

# Amazon

SAP-C02

*AWS Certified Solutions Architect - Professional Exam*



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## Question: 1

A company uses a service to collect metadata from applications that the company hosts on premises. Consumer devices such as TVs and internet radios access the applications. Many older devices do not support certain HTTP headers and exhibit errors when these headers are present in responses. The company has configured an on-premises load balancer to remove the unsupported headers from responses sent to older devices, which the company identified by the User-Agent headers. The company wants to migrate the service to AWS, adopt serverless technologies, and retain the ability to support the older devices. The company has already migrated the applications into a set of AWS Lambda functions. Which solution will meet these requirements?

- A. Create an Amazon CloudFront distribution for the metadata service. Create an Application Load Balancer (ALB). Configure the CloudFront distribution to forward requests to the ALB. Configure the ALB to invoke the correct Lambda function for each type of request. Create a CloudFront function to remove the problematic headers based on the value of the User-Agent header.
- B. Create an Amazon API Gateway REST API for the metadata service. Configure API Gateway to invoke the correct Lambda function for each type of request. Modify the default gateway responses to remove the problematic headers based on the value of the User-Agent header.
- C. Create an Amazon API Gateway HTTP API for the metadata service. Configure API Gateway to invoke the correct Lambda function for each type of request. Create a response mapping template to remove the problematic headers based on the value of the User-Agent. Associate the response data mapping with the HTTP API.
- D. Create an Amazon CloudFront distribution for the metadata service. Create an Application Load Balancer (ALB). Configure the CloudFront distribution to forward requests to the ALB. Configure the ALB to invoke the correct Lambda function for each type of request. Create a Lambda@Edge function that will remove the problematic headers in response to viewer requests based on the value of the User-Agent header.

**Answer: D**

Explanation:

<https://docs.aws.amazon.com/AmazonCloudFront/latest/DeveloperGuide/lambda-examples.html>

## Question: 2

A company is running a traditional web application on Amazon EC2 instances. The company needs to refactor the application as microservices that run on containers. Separate versions of the application exist in two distinct environments: production and testing. Load for the application is variable, but the minimum load and the maximum load are known. A solutions architect needs to design the updated application with a serverless architecture that minimizes operational complexity.

Which solution will meet these requirements MOST cost-effectively?

- A. Upload the container images to AWS Lambda as functions. Configure a concurrency limit for the associated Lambda functions to handle the expected peak load. Configure two separate Lambda integrations within Amazon API Gateway: one for production and one for testing.
- B. Upload the container images to Amazon Elastic Container Registry (Amazon ECR). Configure two auto scaled Amazon Elastic Container Service (Amazon ECS) clusters with the Fargate launch type to handle the expected load. Deploy tasks from the ECR images. Configure two separate Application Load Balancers to direct traffic to the ECS clusters.
- C. Upload the container images to Amazon Elastic Container Registry (Amazon ECR). Configure two auto scaled Amazon Elastic Kubernetes Service (Amazon EKS) clusters with the Fargate launch type to handle the expected load. Deploy tasks from the ECR images. Configure two separate Application Load Balancers to direct traffic to the EKS clusters.
- D. Upload the container images to AWS Elastic Beanstalk. In Elastic Beanstalk, create separate environments and deployments for production and testing. Configure two separate Application Load Balancers to direct traffic to the Elastic Beanstalk deployments.

**Answer: B**

Explanation:

minimizes operational + microservices that run on containers = AWS Elastic Beanstalk

### Question: 3

A company has a multi-tier web application that runs on a fleet of Amazon EC2 instances behind an Application Load Balancer (ALB). The instances are in an Auto Scaling group. The ALB and the Auto Scaling group are replicated in a backup AWS Region. The minimum value and the maximum value for the Auto Scaling group are set to zero. An Amazon RDS Multi-AZ DB instance stores the application's data. The DB instance has a read replica in the backup Region. The application presents an endpoint to end users by using an Amazon Route 53 record.

The company needs to reduce its RTO to less than 15 minutes by giving the application the ability to automatically fail over to the backup Region. The company does not have a large enough budget for an active-active strategy.

What should a solutions architect recommend to meet these requirements?

- A. Reconfigure the application's Route 53 record with a latency-based routing policy that load balances traffic between the two ALBs. Create an AWS Lambda function in the backup Region to promote the read replica and modify the Auto Scaling group values. Create an Amazon CloudWatch alarm that is based on the HTTPCode\_Target\_5XX\_Count metric for the ALB in the primary Region. Configure the CloudWatch alarm to invoke the Lambda function.
- B. Create an AWS Lambda function in the backup Region to promote the read replica and modify the Auto Scaling group values. Configure Route 53 with a health check that monitors the web application and sends an Amazon Simple Notification Service (Amazon SNS) notification to the Lambda function when the health check status is unhealthy. Update the application's Route 53 record with a failover policy that routes traffic to the ALB in the backup Region when a health check failure occurs.
- C. Configure the Auto Scaling group in the backup Region to have the same values as the Auto Scaling

group in the primary Region. Reconfigure the application's Route 53 record with a latency-based routing policy that load balances traffic between the two ALBs. Remove the read replica. Replace the read replica with a standalone RDS DB instance. Configure Cross-Region Replication between the RDS DB instances by using snapshots and Amazon S3.

D. Configure an endpoint in AWS Global Accelerator with the two ALBs as equal weighted targets. Create an AWS Lambda function in the backup Region to promote the read replica and modify the Auto Scaling group values. Create an Amazon CloudWatch alarm that is based on the HTTPCode\_Target\_5XX\_Count metric for the ALB in the primary Region. Configure the CloudWatch alarm to invoke the Lambda function.

