UTM
UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF COMPUTING
UTM Johor Bahru

NETWORK COMMUNICATIONS

(SECR 1213)

PROJECT

TASK 4: MAKING THE CONNECTIONS – LAN and WAN

Submitted To:

DR. RAJA ZAHILAH BINTI RAJA MOHD. RADZI

From:

GROUP 7 LAB RATS

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1	LOKE RUI KEE	A20ET0329	01
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4	LIM JIE HAN	A21EC3013	

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IDENTIFYING WORK AREAS

Floor 1

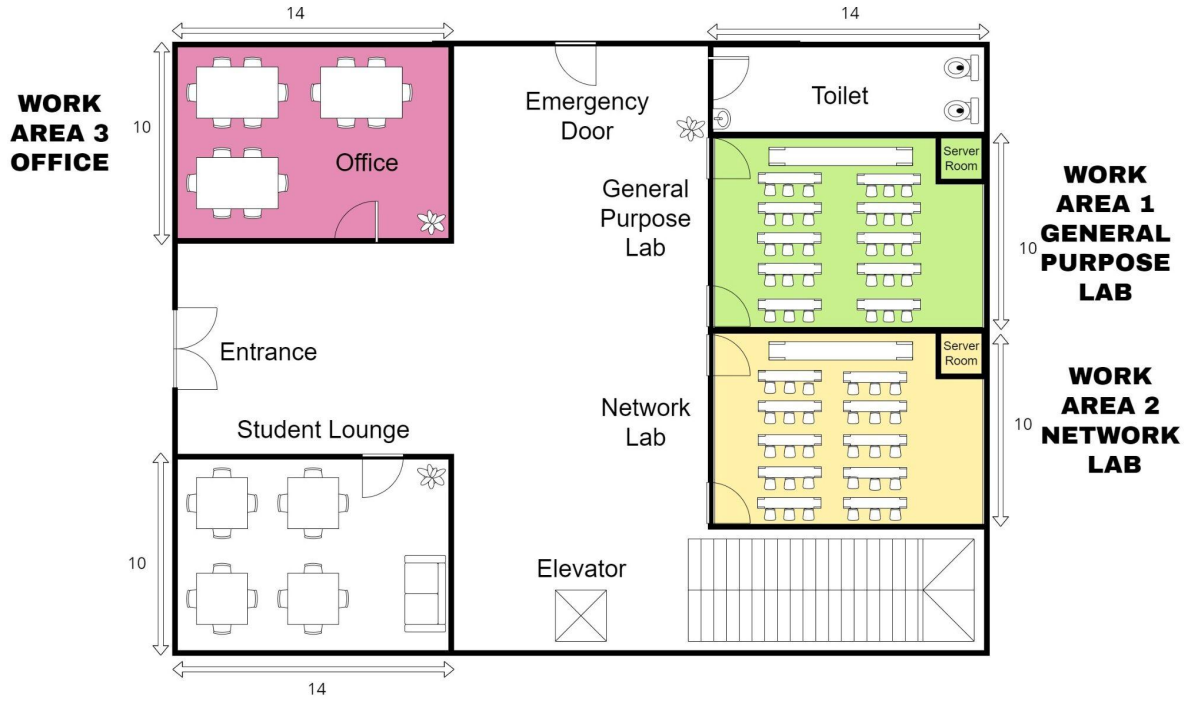


Figure 1 shows a labelled floor plan for level 1

Floor 2

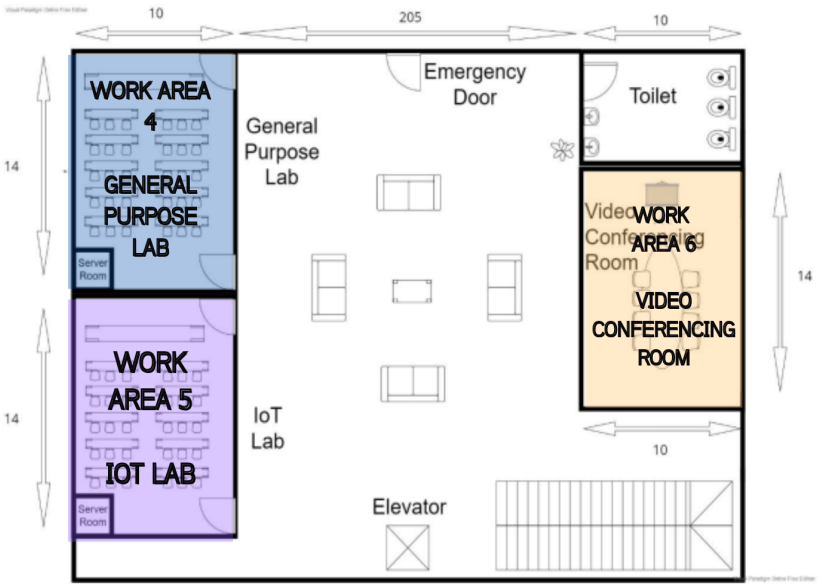


Figure 2 shows a labelled floor plan for level 2

