

Network Communication Section-07

Task 2

Group 6 :

Ahmad Kemal Aushaf (A19EC3002)

Muhammad Aqila Karindra Daffa (A19EC3010)

Savero Fajri Sutiono (A19EC3016)

Zeiad Wael Mohamed (A19EC9047)

1. Why is the size of the rooms are 25x15m?

To answer that we need to know the size of each pc disk and the space that the user will need to have a comfortable place, so for the size of each desk we said it will be 2x1m and will give for the space that the user will need 1m beside the disk so in total we will need 2x2m space for each user for 30 pc disk, 25x15m will be a rectangle area that equal to 375m^2 and if we say we will put 2 disks near each other then a free space equal to 4m then we will have 5 vertical lines contain 6 disks, the total area of each line will be 32m^2 and we have 5 lines and between each line 4m space so in total we will have an area equal to 288m^2 , to make it simpler this is a photo of what the desks position would be like:



There will be much more free space in the lap because we thought each lap could contain closets, shelves, cabinets and more.

2. What kind of cables are we going to use, and why?

We thought about using either CAT5e or CAT6, we thought about using CAT5e known as Category 5 Enhanced because CAT5e offers a lot of improved performance over the old CAT5, including up to 10 times faster speeds and a significantly greater ability to traverse distances without being impacted by crosstalk, CAT5e cables are normally 24-gauge twisted pair wires, which can support Gigabit networks at segment distances up to 100m, and as for CAT6, it came out only a few years after CAT5e, CAT6 cables are twisted pair cable for Ethernet that is backward compatible with CAT5/5e and CAT3 cable standards, CAT6 cables can support Gigabit Ethernet segments up to 100m like CAT5e but they also

allow for use in 10-Gigabit networks over a limited distance, now there are some differences between CAT5e and CAT6 are that CAT6 cables are designed for operating frequencies up to 250 MHz, but CAT5e cables are designed for operating frequencies up to 100 MHz, this means that a CAT6 cable can process more data at the same time, another difference is that CAT6 cables offer speeds up to 10GBASE-T or 10-Gigabit Ethernet but CAT5e cables can support up to 1GBASE-T or 1-Gigabit Ethernet another difference is that CAT6 cables are more expensive than CAT5e cables by 10-20%, so after going through all we concluded that we are going to use CAT6.

3. what approach do we use in the making of the project?

In the other subject (SADM) we have learned about types of approaches to make a project. the approach that we use is the prototype approach because we can see that the prototype approach has many advantages in

doing this project. First, our customers could see the parts of our project earlier as they can see it on the map floor. The second advantage is with this approach we could detect errors much earlier and save a lot of effort and cost. Missing functionality will also be easy to figure out. Thereby we are using this approach.

4. which part is the most expensive is it necessary? why?

So far, the most expensive parts are the labs, our labs consist of high-tech equipment which is expensive and hard to find. It is also important to maintain our lab temperature below 24 or we could say we need extra cost for its own maintenance.

5. what will happen if that part (the most expensive part) was removed?

Laboratories are a facility that supports students to do scientific or technological research. This facility will be very important for students. in here the students are allowed to experiment with things they never did before. laboratories are places for students to reach beyond the limit. without this facility, students will have limitations in their experiment. in that case, it would be hard for the students to develop. and that is why this is very important and cannot be removed.

6. What is the different between the 4 labs (IoT, Network, Computer Security, and General-Purpose lab)?

We should have 4 different labs because each of them has its own function.

The first is IoT lab, IoT Lab is a research platform exploring the potential of crowdsourcing and the Internet of Things for multidisciplinary research with more end-user interactions. **The second is Network lab**, The Network lab is a virtual cluster of multiple networking devices, including servers, clients, routers, switch, and firewalls. The servers and network devices are Microsoft and Cisco-based respectively. **The third is Computer Security lab**, The Computer Security is facilitating space in which students can safely engage in cyber related activities, including malware detection and deactivation, and penetration testing. **And the last is General Purpose lab**, General Purpose Lab is a laboratory for testing and complete project development solution with core equipment.

7. Do the 4 labs (IoT, Network, Computer Security, and General-Purpose lab) have their own functions? And what are them?

Yes, the 4 labs (IoT, Network, Computer Security, and General-Purpose lab) have their own functions. They are:

- **IoT lab** = facilitates the full control of network nodes and direct access to the gateways to which nodes are connected, allowing researchers to monitor the energy consumption and network-related metrics of nodes. For example, end-to-end delay, throughput or overhead.
- **Network lab** = facilitates the process of education in the field of information and communication technologies concerning the problem of computer networks, their design, administration, and management.
- **Computer Security** = facilitates experiences for students who study in field of computer security technologies and serves as a testbed for projects and also gives a space in which students can safely engage in

cyber related activities, including malware detection and deactivation, and penetration testing.

- **General Purpose lab** = for testing and complete project development solution with core equipment like Signal and Spectrum Analyzers, Logic Analyzer, Oscilloscopes, Bench Multi-meter, Soldering Bench, Power Supplies and General-Purpose Tools

8. do we need ethernet switch in the building? and why?

Yes, we need the ethernet switch in this building because the ethernet switch is a central network that creates a network and the router allows for connection between network, it means the ethernet switch is used for connecting the computers and every other wired device to each other.

9. What constitutes a system that "easy to manage"?

It lets network engineers manage a network's independent components inside a bigger network management framework and performs several functions. It could identify, configures, monitors, update, and troubleshoots network devices both wired and wireless in an enterprise network. And could also control application then displays the performance data collected from each network, allowing network engineers to make the change as needed.

10. What are the things that would affect the internet speed connection?

Here are multiple factors that affect speed and internet quality, such as transfer technology(depends on the network technologies available in the area and feature of user's device), location(the speed may vary because the signal depends on coverage area), and number of people that share connection within(during certain hours

like the class time there are many users which causes the speeds to slow down).

11. What causes can affect the network security of the building?

The unknown asset of the network. To make sure our network is secure firstly we have to know all of the assets are on our network. Conduct a review of all devices on our network and identify all platforms they run. We can know all the access points and which are the ones that most need security updates. And then lack defense in depth. How much damage this attacker will be capable of depends on how the network is structured.

Feasibility:

After what we have discussed and revised, we can come to a conclusion that our floor plan and design are fulfilled the requirements. So, with that we can proceed this project to the next step with what we have now.

We are given RM. 1,500,000 to build this project and I think the budget is enough for this building, but we will analysis the benefits to see how good or bad the project with the budget given, we will also try to finish our project at the duration given by measuring the time so we wont be late, we will also will not forget to do the project without conforming the legal and ethical requirement, we also added some rooms beside required rooms for our building, so in total we have 4 different labs (IOT, Network, Computer Security, and General Purpose lab) and 2 video conference rooms, and the additional rooms with certain purposes are 2 level of library, 1 level of reception room but it contain both floors, server room, prayer room, management room, 4 bathrooms, and a cafeteria.