance of a large-scale and highly complex system. Simulation of Internet-scale network systems has to be supported by any simulation tool. (Ahmet Zengin, et al.)

continuation...(search for the categories of cable) insert with picture (copy the ;link, software or the page of books).

CHAPTER III

Technical References

In the project entitled, “**Providing Scalable and Reliable Network Connectivity: JBC Corporation Structured Cabling plan**”, the Researchers used Cisco Packet Tracer in developing wholesome Physical and Logical Topology. *“The main purpose of Cisco Packet Tracer is to help students learn the principles of networking with hands-on experience as well as develop Cisco technology specific skills. Since the protocols are implemented in software only method, this tool cannot replace the hardware Routers or Switches. Interestingly, this tool does not only include Cisco products but also many more networking devices”*, Geeksforgeeks.org, 2021.

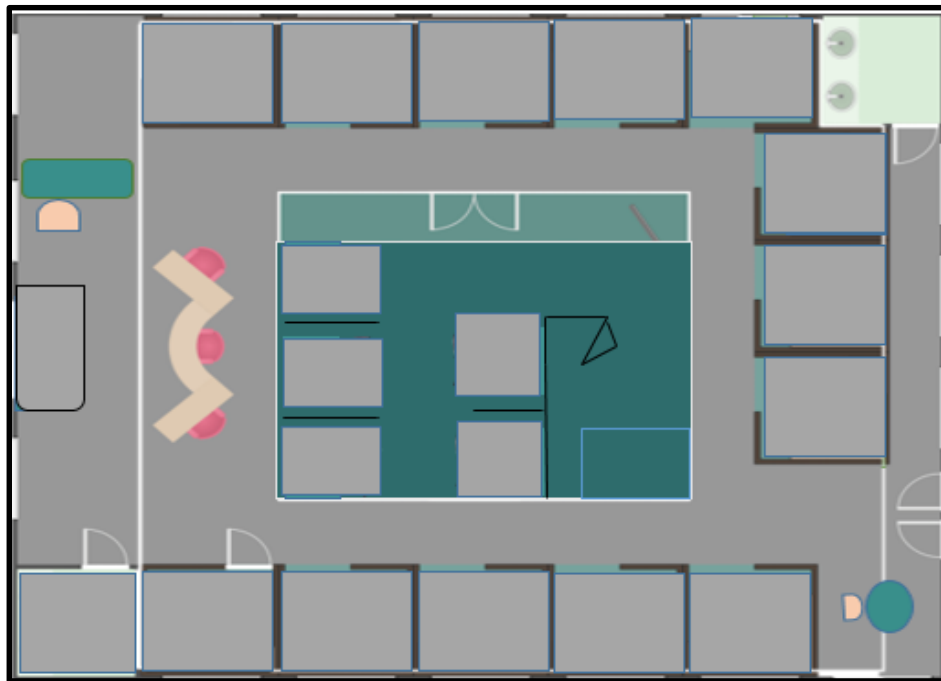
- (1) According to the Library Hi Tech News, n127 p15-21 Nov 1995, *“While most organizations, including libraries, can benefit from a structured wiring system, few likely have the expertise and resources to place, specify, and install network cabling by themselves”*.⁴
- (2) CISCO. Cisco Interfaces and Modules. Cisco.com [online]. [cit. 2018-05-12]. Dostupné <https://www.cisco.com/c/en/us/support/interfaces-modules/mgbsx1-gigabitsx-mini-gbic-sfp-transceiver/model.html>
- (3) ASSIGNMENTHELP. Computer Networks and Types : PAN, LAN, WAN, MAN. Assignmenthelp.net [online]. ©2009-2018 [cit. 2018-05-03]. Dostupné z: http://www.assignmenthelp.net/assignment_help/Computer-Networks-and-Types
- (4) According to Soon Yong Soi of Technology in Society ,*“Economic benefits of interoperability result in lowered production or transaction costs typically utilizing standardized parts or automated processes. In the networked economy, the need for interoperability extends into entire commercial processes, market organizations and products”*.
- (5) Groth, D., McBee, D., Barnett, D. (2001). Cabling: the complete guide to network wiring. Sybex Housel, T. J., & Skopec, E. W. (2001). Global telecommunications revolution. Singapore: McGraw Hill.
- (6) Cablestogo.com <https://www.cablestogo.com/learning/library/data-center/network-topologies>

Chapter IV

Methodology

IV.I Floor Plan

A simple cyber cafe was used as the design program in size 12m x 14 m as figure 1 shows. The program has one private gaming chamber hall size 2.5m x 3.5m, one comfort room sized 1.5m x 1.5m, rectangular sided area divided with mini chambers corridor, and Corridors. Topologically, all spaces connected to the horizontal circulation spaces and the gaming room was in the center linked by a door. The comfort room located most halfly in between two mini rectangular chambers serves for the public, perhaps the customers of the said cafe. The staff also has enough space to cater customers in having rent and desktop bookings as well as cues. The whole floor has its single waiting for those who would have to photocopy or print their stuff.



(figure 1: JBC Corp Cyber Cafe Floor Plan)

Whole Cyber Cafe	10m x 14m
Comfort Room	1.5m x 1.5m
Private Gaming Room	2.5m x 3.5m

IV.I.I Cost Analysis(Financial Statement)

JBC Floor Plan Cost Analysis:

Item	Quantity	Cost/Quantity	Cost
Lot	140sqm	Php 22,000.00/sqm	Php 3,080,000
Others: (miscellaneous)	Transport, etc	Php 500.00	Php 500.00
Total Cost			Php 3,080,500