OVERALL NETWORK DIAGRAM OF THE BUILDING

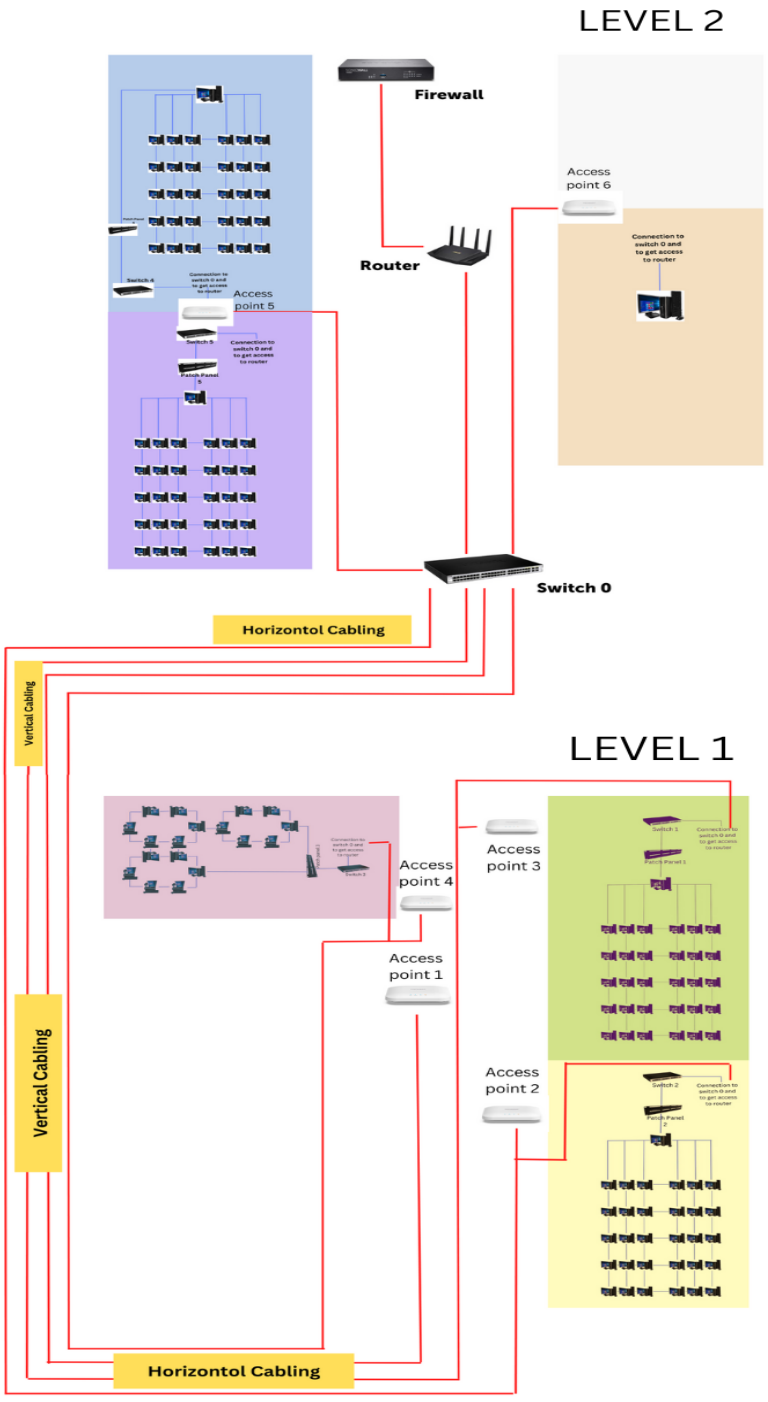


Figure 3 shows an overall network diagram of the building

CLOSED-UP NETWORK DIAGRAM

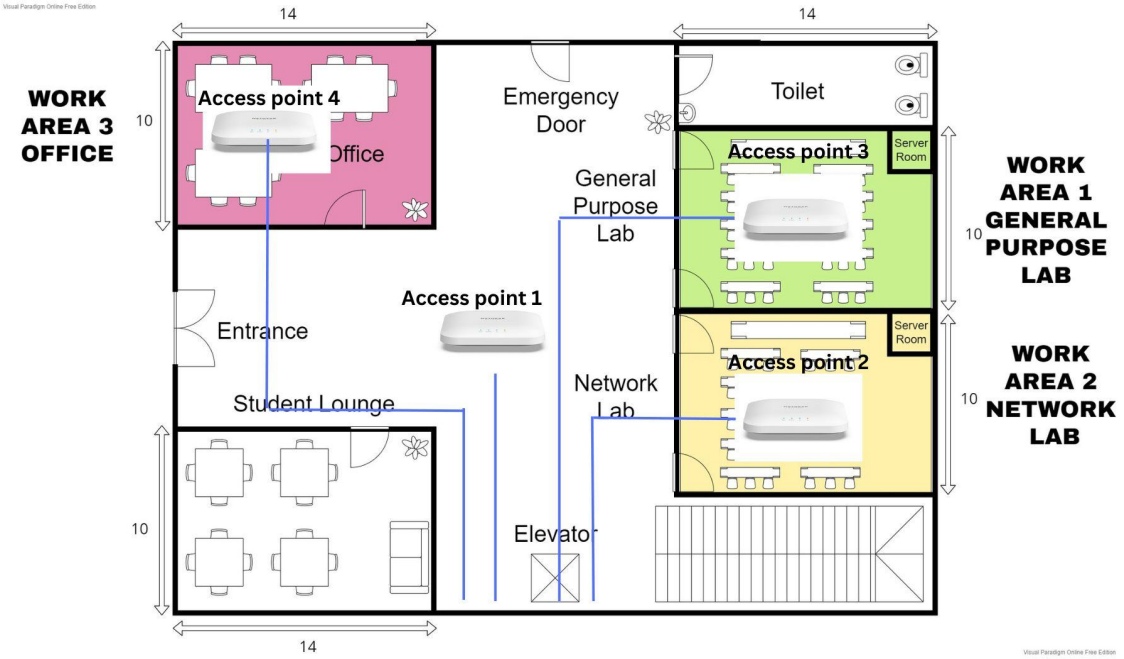


Figure 4 shows the closed-up diagram for floor 1

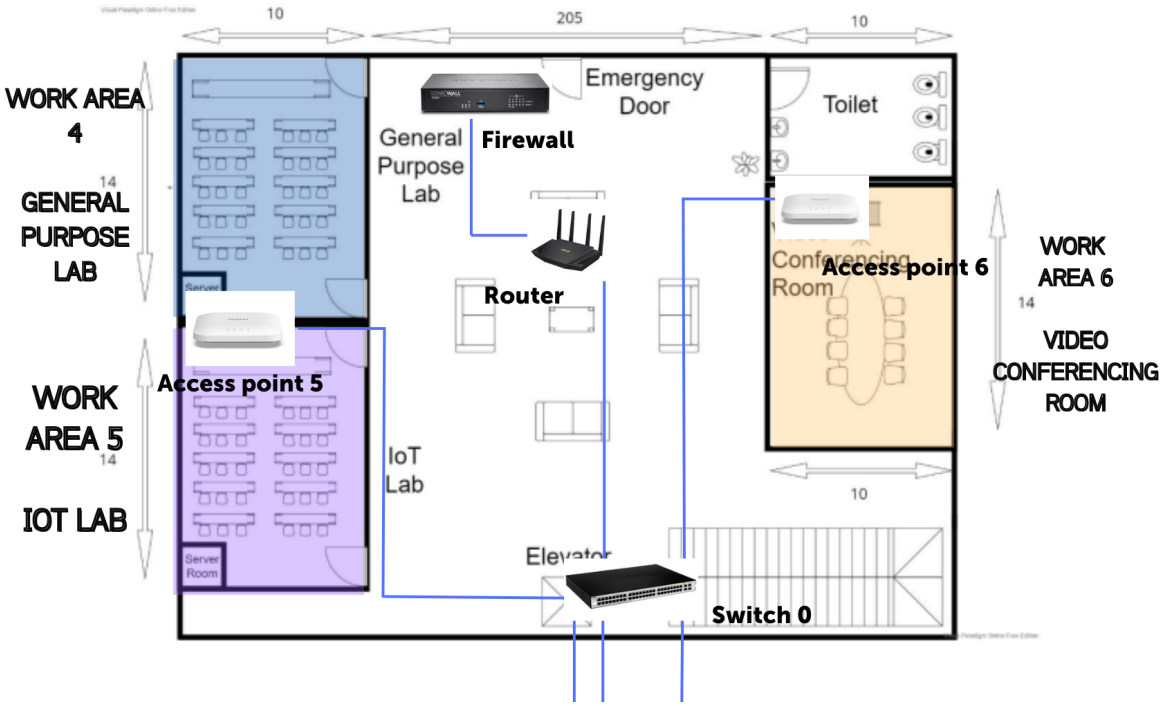
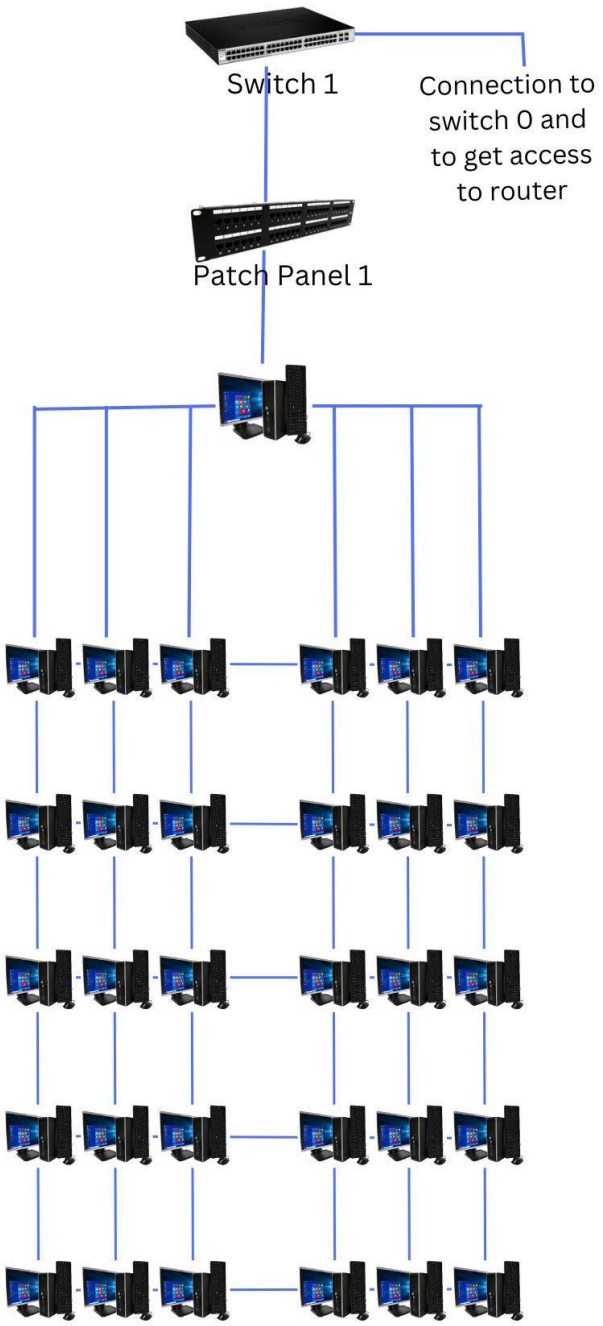


