UTM

UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF COMPUTING

SEMESTER 1/20222023

SECR1213– NETWORK COMMUNICATION

SECTION 04

TASK 2 PROJECT

LECTURER: MS. RASHIDAH KADIR

GROUP NO: 2

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Feasibility Study

This project proposed an overall network design and floor plan to be served in the new building that will be established in the Faculty of Computing, which contains many spaces to be operated by this network, as our country, Malaysia, is heading toward the fourth industrial revolution where the uses of the technology can be very common in our daily lives. Our key goal in creating this floorplan is to support this initial planning, including secured devices, high performance to the core backbone, support for features, the ability to offer secure VPN connections from remote places, and the ability to be a manageable and scalable system. Hence, our project is mainly to achieve those specific requirements mentioned before.

First and foremost, we want to offer a secure device that all users in the network building may access. This device will be configured with policies to monitor and guard against illegal or unwanted access to the network devices. This includes providing the Faculty of Computing building with a secure computing environment by deploying reliable security software. It is intended to be completely practical and nearly inaccessible to those without the necessary credentials for the system. This strategy will lessen the risk of unauthorized consumption by any outsiders and can offer students, staff, and other building users a secure building system.

Aside from that, we would like to offer a system with high performance to the network system's core backbone and support for new features as they are developed. We will offer the highest performance level for any gear used in this facility and by all users. This uses fast technology and is appropriate for running the Faculty of Computing's administrative and educational operations. Any device in this building that will have software installed on it can be used without any problems. Hence, the network that will be utilized in this facility must therefore enable clients to retrieve, process, and store text and graphics .

Other than that, the facility should also undergo routine maintenance to guarantee that the components, cables, routers, and other networking devices can function as intended given the yearly increase in users and to ensure that all users receive the greatest performance. We don't want any confusion to arise while participating in video conferences, giving presentations, giving lectures, or accessing online resources because it could irritate other network users. Update and

integration are therefore essential in this situation. The technology must be dependable, current, and compatible with all potential connected devices because the building used a Local Area Network (LAN) connection to ensure productive communication across the organizations.

In addition, we want to make sure that the network system we plan to use can support safe VPN connections from faraway locations. The VPN will therefore help to reduce the risk of internal data breaches, support remote workers, and provide security against hostile assaults. Many remote users will want to connect through unreliable network connections, such as insecure Wi-Fi. A VPN may eliminate that danger, and we'll see to it that the VPN endpoint software is kept current to prevent vulnerabilities that may arise from using an outdated client software version.

Last but not least, we will increase the network's bandwidth capacity and assist its physical expansion to new development areas to ensure that the network that will be installed is capable of managing increasing workloads in affordable and sustainable ways. Additionally, it has all the qualities of a scalable network, such as responsiveness, efficiency, adaptability, and accessibility, but also security, dependability, and availability.

List of Questions

1. **How will you protect your servers from any attack such as DDoS attack?**

We will use VPNs and private networks to ensure the security of the servers. This needs to be included since the organization may need to protect its server and data from any malicious attack. Moreover, it can also track and trace the users who are connected to the servers and even the location of your PC or laptop. This might help them if anything happens in the future. Besides, we will also set up and maintain a firewall. A firewall's main objective is to limit or get rid of unauthorized network connections so that authorized traffic can flow more freely. They can guide in disconnecting connections to the Internet from PCs and servers, protecting data privacy and security.

2. **What are the desktop computer configurations that you require for every lab ?**

Processor (CPU):	Intel Core i5 sixth generation or newer
Sustainability:	EPEAT Silver rating (preferably EPEAT Gold)
Operating System:	Microsoft Windows 10 Professional x64
Memory:	16GB RAM
Storage:	512 GB internal Solid State Drive (SSD) or 1 TB internal HDD
Monitor/Display:	24" LCD monitor
Network Adaptor:	802.11ac 2.4/5 GHz wireless adapter
Graphics:	Intel HD Graphics 2500

3. **What Internet Service Provider (ISP) suits best for your network?**

We would like to choose Unifi as the main ISP in the building. Since Unifi offers a few plans that are affordable considering that the wifi will be fully utilized by everyone in the faculty. We plan to subscribe to the Unifi plan which consists of 800 Mbps download speed and 200 Mbps upload speed and it costs RM349 per month.

