**Learning Outcomes:**

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| --- | --- | --- |
| CLO2 | Propose cloud-based services to be used, to support either one of the following processes of data migration, virtualization and security to be implemented for the proposed architecture. (A3, PLO6) | Group Assignment  Individual Component |
| CLO3 | Explain cloud computing deployments and migration techniques for an organization. (A4, PLO4) | Group Assignment  Group Component |

**Scenario**

This project provides you with an opportunity to demonstrate the solution design skills that you develop throughout this course. Your assignment is to design and deploy a solution for the following case. To help you complete this project, you will have continuous access to this development environment. The work that you add to your environment is preserved between sessions, so you can continue to develop your solution as you progress through the course materials.

By the end of this project, you should be able to apply the architectural design principles that you learned in this course to:

* Deploy a PHP application that runs on an Amazon Elastic Compute Cloud (Amazon EC2) instance.
* Create a database instance that the PHP application can query.
* Create a MySQL database from a structured query language (SQL) dump file.
* Update application parameters in an AWS Systems Manager Parameter Store.
* Secure the application to prevent public access to backend systems.

**Introducing the Example Social Research Organization**

Example Social Research Organization is a (fictitious) nonprofit organization that provides a website for social science researchers to obtain global development statistics. For example, visitors to the site can look up various data, such as the life expectancy for any country in the world over the past 10 years. (query)

Shirley Rodriguez, a researcher at the organization, developed the website. She thought it would be valuable to share the data that she had gathered with other researchers. Shirley stores the data in a MySQL database, and the data is available through a PHP website that she built. She initially published the site through a commercial hosting company that provides limited support for technical issues and security.

Over the past year, Shirley’s website has grown in popularity. As a result of increased traffic, she started receiving complaints that the site is not as responsive as it used to be. She also experienced an attempted ransomware security breach. The security breach was unsuccessful, but her supervisor, Mateo Jackson, suggested that Shirley investigate new ways to host the website.

Shirley heard about Amazon Web Services (AWS), and initially moved her website and database to an EC2 instance that runs in a public subnet. She also runs an instance of MySQL on the same EC2 instance.

Shirley approached your team to make sure that her current design follows best practices. She wants to make sure that she has a robust and secure website. One of your colleagues started the process of migrating the site to a more secure implementation, but they were reassigned to another project. Your tasks are to complete the implementation, make sure that the website is secure, and confirm that the website returns data from the query page.

The following summary lists the solution requirements and requires adherence to the best architectural practices to design and develop the required environment for the infrastructure. The potential division of the work between group members may be on the security, deployment, and high availability/scalability of the solution.

**Solution requirements:**

* Provide secure hosting of the MySQL database
* Provide secure access for an administrative user
* Provide anonymous access to web users
* Run the website on a t2.small EC2 instance, and provide Secure Shell (SSH) access to administrators
* Provide high availability to the website through a load balancer
* Store database connection information in the AWS Systems Manager Parameter Store
* Provide automatic scaling that uses a launch template

The following parameters are used by the PHP application to connect to the database:

/example/endpoint

/example/username

/example/password

/example/database

**These parameter values are case sensitive.**

**Project deliverables**

To complete this assignment, you must:

* Deploy a PHP application that meets the system requirements outlined above
* Submit a diagram that illustrates your solution
* Submit a written summary of the design decisions that you made to achieve the result
* Assets for completing the project
* Total estimated Cost of using Amazon Web Services (including an estimation of each single service)

You can use the following assets for this project (downloadable form AWS academy sandbox environment/ capstone project):

A SQL dump file that contains sample data

A .zip file that contains the PHP and image files for the Example Social Research Organization website

1. The report must be well presented and should be typed. Submission of reports that are unprofessional in its outlook will not fare well when marks are allocated.
2. Every report must have a *front cover*. A transparent plastic sheet can be placed in front of the report to protect the front cover. The front cover should have the following details: -
   1. Student’s Name
   2. Intake code
   3. Module Name
   4. Project Title
3. **Plagiarism** is a serious offence and will automatically be awarded **zero** (0) marks.
4. **All** information, figures and diagrams obtained from external sources **MUST** be referenced using the APA referencing system accordingly.

**Guidelines for the Report**

Document your research findings in a professional and systematic manner, in the form of a computerized report. Refer to the attached suggestion for your assignment layout.

**Appendices**

* Workload Matrix
* Any other relevant information

***Note:***

*Use appropriate diagrams wherever possible to illustrate your proposals.*

Section A: Assessment Criteria [PLO6 - Digital Skills] (35%)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Marks | 0 | 1-2 | 3-4 | 5 |
| Referencing (5%) | Materials or sources of information used to elicit information not relevant to the subject matter and not adopting Harvard referencing style | Materials or sources of information used to elicit information relevant to the subject matter but with limited effort and require improvements and not adopting Harvard referencing style | Good use of reference materials or sources of information used to elicit information relevant to the subject matter and adopting Harvard referencing style | High quality reference reference materials or sources of information used to elicit information relevant to the subject matter and adopting Harvard referencing style |
| Marks Awarded |  |  |  |  | /5 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  | |  |  |
| Marks | 0-4 | 5-8 | 9-12 | 13-16 | 17-20 |
| Technical Report (20%) | Fails to gather business and site-specific requirements, identifying infrastructure connectivity and power requirements | Least attempt to engage in conversations for gathering business and site-specific requirements, identifying infrastructure connectivity and power requirements | Minimally engage in conversations for gathering business and site-specific requirements, identifying infrastructure connectivity and power requirements | Putting good effort to engage in the conversations for gathering business and site-specific requirements, identifying infrastructure connectivity and power requirements | Highly engaged in the conversations for gathering business and site-specific requirements, identifying infrastructure connectivity and power requirements |
| Marks Awarded |  |  | |  |  | /20 |
|  |  |  | |  |  |
| Marks | 0-2 | 3-5 | | 6-8 | 9-10 |
| Individual Cloud Awareness (10%) | No clear evidence of knowledge and understanding demonstrated in individual work. | Able to demonstrate knowledge and understanding in practice and require minor improvements in individual component. | | Able to demonstrate knowledge and understanding well in individual component’s analysis. | Very clear evidence of knowledge and understanding demonstrated in individual component. |
| Marks Awarded |  |  | |  |  | /10 |
| Total Marks – Section A | | | | | | /35 |

**Section B:** Assessment Criteria [PLO4 - Interpersonal Skills] (15%)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| Marks | 0 | 1-4 | 5-7 | 8-10 |
| Social Communication (10%) | Fail to support the atmosphere of mutual understanding and only concern about self-benefits | Share responsibility for the common good | Often exhibit sharing of responsibilities | Excellent sharing of responsibilities with every group member.  Take turn to talk with respect and actively listen to others |
| Marks Awarded |  |  |  |  | /10 |
|  |  |  |  |  |
| Marks | 0 | 1-2 | 3-4 | 5 |
| Engagement (5%) | Need guidance from others to correct attitude and behaviour and manage emotions | Able to overcome the limitations posed by Cloud Infrastructure and Services with moderate new ideas | Ethical when carrying out responsibilities to the society, but sometimes put self-interest first | Able to overcome the limitations posed by Cloud Infrastructure and Services with excellent new ideas |

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| --- | --- | --- | --- | --- | --- |
| Marks Awarded |  |  |  |  | /5 |

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| --- | --- |
| Total Marks – Section B | 15 |
| Total Marks (Section A + Section B) | /50 |