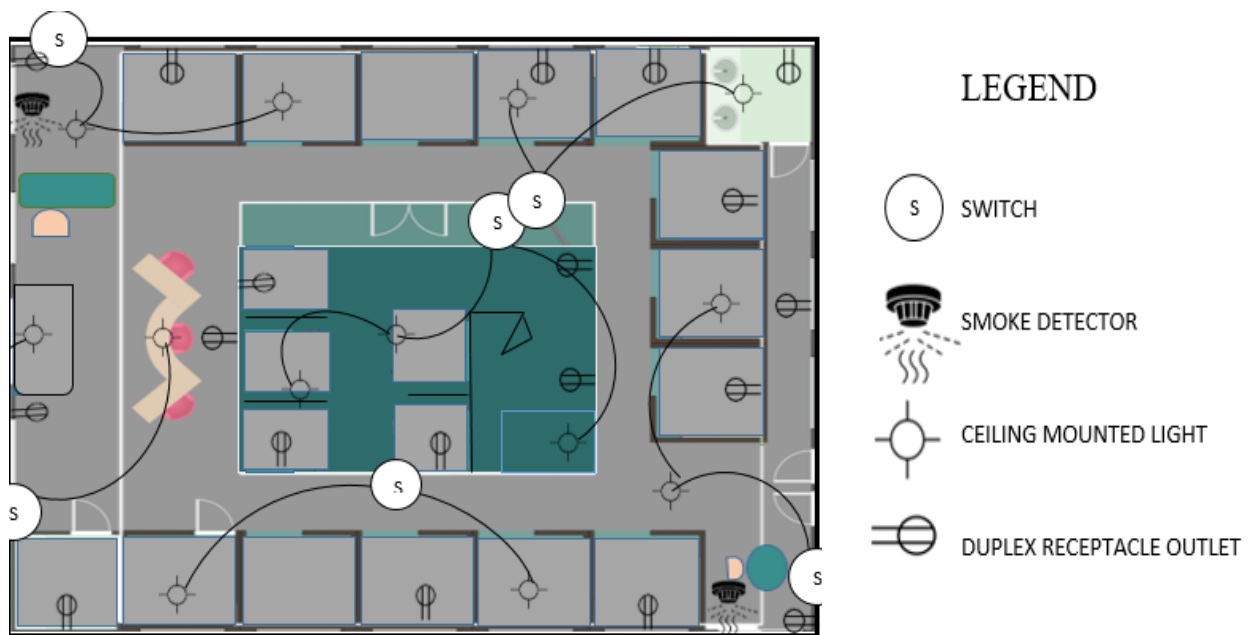
(Table 1: Floor Plan Cost Analysis)

The Researchers are surfing average lot prices per square meters in Cebu City where the main infrastructure of JBC Corp is located and all the information they've stumbled upon from different valid sites lead to Php 22, 000 as the average index price of land. The table above, **Table 1** shows the total amount The **JBC Corp** could cater in their Cyber Cafe as business extension in the building floor plan analysis. Considering that the whole area could consume about 112m x 14m or 140 sqm multiplied by the average lot price per square meter which is Php 22,000, results in Php 3,080,000or 3.08 M pesos. The cost is good enough contemplate to the fact that we are located in the best area, The Sanciangko Street Cebu City where many teenagers could come and go where schools do surround perhaps better than renting an infrastructure that could ruin all the financial statements and could made the Corporation pay for 'how long it takes' process. The Researcher also put others or miscellaneous tags on the table pertaining to the other possible expense especially in the paper transaction of the land. In in all, the whole process of the JBC Corp Cyber Cafe extension floor plan cost analysis resulted to Php 3,080,500 or about 3.8 M.

IV.II Electrical Plan

JBC Corp Cebu City Office main transformers are oil – immersed transformers located on the front of the building mounted in a transformer pad. The transformer location was close to the building perhaps to the location of the Corporation’s Cyber Cafe that could be a great contribution in running electrical gauges smoothly to its exact location.

This part of the study focuses mainly on the electrical components. There are many aspects the Researcher considers for installation. Firstly, is the Area of the floor that would greatly contribute in computing the gauges of the wires used, Equipment specifications, the lighting system, control station, technical specification, etc. **Figure 2** shows wiring connections to switch, smoke detector, ceiling mounted light, and duplex receptacle outlet.



(Figure 2: JBC Corp Cyber Cafe Electrical Plan)

IV.II.I Cost Analysis (Financial Statement)

Types of Wires/ and other products	Gauges/ description	Quantity	Cost/Quantity	Cost
ELEGRP Rocker Double Switch, Metal	Wall mount polycarbonate Switch	7	Php 504.10	Php 3528.70
Ceramic Porcelain Socket Bulb Holder	(this hold diff. Types of bulb)	13	Php 90.00	Php 1,170
Panasonic 15929 Duplex Outlet	(could cater two plugs)	17	Php 201.00	Php 3,417.00
Day Tech Smoke Detector	Stand alone or 110 volt detectors h ave a battery backup.	2	Php 599.00	Php 1,198.00
Red NYA 2.5mm ² Cable	Php 3,134.22 per 100m	70 meters	Php 3,134.22	Php 3,134.22
Black 2.5mm ² Cable	Php 4,534.19 per 100m	60 meters	Php 4,534.19	Php 4,534.19
NYA 2.5mm ² Cable	Php 2,478.00 per 100m	50 meters	Php 1,239.00	Php 1,239.00
20A Circuit Breaker(MCB)	(the usual type)	1	Php 594.00	Php 594.00
Earth Leakage Circuit Breaker(ELCB)	detects small stray voltages	1	Php 637.00	Php 637.00
PVC Pipe	3 meters / length	6/10 (60meters)	Php 269	Php 5,380.00
Pipe Clamp	6/10	120 pieces	Php 26	Php 3,120
Omni Junction pull Box	124 x 124mm omni	10 pieces	Php 99.00	Php 990.00
Total Cost				Php 28, 933.92

(Table 2: Electrical Plan Cost Analysis)

JBC Electrical Plan Cost Analysis:

In the previous section above, the Researchers stated the exact area where the cafe occupied. This are the main data needed to acquire in order to measure the amount of wires essential in electrical installation. Some of the materials used were on the next page of this paper labeled Lighting plan that includes illumination which also needs to be considered for the said installation.

From the floor plan shown above (**figure 1: JBC Corp Cyber Cafe Floor Plan**) and according to the size of the Building of course, persons can easily calculate the length of the entire cable for the electrical installation.

There are seven switches all in all, perhaps double switches which are located in every side portion of the whole room. There are seventeen outlets hence it is a Cyber cafe, also two smoke detectors which is really helpful since the business is open for all. The presence of lighting, lamps or bulbs can be also seen in the table above (**Table 2: Electrical Plan Cost Analysis**) that could be further explained in the next sections. And mostly, electrical installation would be impossible without the presence of wires. Figure 2 shows wirings from bulb to their respective switches and outlets, perhaps table 2 showcases the three wires in use. These are the Red NYA 2.5mm² cables, Black 2.5mm² cable and the NYA 2.5mm² cable with the size measured according to the portion of the room. There is also a circuit breaker, a pipe clamp and a PVC pipe and also a junction box. All these materials are one core recipe in electrical installation.

From the price sited in different platforms, comes up with these unique prices. The table above, (**Table 2: Electrical Plan Cost Analysis**) shows the name of items already mentioned, its gauges and description, the quantity needed and well as the cost per quantity and lastly the total cost. All in all, the electrical plan cost analysis resulted in about Php 28, 933.92 net cost apart from other expenses such as labor, delivery of the products, transportation, etc, which will be allocated tp the lighting cost analysis.

