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**QUESTION 1**

A company's interactive web application uses an Amazon CloudFront distribution to serve images from an Amazon S3 bucket. Occasionally, third-party tools ingest corrupted images into the S3 bucket. This image corruption causes a poor user experience in the application later. The company has successfully implemented and tested Python logic to detect corrupt images.

A solutions architect must recommend a solution to integrate the detection logic with minimal latency between the ingestion and serving.

Which solution will meet these requirements?

- A. Use a Lambda@Edge function that is invoked by a viewer-response event.
- B. Use a Lambda@Edge function that is invoked by an origin-response event.
- C. Use an S3 event notification that invokes an AWS Lambda function.
- D. Use an S3 event notification that invokes an AWS Step Functions state machine.

Correct Answer: B

This solution will allow the detection logic to be run as soon as the image is uploaded to the S3 bucket, before it is served to users via the CloudFront distribution. This way, the detection logic can quickly identify any corrupted images and prevent them from being served to users, minimizing latency between ingestion and serving.

Reference: AWS Lambda@Edge documentation: <https://docs.aws.amazon.com/lambda/latest/dg/lambda-edge.html>

You can use Lambda@Edge to run your code in response to CloudFront events, such as a viewer request, an origin request, a response, or an error.

QUESTION 2

A company hosts a large on-premises MySQL database at its main office that supports an issue tracking system used by employees around the world. The company already uses AWS for some workloads and has created an Amazon Route 53 entry for the database endpoint that points to the on-premises database. Management is concerned about the database being a single point of failure and wants a solutions architect to migrate the database to AWS without any data loss or downtime.

Which set of actions should the solutions architect implement?

- A. Create an Amazon Aurora DB cluster. Use AWS Database Migration Service (AWS DMS) to do a full load from the on-premises database to Aurora. Update the Route 53 entry for the database to point to the Aurora cluster endpoint, and shut down the on-premises database.
- B. During nonbusiness hours, shut down the on-premises database and create a backup. Restore this backup to an Amazon Aurora DB cluster. When the restoration is complete, update the Route 53 entry for the database to point to the Aurora cluster endpoint, and shut down the on-premises database.
- C. Create an Amazon Aurora DB cluster. Use AWS Database Migration Service (AWS DMS) to do a full load with continuous replication from the on-premises database to Aurora. When the migration is complete, update the Route 53 entry for the database to point to the Aurora cluster endpoint, and shut down the on-premises database.



D. Create a backup of the database and restore it to an Amazon Aurora multi-master cluster. This Aurora cluster will be in a master-master replication configuration with the on-premises database. Update the Route 53 entry for the database to point to the Aurora cluster endpoint. and shut down the on-premises database.

Correct Answer: C

"Around the world" eliminates possibility for the maintenance window at night. The other difference is ability to leverage continuous replication in MySQL to Aurora case.

QUESTION 3

A company is building a solution in the AWS Cloud. Thousands of devices will connect to the solution and send data. Each device needs to be able to send and receive data in real time over the MQTT protocol. Each device must authenticate by using a unique X.509 certificate.

Which solution will meet these requirements with the LEAST operational overhead?

- A. Set up AWS IoT Core. For each device, create a corresponding Amazon MQ queue and provision a certificate. Connect each device to Amazon MQ.
- B. Create a Network Load Balancer (NLB) and configure it with an AWS Lambda authorizer. Run an MQTT broker on Amazon EC2 instances in an Auto Scaling group. Set the Auto Scaling group as the target for the NLB. Connect each device to the NLB.
- C. Set up AWS IoT Core. For each device, create a corresponding AWS IoT thing and provision a certificate. Connect each device to AWS IoT Core.
- D. Set up an Amazon API Gateway HTTP API and a Network Load Balancer (NLB). Create integration between API Gateway and the NLB. Configure a mutual TLS certificate authorizer on the HTTP API. Run an MQTT broker on an Amazon EC2 instance that the NLB targets. Connect each device to the NLB.

Correct Answer: D

This solution requires minimal operational overhead, as it only requires setting up AWS IoT Core and creating a thing for each device. (Reference: AWS Certified Solutions Architect - Professional Official Amazon Text Book, Page 537) AWS IoT Core is a fully managed service that enables secure, bi-directional communication between internet-connected devices and the AWS Cloud. It supports the MQTT protocol and includes built-in device authentication and access control. By using AWS IoT Core, the company can easily provision and manage the X.509 certificates for each device, and connect the devices to the service with minimal operational overhead.

QUESTION 4

A company has a media metadata extraction pipeline running on AWS. Notifications containing a reference to a file Amazon S3 are sent to an Amazon Simple Notification Service (Amazon SNS) topic. The pipeline consists of a number of AWS Lambda functions that are subscribed to the SNS topic. The Lambda functions extract the S3 file and write metadata to an Amazon RDS PostgreSQL DB instance.

Users report that updates to the metadata are sometimes slow to appear or are lost. During these times, the CPU utilization on the database is high and the number of failed Lambda invocations increases. Which combination of actions should a solutions architect take to resolve this issue? (Select TWO.)

- A. Enable message delivery status on the SNS topic. Configure the SNS topic delivery policy to enable retries with exponential backoff.



- B. Create an Amazon Simple Queue Service (Amazon SQS) FIFO queue and subscribe the queue to the SNS topic. Configure the Lambda functions to consume messages from the SQS queue.
- C. Create an RDS proxy for the RDS instance. Update the Lambda functions to connect to the RDS instance using the proxy.
- D. Enable the RDS Data API for the RDS instance. Update the Lambda functions to connect to the RDS instance using the Data API.
- E. Create an Amazon Simple Queue Service (Amazon SQS) standard queue for each Lambda function and subscribe the queues to the SNS topic. Configure the Lambda functions to consume messages from their respective SQS queue.

Correct Answer: CE

QUESTION 5

A scientific company needs to process text and image data from an Amazon S3 bucket. The data is collected from several radar stations during a live, time-critical phase of a deep space mission. The radar stations upload the data to the source S3 bucket. The data is prefixed by radar station identification number.

The company created a destination S3 bucket in a second account. Data must be copied from the source S3 bucket to the destination S3 bucket to meet a compliance objective. The replication occurs through the use of an S3 replication rule to cover all objects in the source S3 bucket.

One specific radar station is identified as having the most accurate data. Data replication at this radar station must be monitored for completion within 30 minutes after the radar station uploads the objects to the source S3 bucket.

What should a solutions architect do to meet these requirements?

- A. Set up an AWS DataSync agent to replicate the prefixed data from the source S3 bucket to the destination S3 bucket. Select to use all available bandwidth on the task, and monitor the task to ensure that it is in the TRANSFERRING status. Create an Amazon EventBridge (Amazon CloudWatch Events) rule to trigger an alert if this status changes.
- B. In the second account, create another S3 bucket to receive data from the radar station with the most accurate data. Set up a new replication rule for this new S3 bucket to separate the replication from the other radar stations. Monitor the maximum replication time to the destination. Create an Amazon EventBridge (Amazon CloudWatch Events) rule to trigger an alert when the time exceeds the desired threshold.
- C. Enable Amazon S3 Transfer Acceleration on the source S3 bucket, and configure the radar station with the most accurate data to use the new endpoint. Monitor the S3 destination bucket's TotalRequestLatency metric. Create an Amazon EventBridge (Amazon CloudWatch Events) rule to trigger an alert if this status changes.
- D. Create a new S3 replication rule on the source S3 bucket that filters for the keys that use the prefix of the radar station with the most accurate data. Enable S3 Replication Time Control (S3 RTC). Monitor the maximum replication time to the destination. Create an Amazon EventBridge (Amazon CloudWatch Events) rule to trigger an alert when the time exceeds the desired threshold.

Correct Answer: D

<https://docs.aws.amazon.com/AmazonS3/latest/userguide/replication-time-control.html>