

ASSIGNMENT BRIEF

HTU Course No: **30201470**

HTU Course Name: **Special Topics**

BTEC UNIT No: -----

BTEC UNIT Name: -----

Version: 1



Assignment Brief

Student Name/ID Number/Section	
HTU Course Number and Title	30201470 Special Topics
Academic Year	2021/2022
Assignment Author	Eng. Moath Malkawi
Course Tutor	Eng. Moath Malkawi
Assignment Title	Cloud Computing AWS.
Assignment Ref No	No. 1
Issue Date	20 – December - 2021
Formative Assessment dates	1 – Jan - 2022
Submission Date	26 – Jan - 2022
IV Name & Date	Eng. Moath Sulaiman

Part 2: Submission Format

Deliverables:

1: Report:

- Report: (The report should include screenshots and description for each task)

2: Recorded Video:

- The AWS services you provision/use should be shown in a recorded video (Audio + Video).

3: Presentation one to one assessment.

Please follow the following before submitting your work:

- Sign the student declaration form attached to this assignment brief.
- Make use of appropriate structure in your report – including headings, paragraphs, subsections, and illustrations.
- Sign witness statement after your discussion.
- Your submissions should be in the form of soft copy via the eLearning school system. The report should be:
 1. Written in professional style format
 2. Your work must be supported with references using the Harvard reference system.

Unit Learning Outcomes

- L01** Recognize the definition and the advantages of cloud computing in AWS, introduce the business advantage for moving to the cloud and identify the differences in AWS global infrastructure.
- L02.** Identify and recognize the AWS approach to security, shared responsibility model, IAM service and create and label virtual private cloud and content delivery.
- L03.** Identify and provision compute services that Amazon web services offers, explain, and perform different types of storage at AWS and describe and manage different database types that AWS offers.
- L04.** Design and build cloud architecture according to the best practises and implement Autoscaling and Monitoring on the designed architecture.

Assignment Brief and Guidance

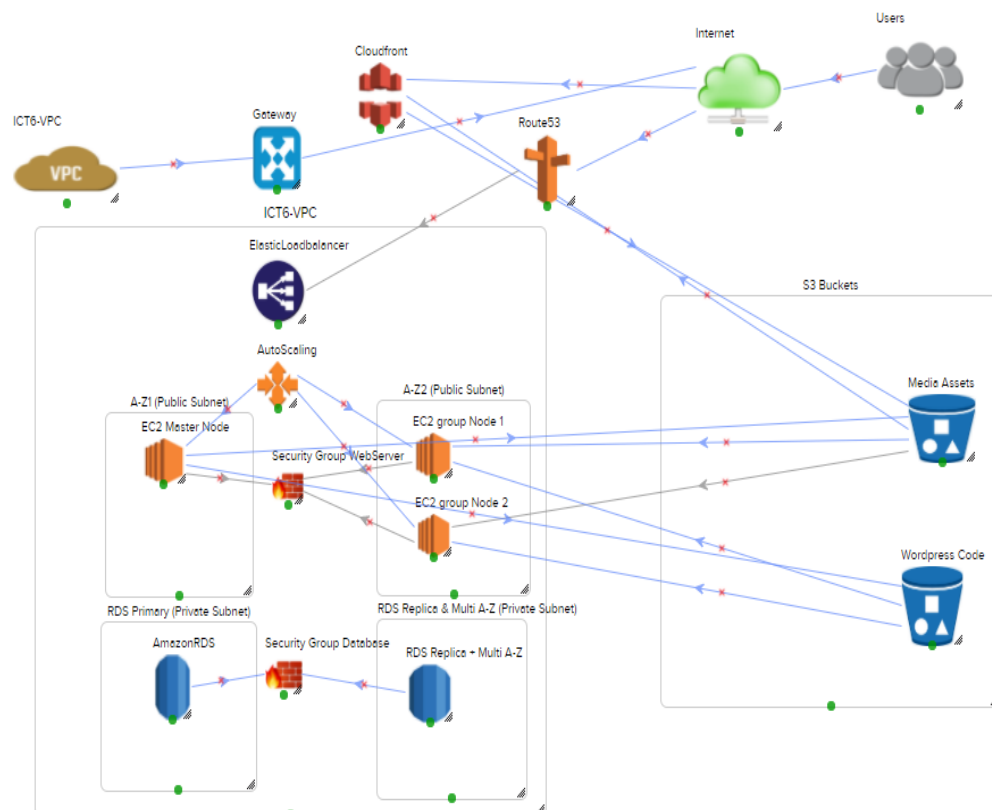
Part 1: (In class)