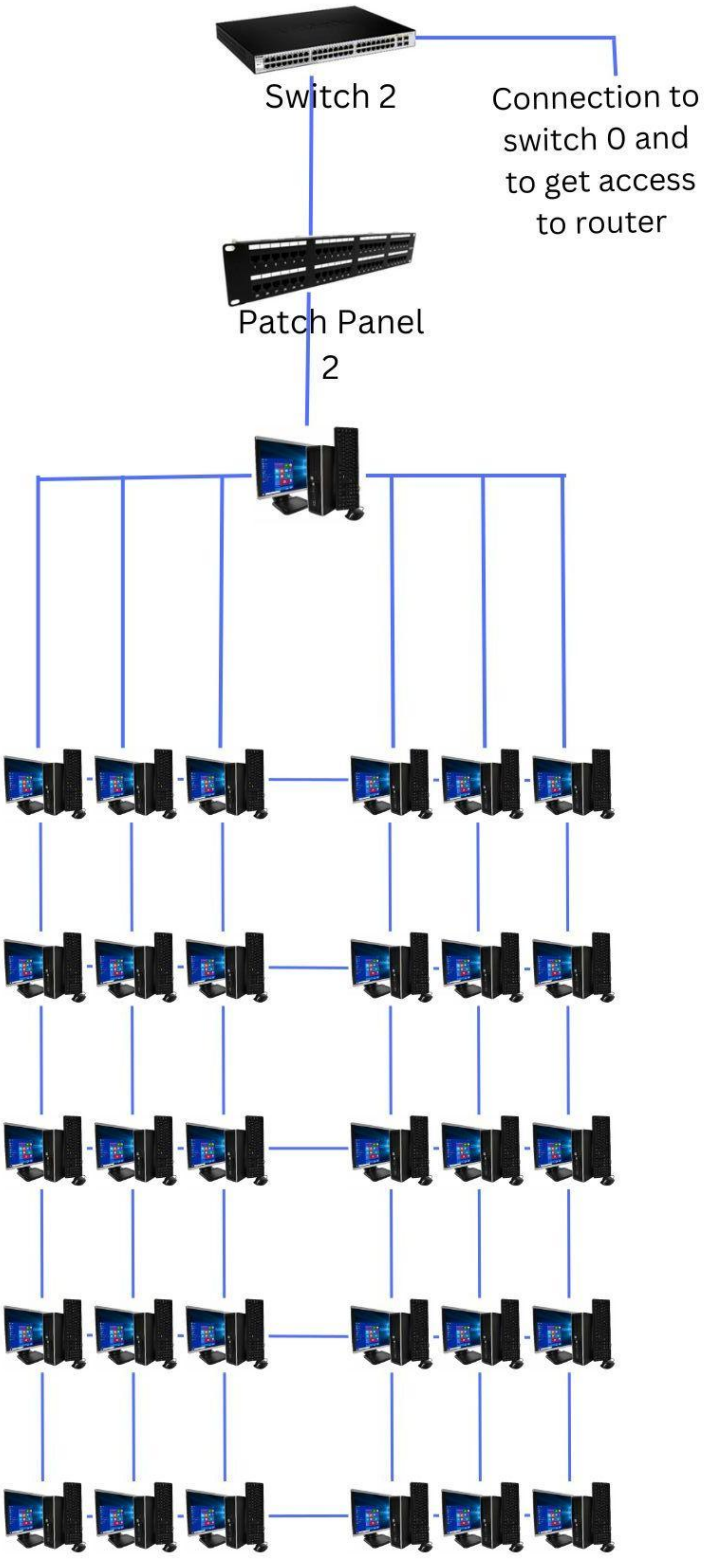
Figure 5 shows the closed-up diagram for floor 2

