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QUESTION 1

An ecommerce company runs an application on AWS. The application has an Amazon API Gateway API that invokes an AWS Lambda function. The data is stored in an Amazon RDS for PostgreSQL DB instance.

During the company's most recent flash sale, a sudden increase in API calls negatively affected the application's performance. A solutions architect reviewed the Amazon CloudWatch metrics during that time and noticed a significant increase in Lambda invocations and database connections. The CPU utilization also was high on the DB instance.

What should the solutions architect recommend to optimize the application's performance?

- A. Increase the memory of the Lambda function. Modify the Lambda function to close the database connections when the data is retrieved.
- B. Add an Amazon ElastiCache for Redis cluster to store the frequently accessed data from the RDS database.
- C. Create an RDS proxy by using the Lambda console. Modify the Lambda function to use the proxy endpoint.
- D. Modify the Lambda function to connect to the database outside of the function's handler. Check for an existing database connection before creating a new connection.

Correct Answer: C

This option will optimize the application's performance by reducing the overhead of opening and closing database connections for each Lambda invocation. An RDS proxy is a fully managed database proxy for Amazon RDS that makes applications more scalable, more resilient to database failures, and more secure¹. It allows applications to pool and share connections established with the database, improving database efficiency and application scalability¹. By creating an RDS proxy by using the Lambda console, you can easily configure your Lambda function to use the proxy endpoint instead of the direct database endpoint². This will enable your Lambda function to reuse existing connections from the proxy's connection pool, reducing the latency and CPU utilization caused by establishing new connections for each invocation. It will also prevent connection saturation or exhaustion on the database, which can degrade performance or cause errors³.

QUESTION 2

A company has developed a hybrid solution between its data center and AWS. The company uses Amazon VPC and Amazon EC2 instances that send application logs to Amazon CloudWatch. The EC2 instances read data from multiple relational databases that are hosted on premises.

The company wants to monitor which EC2 instances are connected to the databases in near-real time. The company already has a monitoring solution that uses Splunk on premises. A solutions architect needs to determine how to send networking traffic to Splunk.

How should the solutions architect meet these requirements?

- A. Enable VPC flows logs, and send them to CloudWatch. Create an AWS Lambda function to periodically export the CloudWatch logs to an Amazon S3 bucket by using the pre-defined export function. Generate ACCESS_KEY and SECRET_KEY AWS credentials. Configure Splunk to pull the logs from the S3 bucket by using those credentials.
- B. Create an Amazon Kinesis Data Firehose delivery stream with Splunk as the destination. Configure a pre-processing AWS Lambda function with a Kinesis Data Firehose stream processor that extracts individual log events from records sent by CloudWatch Logs subscription filters. Enable VPC flows logs, and send them to CloudWatch. Create a CloudWatch Logs subscription that sends log events to the Kinesis Data Firehose delivery stream.



C. Ask the company to log every request that is made to the databases along with the EC2 instance IP address. Export the CloudWatch logs to an Amazon S3 bucket. Use Amazon Athena to query the logs grouped by database name. Export Athena results to another S3 bucket. Invoke an AWS Lambda function to automatically send any new file that is put in the S3 bucket to Splunk.

D. Send the CloudWatch logs to an Amazon Kinesis data stream with Amazon Kinesis Data Analytics for SQL Applications. Configure a 1 -minute sliding window to collect the events. Create a SQL query that uses the anomaly detection template to monitor any networking traffic anomalies in near-real time. Send the result to an Amazon Kinesis Data Firehose delivery stream with Splunk as the destination.

Correct Answer: B

<https://docs.aws.amazon.com/firehose/latest/dev/creating-the-stream-to-splunk.html>

QUESTION 3

An auction website enables users to bid on collectible items. The auction rules require that each bid is processed only once and in the order it was received. The current implementation is based on a fleet of Amazon EC2 web servers that write bid records into Amazon Kinesis Data Streams. A single 12 large instance has a cron job that runs the bid processor, which reads incoming bids from Kinesis Data Streams and processes each bid. The auction site is growing in popularity, but users are complaining that some bids are not registering.

Troubleshooting indicates that the bid processor is too slow during peak demand hours, sometimes crashes while processing, and occasionally loses track of which record is being processed.

What changes should make the bid processing more reliable?

A. Refactor the web application to use the Amazon Kinesis Producer Library (KPL) when posting bids to Kinesis Data Streams. Refactor the bid processor to flag each record in Kinesis Data Streams as being unread, processing, and processed. At the start of each bid processing run; scan Kinesis Data Streams for unprocessed records.