- The students are required to select **one of the topics** to provide a presentation during the class time:
 - Cloud computing models and deployment models.
 - Amazon Cloud adoption Framework and business advantages of cloud computing.
 - AWS pricing philosophy and sample project scenario to describe the pricing.
 - The differences between AWS Regions, Availability zones and edge locations and define each component with examples.
 - Identify the shared responsibility model and show the responsibility on customer and AWS with some examples.
 - Explain and prove IAM service and its components Users, groups, policy, and roles, in addition showing a business usage of the IAM service.
 - Introduce the basic networking in the cloud including subnets, route table, ACL.
 - Explain and define the components of VPC.
 - Explain AWS CloudFront and the usage of this service.
 - Explain AWS Route53 and the usage of this service.
 - Identify the steps to secure new AWS account.
 - Explain the business usage of AWS organization.
 - Provide an overview of different AWS compute services in the cloud.
 - Demonstrate EC2 and describe the family of EC2.
 - Demonstrate when to use Lambda and Elastic Beanstalk.
- The student will present the selected topic in front of the teacher and classmates for **5 minutes**, by the help of **a prepared slides** OR the **student can present an instructional video**.
- The student is expected to be asked on **LO1 & LO2 verbally (P1, P2, P3, P4, M1, M2,P5)**.
(The presentation must include one of the following assessment criteria and the remaining will be asked verbally)

Part 2: (Take home)

Task 1:

You are working as an AWS Junior solution architect at WordPress Company and your Senior Solution Architect has assigned you to build a real Highly Available WordPress website on AWS infrastructure Following the exact design given in the below picture:



Your duty is to:

- 1- To create a VPC named **ICT6AWS** with public subnet and private subnet.
- 2- To create an internet gateway and routing tables that will be associated with Subnets.
- 3- To create Two Security Groups in ICT6AWS VPC one for Web Servers and the other for Database servers.
- 4- To create One EC2 instance (Master) and configure Elastic load balancer with healthy check. Type (Linux 2 AMI)
- 5- To create an Auto Scaling group to provision two EC2 instances as a node instance. Type (Linux 2 AMI)
- 6- To create RDS instance (primary) for WordPress database. Type MariaDB.
- 7- To create a read replica and Multi-AZ RDS instance.
- 8- To create AWS Cloud Front to host the media assets (Images) on edge locations from Media assets bucket.
- 9- To create two buckets one for Media assets and one for wordpress code and need to be up to date with any update from the master EC2 instance and sync these updates into other EC2 nodes and CloudFront (Automatically).
- 10- Explain if you have used the AWS well architected framework pillars in the above design and show what was the pillars and give an example from this design about the pillar used if exists.
- 11- Explain how the autos calling policy works on your design and how the load balancer will distribute the traffic.

Task 2:

Refer to the following sites to answer the questions:

Amazon EC2 Instance Types: <https://aws.amazon.com/ec2/instance-types/>

Amazon S3 Storage Classes: <https://aws.amazon.com/s3/storage-classes/>

In the following table, list the five categories of EC2 instances and describe what each category is designed for:

Category:	Designed for

In the following table, recommend the best category of EC2 instance type and explain your choice.

Purpose	Recommended EC2 Instance type category	Why?
Hosting a web server		
Multiplayer gaming		
Data analytics		
Speech recognition		

In the following table, describe what the different Amazon S3 storage classes are designed for.

Storage Class:	Designed for:
S3 Standard	
S3 Intelligent-Tiering	
S3 Standard-IA	
S3 One Zone-IA	
S3 Glacier	
S3 Glacier Deep Archive	

In the following table, recommend the best Amazon S3 storage class and explain your choice.

Type of Data	Recommended Amazon storage class	Why?
Mobile game data		
Disaster recovery data		
Data that may or may not be used often		
Media archives		

Task 3:

Describe the following benefits of Amazon Elastic Block Store (Amazon EBS):

