



**UNIVERSITI TEKNOLOGI MALAYSIA, JOHOR BAHRU**  
**SCHOOL OF COMPUTING,**  
**SEMESTER 1, SESSION 2021/2022**

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**SECR1213-02 NETWORK COMMUNICATION**

**GROUP PROJECT**

**TASK 4 : MAKING THE CONNECTIONS – LAN and WAN**

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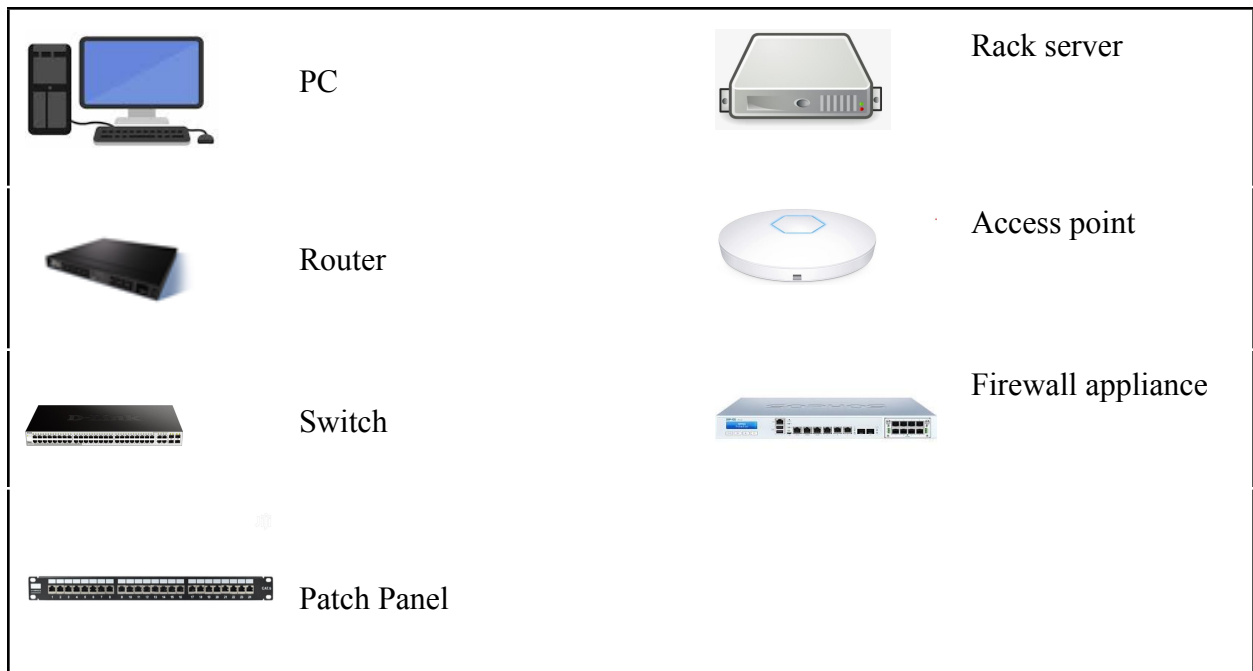


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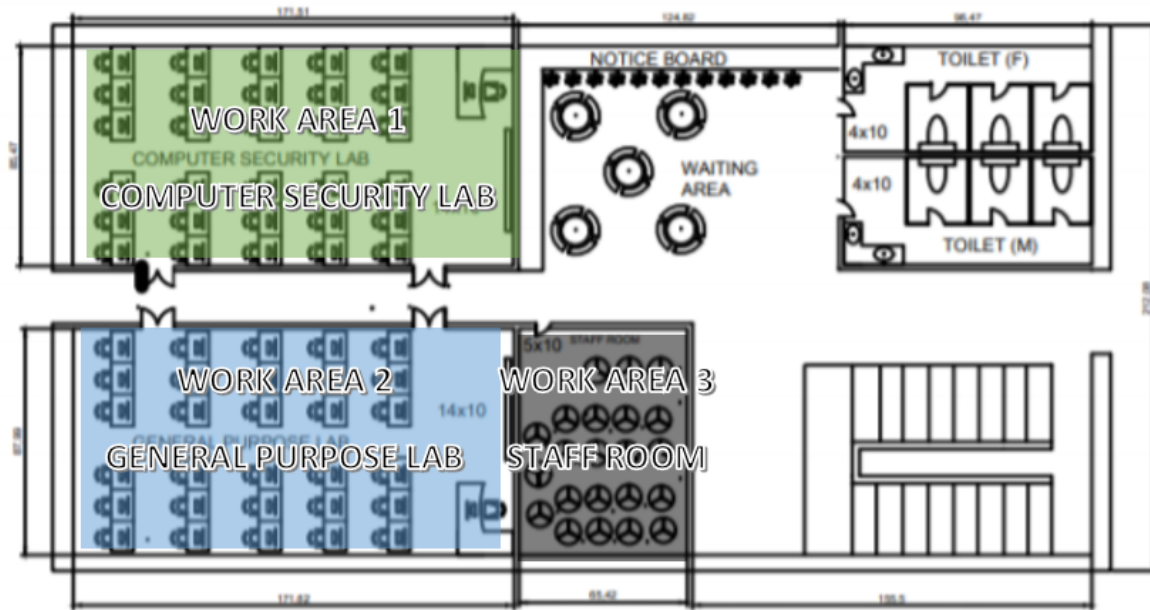


