# AWS Solutions Architect Associate - Reviewer 1

## Designing a High Performance Architectures 1

**Question 1:** An application hosted in EC2 consumes messages from an SQS queue and is integrated with SNS to send out an email to you once the process is complete. The Operations team received 5 orders but after a few hours, they saw 20 email notifications in their inbox.

Which of the following could be the possible culprit for this issue?

a. The web application does not have permission to consume messages in the SQS queue.
b. **The web application is not deleting the messages in the SQS queue after it has processed them.**
c. The web application is set for long polling so the messages are being sent twice.
d. The web application is set to short polling so some messages are not being picked up.

**Question 2**: A company is using a combination of API Gateway and Lambda for the web services of the online web portal that is being accessed by hundreds of thousands of clients each day. They will be announcing a new revolutionary product and it is expected that the web portal will receive a massive number of visitors all around the globe.

How can you protect the backend systems and applications from traffic spikes?

a. **Use throttling limits in API Gateway.**
b. Manually upgrade the EC2 instances being used by APU Gateway.
c. Deploy Multi-AZ in API Gateway with Read Replica
d. API Gateway will automatically scale and handle massive traffic spikes so you do not have to do anything.

**Question 3:** A company has a web application that uses Internet Information Services (IIS) for Windows Server. A file share is used to store the application data on the network-attached storage of the company's on-premises data center. To achieve a highly available system, they plan to migrate the application and file share to AWS.

Which of the following can be used to fulfill this requirement?

a. Migrate the existing file share configuration to Amazon EBS
b. Migrate the existing file share configuration to AWS Storage Gateway.
c. Migrate the existing file share configuration to Amazon EFS.
d. **Migrate the existing file share configuration to Amazon FSx for Windows File Server.**

**Question 4**: A global IT company with offices around the world has multiple AWS accounts. To improve efficiency and drive costs down, the Chief Information Officer (CIO) wants to set up a solution that centrally manages their AWS resources. This will allow them to procure AWS resources centrally and share resources such as AWS Transit Gateways, AWS License Manager configurations, or Amazon Route 53 Resolver rules across their various accounts.

As the Solutions Architect, which combination of options should you implement in this scenario? (Select TWO.)

    a. **Use the AWS Resource Access Manager (RAM) service to easily and securely share your resources with your AWS accounts.**
    b. **Consolidate all of the company's accounts using AWS Organizations.**
    c. Use the AWS Identity and Access Management service to set up cross-account access that will easily and securely share your resources with your AWS accounts.
    d. Use AWS Control Tower to easily and securely share your resources with your AWS accounts.
    e. Consolidate all of the company's accounts using AWS ParallelCluster.

**Question 5:** A popular social network is hosted in AWS and is using a DynamoDB table as its database. There is a requirement to implement a 'follow' feature where users can subscribe to certain updates made by a particular user and be notified via email. Which of the following is the most suitable solution that you should implement to meet the requirement?

    a. **Enable DynamoDB Stream and create an AWS Lambda trigger, as well as the IAM role which contains all of the permissions that the Lambda function will need at runtime. The data from the stream record will be processed by the Lambda function which will then publish a message to SNS Topic that will notify the subscriber via email.**
    b. Create a Lambda function that uses DynamoDB Streams Kinesis Adapter which will fetch data from the DynamoDB Streams endpoint. Set up an SNS Topic that will notify the subscriber via email when there is an update made by a particular user.
    c. Set up a DAX cluster to access the source DynamoDB table. Create a new DynamoDB trigger and a Lambda function. For every update made in the user data, the trigger will send data to Lambda function which will then notify the subscribers via email using SNS.
    d. Using the Kinesis Client Library (KCL), write an application that leverages on DynamoDB Streams Kinesis Adapter that will fetch data from the DynamoDB Streams endpoint. When there are updates made by a particular user, notify the subscribers via email using SNS.

**Question 6:** A cryptocurrency trading platform is using an API built in AWS Lambda and API Gateway. Due to the recent news and rumors about the upcoming price surge of Bitcoin, Ethereum and other cryptocurrencies, it is expected that the trading platform would have a significant increase in site visitors and new users in the coming days ahead.

In this scenario, how can you protect the backend systems of the platform from traffic spikes?

a. Move the Lambda function in a VPC.
b. Use CloudFront in front of the APU Gaateway to act as a cache.
**c. Enable throttling limits and result caching in APU Gateway.**
d. Switch from using AWS Lambda and API Gateway to a more scalable and highly available architecture using EC2 instances, ELC, and Auto Scaling.

**Question 7:** A content management system (CMS) is hosted on a fleet of auto-scaled, On-Demand EC2 instances that use Amazon Aurora as its database. Currently, the system stores the file documents that the users upload in one of the attached EBS Volumes. Your manager noticed that the system performance is quite slow and he has instructed you to improve the architecture of the system.

In this scenario, what will you do to implement a scalable, high-available POSIX-compliant shared file system?

a. Create an S3 bucket and use this as the storage for the CMS.
b. Upgrading your existing EBS volumes to Provisioned IOPS SSD Volumes.
c. Use ElastiCache
**d. Use EFS**

**Question 8:** A popular mobile game uses CloudFront, Lambda, and DynamoDB for its backend services. The player data is persisted on a DynamoDB table and the static assets are distributed by CloudFront. However, there are a lot of complaints that saving and retrieving player information is taking a lot of time.

