



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF COMPUTING

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BACHELOR OF COMPUTER SCIENCE (BIOINFORMATICS)

SECR1213 NETWORK COMMUNICATIONS - SECTION 01

PROJECT TASK 2 - PRELIMINARY ANALYSIS

GROUP NAME: DATA VOYAGERS

GROUP MEMBERS	MATRIC NO
CHIN PEI WEN	A23CS0065
KOO XUAN	A23CS0300
LING YU QIAN	A23CS0301
TAN ZHAO HONG	A23CS0188

**LECTURER'S NAME : DR MUHAMMAD ZAFRAN BIN MUHAMMAD
ZALY SHAH**

SUBMISSION DATE : 7 November 2024

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Questions and Answers

On November 22, 2024, we conducted an interview with Dr. Muhammad Zafran bin Muhammad Zaly Shah. Below are the questions we asked, along with some answers referenced from research.

1. What are the estimated user counts and future growth projections?

Answer from interviewee: As described in the case study description.

Answer from research: The faculty currently expects to have 1,800 students and 100 academic and 40 staff members, with an expected 15% increase in four years. This growth will require a scalable network that can handle increased connections and data traffic.

2. What is the required internet speed and bandwidth capacity?

Answer from interviewee: The fastest current internet can provide. To ensure it is up to date.

Answer from research: A high-speed connection capable of supporting concurrent usage by up to 60 devices per lab is recommended. This ensures a minimum of 1 Gbps for each lab, particularly the Cisco Network Lab, and shared WiFi access points in the lounge for supporting high-density usage of lecturers and students of Faculty Computing.

3. What network security measures are necessary?

Answer from interviewee: Both at the physical level(anti theft) and firewalls to prevent port and network scanning.

Answer from research: Security measures should include firewalls, intrusion detection/prevention systems (IDS/IPS), and encrypted access points to prevent breaches, especially this building is given the network's educational and research focus, which may contain sensitive data.

4. What redundancy and backup measures are required to ensure reliability?

Answer from interviewee: Depending on the function. Critical applications such as hybrid classroom and video conferencing needs to be as reliable as possible.

Answer from research: Redundant switches and routers, along with dual power supplies and backup Internet Service Providers (ISP), should be considered to prevent downtime, especially for high-demand spaces like the hybrid classroom and Cisco lab.

5. What level of scalability is needed to support future network expansions?

Answer from interviewee: Can easily add a number of workstations without too much additional cost.

Answer from research: A scalable network with modular switches that allow additional ports and wireless access points is needed. VLANs (Virtual LANs) could be considered to be implemented to manage traffic and support future expansions without redesigning the entire network.

6. What are the primary use cases of the network in each area (e.g., labs, lounge, hybrid classroom)?

Answer from interviewee: As stated in the description.

Answer from research: Labs require high-speed internet for research and teaching. The Cisco Lab needs dedicated network resources for configuration and practical training, while the Embedded Lab requires connectivity for IoT experiments. The hybrid classroom will need video conferencing capabilities, and the lounge requires reliable WiFi for social and light academic use.

7. Should the network support cloud integration, and if so, to what extent?

Answer from interviewee: Up to the consultant to suggest it.

Answer from research: Cloud integration can offer scalability, remote access, and simplified maintenance. For a faculty network, the cloud could be used for applications such as data storage, learning management systems, and virtual classrooms. It gives beneficiaries like reducing cost, improving accessibility and bolster data security. The decision to integrate should weigh factors like security, budget, and user access requirements.

8. What network monitoring and management tools are recommended?

Answer from interviewee: Up to the consultant to propose it.

Answer from research: Effective monitoring tools are critical for detecting performance issues early and tracking network health. Tools like SolarWinds, NetFlow, and Nagios provide real-time performance analytics and automated alerts, which can help in managing and troubleshooting networks.

9. How should Bring Your Own Device (BYOD) policies be implemented?

Answer from interviewee: It's for locations where workstations are not available. Video conferencing and student lounge. Otherwise no restrictions.

Answer from research: BYOD policies should include network access limits and security protocols, such as endpoint verification. Devices connected to the network should be limited to students/lecturers networks to reduce potential security risks.

10. How will funding impact device and service choices?

Answer from interviewee: This is for the consultant to answer.

Answer from research: Budget constraints may require prioritizing high-performance devices in high-use areas, such as the labs and classrooms. Opting for modular and scalable equipment also allows for gradual upgrades as additional funds become available.

11. What is the estimated budget for network devices, cabling, and installation?

Answer from interviewee: Up to consultant to answer.

Answer from research: Based on our group getting a 2M budget, cost-effective yet robust devices (e.g., Cisco for switches and routers) should be chosen. And approximately 50-60% of the budget could go towards devices, 20-30% for cabling, and the remainder for installation and maintenance.

Feasibility of the project

1. Technical feasibility

- Network infrastructure: the project requires implementing high-speed internet, LAN and WiFi for various rooms, including the specialized labs such as cisco network lab and IoT lab, a video conferencing room and a hybrid classroom. This is technically feasible with modern networking equipment for example Huawei or Cisco.
- Scalability: The network needs to be scalable to support the anticipated growth. By using modular network equipment and structured cabling, the infrastructure can accommodate future expansions.
- Security and performance: To ensure the security and resilience against cyber threats is achievable by selecting appropriate firewall and network security devices. By implementing quality network devices can also ensure high performance, meeting the requirements of Fourth Industrial Revolution (4IR) standards.

2. Financial feasibility

- Budget constraints: The project budget is assigned by the instructor which is RM 2M. With a well-planned approach, it is feasible to source cost-effective yet high-quality networking devices. However, if the project requires a budget increase for high-end devices, the team can submit a justification report for approval.
- Device selection: By carefully comparing the different brands and selecting devices that meet the requirements without exceeding the budget, the project can remain financially viable. For example, using mid-tier routers or access points that still provide robust performance may be a cost-effective choice.

3. Operational feasibility

- Implementation team skills: With the team collaboration and guidance from the instructor, students can manage the project's design, device selection and setup. Any required skill gaps such as network configuration knowledge can be addressed through group learning or consulting resources provided by the instructor.
- Maintenance and management: The network design should focus on being user-friendly and manageable for faculty of computing staff. Using centralized management solutions, like Cisco's Meraki dashboard could simplify network maintenance and reduce operational strain.
- Timeline: By given clear deadlines, the project is feasible within the academic timeline, provided the group adheres to a well-structured project schedule.

Meeting Minutes #4

DATE/TIME	30 Oct 2024 5:00 pm		
LOCATION	Physical		
AGENDA	1. Discuss the question on Task 2		
	2. Task distribution for each person		
MEETING MC	TAN ZHAO HONG		
ATTENDANCE			
NAME	TIME	REASON FOR ABSENCE	
CHIN PEI WEN	1700	-	
KOO XUAN	1700	-	
LING YU QIAN	1700	-	
TAN ZHAO HONG	1700	-	
Minutes			
No.	Item Discussed	Details	Person-In-Charge
1	Understand the task requirement	Slide showed the question and rubric given on Task 2	All members
2	Suggestion for questions.	All members discussed the possible questions that can be used in task 2.Each member suggested 12 question that can be used in task two	All members
3	Filter and select the most related question	We select the top 12 most related questions that can be used in task 2 through Discussion and all members agreed with their suggestions.	All members
		Select the top 10 most related questions that can be used in task 2	

		through discussion.	
		had to do research to find a solution for all selected questions.	
		arrange the references used by all members.	
		All members agreed to the suggested plan to reduce the cost.	All members
		All members review the questions and the answer carefully	
		Suggested drop the question which is not related to the syllabus	
		12 questions are finalized	
4	Discuss on the feasibility assessment	<ul style="list-style-type: none"> - explained the feasibility assessment to all members - Complete feasibility assessment 	All members
5	Meeting ended	2230	All members

Meeting Minutes #5

DATE/TIME		18 Nov 2024 1:00 pm	
LOCATION		Physical	
AGENDA		Correction - Task 2	
MEETING MC		CHIN PEI WEN	
ATTENDANCE			
NAME		TIME	REASON FOR ABSENCE
CHIN PEI WEN		1300	-
KOO XUAN		1300	-
LING YU QIAN		1300	-
TAN ZHAO HONG		1300	-
Minutes			
No.	Item Discussed	Details	Person-In-Charge
1	Identify mistakes for each part	We refer to the comments that were given by the lecturer.	All members
2	Suggestion to correct the mistake.	All members discussed to add more references and citation	All members
5	Meeting ended	1430	All members

Sources of researches

- [1]G. Gercek and N. Saleem, “Designing a Versatile Dedicated Computing Lab to Support Computer Network Courses: Insights from a Case Study,” *Journal of Information Technology Education: Research*, vol. 5, pp. 013–026, 2006, doi: <https://www.jite.org/documents/Vol5/v5p013-026Gercek94.pdf>
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- [3]“LinkedIn,” *Linkedin.com*, 2024.
<https://www.linkedin.com/pulse/how-can-financial-services-industry-benefit-from-things-matthews>
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- [5]Shapur Izadiyar, “How To Start Your Once-in-a-Generation Broadband Project: Conducting a Feasibility Study,” *Calix.com*, Dec. 18, 2023.
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- [6]“Answers to: Outlined feasibility of the network application specification,” *Class Ace*, 2024.
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- [8]F. Anderson, “How Can Schools Benefit from Cloud Services?,” *Symquest.com*, Oct. 13, 2021. <https://blog.symquest.com/how-can-schools-benefit-from-cloud-services>
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