**Answer: B**

Explanation:

an AWS Lambda function in the backup region to promote the read replica and modify the Auto Scaling group values, and then configuring Route 53 with a health check that monitors the web application and sends an Amazon SNS notification to the Lambda function when the health check status is unhealthy. Finally, the application's Route 53 record should be updated with a failover policy that routes traffic to the ALB in the backup region when a health check failure occurs. This approach provides automatic failover to the backup region when a health check failure occurs, reducing the RTO to less than 15 minutes. Additionally, this approach is cost-effective as it does not require an active-active strategy.

## Question: 4

A company is hosting a critical application on a single Amazon EC2 instance. The application uses an Amazon ElastiCache for Redis single-node cluster for an in-memory data store. The application uses an Amazon RDS for MariaDB DB instance for a relational database. For the application to function, each piece of the infrastructure must be healthy and must be in an active state.

A solutions architect needs to improve the application's architecture so that the infrastructure can automatically recover from failure with the least possible downtime.

Which combination of steps will meet these requirements? (Select THREE.)

A. Use an Elastic Load Balancer to distribute traffic across multiple EC2 instances. Ensure that the EC2 instances are part of an Auto Scaling group that has a minimum capacity of two instances.

B. Use an Elastic Load Balancer to distribute traffic across multiple EC2 instances. Ensure that the EC2 instances are configured in unlimited mode.

C. Modify the DB instance to create a read replica in the same Availability Zone. Promote the read replica to be the primary DB instance in failure scenarios.

D. Modify the DB instance to create a Multi-AZ deployment that extends across two Availability Zones.

E. Create a replication group for the ElastiCache for Redis cluster. Configure the cluster to use an Auto Scaling group that has a minimum capacity of two instances.

F. Create a replication group for the ElastiCache for Redis cluster. Enable Multi-AZ on the cluster.

**Answer: A, D, F**

Explanation:

Option A is correct because using an Elastic Load Balancer and an Auto Scaling group with a minimum capacity of two instances can improve the availability and scalability of the EC2 instances that host the application. The load balancer can distribute traffic across multiple instances and the Auto Scaling group can replace any unhealthy instances automatically<sup>1</sup>

Option D is correct because modifying the DB instance to create a Multi-AZ deployment that extends across two Availability Zones can improve the availability and durability of the RDS for MariaDB database. Multi-AZ deployments provide enhanced data protection and minimize downtime by automatically failing over to a standby replica in another Availability Zone in case of a planned or unplanned outage<sup>4</sup>

Option F is correct because creating a replication group for the ElastiCache for Redis cluster and enabling Multi-AZ on the cluster can improve the availability and fault tolerance of the in-memory data store. A replication group consists of a primary node and up to five read-only replica nodes that are synchronized with the primary node using asynchronous replication. Multi-AZ allows automatic failover to one of the replicas if the primary node fails or becomes unreachable<sup>6</sup>

Reference: 1: [https://docs.aws.amazon.com/elasticloadbalancing/latest/userguide/how-elastic-loadbalancing-](https://docs.aws.amazon.com/elasticloadbalancing/latest/userguide/how-elastic-loadbalancing-works.html)

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[https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/USER\\_ReadRepl.html](https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/burstableperformance-instances-unlimited-mode.html) 4:

[https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/Concepts.MultiAZ.html](https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/USER_ReadRepl.html) 5:

<https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/Concepts.MultiAZ.html> 6:

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## Question: 5

A retail company is operating its ecommerce application on AWS. The application runs on Amazon EC2 instances behind an Application Load Balancer (ALB). The company uses an Amazon RDS DB instance as the database backend. Amazon CloudFront is configured with one origin that points to the ALB. Static content is cached. Amazon Route 53 is used to host all public zones.

After an update of the application, the ALB occasionally returns a 502 status code (Bad Gateway) error. The root cause is malformed HTTP headers that are returned to the ALB. The webpage returns successfully when a solutions architect reloads the webpage immediately after the error occurs.

While the company is working on the problem, the solutions architect needs to provide a custom error page instead of the standard ALB error page to visitors.

Which combination of steps will meet this requirement with the LEAST amount of operational overhead? (Choose two.)

A. Create an Amazon S3 bucket. Configure the S3 bucket to host a static webpage. Upload the custom error pages to Amazon S3.

B. Create an Amazon CloudWatch alarm to invoke an AWS Lambda function if the ALB health check response Target.FailedHealthChecks is greater than 0. Configure the Lambda function to modify the forwarding rule at the ALB to point to a publicly accessible web server.

C. Modify the existing Amazon Route 53 records by adding health checks. Configure a fallback target if the health check fails. Modify DNS records to point to a publicly accessible webpage.

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- D. Create an Amazon CloudWatch alarm to invoke an AWS Lambda function if the ALB health check response `Elb.InternalError` is greater than 0. Configure the Lambda function to modify the forwarding rule at the ALB to point to a public accessible web server.
- E. Add a custom error response by configuring a CloudFront custom error page. Modify DNS records to point to a publicly accessible web page.

<b>Answer: C, E</b>
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Explanation:

"Save your custom error pages in a location that is accessible to CloudFront. We recommend that you store them in an Amazon S3 bucket, and that you don't store them in the same place as the rest of your website or application's content. If you store the custom error pages on the same origin as your website or application, and the origin starts to return 5xx errors, CloudFront can't get the custom error pages because the origin server is unavailable."

<https://docs.aws.amazon.com/AmazonCloudFront/latest/DeveloperGuide/GeneratingCustomErrorResponses.html>

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