4. **What type of network topology do you want to implement in the building?**

As each device is connected to a central switch, a star topology will be employed for the network. Because the entire network can be handled from one place using this star architecture, it is simple to add or delete nodes without having to take the network offline. Additionally, it offers a fast data transfer rate, which is essential for students and employees to finish their work.

5. **What is the important software that will be installed on each PC?**

For every workstation, a few internet browsers will be installed such as Google Chrome, Mozilla Firefox, and Internet Explorer. Next, for word, presentation, and spreadsheet software, we will install Microsoft Word 2021, Microsoft Powerpoint, and Microsoft Excel respectively. For a better learning experience, software such as WireShark, Visual Studio Code, and MATLAB will be installed beforehand.

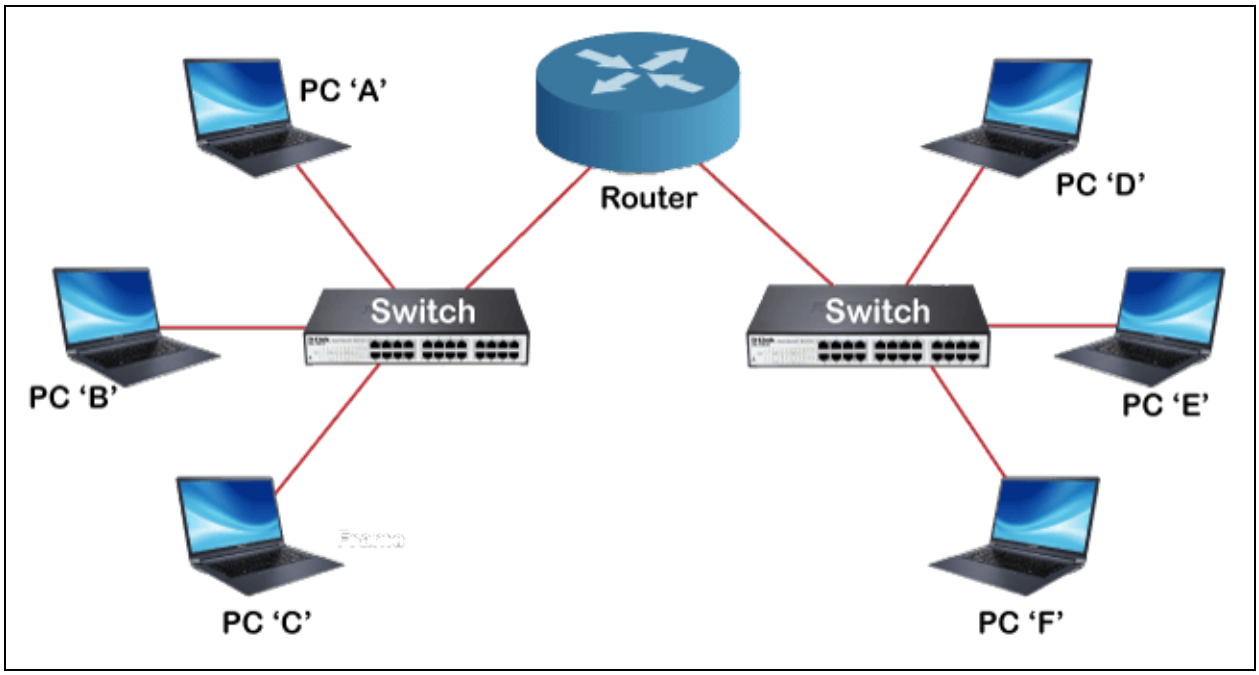
6. W**hat network architecture will be used?**

A Local Area Network will be used for this project and it will implement the client-server architecture. LAN is among the most versatile and flexible networking technology for providing customized communications systems. LAN can basically meet the needs of any place or venue. Any user size, any application kind, and any cost/performance ratio can be handled. LANs are simple to use due to their excellent flexibility, which is caused by a number of variables including distributed architecture design, software standards, and hardware independent technologies.

7. **What are the devices needed to construct the network infrastructure?**

Routers - To connect to the switches or hubs that will be used.

Switches/Hubs - To connect with all the computers in each lab.



8. **What type of physical media do you want to use for your network plan?**

We will use both wired and wireless connections. In terms of wired connections, we will use Ethernet because the speed provided by an Ethernet connection is much faster than that of a wireless connection and also has higher levels of security because it will be able to control who uses the network and prevent security breaches. As for the wireless connection, it will allow multiple devices to be remotely connected to the same internet connectivity. They will also be able to access the Internet using their mobile phones, tablets, laptops, and other devices as long as their devices are within its range.