To improve the game's performance, which AWS service can you use to reduce DynamoDB response times from milliseconds to microseconds?

a. AWS Device Farm
b. Amazon ElastiCache
c. DynamoDB auto Scaling
**d. Amazon DynamoDB Accelerator (DAX)**

**Question 9**: A company plans to launch an Amazon EC2 instance in a private subnet for its internal corporate web portal. For security purposes, the EC2 instance must send data to Amazon DynamoDB and Amazon S3 via private endpoints that don't pass through the public Internet. Which of the following can meet the above requirements?

    a. Use AWS Direct Connect to route all access to S3 and DynamoDB via private endpoints.
    b. **Use VPC endpoints to route all access to S3 and DynamoDB via private endpoints.**
    c. Use AWS VPN CloudHub to route all access to S3 and DynamoDB via private endpoints.
    d. Use AWS Transit Gateway to route all access to S3 and DynamoDB via private endpoints.

**Question 10:** A company collects atmospheric data such as temperature, air pressure, and humidity from different countries. Each site location is equipped with various weather instruments and a high-speed Internet connection. The average collected data in each location is around 500 GB and will be analyzed by a weather forecasting application hosted in Northern Virginia. As the Solutions Architect, you need to aggregate all the data in the fastest way. Which of the following options can satisfy the given requirement?

    a. Set up a Site-to-Site VPN connection.
    b. **Enable Transfer Acceleration in the destination bucket and upload the collected data using Multipart Upload.**
    c. Upload the data to the closest S3 bucket. Set up a cross-region replication and copy the objects to the destination bucket.
    d. Use AWS Snowball Edge to transfer large amounts of data.

**Question 11:** A car dealership website hosted in Amazon EC2 stores car listings in an Amazon Aurora database managed by Amazon RDS. Once a vehicle has been sold, its data must be removed from the current listings and forwarded to a distributed processing system. Which of the following options can satisfy the given requirement?

    a. Create an RDS event subscription and send the notifications to AWS Lambda. Configure the Lambda function to fan out the event notifications to multiple Amazon SQS queues to update the processing system.
    b. Create an RDS event subscription and send the notifications to Amazon SNS. Configure the SNS topic to fan out the event notifications to multiple Amazon SQS queues. Process the data using Lambda functions.
    c. **Create a native function or a stored procedure that invokes a Lambda function. Configure the Lambda function to send event notifications to an Amazon SQS queue for the processing system to consume.**
    d. Create an RDS event subscription and send the notifications to Amazon SQS. Configure the SQS queues to fan out the event notifications to multiple Amazon SNS topics. Process the data using Lambda functions.

**Question 12:** An AI-powered Forex trading application consumes thousands of data sets to train its machine learning model. The application's workload requires a high-performance, parallel hot storage to process the training datasets concurrently. It also needs cost-effective cold storage to archive those datasets that yield low profit. Which of the following Amazon storage services should the developer use?

a. **Use Amazon FSx For Lustre and Amazon S3 for hot and cold storage respectively.**
b. Use Amazon Elastic File System and Amazon S3 for hot and cold storage respectively.
c. Use Amazon FSx For Windows File Server and Amazon S3 for hot and cold storage respectively.
d. Use Amazon FSx For Lustre and Amazon EBS Provisioned IOPS SSD (io1) volumes for hot and cold storage respectively.

**Question 13:** A company plans to build a data analytics application in AWS which will be deployed in an Auto Scaling group of On-Demand EC2 instances and a MongoDB database. It is expected that the database will have high-throughput workloads performing small, random I/O operations. As the Solutions Architect, you are required to properly set up and launch the required resources in AWS.

Which of the following is the most suitable EBS type to use for your database?

a. **Provisioned IOPS SSD (io1)**
b. General Purpose SSD (gp2)
c. Throughput Optimized HDD (st1)
d. Cold HDD (sc1)

**Question 14:** The company that you are working for has a highly available architecture consisting of an elastic load balancer and several EC2 instances configured with auto-scaling in three Availability Zones. You want to monitor your EC2 instances based on a particular metric, which is not readily available in CloudWatch. Which of the following is a custom metric in CloudWatch which you have to manually set up?

a. Network packets out of an EC2 instance
b. CPU Utilization of an EC2 instance
c. **Memory Utilization of an EC2 instance**
d. Disk Reads activity of an EC2 instance

**Question 15:** The company that you are working for has a highly available architecture consisting of an elastic load balancer and several EC2 instances configured with auto-scaling in three Availability Zones. You want to monitor your EC2 instances based on a particular metric, which is not readily available in CloudWatch. Which of the following is a custom metric in CloudWatch which you have to manually set up?

