Case Study

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**TEMASEK POLYTECHNIC**

**SCHOOL OF INFORMATICS & IT**

**DIPLOMA IN INFOCOMM AND DIGITAL MEDIA**

**CIML013**

**Cloud Computing and Security (CCS-C)**

**AY2025/26 APRIL SEMESTER TERM A**

**Case Study**

* 1. 1. This case study specification consists of **6** pages (including cover page).
  2. 2. Submission deadlines are spelt out in the last page. All deliverables/submissions will be via LMS. Please use this template when doing the case study report.
  3. 
  4. 3. This case study carries a total of **80%** weightage of the overall subject assessment with break down as follows:
     + - 1. **Case Study Individual Report – 50%**

|  |  |  |  |
| --- | --- | --- | --- |
| Task No | Description | Individual Marks (70%) | Document to submit |
| Task 1 (shared among 3 group members) | AWS Architecture Diagram | 10% | 1 group report (PDF) |
| Task 2a, 2b or 2c (each person to choose only 1). No duplication is allowed | Task 2a, 2b or 2c | 20% |
| Task 3 | Capstone Project | 20% | Capstone project |

* + - * 1. **Case Study Individual Presentation – 20%**

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| --- | --- | --- | --- |
| Task No | Description | Individual Marks (70%) | Document to submit |
| Task 4 | Individual presentation and Q&A | 20% | NIL |

* + - * 1. **Case Study Group Report – 10%**

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| --- | --- | --- | --- | --- |
| Task No | Description | Group Marks (10%) |  | Document to submit |
| Task 5 |  | 10% |  | 1 group presentation slides (PPT) |

**Scenario**

You are working in a group (maximum 3 persons) in the IT department of an educational institution, **ABC Polytechnic** with an estimate of 4000 students. The following are the hardware equipment currently in place at the campus.

* 3800+ computers (eg. Students BYOD devices such as laptops, tablets)
* 10Gb connection between Polytechnic Schools
* Multi-platform environment (70% Windows, 29% Mac, 1% Linux)
  + 50+ servers
  + 90% of Campus is Wireless

The following are some of the resources & responsibilities of the IT department:

* 5700+ trouble tickets in 2024. 40% of the trouble tickets are accounted from **performance issues** when accessing the staff and student centralized platform (eg. student’s information system, library resources portal) as such that the IT staff need limit the number of users accessing the server. These causes some users experience slowness when accessing the website as well as session timeout especially during peak periods not during term/semester break period.

The management is aware of the yearly budget “bug hitters” as follows:

* Maintenance on 250+ network devices
* Desktop support
* Student Information System
* Payroll, HR and Business System
* Staff and Student email
* Calendar systems
* Student Library System
* Staff and Student File servers
* Disaster Recovery & Backups
* Teacher Grade Book training & support
* Student’s activities & fees system
* Communication Services
* Internet access
* Repair & Maintenance Services
* Library System
* Windows OS Maintenance
* Cisco router/switch Maintenance

Your IT director is thinking of making use of hybrid cloud and on-premises technologies with AWS to provide enhanced services to end users as well as to save costs. He has been told that Amazon Web Services (AWS) is the leading cloud solution provider. He would like your **team to find out and report whether the company should move its operations to the cloud.** The team proposed platform-as-a-service (PAAS) and software-as-a-service (SAAS)

**Submission Requirement:**

**Case Study Individual Report consolidated as 1 group report**

* 1 group report with a range of 10-15 pages in total. Appendices are not part of the page count.
* The group report should include consolidated tasks from Task 1 to Task 3.

Submission date for the group report to be submitted on the 15th of June, Sunday, 2359

Class to break up into groups where each group should comprise of at least 2 and max of 3 persons in a group. 1 person is not allowed. Submit the group members to the tutor by the end of first week.

**CASE STUDY REPORT ( TASK 1, 2 and 3 ) – 50%**

**Task 1. Individual contribution (10 marks-> 10%)**

**You will need to indicate clearly in the diagram your individual contribution in the design of the system and network architecture.**

**Each group is required to propose and design ONE system and network architecture** comprises of both AWS cloud and on-premises solution to achieve **high performance and high availability** as well as addressing migrating data from on-premises to cloud.

The proposed architecture is to be drawn and explained to justify the reason why such AWS and on-premises solution was selected. The architecture should also incorporate infrastructure for migration purposes such as having a transit gateway. The proposed architecture can be drawn in any design tools. All stated sub-tasks under task 2 must be linked to the architecture diagram.

**Task 2. Individual Component (20marks/per allocated task -> 20%).**

Each member must select any **1** of the sub-tasks number as 2a to 2c. No duplication is allowed.

With **reference to the above diagram in Task1**

2a. Explain in detail at least 4 advantages/disadvantages of moving software/hardware to a hybrid AWS cloud services and on-premises architecture? (Other cloud service provider is not accepted).

2b Identify 5 risks, analyse, and propose mitigating measures in detail clearly stating the security risks and how the security control & measures should be enabled and configured in moving some the operations to AWS cloud and some on-premises. All the identified potential vulnerabilities must be reference from the recent AWS threat landscape.

2c. Establish a roadmap to implement AWS cloud computing and on-premises set up in the organisation. What are the estimated costs (CAPEX and OPEX) of operation? You are required to use AWS Cost Explorer

<https://cloudvisor.co/aws-guides/aws-cost-explorer-guide/>

* References. Please use graphics, diagrams, and visuals in your report and references using **APA style**

**Task 3.** Individual – Capstone project AWS academy platform **(20 marks -> 20%)**

**Case Study Individual Presentation (20 marks-> 20%)**

**Task 4:** During presentation, individual members are expected to

* Present their tasks to the class.
* Answer 3 Q&A specific to the task assigned to validate your understanding and presentation skills.

**Case Study Group Report (10 marks-> 10%)**

**Task 5:** Group Case Presentation slides (in PowerPoint) **(10%)**

All group members in a group to submit only **1** integrated slide presentation. This is a combined effort.

* 1 group presentation slides with a range of 10-12 pages
* Submission date on the 8th June, 2359, Sunday 2025

# # # THE END # # #