IV.III Cabling Plan

Cable is the medium through which information usually moves from one network device to another. There are several types of cable which are commonly used with LANs. In some cases, a network will utilize only one type of cable, other networks will use a variety of cable types. The type of cable chosen for a network is related to the network's topology, protocol, and size. Understanding the characteristics of different types of cable and how they relate to other aspects of a network is necessary for the development of a successful network. Cables will be arranged accordingly to its distance to where cable cabinets it is nearly located. Cat5e and Cat6 cables are in used for cabling with RJ54 connectors since Unshielded Twisted Pair(UTP) cables is the most popular and generally the best options for School networks and even Internet Cafes. **Figure3**, shows 17 PC's and three wiring closet as well as the cable arrangement.

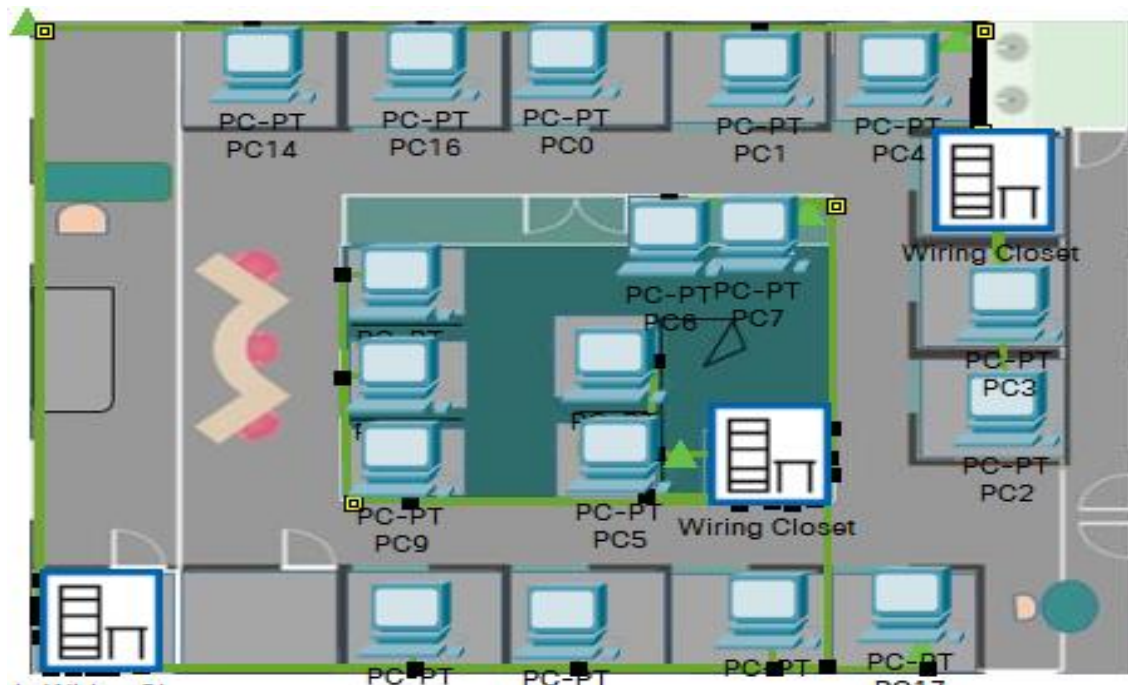


Pic 1: Unshielded Twisted Pair Cables



Pic 2: RJ45 Connectors

The standard connector for unshielded twisted pair cabling is an RJ-45 connector. This is a plastic connector that looks like a large telephone-style connector (See Pic. 2). A slot allows the RJ-45 to be inserted only one way. RJ stands for Registered Jack, implying that the connector follows a standard borrowed from the telephone industry. This standard designates which wire goes with each pin inside the connector.



(Figure 3: JBC Corp Cyber Cafe Cabling Plan)

IV.III.I Cost Analysis (Financial Statement)

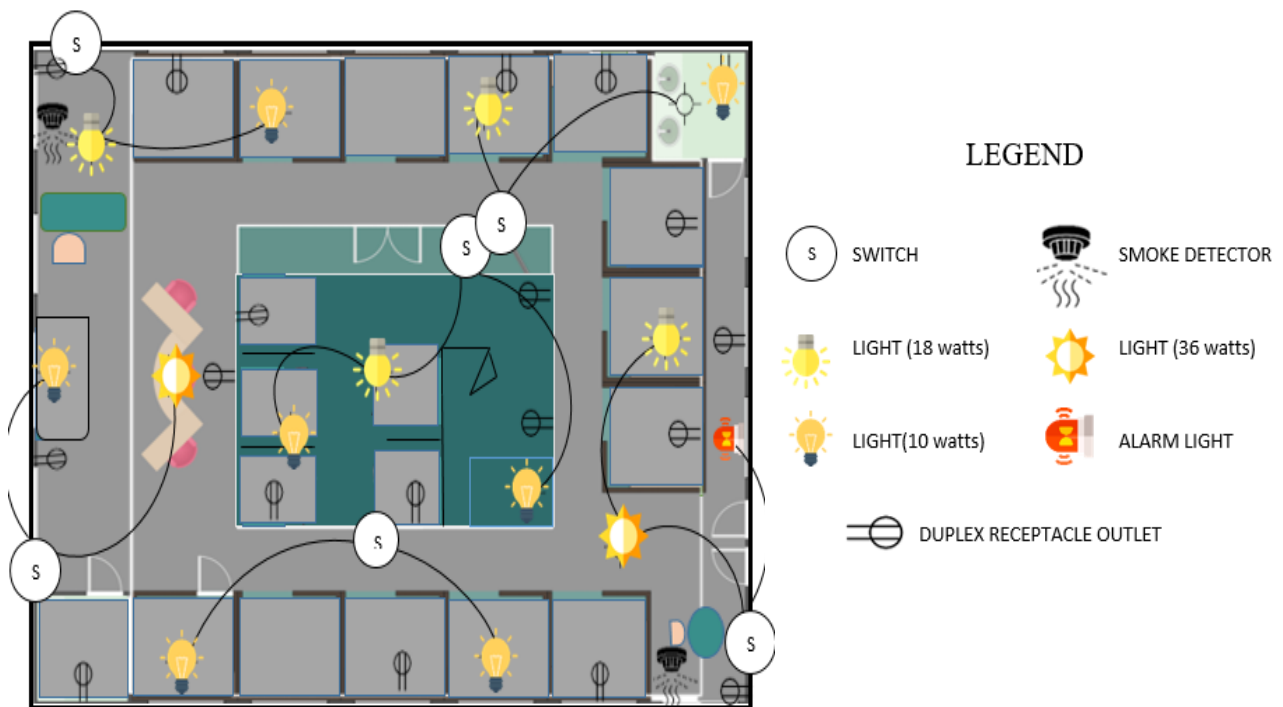
Cables and Network Devices	QUANTITY	COST/QUANTITY	COST
Cisco 2911 Router	1	Php 82,000.00	Php 82,000.00
System Unit	17 pcs	Php 10,398.00	Php 176,766.00
Cat5e Wire	1 Roll(300m)	Php 5,278.00	Php 5,278.00
Cat6 Cable	8 set(10m/set)	Php 280.00	Php 2,240.00
RJ45 Cat5e	1 box (50pcs)	Php 171.00	Php 171.00
RJ45 Cat6	1 box(100 pcs)	Php 294.00	Php 294.00
Server	1pc	Php 55,285.99	Php 55,285.99
Switch	3 pcs	Php 2,992.51	Php 8,977.53
Laptop pc ultra-thin	1	Php 16,000.00	Php 16,000.00
PC Core i5	18	Php 15,719.00	Php 282,942.00
HWIC-2T	1 pc	Php 6,304.16	Php 6,304.16.00
Wiring Closet	3 pcs	Php 11,099.88	Php 33, 299.64
PVC Cable Slotted Duct	27(2 meter)	Php 360.00	Php 9, 720.00
TOTAL COST			Php 679, 278.32

(Table 3: Cabling Plan Cost Analysis)

Costing cabling plan analysis is very crucial especially in choosing the right item and its quality while minding its price. Upon doing a research of all these materials as well as its corresponding prices from different platforms, the Group come up with these pricing tags which can be seen above, **Table 3**. From the Router, System Unit, wires and cables, server, switches, laptop, PC, wiring closets to PVC that resulted about Php 679,278.32.

IV.IV Lighting Plan

JBC Corp Cyber Cafe Extension is catered by lights and bulbs. Total lights in each bulb were corresponding to spaces intended for it, perhaps it's measurement. In Figure 4 shown below, the two lights carrying 36 watts were fitted in the entrance of the building and in the staff desk which serves as the core space of the whole room. This is because there are spaces needed to focus on, the hallway and the place where customers could fill up for their requirements in renting our PC's. There are also seven 10 watts contained lights which are purposely placed on the area where most likely doesn't need so much lighting and also located near the 36 watts contained light. The light with 18 watts were also visible, apparently there are four of them which was located to spaces quite far from the 36 watts' lights and has bigger space needed to be occupied. The smoke detector is also present as well as the switch and the outlet that was already discussed in the previous page (**Chapter IV.II**). Lastly is the single alarm light intended for emergency purposes and safety which was located nearly in the entrance of the cafe.



(Figure 4: JBC Corp Cyber Cafe Lighting Plan)

IV.IV.I Lighting Cost Analysis(Financial Statement)

Item	Gauges/ Description	Quantity	Cost/quantity	Cost
Panasonic LED Ceiling Light VZLED	10 Watts	7	Php 465.5	Php 1,862.00
Ceiling Light Fan Blade	36 watts	2	Php 202.30	Php 1,011.5
Eoppo Led Ceiling Bulb	18 Watts	4	Php 380.00	Php 1,520.00
Alarm Light	24V	1	Php 546.00	Php 546.00
Others:	Miscellaneous	Labor, shipping,etc	Php 5,000.00	Php 5,000.00
Total Cost				Php 9,839.00

(Table 2: Electrical Plan Cost Analysis)

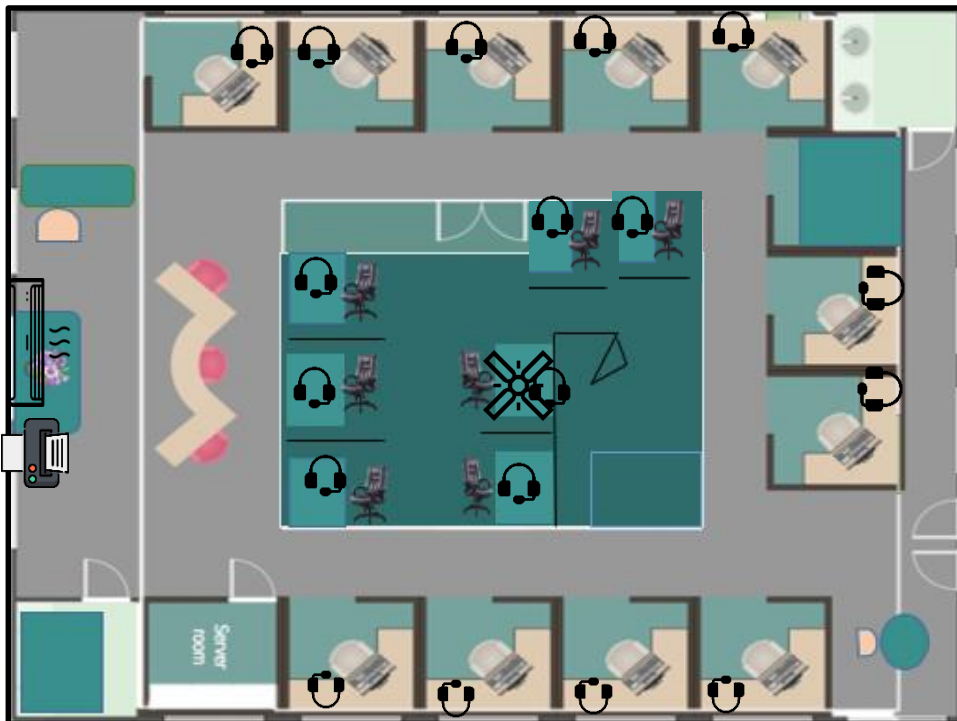
The table above, (**Table 2: Electrical Plan Cost Analysis**) shows relevant prices of the three different lighting or illuminations the JBC Corp Cyber Cafe could have. For the 10 watts bulb there is a Panasonic LED Ceiling Light VZLED with the quantity of seven pieces with the cost of Php 1,862.00 all in all. For the 36 watts lighting, the Ceiling Light Fan Blade cost Php 1,011.5 and Eoppo Led Ceiling Bulb for the 18 watts lights for Php 1,520.00. The 24V contained alarm Light cost Php 546.00 and all the lightning products cost Php 4, 839.00. The labeled ‘Others:’ that totaled Php 5,000.00 can also be seen on the table which denotes the physical force(labor), shipping and transportation of products including those items in electrical plan, **Chapter IV.II Electrical Plan**. To summarize the data, The Researchers resulted in Php 9,839.00 as the net cost of the Lighting Plan.

IV.V Furniture and Fixtures

The JBC Corp Cyber Cafe is categorized being in a middle class cafe hence, the picture below (**Figure 4: JBC Corp Cyber Cafe Furniture and Fixtures**) shows how chairs and tables properly put on its places. The rectangular side chamber consists of eleven desktop spaces containing a chair and table each. The cafe also shows a division where the private gaming room is located. The private room consists of seven desktop spaces with corresponding tables and chairs each. Air Conditioner is also visible as well as the ceiling fan and the printer.

Cost Analysis:

Furniture like tables, chairs and fixtures such as air conditioner and fan was mindfully chosen and categorized based on its usage. The price of each item is mainly coming from the sources stumbled upon and applying the compare and contrast technique in choosing the exact price. The **Table 4: Electrical Plan Cost Analysis** shows that the Total Cost of the Product is Php 105,930.04 with the fees for labor and shipping of Php 5,000.00. All in all, the Furniture and Fixtures gathered about **Php 110,930.04** as its **Net Expense**.



(Figure 4: JBC Corp Cyber Cafe Furniture and Fixtures)

IV.V.I Cost Analysis(Financial Statement)

Item	Quantity	Cost/quantity	Cost
Leather Gaming Executive High Black chair	7	Php 849.00	Php 5,943.00
Elastic Electric Gaming Chair	11	Php 612.00	Php 6,732.00
Jit-rmO5 Computer Table	18	Php 1,850.00	Php 33,300.00
Headphone with microphone	18	Php 99.00	Php 1,782.00
Digital 1.5hp Long-type Air Conditioner	1	Php 24,000.00	Php 24,000.00
Waiting Table	2	Php 1,234.00	Php 2,469.00
Scandinavian Basic chair	5	Php 1, 523.00	Php 7,615.00
Front-desk L-shape table	1	Php 4,599.00	Php 4,599.00
56 inch Industrial Ceiling Fan	1	Php 10,465.00	Php 10,465.00
Epson Multifunction Printer	1	Php 10,807.04	Php 10,807.04
Total Product Cost			Php 107,712.04
Other:		Labor, shipping	Php 5,000.00
Net Expense			Php 112,712.04

(Table 4: Electrical Plan Cost Analysis)

IV.VI Net Expense Statement



JBC Corporation Cyber Cafe Extension
Estimated Financial Statement
As of December 6, 2021

SECTIONS	TOTAL COST
FLOOR PLAN	Php 3,080,500.00
ELECTRICAL PLAN	Php 28, 933.92
CABLING PLAN	Php 679, 278.32
LIGHTING PLAN	Php 9,839.00
FURNITURE AND FIXTURES	Php 112,712.04
OVERALL PROCESS LABOR:	Php 19,200.00
NET EXPENSE:	Php 3,817,751.24

All expenses were estimated accordingly to each of the sections; Floor Plan, Electrical Plan, Cabling Plan, Lightning Plan, Furniture and Fixtures and come up with **Php 4,417,263.28** as the total net expense for successful building of JBC Corp Cyber Café Extension.

IV.VII VLSM Addressing Scheme

JBC CORPORATION: VISAYAS

Department	Host	Borrowed bits	Network	Start IP	End IP	Waste	Subnet Mask
1	20	5	176.16.128.0 /27	176.16.128.1 /27	176.16.128.30 /27	10	255.255.255.224 /27
2	10	4	176.16.128.32 /28	176.16.128.33 /28	176.16.128.46 /28	4	255.255.255.240 /28
3	2	2	176.16.128.48 /30	176.16.128.49 /30	176.16.128.50 /30	0	255.255.255.252 /30

(Address Table 1: Visayas VLSM Scheme)

JBC CORPORATION: LUZON

Department	Host	Borrowed bits	Network	Start IP	End IP	Waste	Subnet Mask
1	14	4	178.12.192.0 /28	178.12.192.1 /28	178.12.192.14 /28	0	255.255.255.240 /28
2	8	4	178.12.192.16 /28	178.12.192.17 /28	178.12.192.30 /28	6	255.255.255.240 /28
3	4	3	178.12.192.32 /29	178.12.192.33 /29	178.12.192.38 /29	2	255.255.255.248 /29
4	2	2	178.12.192.40 /30	178.12.192.41 /30	178.12.192.42 /30	0	255.255.255.252 /30

(Address Table 2: Luzon VLSM Scheme)

JBC CORPORATION: MINDANAO

Department	Host	Borrowed bits	Network	Start IP	End IP	Waste	Subnet Mask
1	16	5	172.14.224.0 /27	172.14.224.1 /27	172.14.224.30 /27	14	255.255.255.224 /27
2	10	4	172.14.224.32 /28	172.14.224.32 /28	172.14.224.47 /28	6	255.255.255.240 /28
3	2	2	172.14.224.48 /30	172.14.224.49 /30	172.14.224.50 /30	0	255.255.255.252 /30
4	2	2	172.14.224.52 /30	172.14.224.53 /30	172.14.224.54 /30	0	255.255.255.252 /30

(Address Table 3: Mindanao VLSM Scheme)

IV.VIII Protocol Implementation

Network Implementation Protocol used is the DHCP. Dynamic Host Configuration Protocol (DHCP) is a client/server protocol that automatically provides an Internet Protocol (IP) host with its IP address and other related configuration information such as the subnet mask and default gateway resulted to IP Addressing of each end devices that corresponds to the Address assigned to every network, there subnet mask address as a whole and its DNS Server address. There is also a serial connection in order to be successfully connected to other LAN. Fixing the Gigabit section as well as the serial is the next step and the demonstrating RIP configuration. Moreover, the initial configurations are also applied.

Considering that there is a server available on the network, Email Configuration protocol are also applied as well as the FTP process.

LUZON

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/1
Router(config-if)#ip dhcp pool mindanao
Router(dhcp-config)#network 178.12.192.16 255.255.255.240
Router(dhcp-config)#default 178.12.192.17
Router(dhcp-config)#dns-server 178.12.192.6
Router(dhcp-config)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/1
Router(config-if)#ip dhcp pool mindanao
Router(dhcp-config)#network 178.12.192.16 255.255.255.240
Router(dhcp-config)#default 178.12.192.17
Router(dhcp-config)#dns-server 178.12.192.6
Router(dhcp-config)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip dhcp pool mindanao
Router(dhcp-config)#network 178.12.192.32 255.255.255.240
Router(dhcp-config)#default 178.12.192.33
Router(dhcp-config)#dns-server 178.12.192.6
Router(dhcp-config)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

VISAYAS

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0
Router(config-if)#
Router(config-if)#ip dhcp pool visayas
Router(dhcp-config)#network 176.16.128.0 255.255.255.224
Router(dhcp-config)#default 176.16.128.1
Router(dhcp-config)#dns-server 176.16.128.10
Router(dhcp-config)#dns-server 176.16.128.10
Router(dhcp-config)#exit
Router(config)#ip dhcp exc 176.16.128.1 176.16.128.9
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
exit
```

```
Router#
Router#
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#v 2
Router(config-router)#no auto-summary
Router(config-router)#network 176.16.128.0
Router(config-router)#network 176.16.128.32
Router(config-router)#network 176.16.128.48
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
|
```

MINDANAO

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip dhcp pool visayas
Router(dhcp-config)#network 172.14.224.32 255.255.255.240
Router(dhcp-config)#default 172.14.224.1
Router(dhcp-config)#dns-server 172.14.224.10
Router(dhcp-config)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip dhcp pool luzon
Router(dhcp-config)#network 172.14.224.0 255.255.255.224
Router(dhcp-config)#default 172.14.224.1
Router(dhcp-config)#dns-server 172.14.224.10
Router(dhcp-config)#exit
Router(config)#ip dhcp exc 172.14.224.1 172.14.224.9
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
exit
```

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip dhcp pool luzon
Router(dhcp-config)#network 172.14.224.48 255.255.255.240
Router(dhcp-config)#default 172.14.224.49
Router(dhcp-config)#dns-sever 172.14.224.10
      ^
% Invalid input detected at '^' marker.

Router(dhcp-config)#dns-server 172.14.224.10
Router(dhcp-config)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
|
```

ISP Rip Configuration

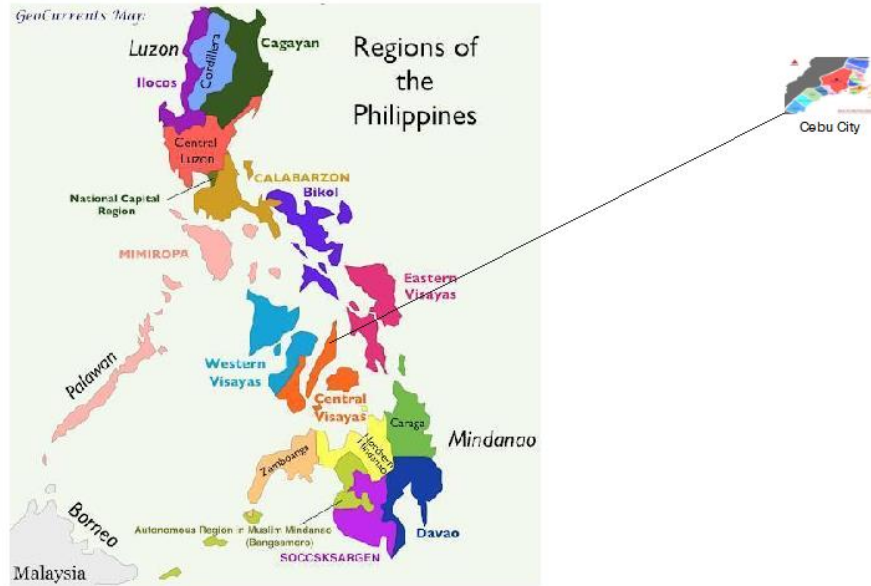
```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router rip
Router(config-router)#v 2
Router(config-router)#no auto-summary
Router(config-router)#network 178.12.192.48
Router(config-router)#network 176.16.128.64
Router(config-router)#network 172.14.224.32
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

```
Router>
Router>ena
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router rip
Router(config-router)#v 2
Router(config-router)#no auto-summary
Router(config-router)#network 178.12.192.48
Router(config-router)#network 172.14.224.0
Router(config-router)#network 172.14.224.48
Router(config-router)#network 172.14.224.32
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#
```

