



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF COMPUTING

SECR1213-06

TASK 4: MAKING THE CONNECTIONS - LAN and WAN

Course Code: SECR1213

Section: 06

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TASK 4 - Making the Connections (LAN and WAN)

After completing the previous task which is doing some research on selecting networking devices such as router, switches, and access points to be used for this whole project, we are required to make the connection for all the devices selected for the building. All of the details for each connection are provided for each section.

In completing this task, we are using several icons to describe the devices that we use for the connection. The indicators are as below:

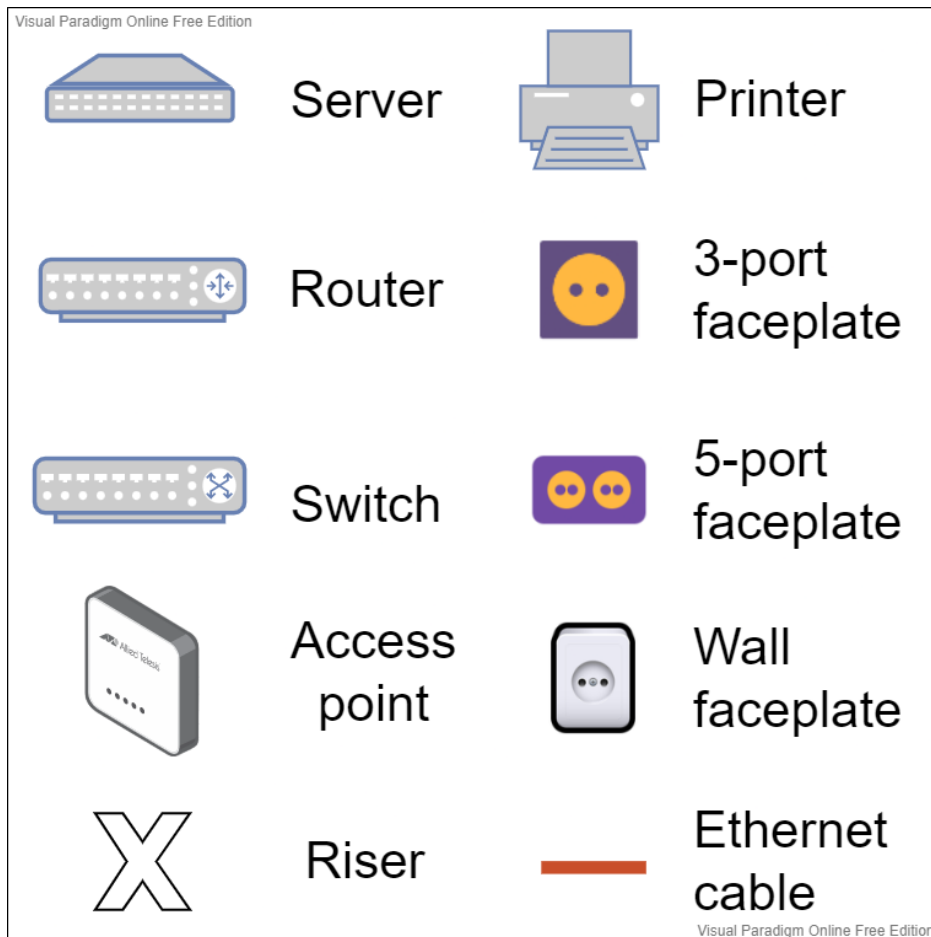


Figure 1: Indicator icons for networking devices

Identifying the work areas

Before we could link the devices, we had to first describe each area network and its requirements. The work area was the location within a building where network equipment was used by a person or group of individuals.

We divided the work area into two sections, each with its own floor.

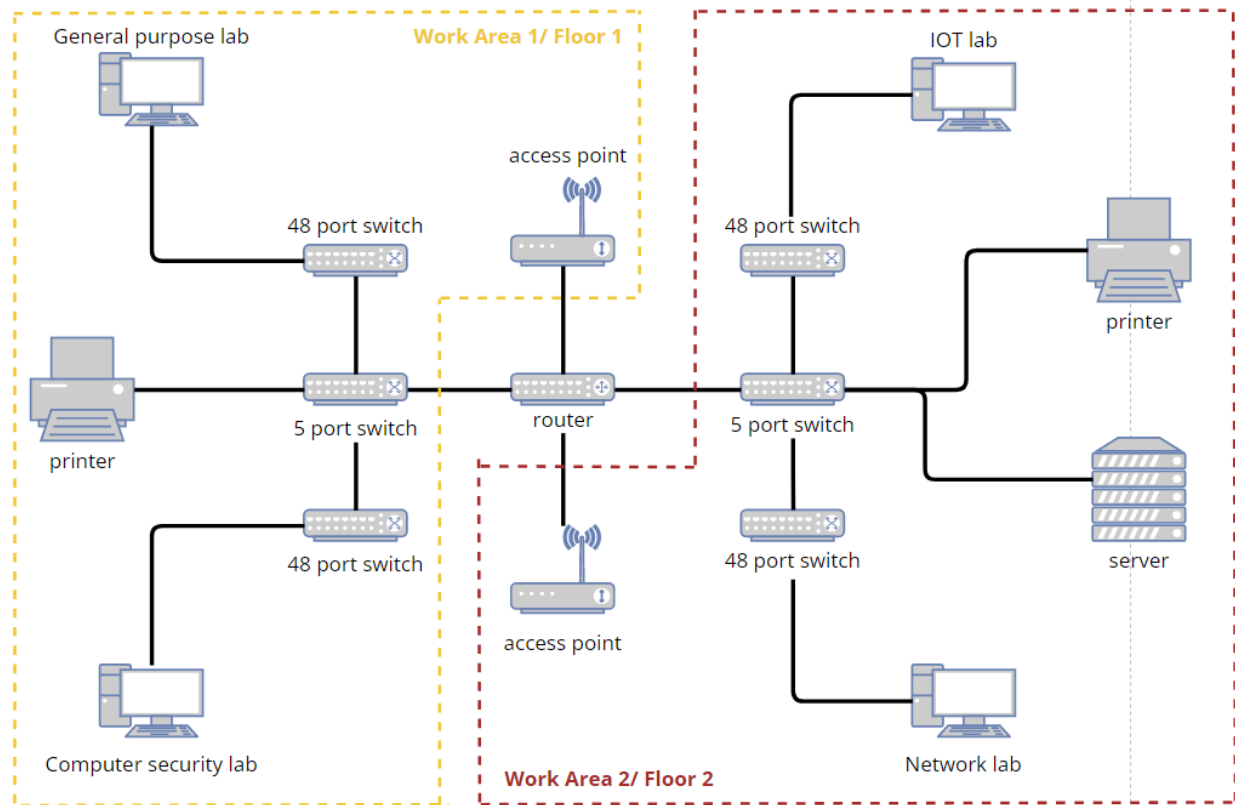


Figure 2: Work area for each floor plan

Work Area 1/ Floor 1 - contains General Purpose Lab, Computer Security Lab and one video conferencing room. This floor also holds a lounge area and toilets.

Work Area 2/ Floor 2 - accommodates IOT Lab, Network Lab and one video conferencing room. In addition, this floor also has a server room, a lounge area and toilets.

Both work areas/ floors are equipped with an all-in-one (multifunction) printer which is a piece of office equipment that combines a printer, scanner, copier, and fax into a machine and an access point for extending the wireless coverage of an existing network.

Connections

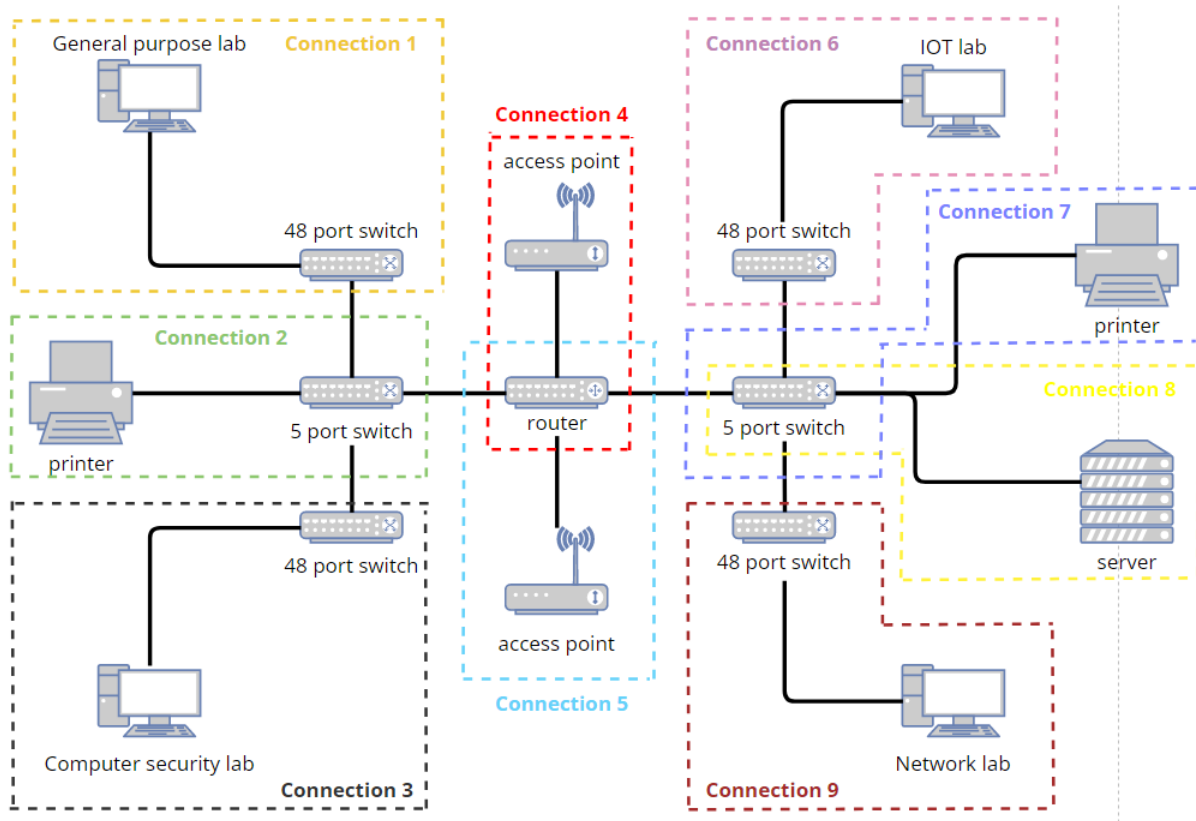


Figure 3: Networking devices with identified connection

We calculated that the building would require 9 connections based on the topology above.

The first four connections were for work area 1/ floor 1, while the next five were for work area 2/ floor two.

Connection 1 - The network is connected to the General Purpose Lab.

Connection 2 - The network is connected to the multifunction printer at floor 1.

Connection 3 - The network is connected to the Computer Security Lab.

Connection 4 - The network is connected to the access point located at floor 1.

Connection 5 - The network is connected to the access point located at floor 2.

Connection 6 - The network is connected to the IOT Lab.

Connection 7 - The network is connected to the multifunction printer at floor 2.

Connection 8 - The network is connected to the server room.

Connection 9 - The network is connected to the Network Lab.

Patch Cords

For our patch cords, we have decided to use Cat6 RJ45 ethernet cable with three different lengths. During our research, we found that Cat6 is the most commonly used cable for networking and has a higher speed connection compared to Cat5 and Cat5e.

The shortest cable is 3 meter long which will be used to connect all computers to faceplates which are connected to switch ports by longer cables which are 30 meter long. The longest cable is 50 meter long and will be used for every other connection between every switch ports and access points to the router.

Overall, we will be using a total length of 2052 meter for the patch cords.

Switch Ports

For our switch ports, we intend to use two different switches which are four of 48-port switches and two of 5-port switches for this project . Both of the 5-port switches are connected to the routers and are used to connect with all remaining 48-port switches, printers, including server. Finally, the 48-port switches are used to connect with all computers. However, not all ports from the switch ports will be used as a few of them can be used as a backup in case another ports are damaged or new devices will be added in the future.

Cable Types and Length

For all of the connections inside the building, UTP/ Ethernet cable Cable will be used for all labs and rooms to connect with workspaces. Both work areas will use the same cable type as it is the best option for students' workspaces and PCs. The length for the cable for work area 1 on the first floor is 1014 meter while total cable length for work area 2 on the second floor is 1028. Lastly, the length for the cable that is going up the wall is 10 meter.

Network Devices Arrangement

All of the devices that will be used in the connection is shown as below:

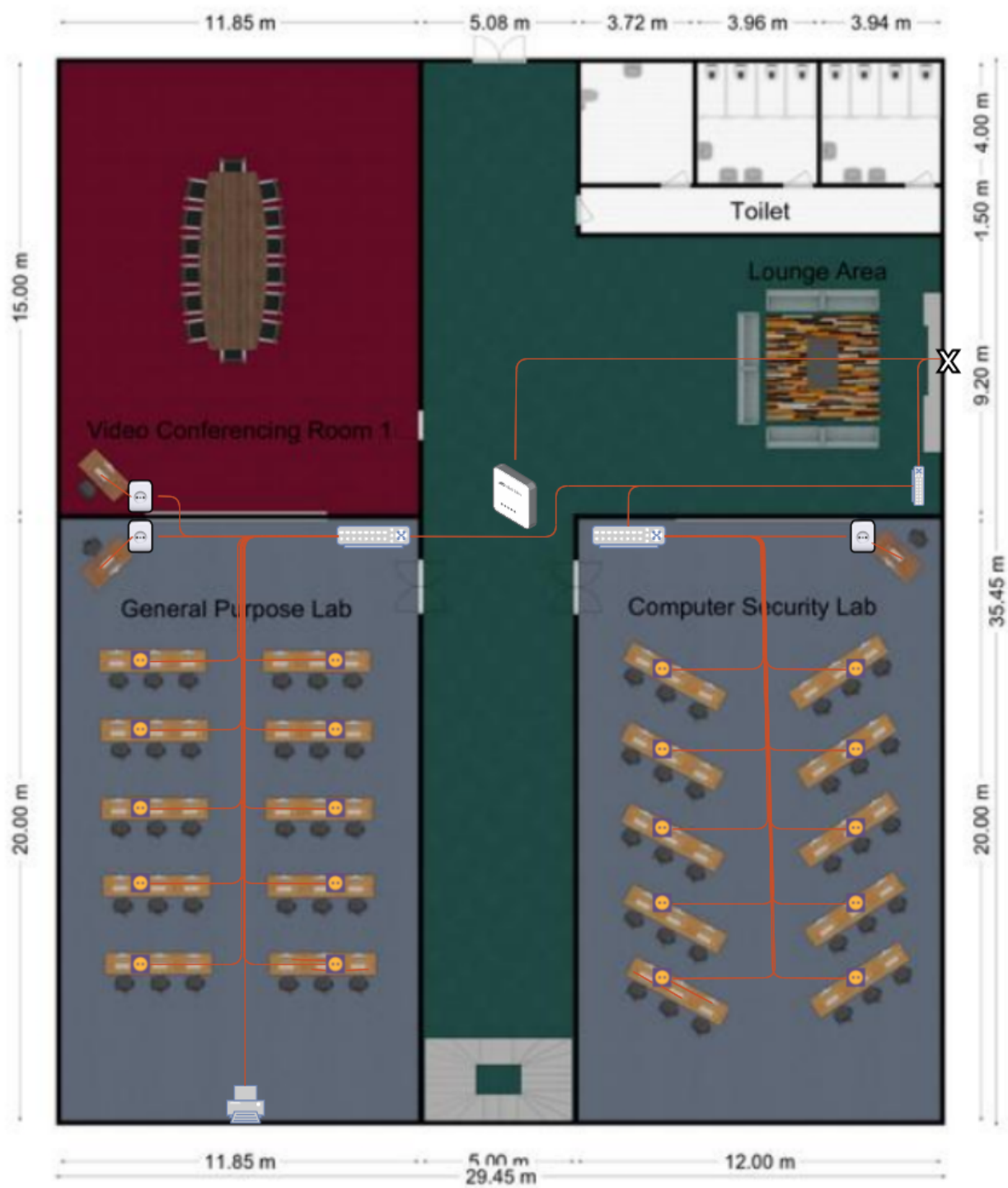


Figure 4: Network Devices in the First Floor

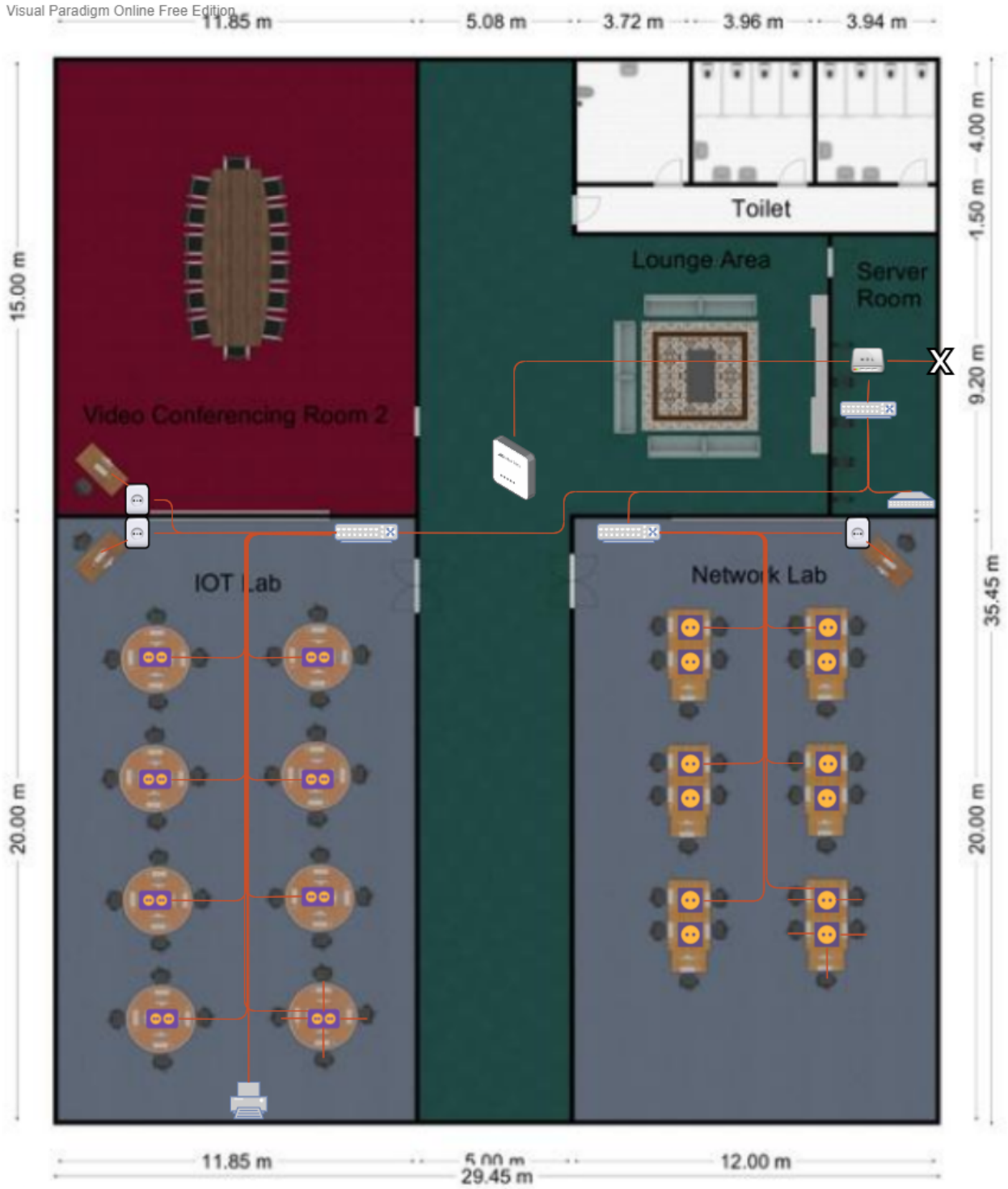


Figure 5: Network Devices in the Second Floor