These are the indicators that we will be using throughout the task





## Identification of the Work Areas



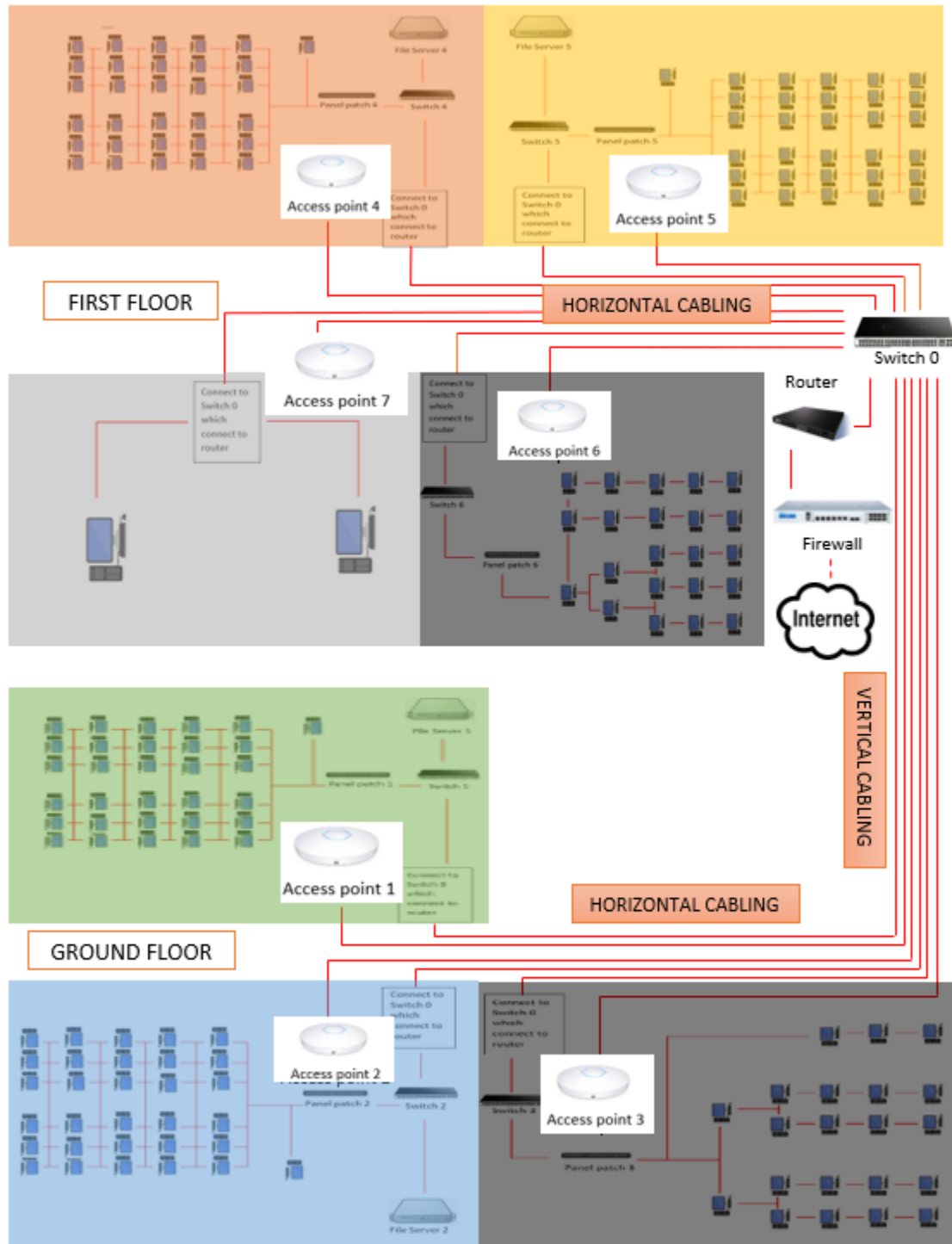
GROUND FLOOR



FIRST FLOOR



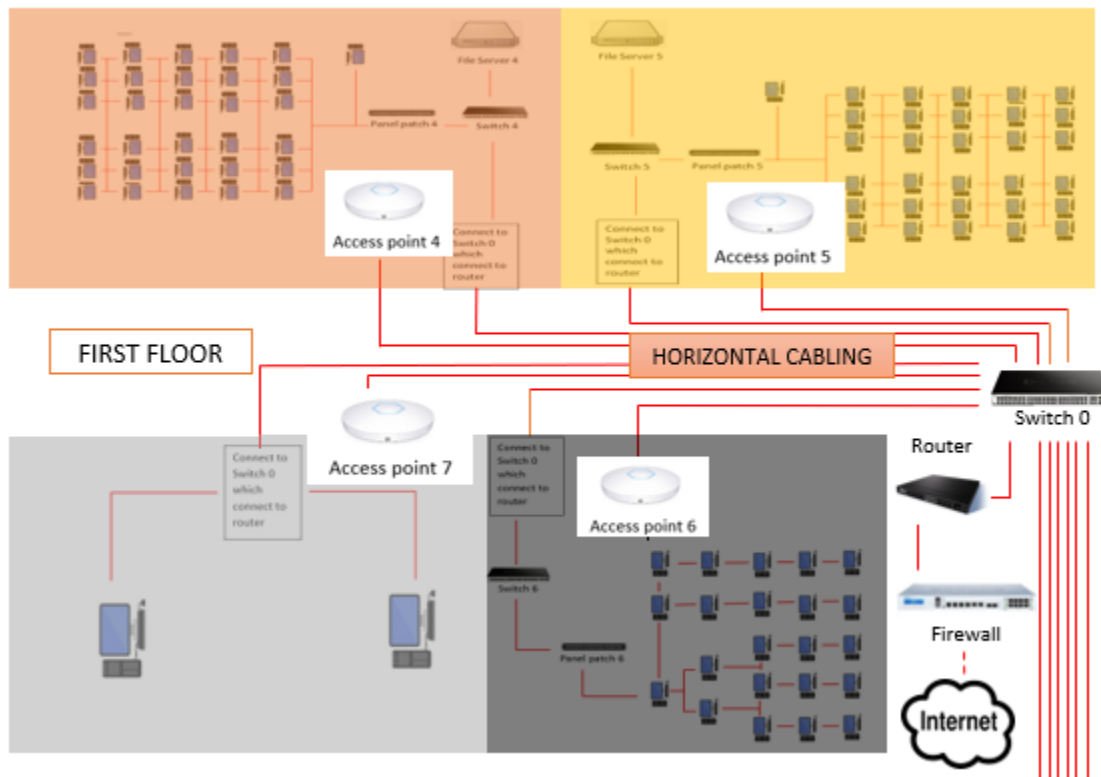
## Overall Network Diagram



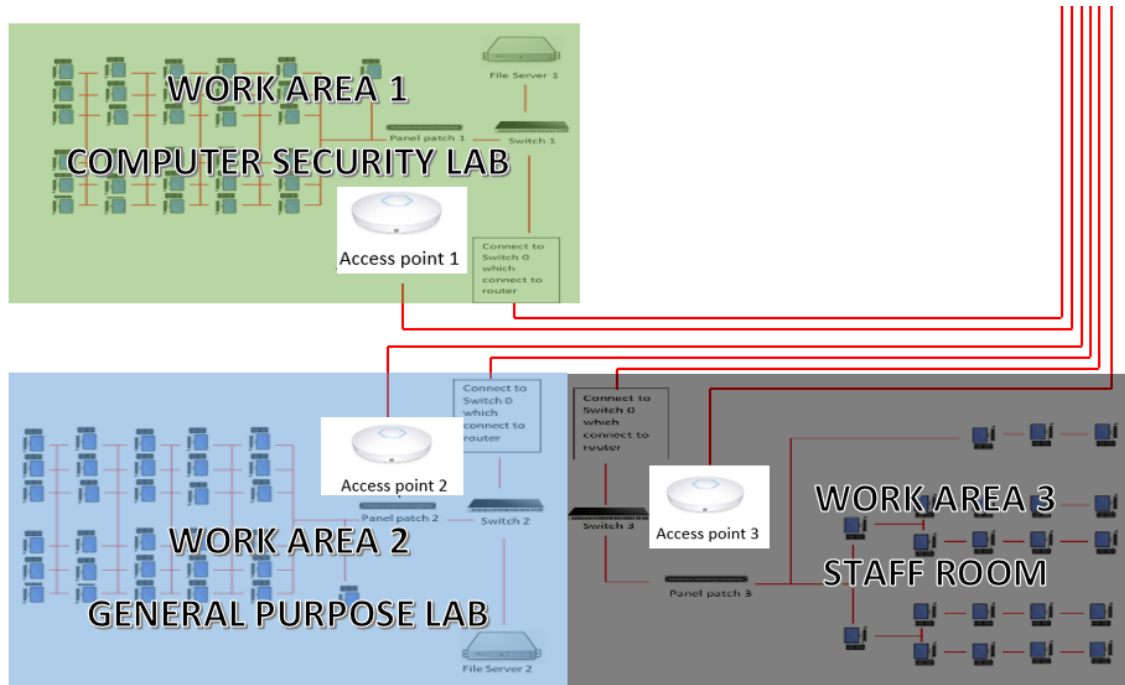


## Closed-up Network Diagram

### First Floor



### Ground Floor

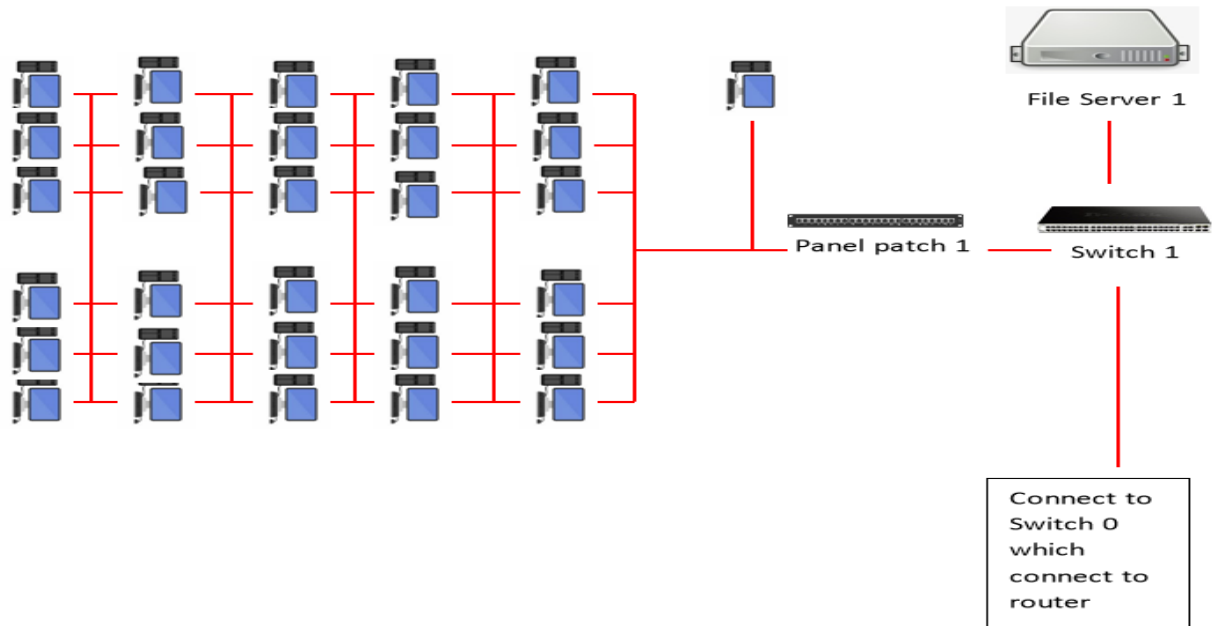




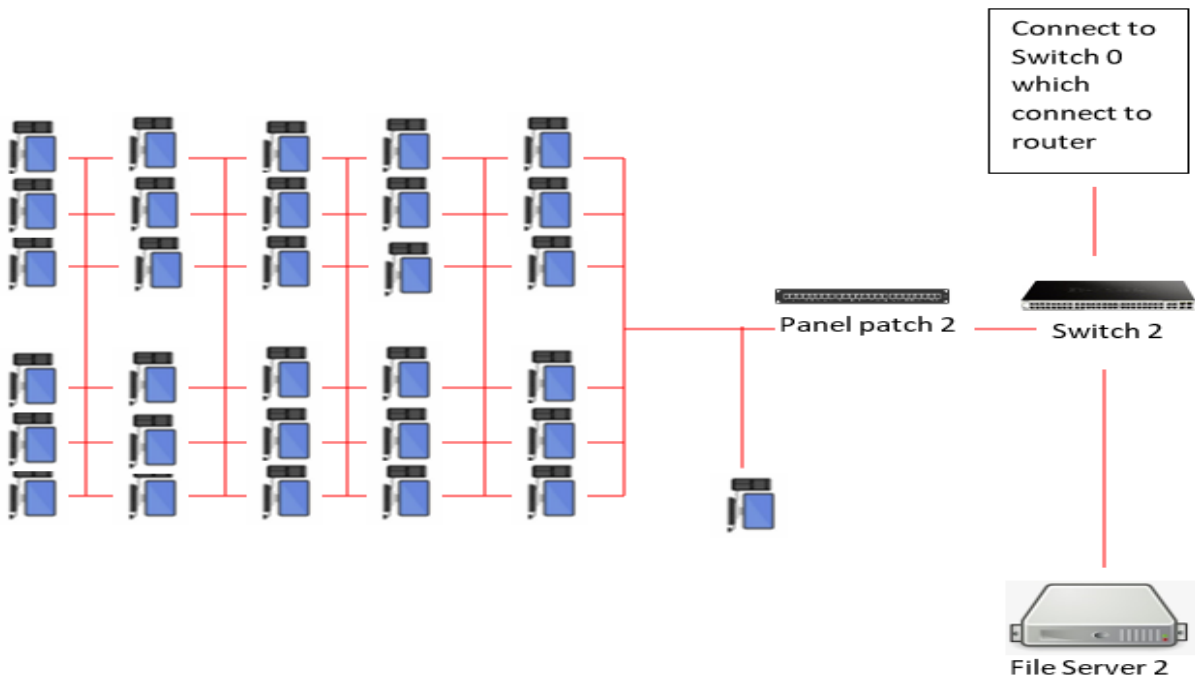
## Network Distribution

### Ground Floor

#### Work Area 1 - Computer Security Lab

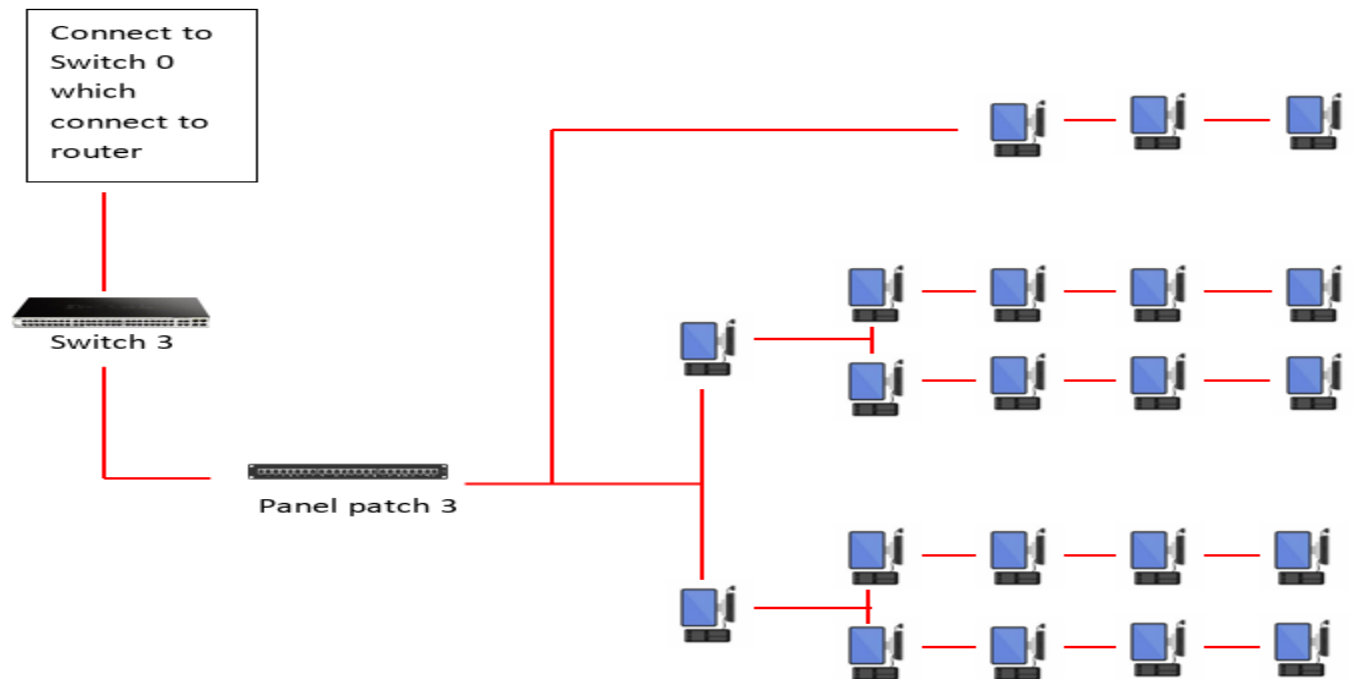


#### Work Area 2 - General Purpose Lab



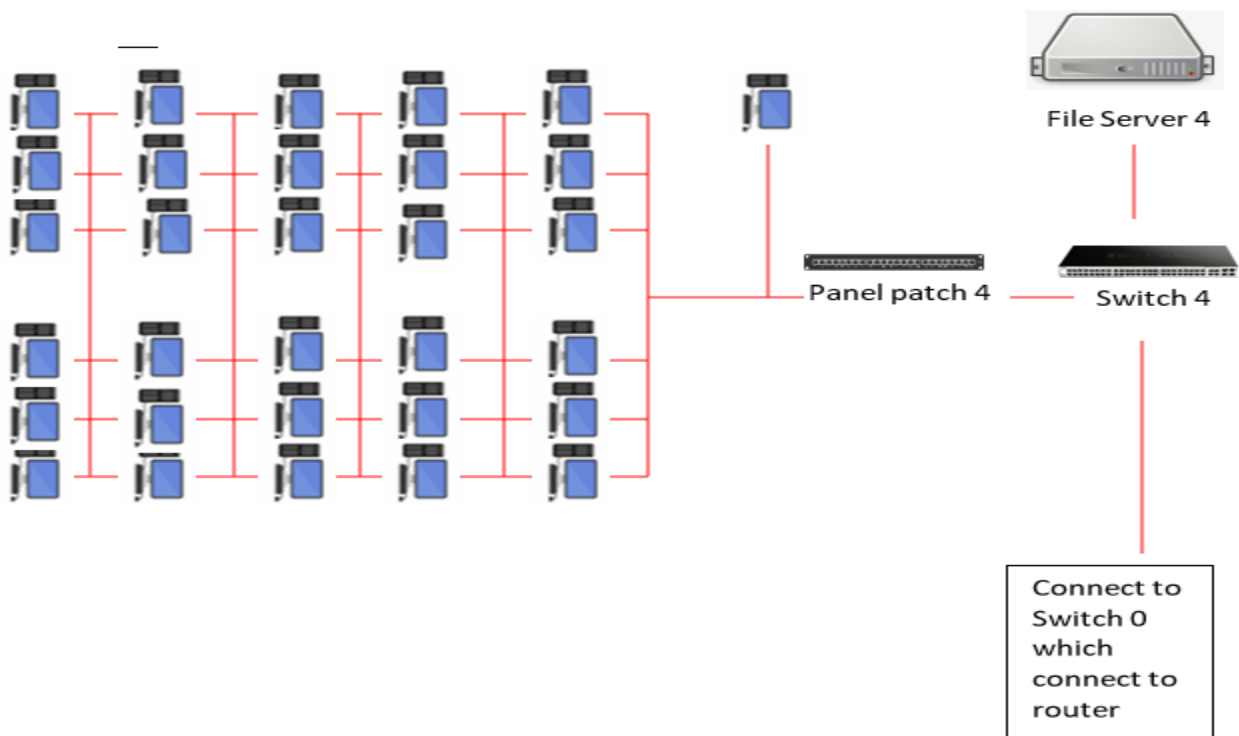


