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**Grade** Not yet graded

Question **1**

Correct

Mark 0.50 out of 0.50

Due to regulatory requirements, your team must inspect all packets that flow into your system. What load balancer can help you achieve this?

Select one:

- ☐ a. Network Load Balancer
- ☒ b. Gateway Load Balancer ✓
- ☐ c. None. This can only be achieved using VPC features
- ☐ d. Application Load Balancer

Your answer is correct.

Question **2**

Correct

Mark 0.50 out of 0.50

The most cost-effective and scalable way to host a static web application on AWS is

Select one:

- ☒ a. Simple Storage Service (S3) ✓
- ☐ b. Elastic Compute Cloud (EC2)
- ☐ c. Elastic Container Service (ECS)

Your answer is correct.

Question **3**

Correct

Mark 0.50 out of 0.50

Your system requires a load-balancing solution that preserves the source IP address. Which solution should you choose?

Select one:

- ☐ a. Setup a custom load balancer using NGINX or HAProxy
- ☐ b. Gateway Load Balancer
- ☒ c. Network Load Balancer ✓
- ☐ d. Application Load Balancer

Your answer is correct.

Question **4**

Correct

Mark 0.50 out of 0.50

CloudFront is a(n)  ✓ and is composed of  ✓ .

Your answer is correct.

Question **5**

Correct

Mark 0.50 out of 0.50

An AWS Region is

Select one:

- ☐ a. An organizational unit designed to serve clients from a specific area
- ☐ b. An AWS data center
- ☒ c. An independent and isolated cloud deployed in a specific geographical region ✓

Your answer is correct.

## Question 6

Correct

Mark 0.50 out of 0.50

Which service models does Amazon Web Services provide?

Select one or more:

- ☒ a. PaaS ✓
- ☒ b. SaaS ✓
- ☒ c. IaaS ✓

Your answer is correct.

## Question 7

Correct

Mark 0.50 out of 0.50

What is CloudFormation?

Select one:

- ☐ a. PaaS Service
- ☒ b. IaC Service ✓
- ☐ c. IaaS Service
- ☐ d. None of the above

Your answer is correct.

## Question 8

Correct

Mark 0.50 out of 0.50

VPCs allow you to control the traffic between (sub)networks ✓ and use private IPs ✓

Your answer is correct.

## Question 9

Correct

Mark 0.50 out of 0.50

An EC2 instance runs in a specific VPC subnet ✓ based on which both public and private ✓ IP addresses are assigned to the instance.

Your answer is correct.

Question **10**

Correct

Mark 0.50 out of 0.50

Security groups act at the  ✓ level, not the  ✓ level

Your answer is correct.

Question **11**

Correct

Mark 0.50 out of 0.50

You are designing a three-tier web application and want to restrict access to the database tier (remember PostgreSQL instance) to accept traffic from the application servers only (Spring Java app). However, these application servers are in an Auto Scaling group and may vary in quantity.

How should you configure the database servers to meet the requirements?

Select one:

- ☐ a. Configure the database security group to allow database traffic from the application server IP addresses.
- ☒ b. Configure the database security group to allow database traffic from the application server security group. ✓
- ☐ c. Configure the database subnet network ACL to deny all inbound non-database traffic from the application-tier subnet.
- ☐ d. Configure the database subnet network ACL to allow inbound database traffic from the application-tier subnet.

Your answer is correct.

Question **12**

Correct

Mark 0.50 out of 0.50

The connection times out while trying to access an EC2 instance via SSH on the standard port. What is the most likely issue?

Select one:

- ☐ a. The instance is not reachable via the internet
- ☐ b. The instance type is misconfigured
- ☒ c. The security group does not explicitly allow traffic on port 22 ✓

Your answer is correct.

Question **13**

Correct

Mark 0.50 out of 0.50

Content stored on S3 can be restricted such that it's accessible only through CloudFront by using

Select one:

- ☐ a. Signed URLs
- ☐ b. S3 Bucket Settings
- ☒ c. Origin Access Identity ✓

Your answer is correct.

Question **14**

Correct

Mark 0.50 out of 0.50

From where does Docker pull the image *hello-world* when running *docker run hello-world*?

Select one:

- ☒ a. Docker tries to find it locally. If it doesn't find it, Docker checks the Docker Hub ✓
- ☐ b. From the registry specified in the Dockerfile from the current directory
- ☐ c. Always pulls it from the Docker Hub
- ☐ d. Docker tries to pull it from AWS ECR

Your answer is correct.

## Question 15

Complete

Marked out of 3.00

Your organization is running a business-critical learning management system (LMS) on its own infrastructure on-premises. Since the platform has been growing exponentially, the stakeholders decided to migrate it to AWS. You are part of the development team and you are responsible for choosing the right services and designing the solution.

The system enables teachers and experts to market, sell, and present their courses to people willing to learn from all around the world. Each course might contain written documents (mostly PDFs and PowerPoint presentations), videos, and images/diagrams. Other functional requirements include:

- students can be notified via email
- each course goes through a review process before being published
- and teachers have access to the API of the system enabling them to publish the courses on their own websites.

The LMS is composed of several backend modules written in Java and Node.js which store data in MySQL databases, while the frontend is built with React. Your team has been struggling lately to run the system locally due to its distributed nature and the increasing number of dependencies. Another important consideration is that the system transcodes the videos before the course is published in order to optimize bandwidth and playback.

Since this is the core product of your organization, the main focus of the design must be the availability of the system and reducing operational/maintenance overhead. Of course, the cost must be optimized whenever possible.

Describe your solution below. Mention which AWS services you would choose, how they communicate with each other, and, equally important, why you have chosen a particular service. Be as explicit as possible.

Optionally, you can upload images to illustrate your design (feel free to use any drawing or diagram tool you wish; images don't have to be pretty).

I would propose the following solution:

EC2, for hosting the react frontend, to allow for the scale of resources based on demand. Costs could also be reduced by using reserved instances.

S3, to store the course provided documents(PDFs, PPTs, videos, images). It is standard practice to use S3 for object storage, it has infinite space, it is cost effective and is also secure.

People from all around the world could access the system, therefore AWSs CDN(CloudFront), can be used to serve content to the users from all around the world, depending on their location. CloudFront is fast, has a global network and edge locations.

In order to transcode the uploaded course content, Lambda can be used. Lambda is serverless and therefore we don't have to manage servers. It is also cheap and the costs would be determined by the duration of its execution and the quantity of resources it uses.

To send emails to students, we can leverage the use of SQS and SNS Topics. These are reliable, cost effective notification systems and don't require additional infrastructure.

For teachers to have access to the api, we would use API Gateway. This way they would have access to API endpoints. It's a fully managed service and it makes it easy for developers to handle APIs at any scale. Pricing is only calculated based on the api calls received and the amount of data transferred. It is cost effective and easily maintainable.

We would also propose the usage of an RDS to manage the MySQL databases.

Application Load Balancer can make the platform more efficient. Also, in case anything happens with one of the instances, traffic will be redirected to a running one so the services can remain available and not affect user experience.

To manage users and access, we would also propose the usage of Cognito. We have several types of users(students, teachers, experts), we can leverage cognito user pool groups and roles and therefore also authorize the calls on the api gateway based on all these groups. Cognito is reliable and can also be configured with social logins, making it scalable.

If the platform continues to grow and have more traffic, these solutions might be adjusted for cost and speed efficiency.

 [Cloud.png](#)

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