Solutions Architect Pathway Final Project

EDUCATOR GUIDE

Title: Solutions Architect

There is no shortage of challenges that can arise on the job. Having the necessary knowledge and skills to identify solutions for complex problems is one of the top skills employers seek in employees, especially in cloud roles. This course project simulates real-world tasks that cloud professionals encounter and challenges students to apply their Amazon Web Services (AWS) knowledge and technical skills to design an efficient, secure, and scalable solution.

Purpose:

To simulate real-world practice by providing a complex, authentic task designed to challenge students to apply their AWS and technical knowledge, critical thinking, and problem-solving skills in a real-world context

Objectives:

The objective(s) of the course project are to

- Identify the most efficient solution to address the computing challenge
- Compare and contrast alternative AWS solutions
- Determine and apply the appropriate AWS architecture to create a stable, fault-tolerant environment
- Summarize in writing the strengths and challenges of proposed solution(s)

Instructional use case(s):

- In-class discussion
- Individual student assignment
- Group project
- Self-paced learning with AWS Educate

Project scenario:

Below is the course project information to be shared with the student. Determine how students will submit their responses based on your instructional use case. The project identifies assessed skills to support your planning efforts as you determine how to best use this content in your course(s). Additionally, you will find a Guidance to Students section and a Resources section to support you as you assist your students.

STUDENT INSTRUCTIONS: Explore the following activities and answer the scenario-based questions to the best of your ability.

SKILLS ASSESSED: Databases, networking, software development and management, AWS compute, AWS analytics, AWS database, AWS management tools, AWS storage, AWS networking, application integration, AWS artificial intelligence and machine learning, cloud security, identity, and compliance, mobile services, Internet of Things (IoT), AWS gaming, data management, data migration, data structures, data warehouse, data lake, non-relational, relational, architecture, directory service, distributed systems, DevOps, software development, Amazon Elastic Compute Cloud (Amazon EC2), Amazon Elastic Container Service (Amazon ECS), AWS Lambda, Amazon ElasticSearch (Amazon ES), Amazon EMR, Amazon Kinesis, Amazon Quicksight, Amazon Redshift, Amazon DynamoDB, RDS, Amazon Elastic Block Storage (Amazon EBS), Amazon Elastic File System (Amazon EFS), Amazon Simple Storage Service (Amazon S3), Amazon S3 Glacier, AWS Direct Connect, Elastic Load Balancing, Amazon Route 53, Amazon API Gateway, Amazon Virtual Private Cloud (Amazon VPC)

PROJECT TITLE: Solutions Architect

SCENARIO: Given the following challenges on the left, provide the best solution.

SCENARIO/CHALLENGE	ANSWER	EXTENDED ACTIVITY
Imagine you are a Solutions Architect. An ERP application is deployed across multiple Availability Zones in a single region. In the event of failure, the recovery time objective (RTO) must be less than three hours, and the recovery point objective (RPO) must be 15 minutes. The customer realizes that data corruption occurred roughly one and a half hours ago. What disaster recovery strategy would you use to achieve this RTO and RPO?	The disaster recovery strategy you will use to achieve this RTO and RPO in the event of this kind of failure is to take hourly database backups to Amazon EC2 instance store volumes with transaction logs stored in Amazon S3 every five minutes.	Build a sample solution design to represent this ERP implementation.
A. Data management is the practice of organizing and maintaining data processes to meet ongoing information lifecycle needs. AWS offers many solutions for organizations to manage their	A. Amazon Redshift manages the process of creating a data warehouse, organizing the data into nodes and clusters. API Gateway, Snowball, and Amazon Kinesis Data Firehose	

data. Identify and describe solutions for data warehousing and data migration. B. A data structure organizes and stores data according to the operations for which it is being used. Identify and explain AWS solutions that help organize date.	are data migration tools designed to transfer existing data to AWS with minimal downtime. B. With data organized in rows and columns, a relational database is ideal for structured querying, database transactions, and routine analysis. Offering nonSQL schema, DynamoDB is a non-relational database designed to accommodate unstructured data in use cases like gaming, mobile backends, and ad tech.	
Explore and explain the benefits and differences between utilizing a CLI versus a GUI interface.	The primary difference between command line interface (CLI) and graphical user interface (GUI) is the text-based versus graphics-based representation in which users interact with a system (software or hardware device). Typically, CLI requires expertise over commands to perform tasks, while GUI is more user friendly and quicker for users with less expertise to learn. You can break down other differences into a few categories: ● **Ease:** GUI is more user friendly, flexible, and visually intuitive than CLI. ● **Multitasking:** Typically, GUI allows users to more easily view, control, and manipulate multiple programs at once through	

	a single pane. ● **Speed:** Typically, CLI enables a user to perform tasks more quickly and efficiently than GUI. ● **Resources:** Typically, CLI uses fewer system resources than GUI.	
DevOps is a cycling process of improvement that helps deliver products and applications at a faster speed. The DevOps Cycle goes from your company to customers, known as the delivery pipeline. Explain and design/draw the delivery pipeline.	**Your Company** **Build → Test → Release → Customers** Then, it goes from customers to your company. This is known as the feedback loop. **Customers** **Monitor → Plan → Your Company**	Outline the process, and include references to AWS services that support the DevOps cycle.

Guidance for students:

To assist students in drafting their response, encourage them to use the following guiding questions to formulate their written response:

Guiding questions:	**Cite evidence from the scenario/AWS resource(s):**
What problem are you trying to solve?	
Brainstorm possible solutions to address the identified problem.	
What are the strengths and challenges of each solution?	
Which solution is most efficient? Stable? Fault-tolerant? Secure?	
What AWS resources can you use to address this problem?	
How must you present your response?	

Recommended resources:

Deep Dive: Infrastructure as Code

https://www.youtube.com/watch?v=E-3fNwPY_mE
https://www.youtube.com/watch?v=e7eGr1Tefho&feature=youtu.be

Introduction to Programming in C Specialization

https://www.coursera.org/specializations/c-programming

Introduction to Programming in Java

https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-092-introduction-to-programming-in-java-january-iap-2010/