NETWORK DISTRIBUTION OF LEVEL 1

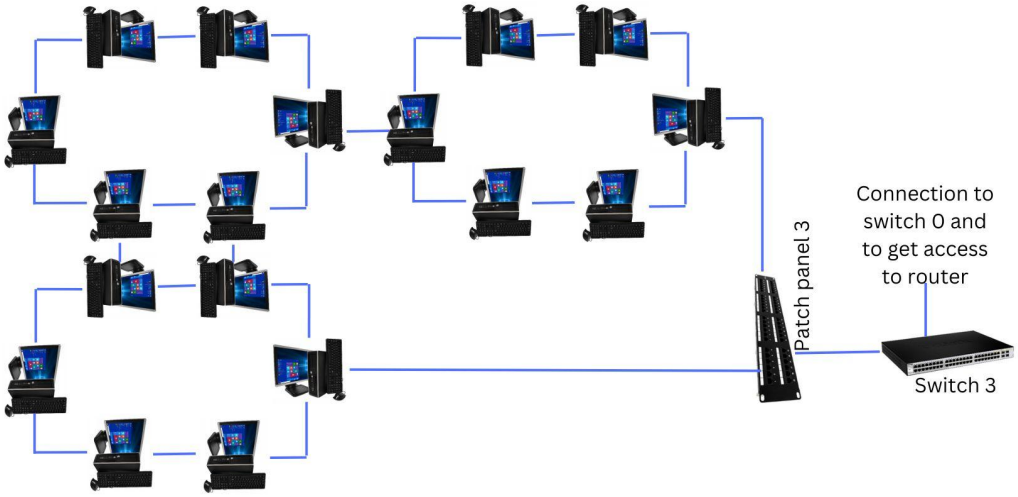
Work Area 1: General Purpose Lab



Work Area 2: Network Lab

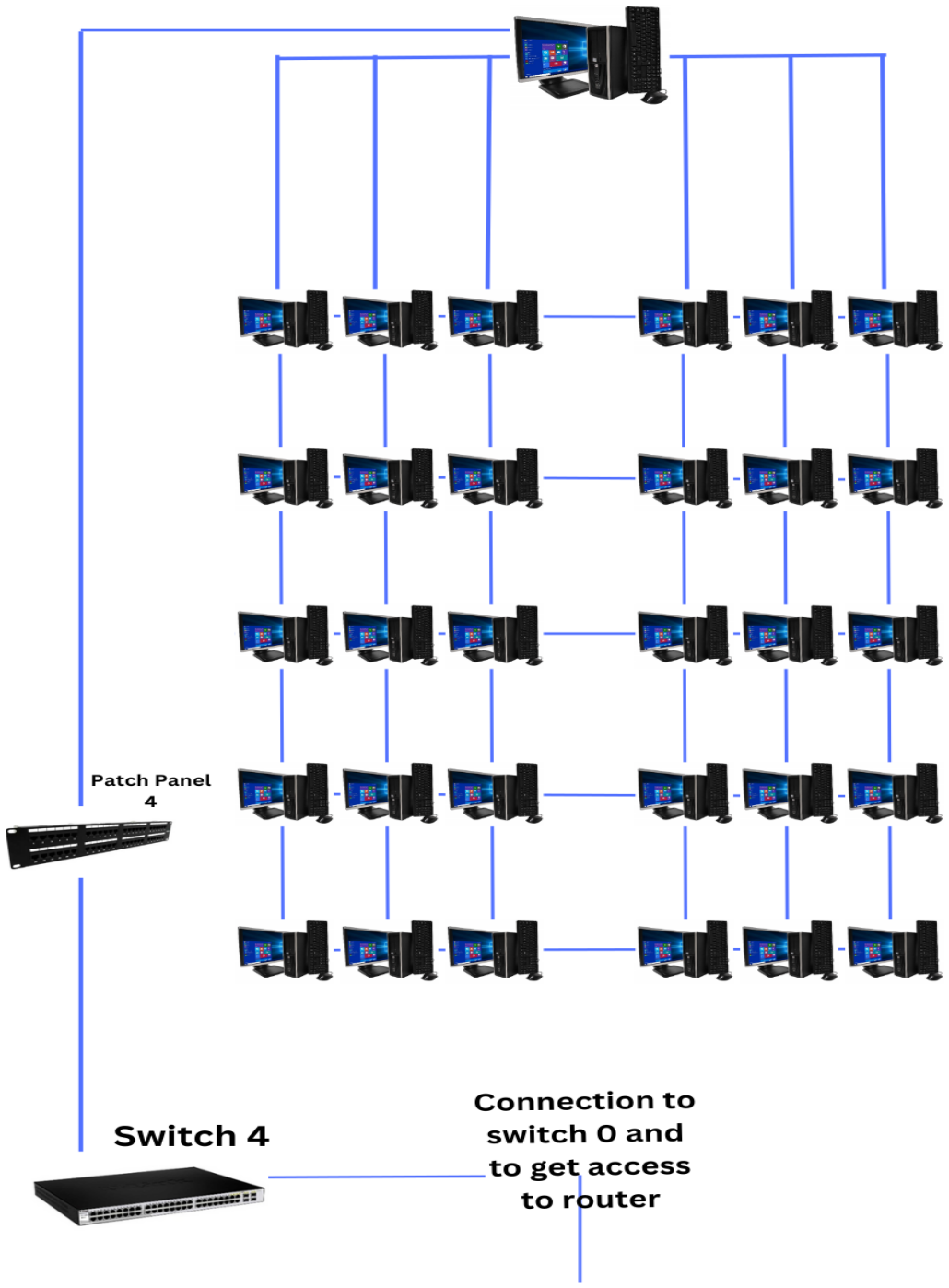


Work Area 3: Office

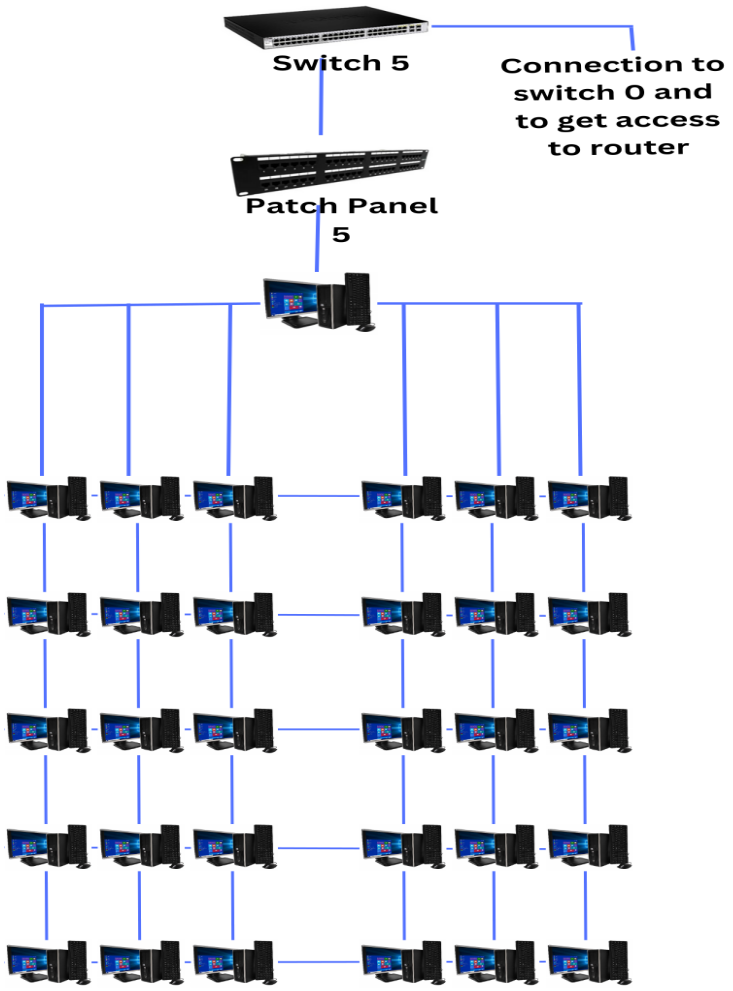


NETWORK DISTRIBUTION OF LEVEL 2

Work Area 4: General Purpose Lab



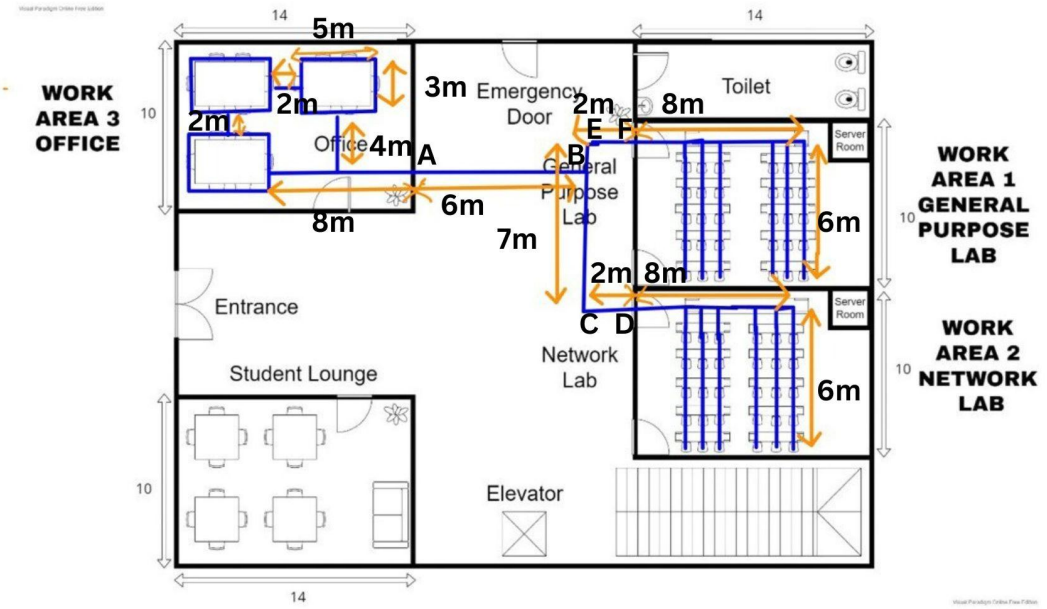
Work Area 5 : IOT Lab



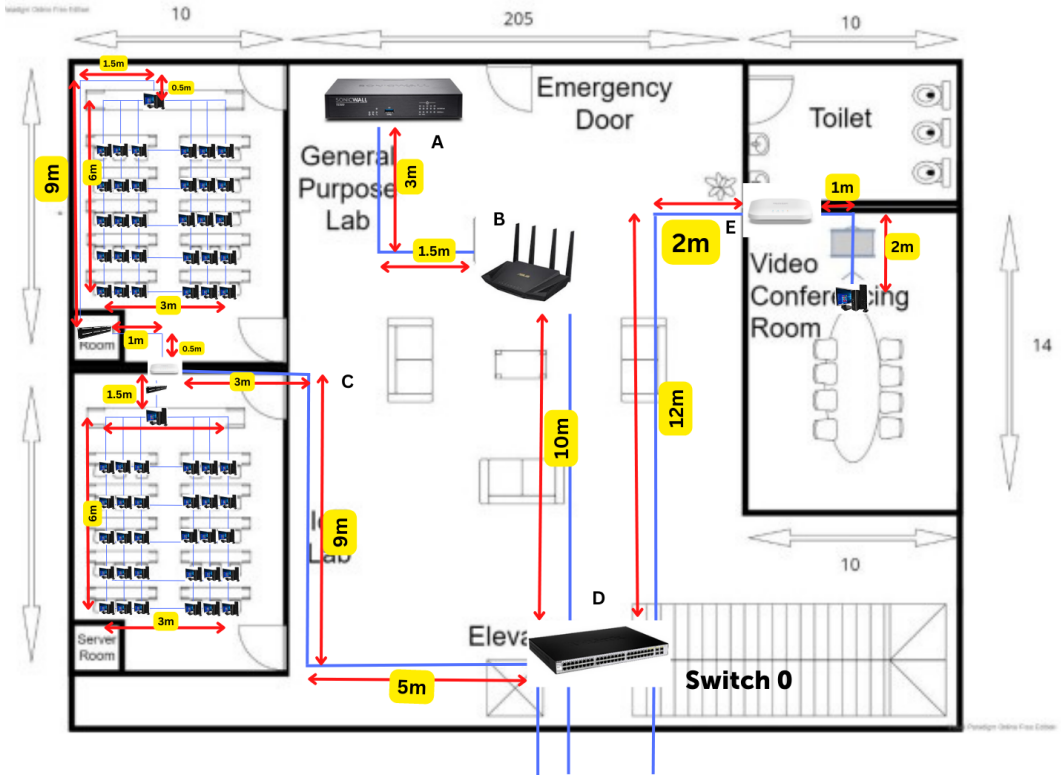
Work Area 6 : Video Conferencing Room

CABLES AND CONNECTIONS

Level 1



Level 2



