



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

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**FACULTY OF COMPUTING**

**SECR1213-06**

**TASK 2: PRELIMINARY ANALYSIS**

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**Course Code:** SECR1213

**Section:** 06

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## **QUESTIONS AND ANSWERS**

### **Q1: What is the type of network used?**

- Local Area Network (LAN) as it is good for computers that are in close proximity such as the school labs. Not just that, LAN is good in resource sharing, software sharing, internet sharing and more[1]. Next, Wireless Local Area Network (WLAN) such as WIFI for the other parts of the building. WLAN uses less physical wires and gives out high rate connections due to the small area covered[2].

### **Q2: What is the network security implemented?**

- Use routers with built-in firewalls and install antivirus software on each computer which is McAfee in order to provide protection from network breaches such as Internet Worms, viruses and DDOS attacks. Other than that, the network itself needs to be physically secured to prevent non-authoritative people from hacking it, by using locks and monitored by security camera CCTV.

### **Q3: What type of connections are preferred, wired or wireless?**

- Both types of connections which are wired and wireless are required. In the labs, we will use a wired connection - Local Area Network (LAN) connection. But in other rooms such as the conference rooms and lounge areas, we will use wireless connection - Wireless Local Area Network (WLAN) such as WIFI.

### **Q4: What is the type of cables or connectors preferred to build the network?**

- Fibre optic cables are recommended as they support very high bandwidth levels, can carry long distance signals, are inherently secure, intrinsically safe and immune to electromagnetic interference (EMI), are not impacted by temperature changes, bad weather or moisture [3]. Besides, they have lower total cost of ownership (TCO) and more flexibility for the future [4].

### **Q5: Which type of server and network topology is preferable?**

- A hybrid topology is used as it is a type of network topology that uses two or more different network topologies. The combination of the star topology and bus topology is preferable in which two or more star topologies are connected together through a bus topology. In general, star topology is very reliable and can reduce data collisions. Bus topology however is easy to install, easy to add extra workstations and uses less cable [5].

### **Q6: Where should the routers and access points be placed in the building?**

- The routers and access points should be placed in a higher in height location that is central to all the computers in the network to ensure each gets coverage. Physical obstructions and reflective surfaces should be avoided as they could reduce the network range and degrade the signal [6]. APs or routers also should not be stacked on top of each other in multi-floor design (one on one floor and other one directly above on second floor) or next to each other to avoid coverage overlap.

**Q7: What is the recommended bandwidth for each lab and room?**

- As most of the labs and rooms in the building will be using the Internet for their activities, high speed bandwidth is recommended because the user needs to have a high data transfer to complete their task especially when a lot of people are connecting to the same network. The higher the bandwidth, the more data can be received and sent at one time.

**Q8: Is the main server needed to be in the building?**

- Having a main server in the same building will ease the job for maintenance and can be used to backup users' works and store their profile.

**Q9: Will there be the need for Virtual-Private-Network (VPN)?**

- Yes, VPNs are used to create a data tunnel between a local Network and an exit node in another location and will be needed in case there is any staff or users who are off-site and required to access the network [7].

**Q10: Standard software that will be installed in the computer of each workstation ?**

- Browsers: Google Chrome
  - The most favorite browser is Google Chrome. It excels in terms of memory usage, graphical interface, friendliness usage and variety of features [8].
- Basic documentation purpose: Microsoft Office 365
  - Microsoft 365 is a bundle of services that includes Office 365, cloud-based suite of apps and services. It also includes Windows 10 Enterprise, Enterprise Mobility + Security (EMS), and machine learning. [9].
- Software to open pdf file: Adobe Acrobat Reader CD
- Virtual meeting and workgroup: Webex



## **FEASIBILITY STUDY**

The School of Computing estimated that there will be 10% growth in the numbers of students and staff in the next 3 years. Therefore, an expansion of a 2-storey building equipped with 4 new labs - general purpose lab, computer security lab, network lab, IOT lab and 2 new video conferencing rooms are needed. In the meantime, it is expected that the new labs and conferencing rooms have improved overall performance, capable of supporting high-performance and secure from malicious attacks. In order to tackle this project, a feasibility study is needed to lay out the cost, practicality of the proposed plan and benefit to the society.

As per client's requirement, we will be installing a firewall for the server, vpn connection and antivirus software for each computer to protect network and connections from network breaches. A server room is also needed to place the main server's database that is connected to each room in the building via routers. This server room will be placed on the second floor of the same building to ease the process of maintenance and management. The addition of a server room in the floor plan will make it easier to access and monitor the server client and at the same time increase the level of protection. In this project, both wired and wireless connection are used, thus requiring ethernet cables to be connected to each computer and fibre optic cables connecting routers to the main server. Next, we were asked to install the router efficiently while at the same time reach all corners of the building for coverage while minimizing cost.

With a budget of RM900,000 to set up this network architecture with cutting-edge technology as well as installation of the required hardware and software, we are more than confident that this project is feasible, practical and will bring a lot of benefits to the user.



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