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    b. CPU Utilization of an EC2 instance
    **c. Memory Utilization of an EC2 instance**
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**Question 16:** A Docker application, which is running on an Amazon ECS cluster behind a load balancer, is heavily using DynamoDB. You are instructed to improve the database performance by distributing the workload evenly and using the provisioned throughput efficiently. Which of the following would you consider to implement for your DynamoDB table?

    a. Use partition keys with low-cardinality attributes, which have a few number of distinct values for each item.
    b. Reduce the number of partition keys in the DynamoDB table.
    **c. Use partition keys with high-cardinality attributes, which have a large number of distinct values for each item.**
    d. Avoid using a composite primary key, which is composed of a partition key and a sort key.

**Question 17:** A company is using Amazon S3 to store frequently accessed data. When an object is created or deleted, the S3 bucket will send an event notification to the Amazon SQS queue. A solutions architect needs to create a solution that will notify the development and operations team about the created or deleted objects. Which of the following would satisfy this requirement?

    **a. Create an Amazon SNS topic and configure two Amazon SQS queues to subscribe to the topic. Grant Amazon S3 permission to send notifications to Amazon SNS and update the bucket to use the new SNS topic.**
    b. Create a new Amazon SNS FIFO topic for the other team. Grant Amazon S3 permission to send the notification to the second SNS topic.
    c. Set up another Amazon SQS queue for the other team. Grant Amazon S3 permission to send a notification to the second SQS queue.
    d. Set up an Amazon SNS topic and configure two Amazon SQS queues to poll the SNS topic. Grant Amazon S3 permission to send notifications to Amazon SNS and update the bucket to use the new SNS topic.

**Question 18:** An organization needs to provision a new Amazon EC2 instance with a persistent block storage volume to migrate data from its on-premises network to AWS. The required maximum performance for the storage volume is 64,000 IOPS.

In this scenario, which of the following can be used to fulfill this requirement?

   a. Directly attach multiple Instance Store volumes in an EC2 instance to deliver maximum IOPS performance.
   b. Launch an Amazon EFS file system and mount it to a Nitro-based Amazon EC2 instance and set the performance mode to Max I/O.
   c. Launch any type of Amazon EC2 instance and attach a Provisioned IOPS SSD EBS volume (io1) with 64,000 IOPS.
   d. **Launch a Nitro-based EC2 instance and attach a Provisioned IOPS SSD EBS volume (io1) with 64,000 IOPS.**


**Question 19:** A startup is using Amazon RDS to store data from a web application. Most of the time, the application has low user activity but it receives bursts of traffic within seconds whenever there is a new product announcement. The Solutions Architect needs to create a solution that will allow users around the globe to access the data using an API.

What should the Solutions Architect do to meet the above requirement?

   a. **Create an API using Amazon API Gateway and use AWS Lambda to handle the bursts of traffic in seconds.**
   b. Create an API using Amazon API Gateway and use the Amazon ECS cluster with Service Auto Scaling to handle the bursts of traffic in seconds.
   c. Create an API using Amazon API Gateway and use an Auto Scaling group of Amazon EC2 instances to handle the bursts of traffic in seconds.
   d. Create an API using Amazon API Gateway and use Amazon Elastic Beanstalk with Auto Scaling to handle the bursts of traffic in seconds.

**Question 20:** A tech company has a CRM application hosted on an Auto Scaling group of On-Demand EC2 instances. The application is extensively used during office hours from 9 in the morning till 5 in the afternoon. Their users are complaining that the performance of the application is slow during the start of the day but then works normally after a couple of hours.

Which of the following can be done to ensure that the application works properly at the beginning of the day?

    a. Configure a Dynamic scaling policy for the Auto Scaling group to launch new instances based on the Memory utilization.
    **b. Configure a Scheduled scaling policy for the Auto Scaling group to launch new instances before the start of the day.**
    c. Set up an Application Load Balancer (ALB) to your architecture to ensure that the traffic is properly distributed on the instances.
    d. Configure a Dynamic scaling policy for the Auto Scaling group to launch new instances based on the CPU utilization.

**Question 21:** A popular social media website uses a CloudFront web distribution to serve their static contents to their millions of users around the globe. They are receiving a number of complaints recently that their users take a lot of time to log into their website. There are also occasions when their users are getting HTTP 504 errors. You are instructed by your manager to significantly reduce the user's login time to further optimize the system.

Which of the following options should you use together to set up a cost-effective solution that can improve your application's performance? (Select TWO.)

    a. Deploy your application to multiple AWS regions to accommodate your users around the world. Set up a Route 53 record with latency routing policy to route incoming traffic to the region that provides the best latency to the user.
    b. Configure your origin to add a Cache-Control max-age directive to your objects, and specify the longest practical value for max-age to increase the cache hit ratio of your CloudFront distribution.
    **c. Set up an origin failover by creating an origin group with two origins. Specify one as the primary origin and the other as the second origin which CloudFront automatically switches to when the primary origin returns specific HTTP status code failure responses.**
    d. Use multiple and geographically dispersed VPCs to various AWS regions then create a transit VPC to connect all of your resources. In order to handle the requests faster, set up Lambda functions in each region using the AWS Serverless Application Model (SAM) service.
    **e. Customize the content that the CloudFront web distribution delivers to your users using Lambda@Edge, which allows your Lambda functions to execute the authentication process in AWS locations closer to the users.**