In this project, CAT 6 cables were used. The CAT 6 cables were used in both floor 1 and floor 2. The cable is used throughout the whole building in every lab and its function is to connect each server.

Cable Lengths

Description	Cable Type	Length
First Floor		
General Purpose Lab 1	CAT 6 Cable	44m
Network Lab	CAT 6 Cable	44m
Office	CAT 6 Cable	64m
Point A to B	CAT 6 Cable	6m
Point C to D	CAT 6 Cable	2m
Point C to E	CAT 6 Cable	7m
Point E to F	CAT 6 Cable	2m
Peripheral Connections	CAT 6 Cable	150 m
Total Length - First Floor (m)		319 m
Second Floor		
IOT Lab	CAT 6 Cable	58.5 m
General Purpose Lab 2	CAT 6 Cable	66.5 m
Video Conferencing Room	CAT 6 Cable	3 m
Point A to B to D	CAT 6 Cable	14.5 m
Point C to D	CAT 6 Cable	14 m
Point E to D	CAT 6 Cable	14 m
Peripheral Connections	CAT 6 Cable	150 m
Total Length - Second Floor (m)		320.5 m
Total Length (distribution cabling) - All Floor (m)		579.5 m
Fiber optic cable	Fiber optic cable	60m
Total Length (backbone cabling) - All Floor (m)		60m
Total Length (ALL)		639.5 m

Switches : D-Link 48-Port 10/100/1000 Gigabit Smart Switch

Quantity : 6

Ports : 288

On the entire floor design, the total length of cables is 639.5m, and the number of ports for deployed switches are 288.