### Work Area 3 - Staff Room



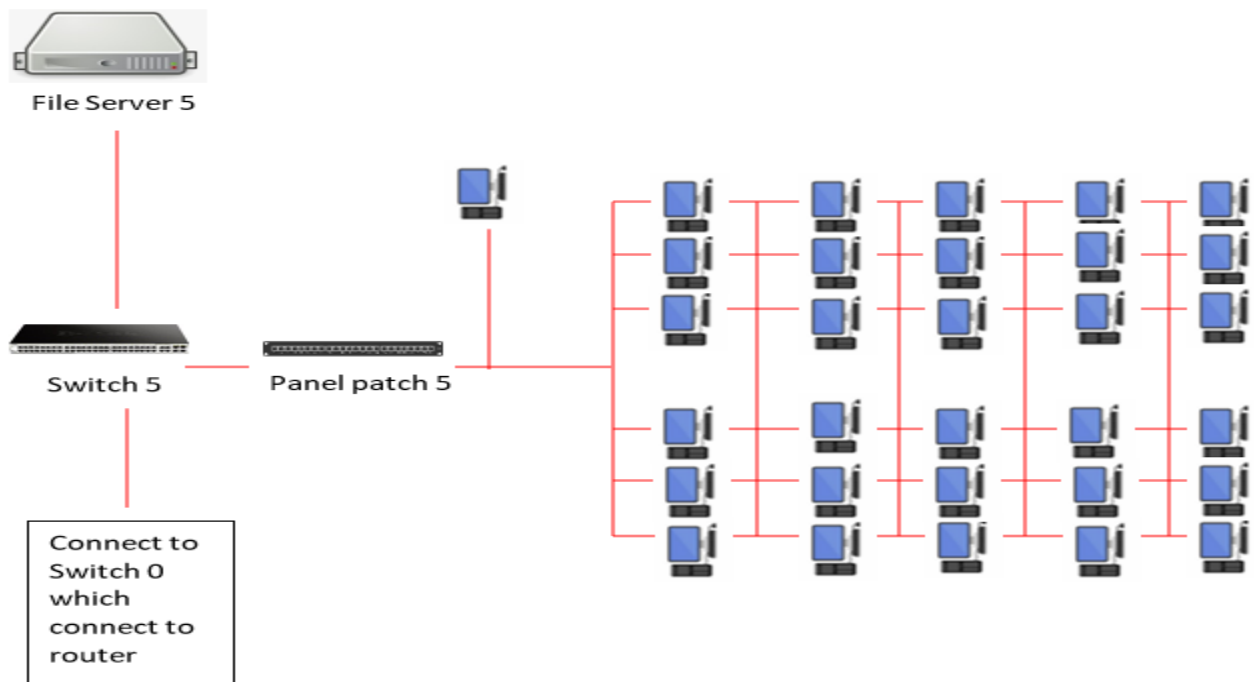
### First Floor

#### Work Area 4 - IOT Lab

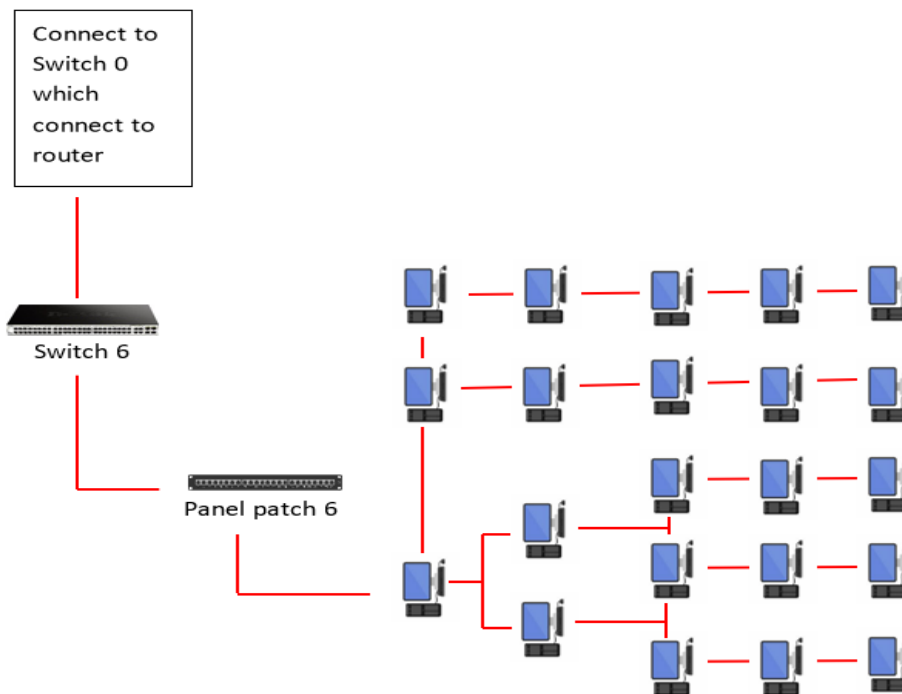




## Work Area 5 - IOT Lab

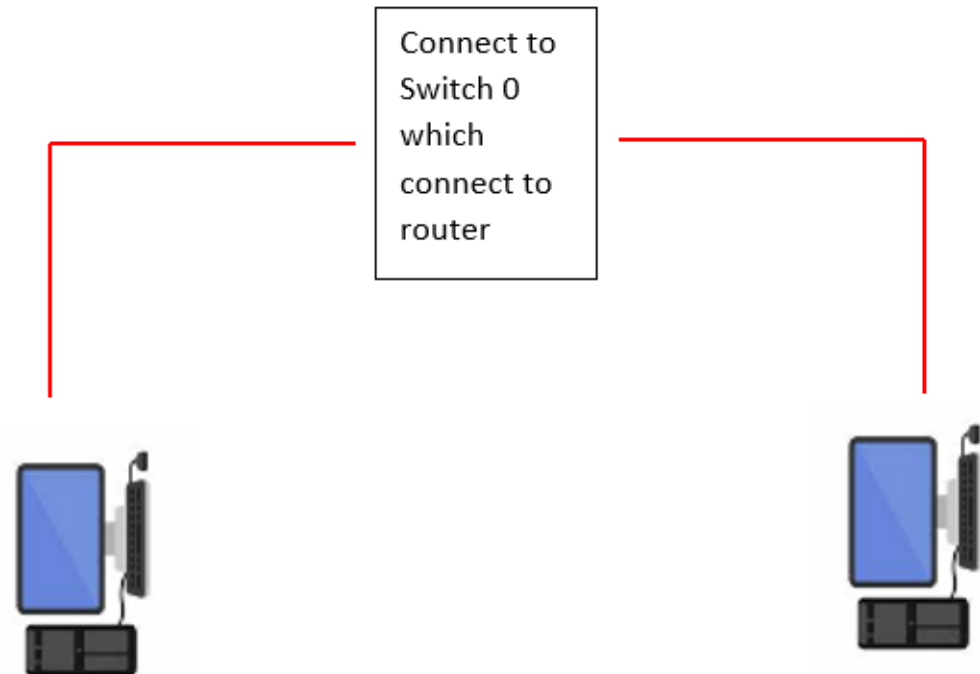


## Work Area 6 - Staff Room



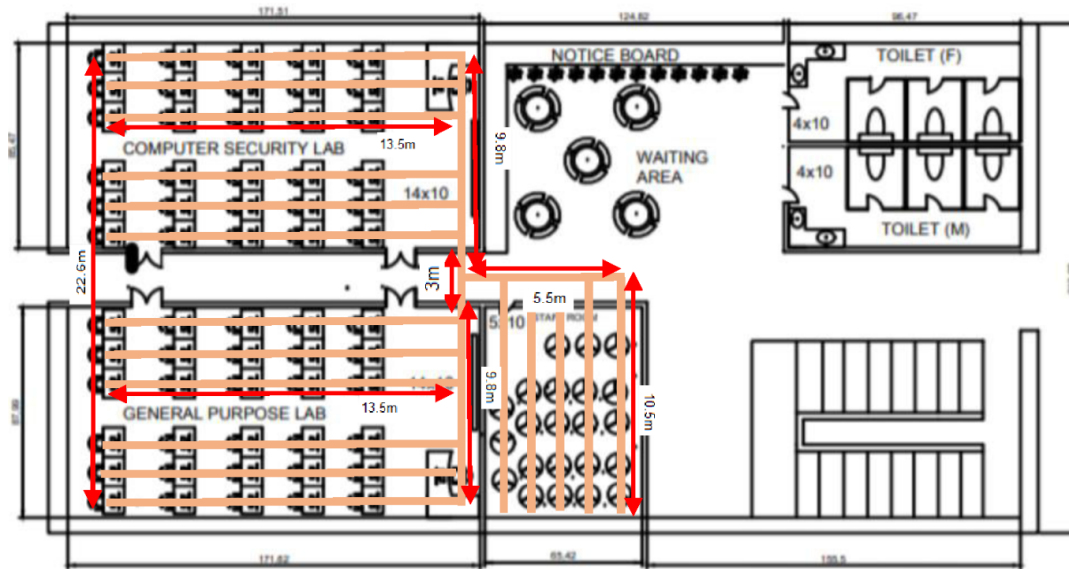


## Work Area 7 - Video Conference Room

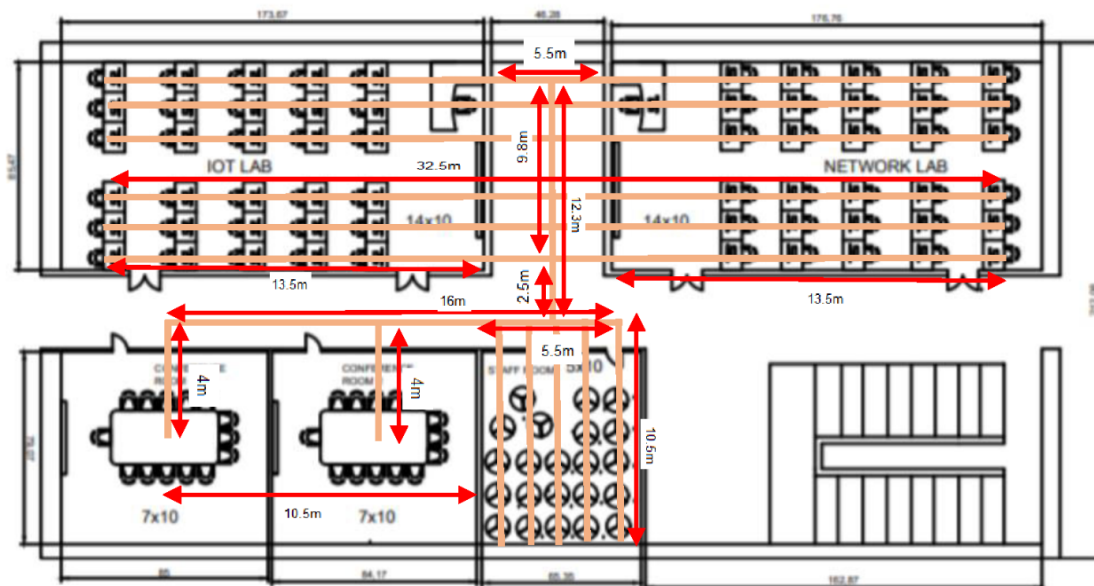




## Cables & Connections



GROUND FLOOR



FIRST FLOOR



## **Cable lengths**

According to the planning the types of cables that are going to be used are Cat 6 cable and fibre optic cable. As shown in the figures above, both cables are applied in all of the floors. These cables are installed all over the building's labs in order to connect the servers.

