INTRODUCTION TO NETWORKING

Group Assigment (50%)

Intake:  APU1F2109CS(CYB), APD1F2109CS(CYB), APU1F2109CS(IS), APD1F2109CS(IS), APU1F2109CS(DF), APD1F2109CS(DF) APU1F2109SE APD1F2109SE, APU1F2109CS, APD1F2109CS, APU1F2109IT, APD1F2109IT

Hand Out Date: Week 3 [11th Oct. 2021]

Due Date: Week 10 [11th Dec. 2021] – Ind. Asgn. and Week 12 [24th Dec. 2021] – Group Asignment

Word Count Limit: 2500 words.

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This assignment aim is to allow students to design and configure a LAN topology by applying basic principles of wired and wireless network, together with configuration of network devices (including routers & switches) by using Cisco Packet Tracer simulation tool. Students are also expected to be able to design their IP addressing scheme with subnetting to segment their network.

1. **Assessed Learning Outcomes:**

* CLO2: Form the local area network design and configuration using simulation tool for the given scenario. (A2, PLO6)
* CLO3: Work in a team to justify the topology and IP addressing plan based on the network design (A3, PLO4)

***Note: PLO6 –Digital Skills. PLO4 – Interpersonal Skills.***

1. **Scenario:**

Seagate.co manufactures computer storage devices. The company provides external hard drives, internal hard drives, and other computer devices for the demand in south east asia. Seagate.co is located in Penang, Malaysia. This company emphasis more on employee values and provide an environment where the employee can learn, think, innovate and build the project. Seagate.co started in 1988 as a one-man-shop and have been growing organically ever since. Recently the CEO of Seagate.co announces an opening of another branch in Cyberjaya by mid of 2023. Meanwhile, the CEO wants to restructure the existing network infrastructure in Penang building and wants to lay down a new network infrastructure. The Penang building has got two floors and the same with the new building in Cyberjaya.

The first floor in both the building have a reception area, waiting room, CEO room, CTO room, Administrative office, Cafeteria, Finance and Sales, Security and Delivery departments. The second floor in both the buildings contains R&D, Manufacturing, Server room and technical assistant departments to monitor the network, staff’s rest area and two conference rooms. All staff will be using PC’s with a suitable office environment and each department contains voice over internet phone (VOIP) to communicate with each other and a printer in each department that is connected in a network. Both blocks have a necessary IoT infrastructure such as CCTV.

Your team is appointed to assist with the proposal to plan for a suitable network design for this new project. The main objective is to identify the requirement and conduct a research to propose for a suitable topology diagram with necessary network devices and IP addressing scheme to make it work. You must connect these buildings with a bandwidth of no less than 100 Mbps.

Your research should include :

* Layout of the building
* Number of hosts (per room / building)
* Justification of the Topology
* IP Adressing scheme

The findings and outcome of your research should be arranged in a proper flow to be presented to the Technical team who are involved in the full design of the network. In addition, prepare a Cisco Packet Tracer diagram as a proof of concept for your research work.

1. **Important Instructions for online submission:**
2. This assignment contains two parts. Individual and Group (Refer the Rubric)
3. The Individual assignment should be **submitted individually** by the students on **10th week** of the sem.
4. The group assignment should be completed in a group of **not more** than **4** members. The group assignment and the packet Tracer must be **submitted by the group leader.**
5. Select the **team leader** among the group members for the group assignment.
6. All submission should be done in Moodle
7. Double check the work before online submission (**Peer Evaluation form and Self-Reflection, etc).**

**3(a). General Instructions.**

1. The assignment should attach front cover, table of contents and attach the completed **Work Breakdown Structure (WBS**) must be digital signed and agreed by all group members.
2. You are required to **build a complete computer network environment** for the scenario, supported with a good research work.
3. Design the floor plan using **any designing tool** with very good justification and provide configuration of the logical network diagram using **Cisco Packet Tracer** Submit. the softcopy of floor plan and network diagram (configuration) together with the assignment.
4. Your report must be typed using Microsoft Word with Times New Roman font size 12. Report should be in 1.5 spacing.
5. The report has to be well presented and should be *typed*. Submission of reports that are *unprofessional* in its outlook will not fare well when marks are allocated.
6. The report should have a one (1”) margin all around the page as illustrated below:



1. Plagiarism is a serious offence and will automatically be awarded zero (0) mark.
2. Allinformation, figures and diagrams obtained from external sources must be referenced using the Harvard referencing system accordingly.
3. **Work Breakdown Structure:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CLO2: Form the local area network design and configuration using simulation tool for the given scenario | | | | |
| (PLO6: Digital Skills) | | | | |
| Introduction   * Objective * Assumptions (number of hosts, rooms, labs, etc.) | | | | |
| **Individual Component** | **Student 1**  **KL (1st floor)** | **Student 2**  **KL (2nd floor)** | **Student 3**  **Penang (1st floor)** | **Student 4**  **Penang (2nd floor)** |
| Floor plan-(Layout) Justification  Network diagram and configuration  (Packet Tracer) | Floor plan-(Layout)  Justification  Network diagram and configuration  (Packet Tracer) | Floor plan-(Layout)  Justification  Network diagram and configuration  (Packet Tracer) | Floor plan-(Layout)  Justification  Network diagram and configuration  (Packet Tracer) |
| CLO2: Work in team to justify the topology and IP addressing plan based on the network design | | | | |
| (PLO4: Interpersonal Skills) | | | | |
| **Group Component** | **KL :**   * TTopology and IP Addressing Justification | | **Penang:**   * TTopology and IP Addressing Justification | |
| Demonstration | | | |

**For students who have to re-do the assignment (failed the 1st attempt), produce the assignment individually. Complete both sections and choose one building design for the new submission.**

1. **Assessment Criteria: Marks Breakdown**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment Criteria | Group Assignment | | | | | | |
| Marks Awarded | | | | | | |
| Digital Skills (60 marks) | Weight | Student 1 | Student 2 | | Student 3 | Student 4 | |
| Floor Plan & Justification | 10 |  |  | |  |  | |
| Analysis & Justification | 10 |  |  | |  |  | |
| Network Diagram | 10 |  |  | |  |  | |
| Configuration | 10 |  |  | |  |  | |
| Demonstration | 10 |  |  | |  |  | |
| Referencing | 10 |  |  | |  |  | |
| Teamwork Skills (40 marks) | Weight |  | | | | | |
| Topology Justification | 10 |  |  | |  |  | |
| IP Addressing Plan & Justification | 10 |  |  | |  |  | |
| Documentation | 10 |  |  | |  |  | |
| Alternate Roles | 5 |  |  | |  |  | |
| Peer Evaluation | 5 |  |  | |  |  | |
| Total Marks | 100 |  | |  |  | |  |

1. **Peer Evaluation and Reflection**

**PEER EVALUATION FORM**

*\*\*To be filled up by individual student and include with soft copy the document.*

Student Name / TP Number :

**Please answer ‘Yes’ / ‘No’**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Myself**  **TP NO:** | **Member 2**  **TP NO:** | **Member 3**  **TP NO:** | **Member 4**  **TP NO:** |
| Participated in group discussion |  |  |  |  |
| Helped to monitor group progress |  |  |  |  |
| Contributed useful ideas |  |  |  |  |
| Completed work on time |  |  |  |  |
| Submitted good quality of work |  |  |  |  |
| Communicated effectively with group members |  |  |  |  |
| Helped others with their work when needed |  |  |  |  |
| Good relationship with group members |  |  |  |  |
| Overall was a valuable member of the team |  |  |  |  |

**Self-Reflection** *(what I did best and what I should improve in future):*

1. **Marking Rubrics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Individual Components (60%)** | | | | | |
| **Marking Criteria** | **0-2**  **(Fail)** | **3-4**  **(Marginal Fail)** | **5-6**  **(Pass)** | **7-8**  **(Credit)** | **9-10**  **(Distinction)** |
| **Floor Plan** | Not able to use a proper tool / software to design the floor plan.  Floor plan is not visible. | Show minimal ability to use a proper tool / software to design the floor plan.  Simple floor plan produced, with no label and legend | Show ability to use a proper tool / software to design the floor plan.  Appropriate floor plan design but with less detail. | Show good ability to use tool / software to design the floor plan.  Good floor plan design with sufficient detail. | Proficient use of tool / software to design the floor plan.  Very detailed floor plan design, with good representation.  Creativity shown in the design |
| **Analysis & Justification** | Almost no requirement analysis and no justification of the network devices (positioning) presented. | Limited requirement analysis.  Very less detail in justification of the network devices (positioning). | Sufficient requirement analysis to design a floor plan.  Minimal justification of the network devices (positioning) provided. | Good requirement analysis and comparison of facts.  Sufficient justification of the network devices (positioning) but lack of critical discussion. | Very good requirement analysis and comparison of facts.  Good justification of the network devices (positioning) with sufficient critical discussion. |
| **Network Diagram** | Not able to show good skills in using Cisco Packet Tracer tool.  Network diagram is not clear. | Able to show sufficient skills in using Cisco Packet Tracer tool.  Minor issues in network diagram (not feasible). | Able to show good skills in using Cisco Packet Tracer tool.  Feasible network diagram, meeting the minimum requirement of a network. | Able to show very good skills in using Cisco Packet Tracer tool.  Good network diagram, showing complete layout of the network | Proficient in using Cisco Packet Tracer tool.  Very good quality of network diagram, with some complexity of design |
| **Configuration** | Weak configuration skills. Not able to fully configure the design. | Limited configuration skills. Only able to meet minimum requirement on the configuration on router and PCs | Good configuration skills. Able to perform good level of configuration on router and PCs | Very good configuration skills. Able to perform some complex configuration on routers and PCs | Outstanding configuration skills. Complex configuration on routers, PCs and switches. |
| **Demonstration** | Not turn up for project demonstration. | Major issues in configuration (some parts are unable to ping). | Minimal issues in configuration – not fully working according to the proposed plan  Able to modify the network configuration with help of friends during demonstration | Successful network configuration (able to ping to all devices)  Able to modify the network configuration without any help during demonstration | Successful network configuration (able to ping to all devices)  Excellent skills in modifying network configuration during demonstration |
| **Referencing** | Not able to use referencing tools in Microsoft Word.  No in-text citation and very minimal references. Major issues in the referencing format. | Minimal use of referencing tools in Microsoft Word.  Minimal in-text citation and references used. Minor issues in the referencing format. | Full use of referencing tools in Microsoft Word.  Sufficient number of references and citation in the report. No issue in the referencing format | Good use of referencing tools in Microsoft Word.  Recent source of references used, with proper reference list. Limited in-text citation in the report | Very good use of referencing tools in Microsoft Word.  Very good quality of references used, with proper citation and reference list for all facts and diagrams used |
| **Group Components (40%)** | | | | | |
| **Marking Criteria** | **0-2**  **(Fail)** | **3-4**  **(Marginal Fail)** | **5-6**  **(Pass)** | **7-8**  **(Credit)** | **9-10**  **(Distinction)** |
| **Topology Justification** | Not able to propose for suitable Topology. | Propose incomplete Topology with weak justification | Propose complete Topology with minimal justification | Propose good Topology with justification, suitable for the scenario | Propose very good Topology with justification, suitable the scenario with supporting evidence. |
| **IP Addressing Plan & Justification** | No explanation to justify the selection of technique for IP addressing plan and segmentation | Almost no relevant explanation to justify the selection of technique for IP addressing plan and segmentation | Appropriate technique chosen for IP addressing plan and segmentation.  Minimal explanation to justify the plan | Good technique chosen for IP addressing plan and segmentation.  Lacking of supporting evidence to justify the plan | Very good technique chosen for IP addressing plan and segmentation.  Supported with extensive research work for technical accuracy |
| **Documentation** | No table of content and page numbering, font size and type are not standardized  Incomplete assignment requirements | Table of content exist but without page numbers, report structure not standardized  Assignment requirements are partially completed. | Table of content included with proper page numbering, standardized report structure & headings.  Proper introduction conclusion of the report | Good structure and flow of documentation with appropriate header & footer  Good introduction and conclusion of the report | Very good structure and flow of documentation, appropriate header & footer with very good appearance  Very good introduction and conclusion of the report. |
| **Marking Criteria** | **1**  **(Fail)** | **2**  **(Marginal Fail)** | **3**  **(Pass)** | **4**  **(Credit)** | **5**  **(Distinction)** |
| **Alternate Roles** | No clear evidence of ability to assume alternate role as a group leader and member. | Attempt to Demonstrate the ability to assume alternate roles as a group leader and member with limited effect and require improvements. | Able to demonstrate the ability to assume alternate roles as a group leader and member with some effect and require minor improvements. | Clear evidence of ability to assume alternate role as a group leader and member to achieve the same goal. | Very clear evidence to assume alternate role as a group leader and member to demonstrated in practice. |
| **Teamwork**  **(Based on peer evaluation and reflection document)** | No clear evidence of ability to foster good relationship and work together effectively with group members. | Able to foster relationship and work together with other group members towards goal achievement but with limited effect. | Able to foster relationship and work together with other group members towards goal achievement with some effects, but still require improvements. | Able to foster good relationship and work together with other group members towards goal achievement. | High ability to foster good relationship and work together effectively with other group members towards goal achievement. |