B. Refactor the web application to post each incoming bid to an Amazon SNS topic in place of Kinesis Data Streams. Configure the SNS topic to trigger an AWS Lambda function that

C. processes each bid as soon as a user submits it.

D. Refactor the web application to post each incoming bid to an Amazon SQS FIFO queue in place of Kinesis Data Streams. Refactor the bid processor to continuously consume the SQS queue. Place the bid processing EC2 instance in an Auto Scaling group with a minimum and a maximum size of 1.

E. Switch the EC2 instance type from t2 large to a larger general compute instance type. Put the bid processor EC2 instances in an Auto Scaling group that scales out the number of EC2 instances running the bid processor based on the incomingRecords metric in Kinesis Data Streams.

Correct Answer: C

<https://aws.amazon.com/sqs/faqs/#:~:text=A%20single%20Amazon%20SQS%20message,20%2C000%20for%20a%20FIFO%20queue.>

QUESTION 4

A company needs to implement a disaster recovery (DR) plan for a web application. The application runs in a single AWS Region.



The application uses microservices that run in containers. The containers are hosted on AWS Fargate in Amazon Elastic Container Service (Amazon ECS). The application has an Amazon RDS for MySQL DB instance as its data layer and uses Amazon Route 53 for DNS resolution. An Amazon CloudWatch alarm invokes an Amazon EventBridge rule if the application experiences a failure.

A solutions architect must design a DR solution to provide application recovery to a separate Region. The solution must minimize the time that is necessary to recover from a failure.

Which solution will meet these requirements?

- A. Set up a second ECS cluster and ECS service on Fargate in the separate Region. Create an AWS Lambda function to perform the following actions: take a snapshot of the RDS DB instance, copy the snapshot to the separate Region, create a new RDS DB instance from the snapshot, and update Route 53 to route traffic to the second ECS cluster. Update the EventBridge rule to add a target that will invoke the Lambda function.
- B. Create an AWS Lambda function that creates a second ECS cluster and ECS service in the separate Region. Configure the Lambda function to perform the following actions: take a snapshot of the RDS DB instance, copy the snapshot to the separate Region, create a new RDS DB instance from the snapshot, and update Route 53 to route traffic to the second ECS cluster. Update the EventBridge rule to add a target that will invoke the Lambda function.
- C. Set up a second ECS cluster and ECS service on Fargate in the separate Region. Create a cross-Region read replica of the RDS DB instance in the separate Region. Create an AWS Lambda function to promote the read replica to the primary database. Configure the Lambda function to update Route 53 to route traffic to the second ECS cluster. Update the EventBridge rule to add a target that will invoke the Lambda function.
- D. Set up a second ECS cluster and ECS service on Fargate in the separate Region. Take a snapshot of the RDS DB instance. Convert the snapshot to an Amazon DynamoDB global table. Create an AWS Lambda function to update Route 53 to route traffic to the second ECS cluster. Update the EventBridge rule to add a target that will invoke the Lambda function.

Correct Answer: C

This option uses a cross-Region read replica of the RDS DB instance to provide a standby database in the separate Region. A cross-Region read replica is a copy of the primary database that is updated asynchronously using the native replication features of the database engine. It provides enhanced availability, scalability, and performance for read-heavy workloads. It also enables fast recovery from a regional outage by promoting the read replica to a standalone database. To use a cross-Region read replica, the company needs to set up a second ECS cluster and ECS service on Fargate in the separate Region. The company also needs to create an AWS Lambda function to promote the read replica to the primary database and update Route 53 to route traffic to the second ECS cluster. The company can then update the EventBridge rule to add a target that will invoke the Lambda function in case of a failure.

QUESTION 5

A company has a website that runs on Amazon EC2 instances behind an Application Load Balancer (ALB). The instances are in an Auto Scaling group. The ALB is associated with an AWS WAF web ACL.

The website often encounters attacks in the application layer. The attacks produce sudden and significant increases in traffic on the application server. The access logs show that each attack originates from different IP addresses. A solutions architect needs to implement a solution to mitigate these attacks.

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

- A. Create an Amazon CloudWatch alarm that monitors server access. Set a threshold based on access by IP address. Configure an alarm action that adds the IP address to the web ACL's deny list.



B. Deploy AWS Shield Advanced in addition to AWS WAF. Add the ALB as a protected resource.

C. Create an Amazon CloudWatch alarm that monitors user IP addresses. Set a threshold based on access by IP address. Configure the alarm to invoke an AWS Lambda function to add a deny rule in the application server's subnet route table for any IP addresses that activate the alarm.

D. Inspect access logs to find a pattern of IP addresses that launched the attacks. Use an Amazon Route 53 geolocation routing policy to deny traffic from the countries that host those IP addresses.

Correct Answer: B

AWS Shield Advanced is focused on protecting against DDoS attacks, while AWS WAF is focused on protecting against web exploits. However, both services can be used together to provide comprehensive protection for your applications.

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