Description	Cable type	Length(m)
<b>Ground Floor</b>		
General Purpose Lab	Cat 6 Cable	90.8
Computer Security Lab	Cat 6 Cable	90.8
Staff Room	Cat 6 Cable	58.0
Corridors/Walking Areas	Cat 6 Cable	3.0
Peripheral Connections(Switches, routers, patch panels, servers)	Cat 6 Cable	300.0
Total Length-Ground Floor		542.6
<b>1<sup>st</sup> Floor</b>		
IOT Lab	Cat 6 Cable	90.8
Network Lab	Cat 6 Cable	90.8
Conference Room 1	Cat 6 Cable	4.0
Conference Room 2	Cat 6 Cable	4.0
Staff Room	Cat 6 Cable	58.0
Corridors/Walking Areas	Cat 6 Cable	61.3
Peripheral Connections(Switches, routers, patch panels, servers)	Cat 6 Cable	340.0
Total Length- 1 <sup>st</sup> Floor (m)		648.9
Total Length (horizontal/distribution cabling) - All Floor		1191.5



Fibre Optic cable	Fibre Optic cable	100.0
Total Length (vertical/backbone cabling) - All Floor		100.0
Total Length of All Used Cable		1291.5

Description	Quantity	Total Ports
Switch	7	336

The total length of cables used on the overall floor plan are 1291.5 meters while the number of ports used by switches are 336 ports.

The patch cable also known as patch cord is used to link up the switch or router to peripheral devices such as computers and printers. It can also be used as Ethernet cable. Usually, patch cables use Cat 6 cable as it is a more standardized twisted pair cable.