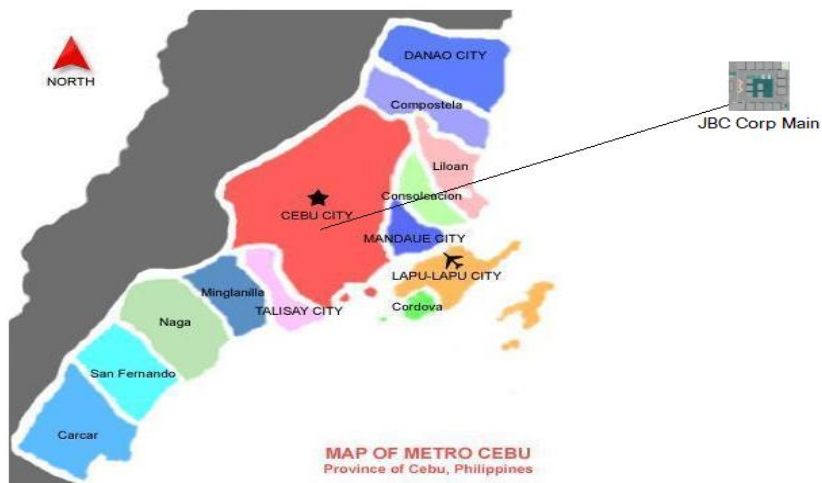
```
Router>ena
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router rip
Router(config-router)#v 2
Router(config-router)#no auto-summary
Router(config-router)#network 176.16.128.64
Router(config-router)#network 176.16.128.48
Router(config-router)#network 176.16.128.0
Router(config-router)#network 176.16.128.32
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

IV.IX Packet Tracer

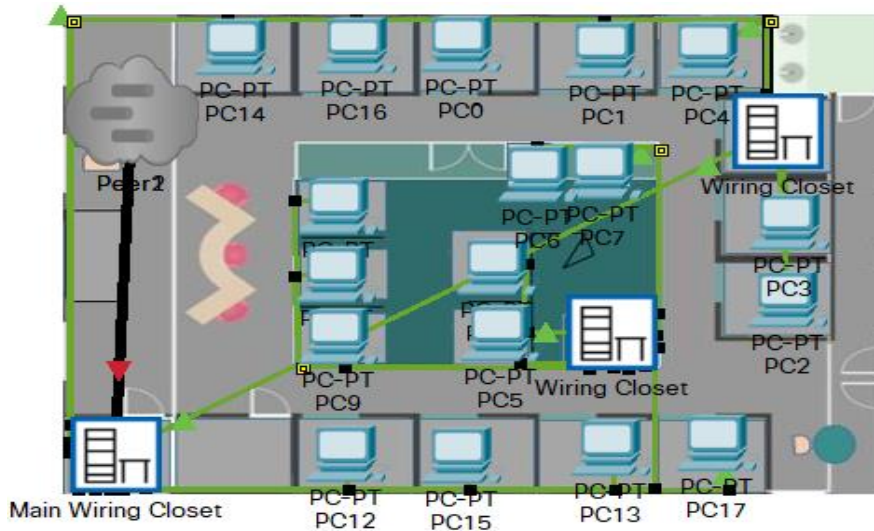
Packet Tracer Topological View



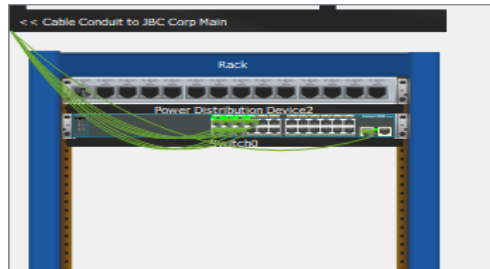
Pic 4: Philippines to Visayas Section View



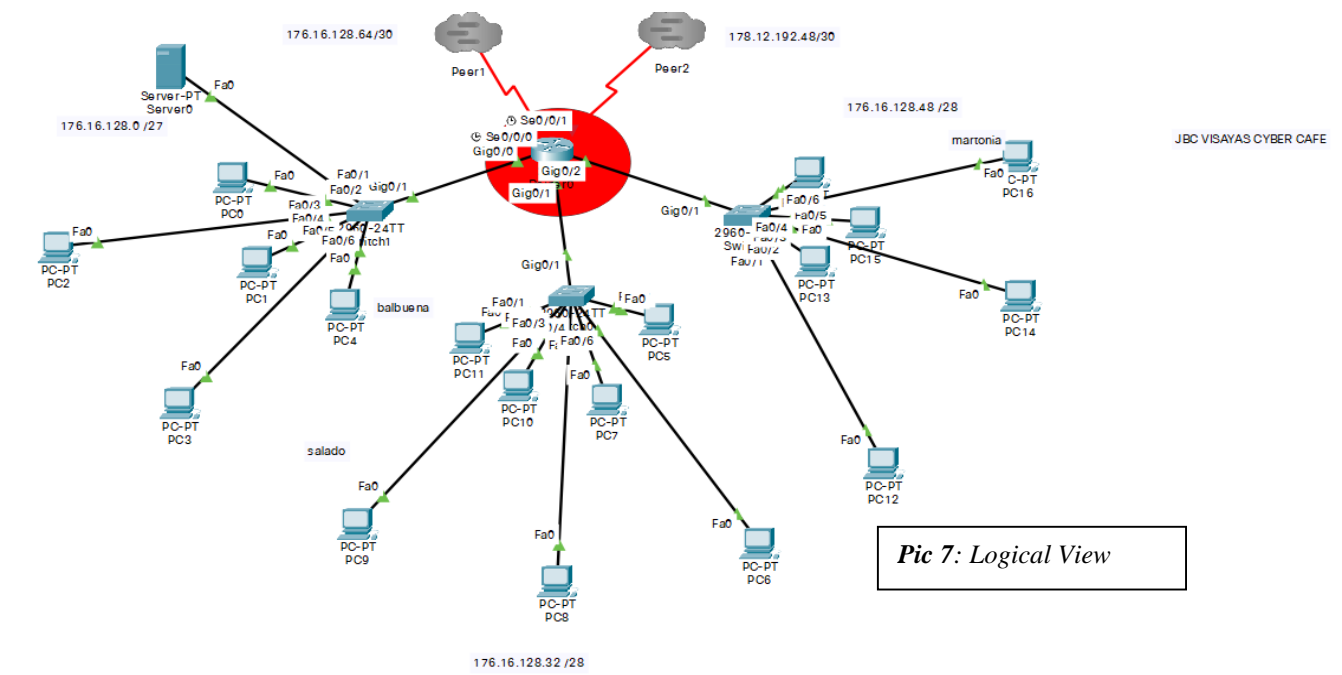
Pic 5: Whole Province to its Exact location View



Pic 5: The Actual Site

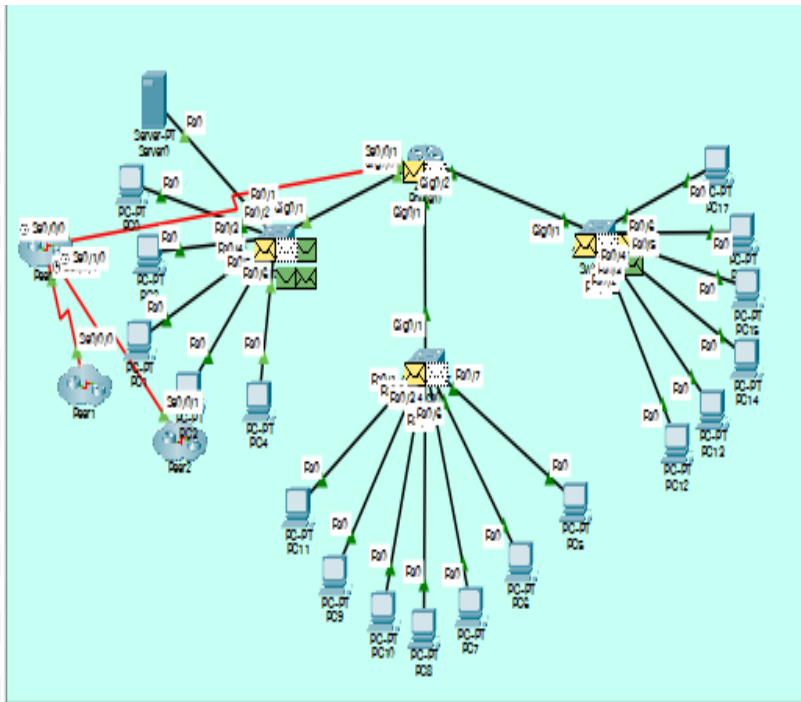


Pic 6: Wiring Closet



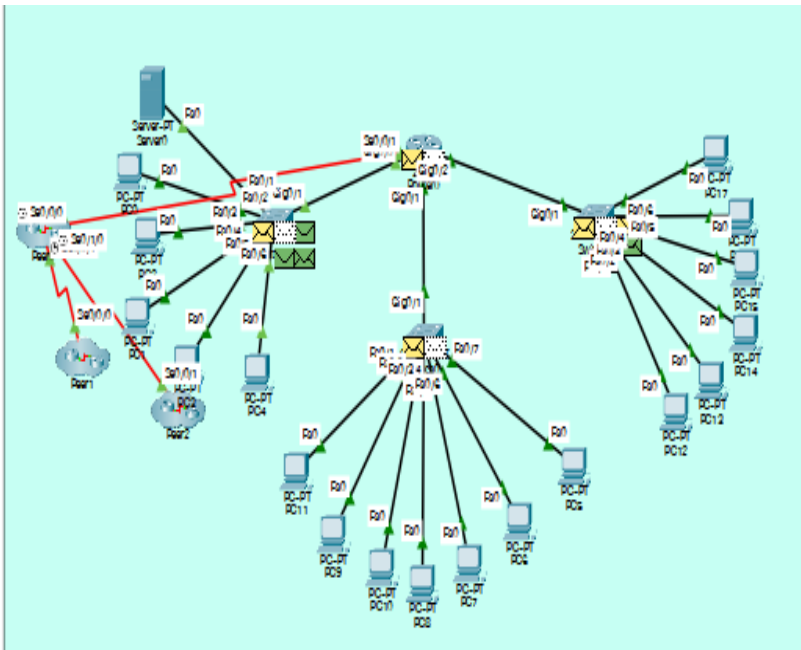
Pic 7: Logical View

Vis.	Time(sec)	Last Device	At Device	Type
	3.388	--	Switch0	STP
	3.389	Switch0	PC1	STP
	3.389	Switch0	PC3	STP
	3.389	Switch0	Server0	STP
	3.389	Switch0	PC2	STP
	3.389	Switch0	PC0	STP
	3.389	Switch0	Router0	STP
	4.539	--	Switch3	STP
	4.540	Switch3	PC13	STP
	4.540	Switch3	PC14	STP
	4.540	Switch3	PC10	STP
	4.540	Switch3	PC11	STP
	4.540	Switch3	PC12	STP
	4.540	Switch3	Router0	STP
	4.540	--	Switch1	STP
	4.541	Switch1	Router0	STP
	4.541	Switch1	PC8	STP
	4.541	Switch1	PC4	STP
	4.541	Switch1	PC5	STP
	4.541	Switch1	PC6	STP
	4.541	Switch1	PC7	STP



(figure 5: Packet Simulation)

Vis.	Time(sec)	Last Device	At Device	Type
	19.986	Switch1	PC4	STP
	19.986	Switch1	Server0	STP
	19.986	Switch1	PC0	STP
	19.986	Switch1	PC3	STP
	19.986	Switch1	Router0	STP
	20.426	--	Router0	ICMP
	20.427	--	Router0	ICMP
	20.428	--	Router0	ICMP
	20.428	--	Router0	ICMP
	20.428	--	Router0	ICMP
	20.428	--	Router0	ICMP
	20.428	--	Router0	ICMP
	20.428	--	Router0	ARP
	20.428	--	Router0	ICMP
	20.428	--	Router0	ICMP
	20.428	--	Router0	ARP
	20.429	Router0	Switch0	ARP
	20.429	Router0	Switch3	ARP



Chapter V

Conclusion

A structured cabling system is a collective infrastructure of cables, pipes, connectors and other devices that comply with a series of standards and whose main objective is to establish a system of generic telecommunication within a space. The characteristics and installation of these elements must be done in compliance with standards to qualify as structured cabling. The adherence of structured cabling installations to standards brings with it the benefits of provider and protocol independence (infrastructure generic), installation flexibility, growth capacity and ease of Administration.

The JBC Corporation's Cyber Café success depending the how infrastructure was built. The whole building was about 20m x 50m (1,000sqm) and Planning its Cyber Café Extension from its main Building located in Sancianco Street Cebu City, the process expands from the of the building itself by creating a blueprint (floor plan) as well as allocating its size, 10m x 12m (120 sqm). Furthermore, this recorded size was critically examining in corresponds to the average lot prices per square meter in Cebu City. Considering the location of the building surrounds by schools and other publishment where people are passing by, middle class building denotes to the average lot price per square meter of 22,000 in Philippine Peso, that would be multiplied by its whole 120 sqm that results to php 2,640,000. There several plans exposed, like floor plan, electrical plan, cabling plan lighting plan and even the furniture and fixtures that are used as an asset of the business. All materials and equipment in every plan undergoes to a crucial comparison and contrast pricing. The total net expense of all the materials and equipment used as well as the labor for ten days' installation costed about-----.