9. **Are the labs using the same equipment as other labs?**

No, because each lab will have its own specific equipment and tools to help students in their studies.

10. **What WiFi technology is going to be used in the building?**

We will use WiFi 6 instead of WiFi 5. This is due to the fact that WiFi 6 expands the number of devices that can be supported by a single router while also providing faster speed than WiFi 5 for both single and multiple devices when connected to a router. Furthermore, it has improved security protocols for secure internet browsing.

11. **What are the types of servers going to be used in the labs altogether?**

There will be two types of servers used, which are file servers and web servers. For file servers, it will allow the user to easily access all of the user's files from one central location while also allowing the user to control access so that the user's information is not leaked to others. Meanwhile, web servers deliver site content to users. It is critical that the web user functions properly so that the site content can be delivered to users as quickly as possible.

12. **What application architecture is going to be used in the labs?**

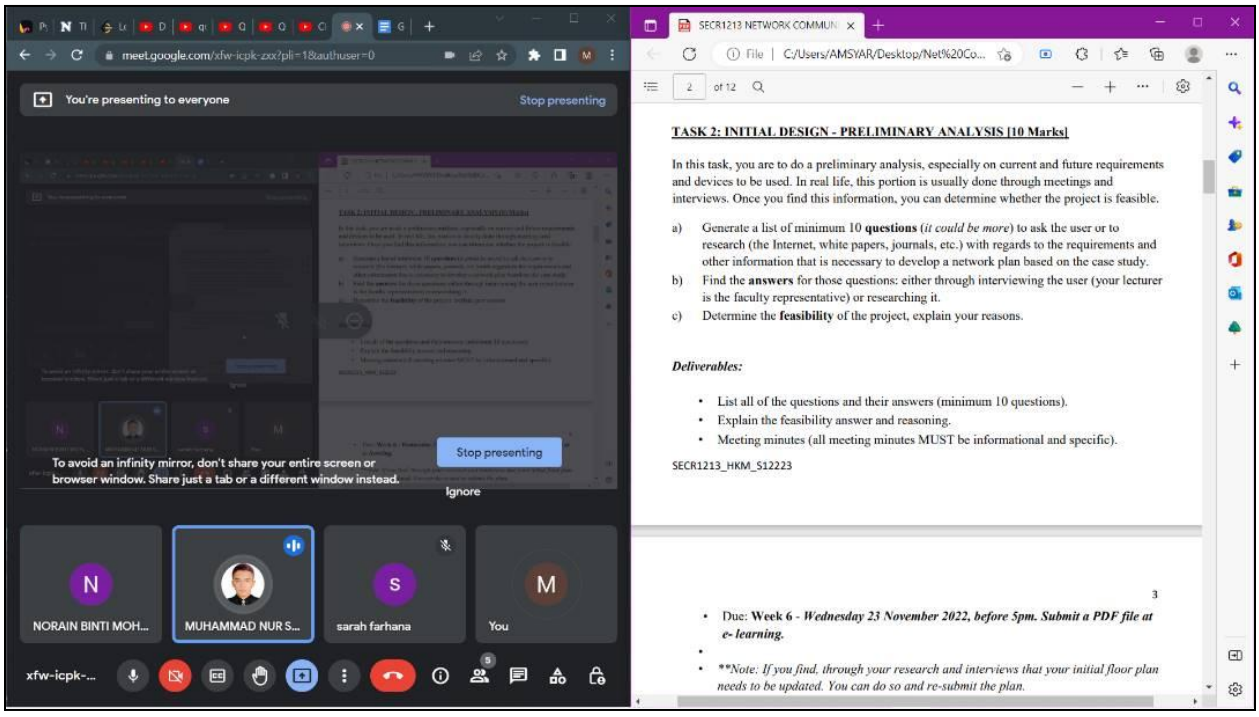
The client-server architecture will be used in all labs and conference rooms. This is because it is easy to manage and maintain, and data can be delivered to clients quickly. Because the data is centralized, it also adds security to the data, making it less likely to be leaked.

APPENDIX

DATE: 20/11/2022 (Sunday)
PLATFORM: Google Meet

Attendees:

1. Muhammad Nur Solihin Bin Malik Radzuan
2. Sarah Farhana Binti Salleh
3. Norain Binti Mohd Sulaiman
4. Muhamad Amsyar Bin Ibrahim



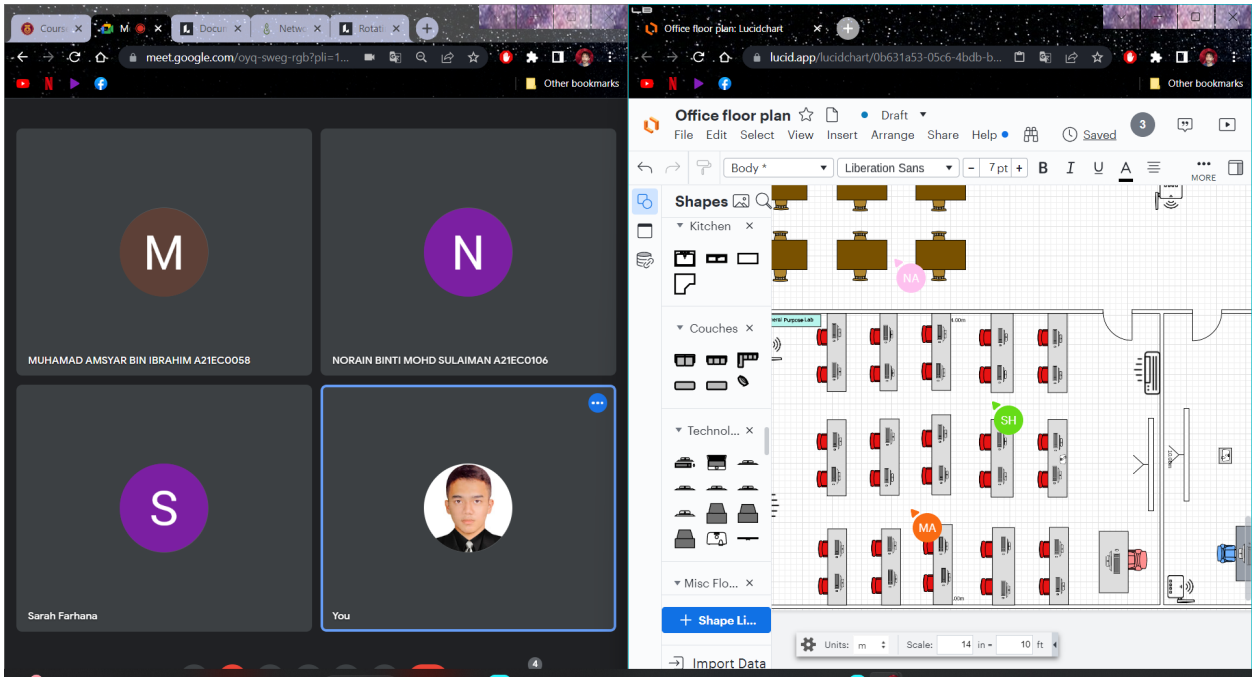
Agenda:

1. Read the task 2 instructions
2. Divide the tasks for each of the members in group
3. Provide ideas for the type of questions that need to be included in the project based on the case study provided.

DATE: 22/11/2022 (Sunday)
PLATFORM: Google Meet

Attendees:

1. Muhammad Nur Solihin Bin Malik Radzuan
2. Sarah Farhana Binti Salleh
3. Norain Binti Sulaiman
4. Muhamad Amsyar Bin Ibrahim



Agenda:

1. Read the task 2 questions
2. Divide the tasks for each of the members in group
3. Provide ideas for the type of questions that need to be included in the project based on the case study provided.
4. Discuss and improvise the floor plan that each of us have made.
5. Exchange ideas on creating the question for task 2.

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2. NordLayer (no date) *Remote Access VPN – Access Your Work Network securely*, *NordLayer*. Available at: https://nordlayer.com/remote-access-vpn/?gclid=Cj0KCQiAveebBhD_ARIsAFaAvrGNIQtky0g90OIk6dtt5_tredlLoA5s-nMfuZIC3iDPTRDYZalKad8aAoIIEALw_wcB (Accessed: November 20, 2022).

3. Cepero, R. (2020) *Why network scalability is important for your company*, *Bleuwire*. Available at: https://bleuwire.com/why-network-scalability-important-for-company/ (Accessed: November 20, 2022).