The switch ports are layer-2 only interfaces associated with a physical port. Switch ports are used to manage physical interfaces and associated Layer 2 protocols. Based on this network, each of the switches use 48 ports, thus 7 switches will require 336 ports.



## **Identifying Cable Lengths & Type**

### **Cat 6 Cable**

Cat 6 is a short term of category 6, which defined only a few years after Cat5e cables. For horizontal cabling, we have chosen Cat 6 cables as it can support Gigabit Ethernet segments up to 100m just like Cat 5e cables, however Cat6 cables also allow for use in 10-Gigabit networks over a limited distance. Besides, Cat 6 can handle speeds up to 1000 Mbps (1Gbps), which is more than enough for the common speed of most internet connections. As they are designed for operating frequencies up to 250 MHz, therefore we are sure that they can process more data. Furthermore, Cat 6 cables provide speeds up to 10GBASE-T as they perform up to 250MHz.

### **Fibre Optic Cable**

Fibre optic cable is an advanced type of network connection that provides much better bandwidth and data transmission than previous metal conductor versions. It contains strands of glass fibres in the insulated container. They are made for long distance, high performance data networking and telecommunications applications. Fibre optic lines have a higher bandwidth than conventional cables and it also can carry data across longer distances. There are a few services that are supported by fibre optic connections such as Internet, television's cables, medical applications, LED lighting and others.

### **Wireless**

A wireless network allows devices to stay connected to the network while roaming without the need for cords. It provides a lot of flexibility, which means they can be set up quickly. Wireless networks connect users to an existing network using a variety of stations. For example, a computer can be far away from a router and still be connected to the network.



## **References**

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