A patch cable or patch cord is an optical or electrical wire used to connect ("patched in") another electronics or optical component to a different one for signal transmission. It is a thick insulated twisted pair of copper cables with an RJ45 connection at either end and capable of connecting various devices together such as the router switch or hub to PCs and other peripheral devices in the workplace. For our network connection, we use 579.5 meters of patch cord.

Switch ports are Layer-2 Gigabit switch interfaces related to physical ports. A switch port can be an access port, trunk port, or a tunnel port.Some switches can also forward data at the network layer (layer 3) by additionally incorporating routing functionality. This network makes use of 6 switch ports, each having 52 ports.

IDENTIFYING CABLE LENGTHS AND TYPE

CAT 6 Cable

For distribution cabling, we had chosen to add CAT 6 twisted copper cable. The CAT 6 is a twisted copper wire that can handle up to 100 meters supporting up to 1000Mbps and 550MHz ethernet data speeds bandwidth for a single cable. We can guarantee that this cable can still provide high data transfer rates and high Ethernet efficiency for the building network, and the access layer and network closets are less than 100 meters. In addition, it can also support most of the building's Ethernet applications.

Therefore, we concluded that the unshielded cable for the installation is effective, with this 24AWG unshielded twisted pair stranded copper cable including a high performance modular plug at either end, making it easy to terminate modular connections.This is due to the building's location in a region with low Electromagnetic Interference (EMI) and distance from an airport or medical centre, both of which have a significant possibility of interfering with cable efficiency. Additionally, the twisted wire itself might reduce the EMI influence on the cable. As a result of the unshielded cable's capabilities, it can be certain that the CAT 6 cable will continue to perform well for at least the next ten years.

Fiber Optic Cable

A fibre-optic cable contains anywhere from a few to hundreds of optical fibres within a plastic casing. Also known as optic cables or optical fibre cables, they transfer data signals in the form of light and travel hundreds of miles significantly faster than those used in traditional electrical cables. And because fibre-optic cables are non-metallic, they are not affected by electromagnetic interference (i.e. lightening) that can reduce speed of transmission. Fibre cables are also safer as they do not carry a current and therefore cannot generate a spark.

Wireless

Wireless networks are computer networks that are not connected by cables of any kind. The Wi-Fi signals are amplified by access points, so a computer can be far from a router but still be network connected.

REFERENCES

- 2022. *Fiber Optics:* Retrieved January 20, 2023, from https://www.verizon.com/articles/internet-essentials/fiber-optics-definition/#:~:text=A%20fiber%2Doptic%20cable%20contains,used%20in%20traditional%20electrical%20cables.
- Wikimedia Foundation. (2022, September 16). *Patch Cable*. Wikipedia. Retrieved January 16, 2023, from https://en.wikipedia.org/wiki/Patch_cable

MEETING MINUTES

1st Meeting

DATE : 15/01/2023 (SUNDAY)

TIME : 6.00 PM - 7.00 PM

ATTENDEES: LIM JIE HAN

: LOKE RUI KEE

: MALLEYLENE PENEH

: JELIZA JUSTINE A/P SEBASTIN

LOCATION : ONLINE - GOOGLE MEET

GOAL : FOCUS ON COMPLETING THE TASK 4

DISCUSSION NOTES :

1). Firstly, the task leader, Jeliza, gave a briefing for task 4, what the task was about, and the deliverables that need to be obtained.

2). Then, the meeting continued with task allocation. Each task is allocated to finish in a week respectively.

Task allocation

Sketch/drawing of your PC & network devices arrangement.	Jeliza Justine A/P Sebastin, Malleylene Peneh
The cable length in the identified work areas.	Lim Jie Han
Connections, patch cord, switchport identified.	Loke Rui Kee
Meeting Minutes.	Malleylene Peneh

Adjournment at 7.00pm.

Next meeting is scheduled on 23/01/2023 (MONDAY) at 7.00pm.

2nd Meeting

DATE : 23/01/2023 (MONDAY)

TIME : 7.00 PM – 8.00 PM

ATTENDEES: LIM JIE HAN

: LOKE RUI KEE

: MALLEYLENE PENEH

: JELIZA JUSTINE A/P SEBASTIN

LOCATION : ONLINE - GOOGLE MEET

GOAL : FOCUS ON COMPLETING THE TASK 4

DISCUSSION NOTES :

1). Firstly, each member updated their progress. Then, they reviewed their own part and others' parts.

2). Then, the members had a discussion to improve their respective tasks.

3). After that, the team has decided to complete the remaining tasks on the spot and review it before the submission.

Adjournment at 8.00pm.