

## SCHOOL OF INFOCOMM TECHNOLOGY

Diploma in IT, FI, CSF

**Cloud Architecture and Technologies (CAT)**

**April 2021 Semester**

**Assignment 2**

**30% of CAT Module – (Team: 70%, Individual 30%)**

**5 July – 1 August 2021 (Weeks 12 - 15)**

**Deadline for submission:**

**SOFTCOPY:** Submit in MeL by 1 August 2021, 23:59

**Penalty for late submission:**

* **10%** of the marks will be deducted for each day (inclusive of Saturdays, Sundays and public holidays) after the deadline for softcopy submission.
* **NO submission will be accepted after 8 August 2021, 23:59 pm.**

1. **Objectives**

The objective of this assignment is to assess students’ understanding of Cloud Services to implement a given business’ requirement in AWS. The students will be assessed on their ability to:

1. Deploy ec2 instances to create a elastic and resilient server infrastructure using auto scaling and elastic load balancers
2. Deploy s3 object storage for cloud storage requirements
3. Create a database to manage business data
4. Implement Lambda functions to monitor events and trigger notifications
5. Implement Lambda functions to run applications when triggered
6. **Scope**

Assume that your team (consisting of 4 - 6 members) has been appointed by a large business organisation as consultants to implement a cloud infrastructure. In view of the Covid-19 pandemic, they want to meet enable the organisation to engage their customers online.

The organisation **mandatory** requirements are:

1. Deploy a scalable, resilient, and load-balanced web servers to host their ecommerce website. The servers should be built on general purpose servers. They require at least 2 servers at any one time, but able to scale up to 4 servers in times of high demand. To save cost, the number of servers need to reduce back to 2 when there is low demand.
2. Create a NoSQL database that is able to store customer data that are posted to the website. The database should data fields to capture the customer first name, last name, and email address.
3. Create a serverless function that will post data to the NoSQL database using the HTTP function.
4. Create a notification system that will notify the administrator when new customer data is added to the NoSQL database and when new pictures have been uploaded to the S3 bucket

The organisation **optional** requirements are:

1. Create a forms page to capture the customer data and post it to the NoSQL database using HTTP
2. Create a serverless function to create thumbnails for pictures uploaded to the pictures S3 bucket
3. **Deliverables** 
   1. **Report (20% Team.10% INDIVIDUAL)**

Each team is required to submit a single report of 3000 to 4000 words. The report should include the following:

1. A detail description of the solution implemented
2. Problems encountered and resolutions implemented, if any
3. Code used for the Lambda functions
4. Tools used to create/test the infrastructure, if any

Present your report with suitable section and subsection headings. You should also include relevant screenshots of the AWS infrastructure you have implemented. Include a table of contents and appropriate citation and a list of references.

**Important Note:**

Students from the same team may be given different grades for the team component if the tutor is so convinced by evidence of widely unequal contribution by the members.

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| **Plagiarism Warning:**  If a student is found to have submitted work not done by him/her, he/she will not be awarded any marks for this assignment. Disciplinary action may also be taken. Similar action will be taken for the student who allows other student(s) to copy his/her work. |

* 1. **Presentation (20% Individual)**

Each member of the team is required to do a presentation not exceeding 10 minutes. Each member must explain at least one part of the solution implemented done by him/her. The presentation will be on the week of 2 August 2021.

* 1. **demonstration (20% TEAM)**

The team is required to do a demonstration, not exceeding 10 minutes. Each member must explain at least one part of the solution implemented done by him/her. The demostration will be done in class on the week of 2 August 2021.

* 1. **Feature implementation (30% TEAM)**

| **Requirements** | **Marks** |
| --- | --- |
| ***A) Ability to deploy scalable, resilient, load-balanced servers*** | ***20*** |
| * Infrastructure is resilient * Infrastructure is scalable * Infrastructure is load-balanced | 5  5  10 |
| ***C) Serverless function to post data to the NoSQL database*** | ***40*** |
| * Functioning Lambda function * Testing method used | 30  10 |
| ***D) Notification System*** | ***40*** |
| * Functioning notification system for NoSQL item creation * Functioning notification system for S3 uploads | 20  20 |
| **Total** | **100** |

**Note: Additional marks will be awarded to successful completion of optional business requirements.**



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| **Tutorial Group:** |  | **Team Number:** |  |
| **Members** | **Student No.** | **Student Name** | **Grade** |
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