Moreover, topologies both physical and logical were also proposed and implemented. PC. Switch, routers and multiuser icons represents, wiring closet and many more are arranging accordingly to the space intended to it. Cables are in metered and set on the sideways of each chamber. The routers and end devices are connected as well as the server

Recommendation

Connecting devices to the network allows communication and cooperation between these devices. The development of personal computers, mobile devices, and overall modern technologies has created some pressure on the development of computer networks. This work is focused on the issue computer networks, specifically for the design of communication infrastructure. Communication infrastructure is an element of any computer network. Represents routes and nodes, which are arranged in a topology and create an environment in which it is possible transmit data.

Based on the study entitled “StarNet: Pedestrian Trajectory Prediction using Deep Neural Network in Star Topology”, it states that StarNet has a star topology which includes a unique hub network and multiple host networks. The hub network takes observed trajectories of all pedestrians to produce a comprehensive description of the interpersonal interactions. Then the host networks, each of which corresponds to one pedestrian, consult the description and predict future trajectories. The star topology gives StarNet two advantages over conventional models. First, StarNet is able to consider the collective influence among all pedestrians in the hub network, making more accurate predictions. Second, StarNet is computationally efficient since the number of host networks is linear to the number of pedestrians.(Yanliang Zhu, et. al.). Therefore, the Researchers recommended that organization must be more focused on the center part of the whole network, the Router which serves as the epi center of whole system. They must do weekly survey and testing for its effective functions for all those devices and equipment’s that are part on the business. Expect that today’s circumstances are evolving, the Corporation may better have a watched on the trends related to Cisco, and other networking sites for better awareness applications in preparation for future problems. In turn, the system must be flexible to new technologies, that is, it must adapt to electronic changes.

On the other hand, being a planned and orderly installation, various ways of labeling the numerous elements in order to locate them in an efficient its physical location in the infrastructure. Although there is no standard of how components should be labeled, two fundamental characteristics are: that each component must have a unique label to avoid being confused with other elements and that every label. They are: spaces, ducts or conduits, cables, hardware and commissioning system Earth.