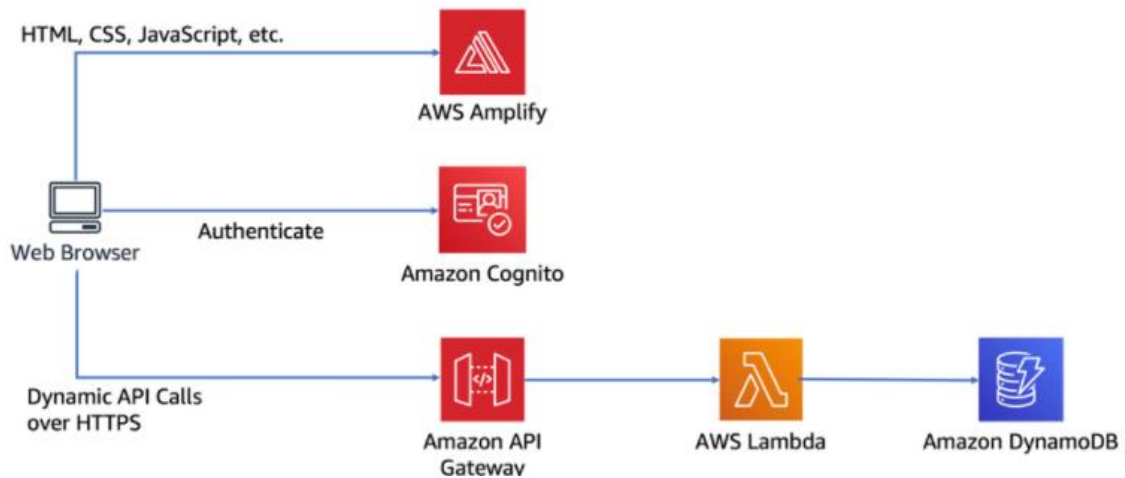
- Data availability:
- Data persistence:
- Data encryption:
- Snapshots:

Describe each type of volume and identify use cases. Refer to the Amazon EBS volume types page (<https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/EBSVolumeTypes.html>)

Volume Type:	Description	Use cases
General purpose SSD (gp2)		
Provisioned IOPS SSD (io1)		
Throughput optimized HDD (st1)		
Cold HDD (sc1)		

Task 4:

You are working as a Junior DevOps Engineer at Amazon Web Services. You have been assigned recently to implement and build the Serverless application on AWS infrastructure. Your team leader asked you before you start working with the clients to implement a Serverless application on AWS according to the below steps and scenario:



You would use the references and steps for the above design using the below links: Please follow them

<https://aws.amazon.com/getting-started/hands-on/build-serverless-web-app-lambda-apigateway-s3-dynamodb-cognito/>

Assessment Criteria

Pass	Merit	Distinction
LO1: Recognize the definition and the advantages of cloud computing in AWS, introduce the business advantage for moving to the cloud and identify the differences in AWS global infrastructure.		LO1 & LO2: D1 Show the ability of categorizing different cloud models and create and label virtual private cloud and content delivery.
P1 Define cloud computing and the business advantage of it. P2 Define AWS global infrastructure.	M1 Differentiate the differences of using AWS global infrastructure.	
LO2. Identify and recognize the AWS approach to security, shared responsibility model, IAM service and create and label virtual private cloud and content delivery		
P3 State the AWS approach in security. P4 manage users, groups, policies, and roles in IAM.	M2. Define the shared responsibility model in AWS.	
LO3 Identify and provision compute services that Amazon web services offers, explain, and perform different types of storage at AWS and describe and manage different database types that AWS offers.		LO3 & LO4: D2 Create EC2, RDS and S3 that are connected to each other and Perform scaling and load balancing tasks to improve an architecture.
P5 Provide an overview of different AWS compute services in the cloud and perform basic functions in compute services. P6. Define and differentiate between Amazon EBS, Amazon S3, Amazon EFS, and Amazon S3 Glacier.	M3 Perform tasks in an Amazon RDS database such as launching, configuring, and interacting.	

<p>LO4 Design and build cloud architecture according to the best practices and implement Autoscaling and Monitoring on the designed architecture.</p>		
<p>P7 Describe the AWS Well-Architected Framework, including the five pillars</p> <p>P8 Explain how Amazon EC2 Auto Scaling launches and releases servers in response to workload changes</p>	<p>M4 Design a website that has reliability and high availability.</p>	

STUDENT ASSESSMENT SUBMISSION AND DECLARATION

When submitting evidence for assessment, each student must sign a declaration confirming that the work is their own.

Student name:		Assessor name: Eng Moath Malkawi	
Issue date: 14th December 2022	Submission date: 26 Jan 2022	Submitted on:	
Programme:			
Course Name: Special Topics			
HTU Course Code: 30201470		BTEC UNIT:	
Assignment number and title: No. 1: Protecting Users from use of technologies			

Plagiarism

Plagiarism is a particular form of cheating. Plagiarism must be avoided at all costs and students who break the rules, however innocently, may be penalized. It is your responsibility to ensure that you understand correct referencing practices. As a university-level student, you are expected to use appropriate references throughout and keep carefully detailed notes of all your sources of materials for the material you have used in your work, including any material downloaded from the Internet. Please consult the relevant unit lecturer or your course tutor if you need any further advice.

Student declaration

I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.

Student signature:

Date: