CSAA Practice Test 1

Attempt
3

Completed on
Tuesday , 05 March 2019 , 02:00 PM

Marks Obtained
0 / 65

Time Taken
00 H 00 M 06 S

Your score is
0.0%

Result
Fail

Mode
Exam

Domains wise Quiz Performance Report

No	1
Domain	Define Operationally-Excellent Architectures
Total Question	8
Correct	0
Incorrect	0
Unattempted	8
Marked for review	0

No	2
Domain	Design Resilient Architectures
Total Question	22
Correct	0
Incorrect	0
Unattempted	22
Marked for review	0

No	3
Domain	Design Cost-Optimized Architectures
Total Question	7
Correct	0
Incorrect	0
Unattempted	7
Marked for review	0
No	4
Domain	Define Performant Architectures
Total Question	18
Correct	0
Incorrect	0
Unattempted	18
Marked for review	0
No	5
Domain	Specify Secure Applications and Architectures
Total Question	10
Correct	0
Incorrect	0
Unattempted	10
Marked for review	0
Total	Total
All Domain	All Domain
Total Question	65
Correct	0
Incorrect	0
Unattempted	65
Marked for review	0

Review the Answers

Sorting by All

Question 1 Unattempted

Domain :Define Operationally-Excellent Architectures

You are working as an AWS Architect for a start-up company. They have a production website which is two-tier with web servers in front end & database servers in back end. All these database servers are spread across multiple Availability Zones & are stateful instance. You have configured Auto Scaling Group for these servers with minimum of 2 instance & maximum of 6 instance. During

scale in of these instances post peak hours, you are observing data loss from these database servers. What feature needs to be configured additionally to avoid data loss & copy data before instance termination?

A. **Modify cooldown period to complete custom actions before Instance terminates.**

B. **Add lifecycle hooks to Auto scaling group** ✓

C. **Customise Termination policy to complete data copy before termination.**

D. **Suspend Terminate process which will avoid data loss.**

Explanation:

Correct Answer – B

Explanation: Adding Lifecycle Hooks to Auto Scaling group puts instance into wait state before termination. During this wait state, you can perform custom activities to retrieve critical operational data from stateful instance. Default Wait period is 1 hour.

Option A is incorrect as cooldown period will not help to copy data from instance before termination.

Option C is incorrect as Termination policy is used specify which instances to terminate first during scale in, configuring termination policy for the Auto Scaling group will not copy data before instance termination.

Option D is incorrect as Suspending Terminate policy will not prevent data loss but will disrupts other process & prevent scale in.

For more information on lifecycle-hooks, refer to following URLs,

https://docs.aws.amazon.com/autoscaling/ec2/userguide/lifecycle-hooks.html

https://aws.amazon.com/ec2/autoscaling/faqs/

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Question 2 Unattempted

Domain :Design Resilient Architectures

You have an application running in us-west-2 requiring 6 EC2 Instances running at all times. With 3 Availability Zones in the region viz. us-west-2a, us-west-2b, and us-west-2c, which of the following deployments provides fault tolerance if an Availability Zone in us-west-2 becomes unavailable?

Choose 2 answers from the options given below.

A. 2 EC2 Instances in us-west-2a, 2 EC2 Instances in us-west-2b, and 2 EC2 Instances in us-west-2c

B. 3 EC2 Instances in us-west-2a, 3 EC2 Instances in us-west-2b, and no EC2 Instances in us-west-2c

C. 4 EC2 Instances in us-west-2a, 2 EC2 Instances in us-west-2b, and 2 EC2 Instances in us-west-2c

D. 6 EC2 Instances in us-west-2a, 6 EC2 Instances in us-west-2b, and no EC2 Instances in us-west-2c ✓

E. 3 EC2 Instances in us-west-2a, 3 EC2 Instances in us-west-2b, and 3 EC2 Instances in us-west-2c ✓

Explanation:

Answer – D and E

Option A is incorrect because, even if one AZ becomes unavailable, you would only have 4 instances available. This does not meet the specified requirements.

Option B is incorrect because, in the case of either us-west-2a or us-west-2b becoming unavailable, you would only have 3 instances available. Even this does not meet the specified requirements.

Option C is incorrect because, if us-west-2a becomes unavailable, you would only have 4 instances available. This also does not meet the requirements.

For more information on AWS Regions and Availability Zones, please visit the following URL:

https://docs.aws.amazon.com/AmazonRDS/latest/UserGuide/Concepts.RegionsAndAvailabilityZon

Note:
In this scenario we need to have 6 instances running all the time even when 1 AZ is down.

Option D- US West 2a-6 , US West 2b - 6, US West 2c-0
If US West 2a goes down we will still have 6 instances running in US West 2b
If US West 2b goes down we will still have 6 instances running in US West 2a
If US West 2c goes down we will still have 6 instances running in US West 2a, 6 instances running in US West 2b

Option E- US West 2a-3 , US West 2b - 3, US West 2c-3
If US West 2a goes down we will still have 3 instances running in US West 2b, 3 instances running in US West 2c
If US West 2b goes down we will still have 3 instances running in US West 2a, 3 instances running in

US West 2c
If US West 2c goes down we will still have 3 instances running in US West 2a, 3 instances running in US West 2b

hence options D & E are correct.

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Question 3 Unattempted

Domain :Design Cost-Optimized Architectures

An application allows a manufacturing site to upload files. Each uploaded 3 GB file is processed to extract metadata, and this process takes a few seconds per file. The frequency at which the uploads happen is unpredictable. For instance, there may be no updates for hours, followed by several files being uploaded concurrently.
What architecture addresses this workload in the most cost efficient manner?

A. **Use a Kinesis Data Delivery Stream to store the file. Use Lambda for processing.**

B. **Use an SQS queue to store the file, to be accessed by a fleet of EC2Instances.**

C. **Store the file in an EBS volume, which can then be accessed by another EC2 Instancefor processing.**

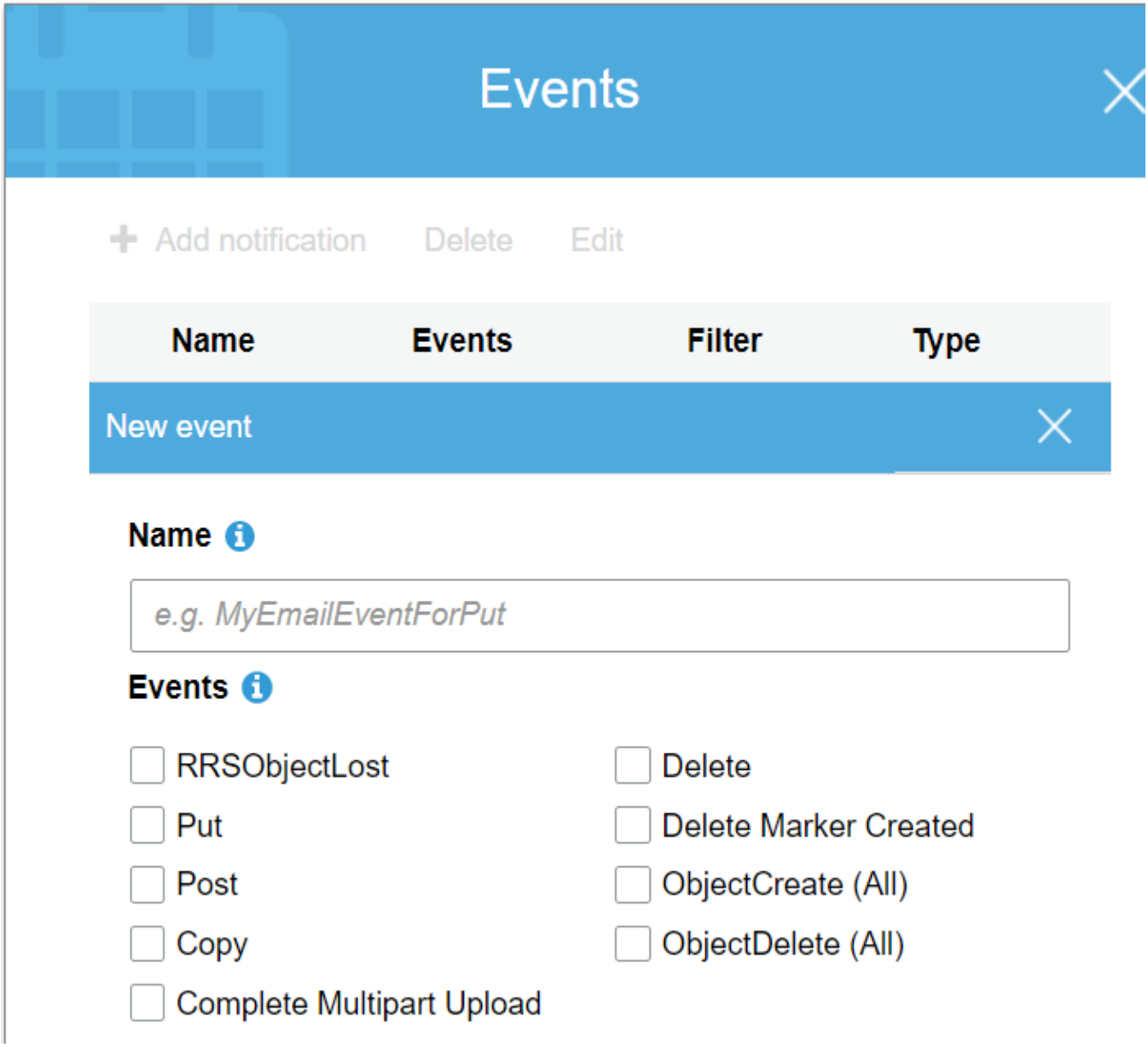
D. **Store the file in an S3 bucket. Use Amazon S3 event notification to invoke aLambda function for file processing.**

Explanation:

Answer – D

You can first create a Lambda function with the code to process the file.

You can then use an Event Notification from the S3 bucket to invoke the Lambda function whenever a file is uploaded.



For more information on Amazon S3 event notification, please visit the following URL:

https://docs.aws.amazon.com/AmazonS3/latest/dev/NotificationHowTo.html

Option A is incorrect. Kinesis is used to collect, process and analyze real time data.

The frequency of updates are quite unpredictable. By default SQS uses short polling. In this case, it will lead to the cost factor going up since we are getting messages in an unpredictable manner and many a times it will be returning empty responses. Hence option B is not a solution.

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Question 4 Unattempted

Domain :Define Performant Architectures

A company is migrating an on-premises 10TB MySQL database to AWS. With a business requirement that the replica lag be under 100 milliseconds, the company expects this database to quadruple in size.
Which Amazon RDS engine meets the above requirements?

A. MySQL

B. Microsoft SQL Server

C. Oracle

D. Amazon Aurora

Explanation:

Answer – D

AWS Documentation clarifies that the above requirements are supported by AWS Aurora.

Amazon Aurora (Aurora) is a fully managed, MySQL- and PostgreSQL-compatible, relational database engine. It combines the speed and reliability of high-end commercial databases with the simplicity and cost-effectiveness of open-source databases. It delivers up to five times the throughput of MySQL and up to three times the throughput of PostgreSQL without requiring changes to most of your existing applications.

All Aurora Replicas return the same data for query results with minimal replica lag—usually much less than 100 milliseconds after the primary instance has written an update.

For more information on AWS Aurora, please visit the following URL:

http://docs.aws.amazon.com/AmazonRDS/latest/UserGuide/Aurora.Overview.html

The company expects the database to quadruple in size and the business requirement is that replica lag must be kept under 100 milliseconds.

Aurora Cluster can grow up to 64 TB in size and replica lag—is less than 100 milliseconds after the primary instance has written an update.

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Question 5 Unattempted

Domain :Define Operationally-Excellent Architectures

For which of the following workloads should a Solutions Architect consider using Elastic Beanstalk? Choose 2 answers from the options given below.

A. A Web application using Amazon RDS

B. An Enterprise Data Warehouse

C. A long running worker process

D. A static website

E. A management task run once on nightly basis

Explanation:

Answer – A and C

AWS Documentation clearly mentions that the Elastic Beanstalk component can be used to create Web Server environments and Worker environments.

This following diagram illustrates an example Elastic Beanstalk architecture for a web server environment tier and shows how the components in that type of environment tier work together. The remainder of this section discusses all the components in more detail.

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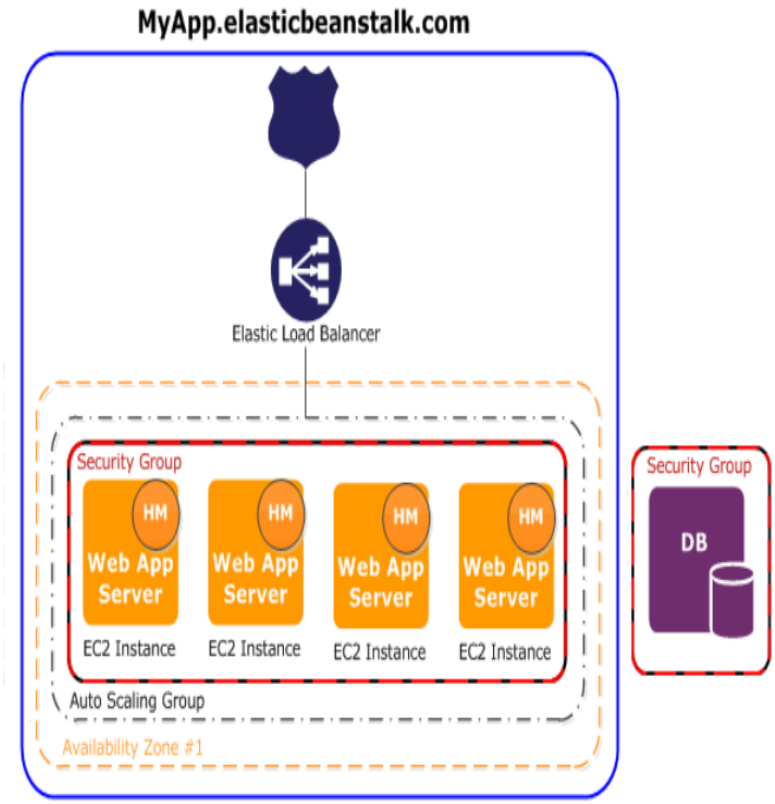

For more information on AWS Elastic beanstalk Web server environments, please visit the following URL:

https://docs.aws.amazon.com/elasticbeanstalk/latest/dg/concepts-webserver.html

For more information on AWS Elastic beanstalk Worker environments, please visit the following URL:

https://docs.aws.amazon.com/elasticbeanstalk/latest/dg/concepts-worker.html

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Question 6 Unattempted

Domain :Design Cost-Optimized Architectures

An application with a 150 GB relational database runs on an EC2 Instance.
While the application is used infrequently with small peaks in the morning and evening, what is the MOST cost effective storage type among the options below?

A. Amazon EBS provisioned IOPS SSD

B. Amazon EBS Throughput Optimized HDD

C. Amazon EBS General Purpose SSD

D. Amazon EFS

Explanation:

Answer – C

Since the database is used infrequently and not throughout the day, and the question mentions the MOST cost effective storage type, the preferred choice would be EBS General Purpose SSD over EBS provisioned IOPS SSD.

The minimum volume of Throughput Optimized HDD is 500 GB. As per our scenario, we need 150 GB only. Hence, option C: Amazon EBS General Purpose SSD, would be the best choice for cost-effective.

For more information on AWS EBS Volumes, please visit the following URL:

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/EBSVolumes.html

Note:

SSD-backed volumes are optimized for transactional workloads involving frequent read/write operations with small I/O size, where the dominant performance attribute is **IOPS.** The question is focusing on a relational DB where we will give importance to Input/output operations per second. Hence gp2 seems to be a good option in this case. Since the question does not mention on any mission-critical low-latency requirement PIOPS is not required.

HDD-backed volumes are optimized for large streaming workloads where **throughput** (measured in MiB/s) is a better performance measure than IOPS.

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Question 7 Unattempted

Domain :Design Cost-Optimized Architectures

You are working as a consultant for a start-up firm. They have developed a web application for employee to enable them file sharing with external vendors securely. They created an Auto Scaling group for Web servers which require two m4. large EC2 instances running at all time & scaling up to maximum twelve instances. Post deploying this application, huge rise in billing is observed. Due to

limited budget, CTO has requested your advice to optimise usage of instance in Auto Scaling groups. What will be best solution to reduce cost without any performance impact?

A. **Create an Auto Scaling group with t2. micro On-Demand instances.**

B. **Create an Auto Scaling group with a mix of On-Demand & Spot Instance. Select On-Demand base as 0. Above On-Demand base, select 100% of On-Demand instance & 0% of Spot Instance.**

C. **Create an Auto Scaling group with all Spot Instance.**

D. **Create an Auto Scaling group with a mix of On-Demand & Spot Instance.Select On-Demand base as 2. Above On-Demand base, select 20% of On-Demand instance & 80% of Spot Instance.** ✓

Explanation:

Correct Answer – D

Auto Scaling group supports a mix of On-Demand & Spot instance which help to design cost optimised solution without any performance impact. You can choose percentage of On-Demand & Spot instance based upon application requirements. With Option D , Auto Scaling group will have initial 2 instance as On-Demand instance while remaining instance will be launched in a ratio of 20 % On-Demand instance & 80% Spot Instance.

Option A is incorrect as all though with t2. micro, there would be reduction in cost, but it will impact performance of application.

Option B is incorrect as there would not be any cost reduction with all On Demand instance.

Option C is incorrect as although this will reduce cost, all spot instance in an auto scaling group may cause inconsistencies in application & lead to poor performance.

For more information on Auto Scaling with multiple Instance types & purchase options, refer to following URLs,

https://aws.amazon.com/blogs/aws/new-ec2-auto-scaling-groups-with-multiple-instance-types-purchase-options/

https://docs.aws.amazon.com/autoscaling/ec2/userguide/AutoScalingGroup.html#asg-purchase-options

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Question 8 Unattempted

Domain :Specify Secure Applications and Architectures

You are working as an AWS Architect for a start-up company. It has production website on AWS which is a two-tier with web servers in front end & database servers in back end. Third party firm has been looking after operations of these database servers. They need to access these database servers in private subnets on SSH port. As per standard operating procedure provided by Security team, all access to these servers should be over secure layer & should be logged, what will be best solution to meet this requirement?

A. **Deploy Bastion hosts in Private Subnet**

B. **Deploy NAT Instance in Private Subnet**

C. **Deploy NAT Instance in Public Subnet**

D. **Deploy Bastion hosts in Public Subnet** ✓

Explanation:

Correct Answer – D

External users will be unable to access instance in private subnets directly. To provide such access , we need to deploy Bastion hosts in public subnets. In case of above requirement, third-party users will initiate a connection to Bastion hosts in public subnets & from their they will access SSH connection to database servers in private subnets.

Option A is incorrect as Bastion hosts needs to in Public subnets, & not in Private subnets, as third-party users will be accessing these servers from internet.

Option B is incorrect as NAT instance are used to provide internet traffic to hosts in private subnets. Users from internet will not be able to do SSH connections to hosts in private subnets using NAT instance. NAT instance are always in Public subnets.

Option C is incorrect as NAT instance are used to provide internet traffic to hosts in private subnets. Users from internet will not be able to do SSH connections to hosts in private subnets using NAT instance.

For more information on bastion instance, refer to following URL,

https://docs.aws.amazon.com/quickstart/latest/linux-bastion/architecture.html

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Question 9 Unattempted

Domain :Design Resilient Architectures

A Solutions Architect designing a solution to store and archive corporate documents, has determined Amazon Glacier as the right choice of solution.
An important requirement is that the data must be delivered within 10 minutes of a retrieval request.
Which feature in Amazon Glacier can help meet this requirement?

A. **Vault Lock**

B. **Expedited retrieval** ✓

C. **Bulk retrieval**

D. **Standard retrieval**

Explanation:

Answer – B

AWS Documentation mentions the following:

Expedited retrievals to access data in 1 – 5 minutes for a flat rate of $0.03 per GB retrieved. Expedited retrievals allow you to quickly access your data when occasional urgent requests for a subset of archives are required.

For more information on AWS Glacier Retrieval, please visit the following URL:

https://docs.aws.amazon.com/amazonglacier/latest/dev/downloading-an-archive-two-steps.html

The other two are standard (3-5 hours retrieval time) and Bulk retrievals which is the cheapest option.(5-12 hours retrieval time)

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Question 10 Unattempted

Domain :Define Operationally-Excellent Architectures

A data processing application in AWS must pull data from an Internet service. A Solutions Architect is to design a highly available solution to access this data without placing bandwidth constraints on the application traffic.
Which solution meets these requirements?

A. Launch a NAT gateway and add routes for 0.0.0.0/0

B. Attach a VPC endpoint and add routes for 0.0.0.0/0

C. Attach an Internet gateway and add routes for 0.0.0.0/0

D. Deploy NAT instances in a public subnet and add routes for 0.0.0.0/0

Explanation:

Answer – C

The AWS Documentation mentions the following:

An Internet gateway is a horizontally scaled, redundant, and highly available VPC component that allows communication between instances in your VPC and the Internet. It therefore imposes no availability risks or bandwidth constraints on your network traffic.

For more information on the Internet gateway, please visit the following URL:

https://docs.aws.amazon.com/AmazonVPC/latest/UserGuide/VPC_Internet_Gateway.html

Note: NAT gateway is also a highly available architecture and is used to enable instances in a private subnet to connect to the internet or other AWS services, but prevent the internet from initiating a connection with those instances.

It can only scale up to 45 Gbps.
NAT instances bandwidth capability depends upon the instance type.

https://docs.aws.amazon.com/vpc/latest/userguide/vpc-nat-gateway.html

VPC Endpoints are used to enable private connectivity to services hosted in AWS, from within your VPC without using an Internet Gateway, VPN, Network Address Translation (NAT) devices, or firewall proxies. So it cannot be used to connect to internet.

An Internet gateway is horizontally-scaled, redundant, and highly available. It imposes no bandwidth constraints.

NOTE:

Network Address Translation (NAT) gateway is recommended for the instances in a private subnet to connect to the internet or other AWS services. As we don't have any instructions for applications are in private subnet and question is talking about the entire application traffic rather than the specific instance(inside private subnet). so NAT can't be the answer to this question.

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Question 11 Unattempted

Domain :Design Cost-Optimized Architectures

While reviewing the Auto Scaling events for your application, you notice that your application is scaling up and down multiple times in the same hour.
What design choice could you make to optimize costs while preserving elasticity?
Choose 2 answers from the options given below.

A. **Modify the Auto Scaling group termination policy to terminate the older instance first.**

B. **Modify the Auto Scaling group termination policy to terminate the newest instance first.**

C. **Modify the Auto Scaling group cool down timers.**

D. **Modify the Auto Scaling group to use Scheduled Scaling actions.**

E. **Modify the CloudWatch alarm period that triggers your Auto Scaling scale down policy** ✓

Explanation:

Answer – C and E

Here, not enough time is being given for the scaling activity to take effect and for the entire infrastructure to stabilize after the scaling activity. This can be taken care of by increasing the Auto Scaling group CoolDown timers.

For more information on Auto Scaling CoolDown, please visit the following URL:

https://docs.aws.amazon.com/autoscaling/ec2/userguide/Cooldown.html

You will also have to define the right threshold for the CloudWatch alarm for triggering the scale down policy.

For more information on Auto Scaling Dynamic Scaling, please visit the following URL:

https://docs.aws.amazon.com/autoscaling/ec2/userguide/as-scale-based-on-demand.html

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Question 12 Unattempted

Domain :Define Performant Architectures

A company hosts a popular web application that connects to an Amazon RDS MySQL DB instance running in a default VPC private subnet created with default ACL settings. The web servers must be accessible only to customers on an SSL connection and the database must only be accessible to web servers in a public subnet. Which solution meets these requirements without impacting other running applications?
Select 2 answers from the options given below.

A. **Create a network ACL on the Web Server's subnets, allow HTTPS port 443 inbound and specify the source as 0.0.0.0/0**

B. Create a Web Server security group that allows HTTPS port 443 inbound traffic from anywhere(0.0.0.0/0) and apply it to the Web Servers. ✓

C. Create a DB Server security group that allows MySQL port 3306 inbound and specify the source as the Web Server security group. ✓

D. Create a network ACL on the DB subnet, allow MySQL port 3306 inbound for Web Servers and deny all outbound traffic.

E. Create a DB Server security groups that allows HTTPS port 443 inbound and specify the source as a Web Server security group.

Explanation:

Answer – B and C

This sort of setup is explained in the AWS documentation.

1) To ensure that traffic can flow into your web server from anywhere on secure traffic, you need to allow inbound security at 443.

2) And then, you need to ensure that traffic can flow from the database server to the web server via the database security group.

The below snapshot from the AWS Documentation shows rule tables for security groups that relate to the same requirements as in the question.

WebServerSG: Recommended Rules

Inbound			
Source	Protocol	Port Range	Comments
0.0.0.0/0	TCP	80	Allow inbound HTTP access to the web servers from any IPv4 address.
0.0.0.0/0	TCP	443	Allow inbound HTTPS access to the web servers from any IPv4 address.

DBServerSG: Recommended Rules

Inbound			
Source	Protocol	Port Range	Comments
The ID of your WebServerSG security group	TCP	1433	Allow inbound Microsoft SQL Server access from the web servers associated with the WebServerSG security group.
The ID of your WebServerSG security group	TCP	3306	Allow inbound MySQL Server access from the web servers associated with the WebServerSG security group.

For more information on this use case scenario, please visit the following URL:

https://docs.aws.amazon.com/AmazonVPC/latest/UserGuide/VPC_Scenario2.html

Options A and D are invalid answers.
Network ACL's are stateless. So we need to set rules for both inbound and outbound traffic for Network ACL's.
Option E is also invalid because to communicate with the MySQL servers we need to allow traffic to flow through port 3306.

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Question 13 Unattempted

Domain :Define Performant Architectures

An application reads and writes objects to an S3 bucket. When the application is fully deployed, the read/write traffic is very high.
How should the architect maximize the Amazon S3 performance?

A. Use as many S3 prefixes as you need in parallel to achieve the required throughput.

B. Use the STANDARD_IA storage class.

C. Prefix each object name with a hex hash key along with the current data.

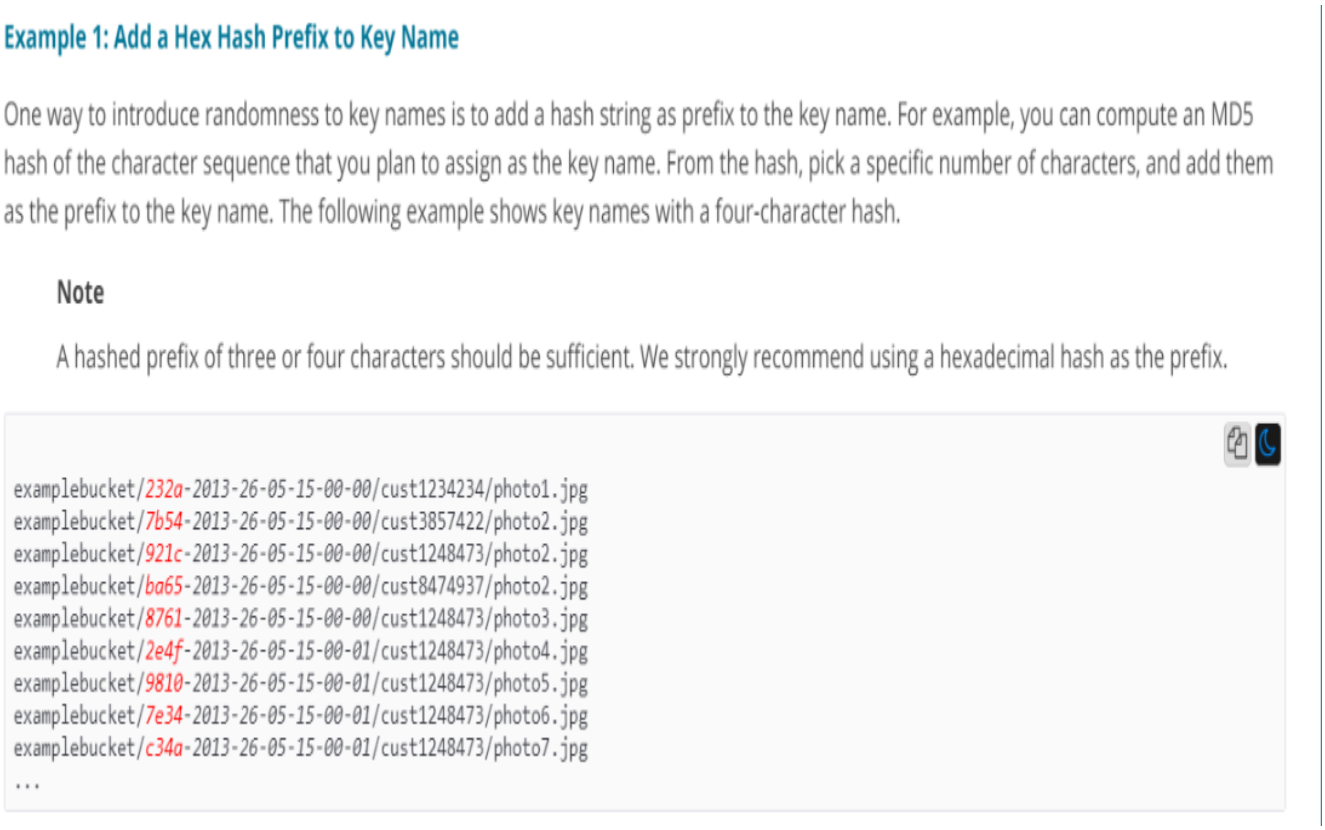
D. Enable versioning on the S3 bucket.

Explanation:

Answer – C

NOTE: Based on the S3 new performance announcement, " S3 request rate performance increase removes any previous guidance to randomize object prefixes to achieve faster performance." But Amazon exam questions and answers not yet updated. So Option C is correct answer as per AWS exam.

This recommendation for increasing performance in case of a high request rate in s3 is given in the documentation.



Example 1: Add a Hex Hash Prefix to Key Name

One way to introduce randomness to key names is to add a hash string as prefix to the key name. For example, you can compute an MD5 hash of the character sequence that you plan to assign as the key name. From the hash, pick a specific number of characters, and add them as the prefix to the key name. The following example shows key names with a four-character hash.

Note

A hashed prefix of three or four characters should be sufficient. We strongly recommend using a hexadecimal hash as the prefix.

```
examplebucket/232a-2013-26-05-15-00-00/cust1234234/photo1.jpg
examplebucket/7b54-2013-26-05-15-00-00/cust3857422/photo2.jpg
examplebucket/921c-2013-26-05-15-00-00/cust1248473/photo2.jpg
examplebucket/ba65-2013-26-05-15-00-00/cust8474937/photo2.jpg
examplebucket/8761-2013-26-05-15-00-00/cust1248473/photo3.jpg
examplebucket/2e4f-2013-26-05-15-00-01/cust1248473/photo4.jpg
examplebucket/9810-2013-26-05-15-00-01/cust1248473/photo5.jpg
examplebucket/7e34-2013-26-05-15-00-01/cust1248473/photo6.jpg
examplebucket/c34a-2013-26-05-15-00-01/cust1248473/photo7.jpg
...
```

https://aws.amazon.com/blogs/aws/amazon-s3-performance-tips-tricks-seattle-hiring-event/

https://docs.aws.amazon.com/AmazonS3/latest/dev/request-rate-perf-considerations.html

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Question 14 Unattempted

Domain :Specify Secure Applications and Architectures

You are deploying an application on Amazon EC2, which must call AWS APIs.
What method should you use to securely pass credentials to the application?

A. Pass API credentials to the instance using Instance userdata.

B. Store API credentials as an object in Amazon S3.

C. Embed the API credentials into your application.

D. Assign IAM roles to the EC2 Instances.

Explanation:

Answer - D

AWS Documentation mentions the following:

You can use roles to delegate access to users, applications, or services that don't normally have access to your AWS resources. It is not a good practice to use IAM credentials for a production based application. A good practice however, is to use IAM Roles.

For more information on IAM Roles, please visit the following URL:

https://docs.aws.amazon.com/IAM/latest/UserGuide/id_roles.html

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Question 15 Unattempted

Domain :Define Performant Architectures

A website runs on EC2 Instances behind an Application Load Balancer. The instances run in an Auto Scaling Group across multiple Availability Zones and deliver several large files that are stored on a shared Amazon EFS file system. The company needs to avoid serving the files from EC2 Instances every time a user requests these digital assets.
What should the company do to improve the user experience of the website?

A. Move the digital assets to Amazon Glacier.

B. Cache static content using CloudFront.

C. Resize the images so that they are smaller.

D. Use reserved EC2 Instances.

Explanation:

Answer - B

AWS Documentation mentions the following on the benefits of using CloudFront:

Amazon CloudFront is a web service that speeds up distribution of your static and dynamic web content, such as .html, .css, .js, and image files to your users. CloudFront delivers your content through a worldwide network of data centers called edge locations. When a user requests content that you're serving with CloudFront, the user is routed to the edge location that provides the lowest latency (time delay), so that content is delivered with the best possible performance. If the content is already in the edge location with the lowest latency, CloudFront delivers it immediately.

For more information on AWS CloudFront, please visit the following URL:

https://docs.aws.amazon.com/AmazonCloudFront/latest/DeveloperGuide/Introduction.html

Glacier is not used for frequent retrievals. So Option A is not a good solution. Options C & D scenarios will also not help in this situation.

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Question 16 Unattempted

Domain :Design Resilient Architectures

A Solutions Architect is designing a highly scalable system to track records. These records must remain available for immediate download for up to three months and then must be deleted. What is the most appropriate decision for this use case?

A. **Store the files in Amazon EBS and create a Lifecycle Policy to remove files after3 months.**

B. **Store the files in Amazon S3 and create a Lifecycle Policy to remove files after3 months.** ✓

C. **Store the files in Amazon Glacier and create a Lifecycle Policy to remove filesafter 3 months.**

D. **Store the files in Amazon EFS and create a Lifecycle Policy to remove files after3 months.**

Explanation:

Answer – B

Option A is invalid, since the records need to be stored in a highly scalable system.

Option C is invalid, since the records must be available for immediate download.

Option D is invalid, because it does not have the concept of a Lifecycle Policy.

AWS Documentation mentions the following on Lifecycle Policies:

Lifecycle configuration enables you to specify the Lifecycle Management of objects in a bucket. The configuration is a set of one or more rules, where each rule defines an action for Amazon S3 to apply to a group of objects. These actions can be classified as follows:

Transition actions – In which you define when the objects transition to another storage class. For example, you may choose to transition objects to the STANDARD_IA (IA, for infrequent access) storage class 30 days after creation, or archive objects to the GLACIER storage class one year after creation.

Expiration actions – In which you specify when the objects expire. Then Amazon S3 deletes the expired objects on your behalf.

For more information on AWS S3 Lifecycle Policies, please visit the following URL:

https://docs.aws.amazon.com/AmazonS3/latest/dev/object-lifecycle-mgmt.html

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Question 17 Unattempted

Domain :Define Operationally-Excellent Architectures

A consulting firm repeatedly builds large architectures for their customers using AWS resources from several AWS services including IAM, Amazon EC2, Amazon RDS, DynamoDB and Amazon VPC. The consultants have architecture diagrams for each of their architectures, and are frustrated that they cannot use them to automatically create their resources.
Which service should provide immediate benefits to the organization?

A. AWS Beanstalk

B. AWS CloudFormation

C. AWS CodeBuild

D. AWS CodeDeploy

Explanation:

Answer - B

AWS CloudFormation: This supplements the requirement in the question and enables consultants to use their architecture diagrams to construct CloudFormation templates.

AWS Documentation mentions the following on AWS CloudFormation:

AWS CloudFormation is a service that helps you model and set up your Amazon Web Service resources so that you can spend less time managing those resources and more time focusing on your applications that run in AWS. You create a template that describes all the AWS resources that

you want (like Amazon EC2 instances or Amazon RDS DB instances), and AWS CloudFormation takes care of provisioning and configuring those resources for you.

For more information on AWS Cloudformation, please visit the following URL:

https://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/Welcome.html

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Question 18 Unattempted

Domain :Specify Secure Applications and Architectures

The security policy of an organization requires an application to encrypt data before writing to the disk. Which solution should the organization use to meet this requirement?

A. AWS KMS API

B. AWS Certificate Manager

C. API Gateway with STS

D. IAM Access Key

Explanation:

Answer – A

Option B is incorrect - The AWS Certificate Manager can be used to generate SSL certificates to encrypt traffic in transit, but not at rest.

Option C is incorrect - It is used for issuing tokens while using the API gateway for traffic in transit.

Option D is used for secure access to EC2 Instances.

AWS Documentation mentions the following on AWS KMS:

AWS Key Management Service (AWS KMS) is a managed service that makes it easy for you to create and control the encryption keys used to encrypt your data. AWS KMS is integrated with other AWS services including Amazon Elastic Block Store (Amazon EBS), Amazon Simple Storage Service (Amazon S3), Amazon Redshift, Amazon Elastic Transcoder, Amazon WorkMail, Amazon Relational Database Service (Amazon RDS), and others to make it simple to encrypt your data with encryption keys that you manage.

For more information on AWS KMS, please visit the following URL:

https://docs.aws.amazon.com/kms/latest/developerguide/overview.html

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Question 19 Unattempted

Domain :Design Resilient Architectures

An application currently stores all its data on Amazon EBS Volumes. All EBS volumes must be backed up durably across multiple Availability Zones.
What is the MOST resilient and cost-effective way to back up the volumes?

A. **Take regular EBS snapshots.**

B. **Enable EBS volume encryption.**

C. **Create a script to copy data to an EC2 Instance store.**

D. **Mirror data across 2 EBS volumes.**

Explanation:

Answer – A

Option B is incorrect, because it does not help the durability of EBS Volumes.

Option C is incorrect, since EC2 Instance stores are not durable.

Option D is incorrect, since mirroring data across EBS volumes is inefficient in comparison with the existing option for EBS snapshots.

AWS Documentation mentions the following on AWS EBS Snapshots:

You can back up the data on your Amazon EBS volumes to Amazon S3 by taking point-in-time snapshots. Snapshots are *incremental* backups, which means that only the blocks on the device that have changed after your most recent snapshot are saved. This minimizes the time required to create the snapshot and saves on storage costs by not duplicating data. When you delete a snapshot, only the data unique to that snapshot is removed. Each snapshot contains all of the information needed to restore your data (from the moment when the snapshot was taken) to a new EBS volume.

For more information on AWS EBS Snapshots, please visit the following URL:

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/EBSSnapshots.html

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Question 20 Unattempted

Domain :Specify Secure Applications and Architectures

A retailer exports data daily from its transactional databases into an S3 bucket in the Sydney region. The retailer's Data Warehousing team wants to import this data into an existing Amazon Redshift cluster in their VPC at Sydney. Corporate security policy mandates that data can only be transported within a VPC.
What combination of the following steps will satisfy the security policy?
Choose 2 answers from the options given below.

A. **Enable Amazon Redshift Enhanced VPC Routing.**

B. **Create a Cluster Security Group to allow the Amazon Redshift cluster to access Amazon S3.**

C. **Create a NAT gateway in a public subnet to allow the Amazon Redshift cluster to access Amazon S3.**

D. **Create and configure an Amazon S3 VPC endpoint.**

Explanation:

Answer – A and D

Amazon Redshift Enhanced VPC Routing provides VPC resources, the access to Redshift.

Redshift will not be able to access the S3 VPC endpoints without enabling Enhanced VPC routing, so one option is not going to support the scenario if another is not selected.

NAT instance (the proposed answer) cannot be reached by Redshift without enabling Enhanced VPC Routing.

https://aws.amazon.com/about-aws/whats-new/2016/09/amazon-redshift-now-supports-enhanced-vpc-routing/

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Question 21 Unattempted

Domain :Design Resilient Architectures

A team is building an application that must persist and index JSON data in a highly available data store. Latency of data access must remain consistent despite very high application traffic.
What service should the team choose for the above requirement?

A. Amazon EFS

B. Amazon Redshift

C. DynamoDB

D. AWS CloudFormation

Explanation:

Answer – C

AWS Documentation mentions the following on DynamoDB:

Amazon DynamoDB is a fully managed NoSQL database service that provides fast and predictable performance with seamless scalability.

The data in DynamoDB is stored in JSON format, and hence is the perfect data store for the requirement in question.

For more information on AWS DynamoDB, please visit the following URL:

https://docs.aws.amazon.com/amazondynamodb/latest/developerguide/Introduction.html

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Question 22 Unattempted

Domain :Define Operationally-Excellent Architectures

An organization hosts a multi-language website on AWS, which is served using CloudFront. Language is specified in the HTTP request as shown below:

http://d11111f8.cloudfront.net/main.html?language=de
http://d11111f8.cloudfront.net/main.html?language=en
http://d11111f8.cloudfront.net/main.html?language=es

How should AWS CloudFront be configured to delivered cache data in the correct language?

A. Forward cookies to the origin

B. Based on query string parameters

C. Cache objects at the origin

D. Serve dynamic content

Explanation:

Answer – B

Since language is specified in the query string parameters, CloudFront should be configured for the same.

For more information on configuring CloudFront via query string parameters, please visit the following URL:

https://docs.aws.amazon.com/AmazonCloudFront/latest/DeveloperGuide/QueryStringParameters.h

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Question 23 Unattempted

Domain :Design Resilient Architectures

You have developed a new web application on AWS for a real estate firm. It has web interface where real estate employees upload photos of new construction houses in S3 buckets. Prospective buyer's login to these web site & access photos. Marketing Team has initiated an intensive marketing event to promote new housing schemes which we will lead to buyer's frequently accessing these images. As this is a new application you have no projection of traffic. You have created Auto Scaling across multiple instance types for these web servers, but you also need to optimised cost for storage. You don't want to compromise on latency & all images should be downloaded instantaneously without any outage. Which of the following is recommended storage solution to meet this requirement?

A. Use One Zone-IA storage class to store all images.

B. Use Standard-IA to store all images.

C. Use S3 Intelligent-Tiering storage class.

D. Use Standard storage class, use Storage class analytics to identify & move objects using lifecycle policies.

Explanation:

Correct Answer – C

When access pattern to web application using S3 storage buckets is unpredictable, you can use S3 intelligent-Tiering storage class.S3 Intelligent-Tiering storage class includes two access tiers: frequent access and infrequent access. Based upon access patterns it moves data between these tiers which helps in cost saving. S3 Intelligent-Tiering storage class have same performance as that of Standard storage class.

Option A is incorrect as all though it will save cost, but it will not provide any protection in case of AZ failure. Also, this class is suitable for infrequently accessed data & not for frequently access data.

Option B is incorrect as Standard-IA storage class is for infrequently accessed data & there are retrieval charges associated. In above requirement you do not have any projections of data being access which may result in higher cost.

Option D is incorrect it has operational overhead to setup Storage class analytics & move objects between various classes. Also, since access pattern is undetermined, this will run into costlier option.

For more information on S3 Intelligent-Tiering, refer to following URLs,

https://aws.amazon.com/blogs/aws/new-automatic-cost-optimization-for-amazon-s3-via-intelligent-tiering/

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Question 24 Unattempted

Domain :Design Resilient Architectures

A Solutions Architect is designing a shared service for hosting containers from several customers on Amazon ECS. These containers will use several AWS services. A container from one customer should not be able access data from another customer.
Which of the below solutions should the architect use to meet these requirements?

A. IAM roles for tasks

B. IAM roles for EC2 Instances

C. IAM Instance profile for EC2 Instances

D. Security Group rules

Explanation:

Answer – A

The AWS Documentation mentions the following:

With IAM roles for Amazon ECS tasks, you can specify an IAM role to be used by the containers in a task. Applications are required to sign their AWS API requests with AWS credentials, and this feature provides a strategy to manage credentials for your application's use. This is similar to how Amazon EC2 instance profiles provide credentials to EC2 instances.

For more information on configuring IAM Roles for tasks in ECS, please visit the following URL:

https://docs.aws.amazon.com/AmazonECS/latest/developerguide/task-iam-roles.html

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Question 25 Unattempted

Domain :Define Performant Architectures

A company is generating large datasets with millions of rows to be summarized column-wise. Existing business intelligence tools will be used to build daily reports from these datasets. Which storage service meets these requirements?

A. Amazon Redshift

B. Amazon RDS

C. ElastiCache

D. DynamoDB

Explanation:

Answer – A

AWS Documentation mentions the following:

Amazon Redshift is a fully managed, petabyte-scale data warehouse service in the cloud. You can start with just a few hundred gigabytes of data and scale to a petabyte or more. This enables you to use your data to acquire new insights for your business and customers.

For more information on AWS Redshift, please visit the following URL:

https://docs.aws.amazon.com/redshift/latest/mgmt/welcome.html

Columnar storage for database tables is an important factor in optimizing analytic query performance because it drastically reduces the overall disk I/O requirements and reduces the amount of data you need to load from disk.

Amazon Redshift uses a block size of 1 MB, which is more efficient and further reduces the number of I/O requests needed to perform any database loading or other operations that are part of query execution.

More information on how redshift manages the columnar storage is available here:

https://docs.aws.amazon.com/redshift/latest/dg/c_columnar_storage_disk_mem_mgmnt.html

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Question 26 Unattempted

Domain :Define Performant Architectures

A company is developing a web application to be hosted in AWS. This application needs a data store for session data.
As an AWS Solution Architect, which of the following would you recommend as an ideal option to store session data? Choose 2 answers from the options given below.

A. CloudWatch

B. DynamoDB ✓

C. Elastic Load Balancing

D. ElastiCache ✓

E. Storage Gateway

Explanation:

Answer - B and D

DynamoDB and ElastiCache are perfect options for storing session data.

AWS Documentation mentions the following on these services:

Amazon DynamoDB is a fast and flexible NoSQL database service for all applications that need consistent, single-digit millisecond latency at any scale. It is a fully managed cloud database and supports both document and key-value store models. Its flexible data model, reliable performance, and automatic scaling of throughput capacity, makes it a great fit for mobile, web, gaming, ad tech, IoT, and many other applications.

For more information on AWS DynamoDB, please visit the following URL:

https://aws.amazon.com/dynamodb/

ElastiCache is a web service that makes it easy to set up, manage, and scale a distributed in-memory data store or cache environment in the cloud. It provides a high-performance, scalable, and cost-effective caching solution, while removing the complexity associated with deploying and managing a distributed cache environment.

For more information on AWS Elasticache, please visit the following URL:

https://docs.aws.amazon.com/AmazonElastiCache/latest/UserGuide/WhatIs.html

Incorrect answers:

AWS CloudWatch offers cloud monitoring services for customers of AWS resources.

AWS Storage Gateway is a hybrid storage service that enables your on- premises applications to seamlessly use AWS cloud storage.

AWS Elastic Load Balancing automatically distributes incoming application traffic across multiple targets.

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Question 27 Unattempted

Domain :Design Resilient Architectures

A company needs to store images that are uploaded by users via a mobile application. There is also a need to ensure that a security measure is in place to avoid the data loss.
What step should be taken for protection against unintended user actions?

A. **Store data in an EBS volume and create snapshots once a week.**

B. **Store data in an S3 bucket and enable versioning.**

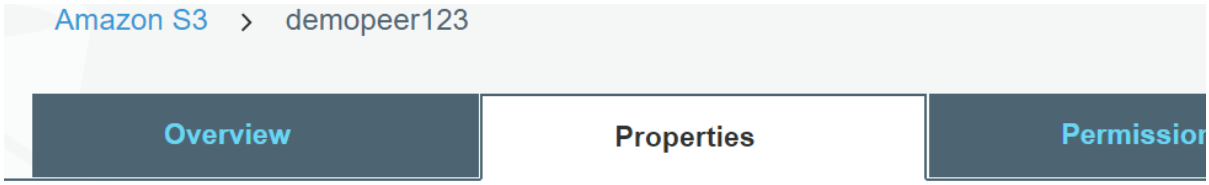
C. **Store data on Amazon EFS storage.**

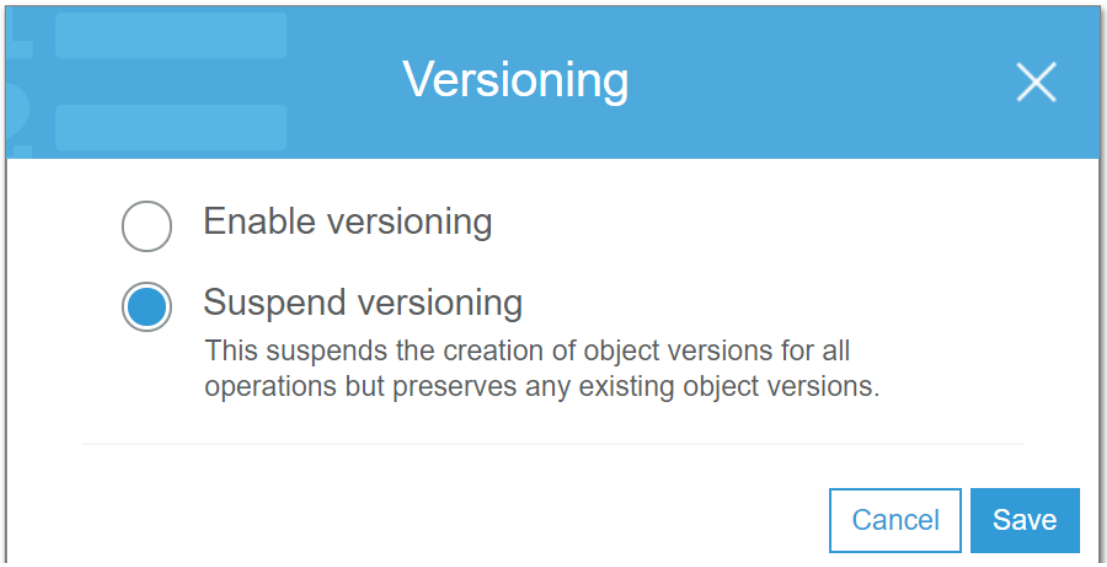
D. **Store data on EC2 instance storage.**

Explanation:

Answer - B

Amazon S3 has an option for versioning as shown below. Versioning is on the bucket level and can be used to recover prior versions of an object.





For more information on AWS S3 versioning, please visit the following URL:

https://docs.aws.amazon.com/AmazonS3/latest/dev/Versioning.html

Option A is invalid as it does not offer protection against accidental deletion of files.

Option C is invalid as This is not the ideal one because multiple EC2 instances can access the file system.

Option D is ephemeral.

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Question 28 Unattempted

Domain :Define Performant Architectures

An application needs to have a Data store hosted in AWS. The following requirements are in place for the Data store:

a) An initial storage capacity of 8 TB
b) The ability to accommodate a database growth of 8GB per day
c) The ability to have 4 Read Replicas
Which of the following Data stores would you choose for this requirement?

A. DynamoDB

B. Amazon S3

C. Amazon Aurora

D. SQL Server

Explanation:

Answer – C

Aurora can have a storage limit of 64TB and can easily accommodate the initial 8TB plus a database growth of 8GB/day for nearly a period of 20+ years. It can have up to 15 Aurora Replicas that can be distributed across the Availability Zones that a DB cluster spans within an AWS Region.

Aurora Replicas work well for read scaling because they are fully dedicated to read operations on your cluster volume. Write operations are managed by the primary instance. Because the cluster volume is shared among all DB instances in your DB cluster, no additional work is required to replicate a copy of the data for each Aurora Replica.

For more information on AWS Aurora, please visit the following URL:

https://docs.aws.amazon.com/AmazonRDS/latest/UserGuide/Aurora.Replication.html

Note:
Our db choice need to fulfill 3 criteria's.

1. Initial Storage capacity 8 TB
2. Daily db growth of 8GB/day
3. Need 4 Read replicas

DynamoDB, along side DynamoDB Accelerator**(DAX)** can support up to 9 read replicas in its primary cluster. However we have to choose the best suitable one from the options listed in the question. We have Aurora also listed under the option which is fully dedicated for read operations in the cluster.

NOTE:

Yes, the first line of the question has not mentioned anything about the database, but the requirements have a mention of it, and also you were asked about read replicas. Also, would like to inform you that in real time exam, Amazon asks these type of questions to check your understanding under stress, hence we do try replicating them for you to get prepared for the exam.

Dynamo DB also fulfills all 3 criteria's mentioned above. But when we think about the "Read replicas", Aurora is fully dedicated for read operations in the cluster. For this question, we have to choose only one option. So Aurora is the best Option here. Please analyze the Explanation part of this question.

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Question 29 Unattempted

Domain :Design Resilient Architectures

There is a requirement to host a database on an EC2 Instance. It is also required that the EBS volume should support 18,000 IOPS.
Which Amazon EBS volume type meets the performance requirements of this database?

A. **EBS Provisioned IOPS SSD** ✓
B. **EBS Throughput Optimized HDD**
C. **EBS General Purpose SSD**
D. **EBS Cold HDD**

Explanation:

Answer – A

For high performance and high IOPS requirements as in this case, the ideal choice would be to opt for EBS Provisioned IOPS SSD.

The below snapshot from the AWS Documentation shows the usage of Provisioned IOPS for better IOPS performance in database based applications.

	Solid-State Drives (SSD)		Hard Disk Drives (HDD)	
Volume Type	General Purpose SSD (gp2)*	Provisioned IOPS SSD (io1)	Throughput Optimized HDD (st1)	Cold HDD (sc1)
Description	General purpose SSD volume that balances price and performance for a wide variety of workloads	Highest-performance SSD volume for mission-critical low-latency or high-throughput workloads	Low-cost HDD volume designed for frequently accessed, throughput-intensive workloads	Lowest cost HDD volume designed for less frequently accessed workloads
Use Cases	• Recommended for most workloads • System boot volumes • Virtual desktops • Low-latency interactive apps • Development and test environments	• Critical business applications that require sustained IOPS performance, or more than 16,000 IOPS or 250 MiB/s of throughput per volume • Large database workloads, such as: ◦ MongoDB ◦ Cassandra ◦ Microsoft SQL Server ◦ MySQL ◦ PostgreSQL ◦ Oracle	• Streaming workloads requiring consistent, fast throughput at a low price • Big data • Data warehouses • Log processing • Cannot be a boot volume	• Throughput-oriented storage for large volumes of data that is infrequently accessed • Scenarios where the lowest storage cost is important • Cannot be a boot volume

For more information on AWS EBS Volume types, please visit the following URL:

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/EBSVolumeTypes.html

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Question 30 Unattempted

Domain :Design Resilient Architectures

Development teams in your organization use S3 buckets to store log files for various applications hosted in AWS development environments. The developers intend to keep the logs for a month for troubleshooting purposes, and subsequently purge the logs.
What feature will enable this requirement?

A. **Adding a bucket policy on the S3 bucket.**

B. **Configuring lifecycle configuration rules on the S3 bucket.** ✓

C. **Creating an IAM policy for the S3 bucket.**

D. **Enabling CORS on the S3 bucket.**

Explanation:

Answer – B

AWS Documentation mentions the following on Lifecycle policies:

Lifecycle configuration enables you to specify the Lifecycle management of objects in a bucket. The configuration is a set of one or more rules, where each rule defines an action for Amazon S3 to apply to a group of objects. These actions can be classified as follows:

Transition actions – In which you define when objects transition to another storage class. For example, you may choose to transition objects to the STANDARD_IA (IA, for infrequent access) storage class 30 days after creation, or archive objects to the GLACIER storage class one year after creation.

Expiration actions – In which you specify when the objects expire. Then, Amazon S3 deletes the expired objects on your behalf.

For more information on AWS S3 Lifecycle policies, please visit the following URL:

https://docs.aws.amazon.com/AmazonS3/latest/dev/object-lifecycle-mgmt.html

Option D is for Sharing resources between regions.

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Question 31 Unattempted

Domain :Define Performant Architectures

As an AWS solutions architect, you are building a new image processing application with queuing service. There are fleet of m4. large EC2 instance which would poll SQS as images are uploaded by users. Once image processing is complete after approximately 1 minute, users are notified via emails. During trial period, you are seeing a lot of duplicate messages being generated due to which users are getting multiple mails for same image. What is of the following is best option to eliminate duplicate messages before going to production?

A. **Create delay queue for 60 seconds.**

B. **Increase visibility timeout to 60 seconds.**

C. **Create delay queue to greater than 60 seconds.**

D. **Decrease visibility timeout below 60 seconds.**

Explanation:

Correct Answer: B

Default visibility timeout is 30 seconds. Since application needs 60 seconds to complete the processing , visibility timeout should be increase to 60 seconds. This will hide message from other consumers for 60 seconds , so they will not process the same file which is in process by original consumer.

Option A & C are incorrect as Delay queues let you postpone the delivery of new messages to a queue for a number of seconds. Creating delay queue for 60 seconds or more will delay delivery of new message by specific seconds & not eliminate duplicate message.

Option D is incorrect as visibility timeout should be set to maximum time it takes to process & delete message from the queue. If visibility timeout is set to below 60 seconds, message will be again visible to other consumers while original consumer is already working on it.

For more information on SQS visibility timeout, refer to the following URL,

https://docs.aws.amazon.com/AWSSimpleQueueService/latest/SQSDeveloperGuide/sqs-visibility-timeout.html#changing-message-visibility-timeout

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Question 32 Unattempted

Domain :Define Performant Architectures

What options can be used to host an application that uses NGINX and is scalable at any point in time?
Choose 2 correct answers.

A. AWS EC2

B. AWS Elastic Beanstalk

C. AWS SQS

D. AWS ELB

Explanation:

Answer – A, B

NGINX is an open source software for web serving, reverse proxying, caching, load balancing etc. It complements the load balancing capabilities of Amazon ELB and ALB by adding support for multiple HTTP, HTTP/2, and SSL/TLS services, content-based routing rules, caching, Auto Scaling support, and traffic management policies.

NGINX can be hosted on an EC2 instance through a series of clear steps- Launch an EC2 instance through the console. SSH into the instance and use the command yum install -y nginx to install nginx. Also, make sure that it is configured to restart automatically after a reboot.

It can also be installed with an Elastic Beanstalk service.
To enable the NGINX proxy server with your Tomcat application, you must add a configuration file to .ebextensions in the application source bundle that you upload to Elastic Beanstalk.

More information is available at:

https://docs.aws.amazon.com/elasticbeanstalk/latest/dg/java-tomcat-platform.html#java-tomcat-proxy

The below snippet from the AWS Documentation shows the server available for Web server environments that can be created via Elastic Beanstalk. The server shows that NGINX servers can be provisioned via the Elastic Beanstalk service.

Java SE

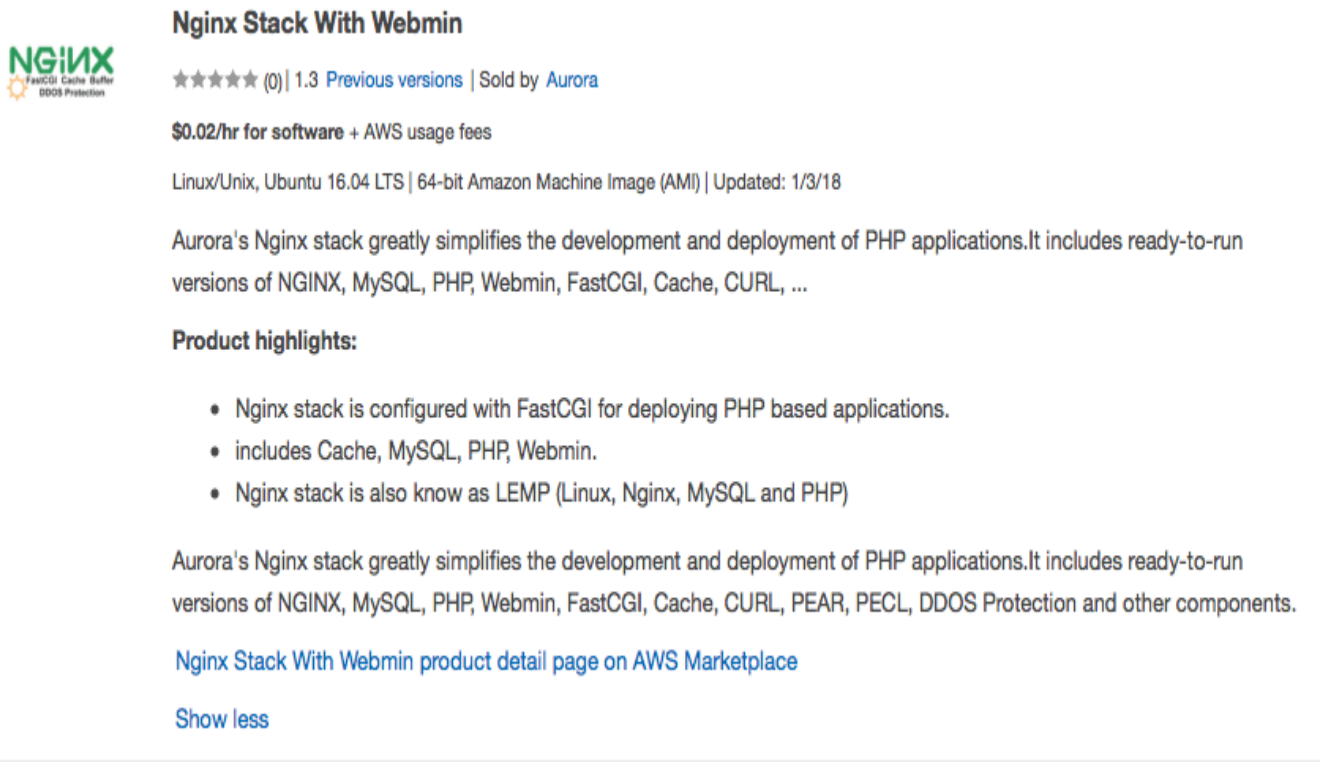
Elastic Beanstalk supports the following Java SE configurations.

Configuration and *Solution Stack Name*	AMI	Language	Tools	AWS X-Ray	Proxy Server
Java 8 version 2.6.5 *64bit Amazon Linux 2017.09 v2.6.5 running Java 8*	2017.09.1	Java 1.8.0_151	Ant 1.9.6, Gradle 2.7, Maven 3.3.3	2.0.0	nginx 1.12.1
Java 7 version 2.6.5 *64bit Amazon Linux 2017.09 v2.6.5 running Java 7*	2017.09.1	Java 1.7.0_161	Ant 1.9.6, Gradle 2.7, Maven 3.3.3	2.0.0	nginx 1.12.1

For more information on the supported platforms for AWS Elastic Beanstalk, please visit the following URL:

https://docs.aws.amazon.com/elasticbeanstalk/latest/dg/concepts.platforms.html

NGINX is available as AMI for EC2.



Nginx Stack With Webmin

(0) | 1.3 Previous versions | Sold by Aurora

$0.02/hr for software + AWS usage fees

Linux/Unix, Ubuntu 16.04 LTS | 64-bit Amazon Machine Image (AMI) | Updated: 1/3/18

Aurora's Nginx stack greatly simplifies the development and deployment of PHP applications.It includes ready-to-run versions of NGINX, MySQL, PHP, Webmin, FastCGI, Cache, CURL, ...

Product highlights:

- Nginx stack is configured with FastCGI for deploying PHP based applications.
- includes Cache, MySQL, PHP, Webmin.
- Nginx stack is also know as LEMP (Linux, Nginx, MySQL and PHP)

Aurora's Nginx stack greatly simplifies the development and deployment of PHP applications.It includes ready-to-run versions of NGINX, MySQL, PHP, Webmin, FastCGI, Cache, CURL, PEAR, PECL, DDOS Protection and other components.

Nginx Stack With Webmin product detail page on AWS Marketplace

Show less

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Question 33 Unattempted

Domain :Define Operationally-Excellent Architectures

A million images are required to be uploaded to S3. What option ensures optimal performance in this case?

A. Use a sequential ID for the prefix.

B. Use a hexadecimal hash for the prefix.

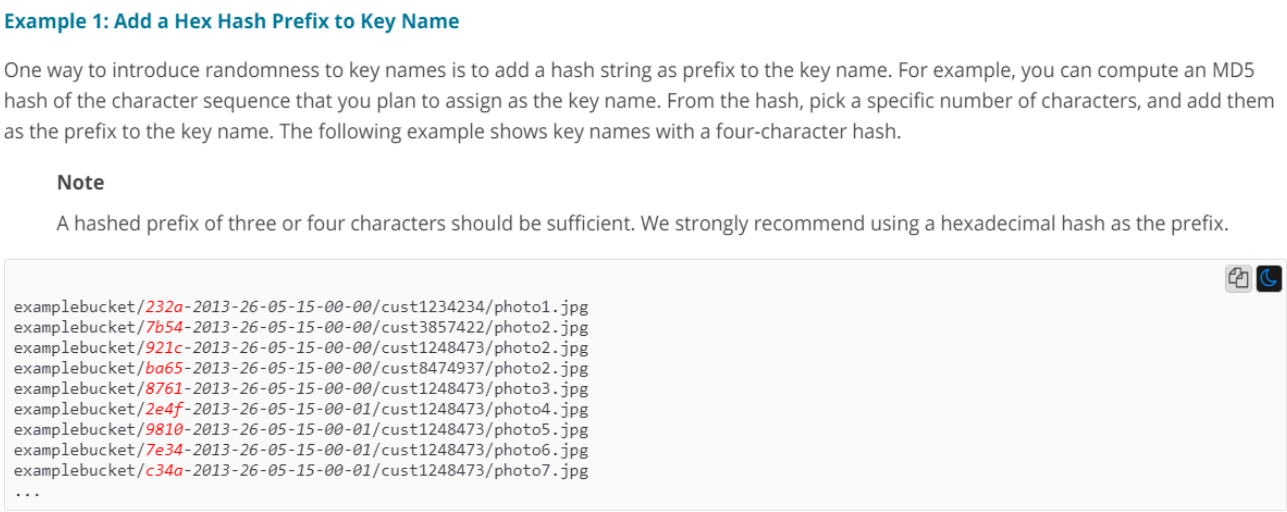
C. Use a hexadecimal hash for the suffix.

D. Use a sequential ID for the suffix.

Explanation:

Answer – B

This recommendation for increasing performance in case of a high request rate in S3 is given in the AWS documentation.



Example 1: Add a Hex Hash Prefix to Key Name

One way to introduce randomness to key names is to add a hash string as prefix to the key name. For example, you can compute an MD5 hash of the character sequence that you plan to assign as the key name. From the hash, pick a specific number of characters, and add them as the prefix to the key name. The following example shows key names with a four-character hash.

Note

A hashed prefix of three or four characters should be sufficient. We strongly recommend using a hexadecimal hash as the prefix.

```
examplebucket/232a-2013-26-05-15-00-00/cust1234234/photo1.jpg
examplebucket/7b54-2013-26-05-15-00-00/cust3857422/photo2.jpg
examplebucket/921c-2013-26-05-15-00-00/cust1248473/photo2.jpg
examplebucket/ba65-2013-26-05-15-00-00/cust8474937/photo2.jpg
examplebucket/8761-2013-26-05-15-00-00/cust1248473/photo3.jpg
examplebucket/2e4f-2013-26-05-15-00-01/cust1248473/photo4.jpg
examplebucket/9810-2013-26-05-15-00-01/cust1248473/photo5.jpg
examplebucket/7e34-2013-26-05-15-00-01/cust1248473/photo6.jpg
examplebucket/c34a-2013-26-05-15-00-01/cust1248473/photo7.jpg
...
```

For more information on S3 performance considerations, please visit the following URL:

https://docs.aws.amazon.com/AmazonS3/latest/dev/request-rate-perf-considerations.html

Note:

Amazon S3 maintains an index of object key names in each AWS Region. Object keys are stored in UTF-8 binary ordering across multiple partitions in the index. The key name determines which partition the key is stored in. Using a sequential prefix, such as a **timestamp or an alphabetical sequence,** increases the likelihood that Amazon S3 will target a specific partition for a large number of your keys, **which can overwhelm the I/O capacity of the partition.**

If your workload is a mix of request types, introduce some randomness to key names by adding a hash string as a prefix to the key name. **By introducing randomness to your key names, the I/O load is distributed across multiple index partitions.** For example, you can compute an MD5 hash of the character sequence that you plan to assign as the key, and add three or four characters from the hash as a prefix to the key name.

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Question 34 Unattempted

Domain :Specify Secure Applications and Architectures

There is a requirement to get the IP addresses for resources accessed in a private subnet. Which of the following can be used to fulfill this purpose?

A. Trusted Advisor

B. VPC Flow Logs

C. Use CloudWatch metrics

D. Use CloudTrail

Explanation:

Answer – B

The AWS Documentation mentions the following:

VPC Flow Logs is a feature that enables you to capture information about the IP traffic going to and from network interfaces in your VPC. Flow log data is stored using Amazon CloudWatch Logs. After you've created a flow log, you can view and retrieve its data in Amazon CloudWatch Logs.

For more information on VPC Flow Logs, please visit the following URL:

https://docs.aws.amazon.com/AmazonVPC/latest/UserGuide/flow-logs.html

Incorrect answers:

AWS Trusted Advisor is your customized cloud expert! It helps you to observe best practices for the use of AWS by inspecting your AWS environment with an eye toward saving money, improving system performance and reliability, and closing security gaps.

AWS CloudTrail is a service that enables governance, compliance, operational auditing, and risk auditing of your AWS account. With CloudTrail, you can log, continuously monitor, and retain account activity related to actions across your AWS infrastructure.

Cloud watch Metric is mainly for used for performance metrics.

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Question 35 Unattempted

Domain :Design Resilient Architectures

There is a requirement for 500 messages to be sent and processed in order. Which service can be used in this regard?

A. AWS SQS FIFO

B. AWS SNS

C. AWS Config

D. AWS ELB

Explanation:

Answer – A

One can use SQS FIFO queues for this purpose. The AWS Documentation mentions the following on SQS FIFO Queues:

Amazon SQS is a reliable and highly-scalable managed message queue service for storing messages in transit between application components. FIFO queues complement the existing Amazon SQS standard queues, which offer high throughput, best-effort ordering, and at-least-once delivery. FIFO queues have essentially the same features as standard queues, but provide the added benefits of supporting ordering and exactly-once processing. FIFO queues provide additional features that help prevent unintentional duplicates from being sent by message producers or from being received by message consumers. Additionally, message groups allow multiple separate ordered message streams within the same queue.

For more information on SQS FIFO Queues, please visit the following URL:

https://aws.amazon.com/about-aws/whats-new/2016/11/amazon-sqs-introduces-fifo-queues-with-exactly-once-processing-and-lower-prices-for-standard-queues/

Note:

Yes, SNS is used to send out the messages.

SNS is a web service that coordinates and manages the delivery or sending of messages to subscribing endpoints or clients. In Amazon SNS, there are two types of clients—publishers and subscribers—also referred to as producers and consumers. Publishers communicate asynchronously with subscribers by producing and sending a message to a topic, which is a logical access point and communication channel. Subscribers (i.e., web servers, email addresses, Amazon SQS queues, AWS Lambda functions) consume or receive the message or notification over one of the supported protocols (i.e., Amazon SQS, HTTP/S, email, SMS, Lambda) when they are subscribed to the topic. There is no such thing like maintain the messages order in SNS.

In the question, it mentioned that "There is a requirement for 500 messages to be sent and **processed in order**". By SNS all messages will send at the same time to all the subscribers.

Please refer following the link to get more information.

https://docs.aws.amazon.com/sns/latest/dg/welcome.html

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Question 36 Unattempted

Domain :Define Performant Architectures

A database is required for a Two-Tier application. The data would go through multiple schema changes. The database needs to be durable, ACID compliant and changes to the database should not result in database downtime. Which of the following is the best option for data storage?

A. **AWS S3**

B. **AWS Redshift**

C. **AWS DynamoDB**

D. **AWS Aurora**

Explanation:

Answer – D

As per the AWS documentation Aurora does support Schema changes.

Amazon Aurora is a MySQL-compatible database that combines the speed and availability of high-end commercial databases with the simplicity and cost- effectiveness of open-source databases. Amazon Aurora has taken a common data definition language (DDL) statement that typically requires hours to complete in MySQL and made it near-instantaneous.i.e.0.15 sec for a 100BG table on r3.8xlarge instance.

Note: Amazon *DynamoDB* is *schema*-less, in that the data items in a table need *not* have the same attributes or even the same number of attributes.
Hence it is not a solution.

In Aurora, when a user issues a DDL statement: The database updates the INFORMATION_SCHEMA system table with the new schema. In addition, the database timestamps the operation, records the old schema into a new system table (Schema Version Table), and propagates this change to read replicas.

For more information, please check below AWS Docs:

https://aws.amazon.com/blogs/database/amazon-aurora-under-the-hood-fast-ddl/

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Question 37 Unattempted

Domain :Design Resilient Architectures

A Redshift cluster currently contains 60TB of data. There is a requirement that a disaster recovery site is put in place in a region located 600km away. Which of the following solutions would help ensure that this requirement is fulfilled?

A. **Take a copy of the underlying EBS volumes to S3, and then do Cross-Region Replication.**

B. **Enable Cross-Region snapshots for the Redshift Cluster.** ✓

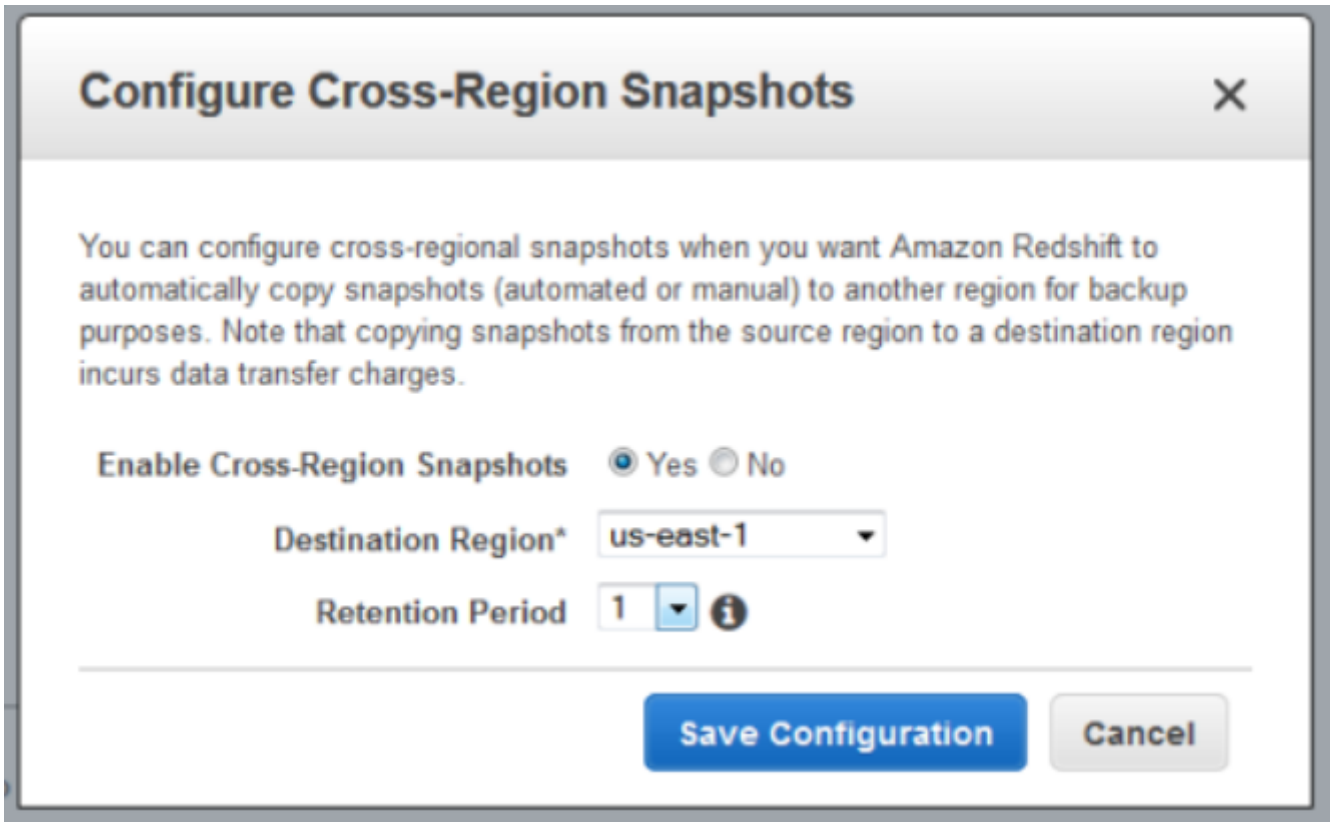
C. Create a CloudFormation template to restore the Cluster in another region.

D. Enable Cross Availability Zone snapshots for the Redshift Cluster.

Explanation:

Answer – B

The below diagram shows that snapshots are available for Redshift clusters enabling them to be available in different regions.



For more information on managing Redshift snapshots, please visit the following URL:

https://docs.aws.amazon.com/redshift/latest/mgmt/managing-snapshots-console.html

https://aws.amazon.com/blogs/aws/automated-cross-region-snapshot-copy-for-amazon-redshift/

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Question 38 Unattempted

Domain :Specify Secure Applications and Architectures

A company is using a Redshift cluster to store their data warehouse. There is a requirement from the Internal IT Security team to encrypt data for the Redshift database. How can this be achieved?

A. Encrypt the EBS volumes of the underlying EC2 Instances.

B. Use AWS KMS Customer Default master key.

C. Use SSL/TLS for encrypting the data.

D. Use S3 Encryption.

Explanation:

Answer - B

AWS documentation mentions the following:

Amazon Redshift uses a hierarchy of encryption keys to encrypt the database. You can use either AWS Key Management Service (AWS KMS) or a hardware security module (HSM) to manage the top-level encryption keys in this hierarchy. The process that Amazon Redshift uses for encryption differs depending on how you manage keys.

For more information on Redshift encryption, please visit the following URL:

https://docs.aws.amazon.com/redshift/latest/mgmt/working-with-db-encryption.html

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Question 39 Unattempted

Domain :Design Cost-Optimized Architectures

An EC2 instance in private subnet needs access on S3 bucket placed in the same region as that of the EC2 instance. The EC2 instance needs to upload and download bigger files to S3 bucket frequently. As an AWS solutions architect what quick and cost effective solution would you suggest to your customers. You need to consider the fact that the EC2 instances being present in a private subnet, the customers do not want their data to be exposed over the internet.

A. **Place the S3 bucket in other public subnet of the same region and create VPC peering connection to this private subnet where the EC2 instance is placed. The traffic to upload and download files will go through secure Amazons private network.**

B. **The quick and cost effective solution would be, to create an IAM role having access over S3 service & assign it to the EC2 instance.**

C. **Create a VPC Endpoint for the VPC, update the route entry of the private subnet to point to VPC endpoint. The traffic to upload and download files will go through the Amazon private network.** ✓

D. **Private subnet can always access S3 bucket/service through the NAT Gateways or NAT instances, so there is no need for additional setup.**

Explanation:

Answer: Option C

A.Place the S3 bucket in other public subnet of the same region and create VPC peering connection to this private subnet where the EC2 instance is placed. The traffic to upload and download files will go through secure Amazon private network.

This option is incorrect, because the S3 service is region specific not AZ's specific, as the statement talks about placing the S3 bucket in Public Subnet

B. The quick and cost effective solution would be, to create an IAM role having access over S3 service & assign it to the EC2 instance.

This option is incorrect, as this is indeed a quick solution but cost expensive as the EC2 instances from private or public subnet will communicate with the S3 services over its endpoint. And when endpoint is used it uses the internet for download and upload and hence exposing the data over the internet. Besides, the number of requests will have a cost associated with it.

C.Create a VPC Endpoint for the VPC, update the route entry of the private subnet to point to VPC endpoint. The traffic to upload and download files will go through the Amazons private network.

This is a correct option, to be able to access the S3 services placed in same region as that of the VPC having EC2 instance present in the Private subnet. You can create a VPC endpoint and update the route entry of the route table associated with private subnet. This is a quick solution as well as cost effective as it will use the Amazons own private network. Hence, it won't expose the data over the internet.

D. Private subnet can always access S3 bucket/service through the NAT Gateways or NAT instances, so there is no need for additional setup.

This option is incorrect, as this is certainly not a default setup unless we create a NAT Gateway or Instance. Even if they are there it's a cost expensive and exposes the data over internet.

Reference:

https://aws.amazon.com/blogs/aws/new-vpc-endpoint-for-amazon-s3/

https://docs.aws.amazon.com/vpc/latest/userguide/vpc-endpoints.html

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Question 40 Unattempted

Domain :Define Performant Architectures

An application requires an EC2 Instance for continuous batch processing activities requiring a maximum data throughput of 500MiB/s. Which of the following is the best storage option for this?

A. EBS IOPS

B. EBS SSD

C. EBS Throughput Optimized

D. EBS Cold Storage

Explanation:

Answer – C

For storage volume types for batch processing activities with large throughput, consider using EBS Throughput Optimized Volume type. AWS Documentation also mentions this:

	Solid-State Drives (SSD)		Hard Disk Drives (HDD)	
Volume Type	General Purpose SSD (gp2)*	Provisioned IOPS SSD (io1)	Throughput Optimized HDD (st1)	Cold HDD (sc1)
Description	General purpose SSD volume that balances price and performance for a wide variety of workloads	Highest-performance SSD volume for mission-critical low-latency or high-throughput workloads	Low-cost HDD volume designed for frequently accessed, throughput-intensive workloads	Lowest cost HDD volume designed for less frequently accessed workloads
Use Cases	• Recommended for most workloads • System boot volumes • Virtual desktops • Low-latency interactive apps • Development and test environments	• Critical business applications that require sustained IOPS performance, or more than 16,000 IOPS or 250 MiB/s of throughput per volume • Large database workloads, such as: ◦ MongoDB ◦ Cassandra ◦ Microsoft SQL Server ◦ MySQL ◦ PostgreSQL ◦ Oracle	• Streaming workloads requiring consistent, fast throughput at a low price • Big data • Data warehouses • Log processing • Cannot be a boot volume	• Throughput-oriented storage for large volumes of data that is infrequently accessed • Scenarios where the lowest storage cost is important • Cannot be a boot volume
API Name	gp2	io1	st1	sc1
Volume Size	1 GiB - 16 TiB	4 GiB - 16 TiB	500 GiB - 16 TiB	500 GiB - 16 TiB
Max. IOPS/Volume**	16,000***	64,000****	500	250
Max. Throughput/Volume	250 MiB/s***	1,000 MiB/s†	500 MiB/s	250 MiB/s
Max. IOPS/Instance	80,000	80,000	80,000	80,000
Max. Throughput/Instance††	1,750 MiB/s	1,750 MiB/s	1,750 MiB/s	1,750 MiB/s
Dominant Performance Attribute	IOPS	IOPS	MiB/s	MiB/s

For more information on EBS Volume types, please visit the following URL:

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/EBSVolumeTypes.html

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Question 41 Unattempted

Domain :Design Resilient Architectures

An application needs to access data in another AWS account in the same region. Which of the following can be used to ensure that the data can be accessed as required?

A. **Establish a NAT instance between both accounts.**

B. Use a VPN between both accounts.

C. Use a NAT Gateway between both accounts.

D. Use VPC Peering between both accounts. ✓

Explanation:

Answer – D

Options A and C are incorrect because these are used when private resources are required to access the Internet.

Option B is incorrect because it's used to create a connection between the On-premises and AWS resources.

AWS Documentation mentions the following about VPC Peering:

A VPC Peering connection is a networking connection between two VPCs that enables you to route traffic between them privately. Instances in either VPC can communicate with each other as if they are within the same network. You can create a VPC Peering connection between your own VPCs, with a VPC in another AWS account, or with a VPC in a different AWS Region.

For more information on VPC Peering, please visit the following URL:

https://docs.aws.amazon.com/AmazonVPC/latest/UserGuide/vpc-peering.html

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Question 42 Unattempted

Domain :Design Resilient Architectures

An application currently using a NAT Instance is required to use a NAT Gateway. Which of the following can be used to accomplish this?

A. Use NAT Instances along with the NAT Gateway.

B. Host the NAT Instance in the private subnet.

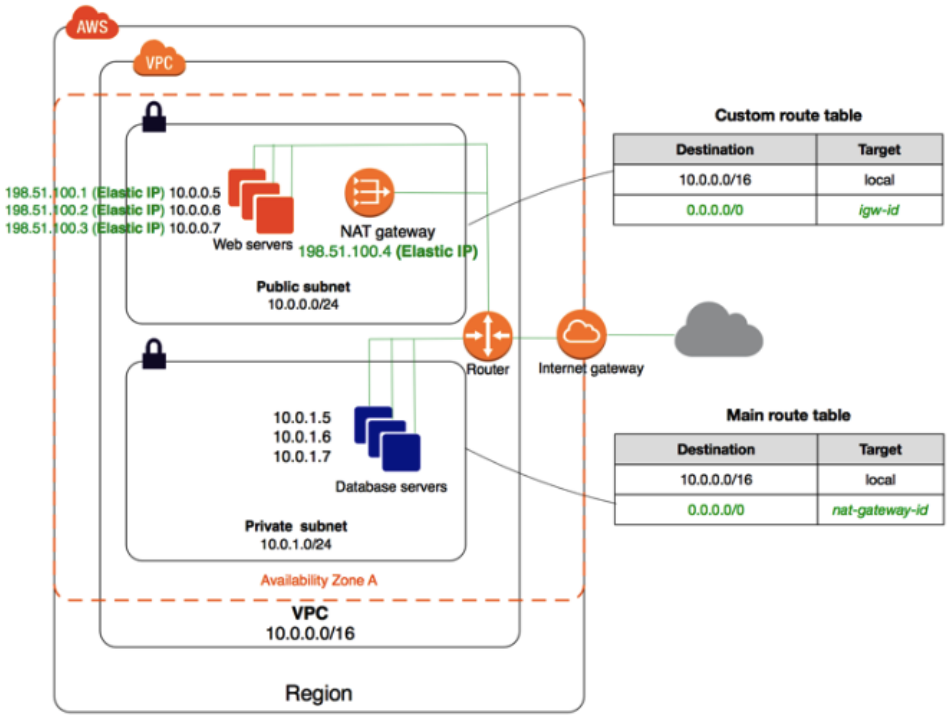
C. Migrate from a NAT Instance to a NAT Gateway and host the NAT Gateway in the public subnet.

D. Convert the NAT Instance to a NAT Gateway.

Explanation:

Answer – C

One can simply start and stop using the NAT Gateway service using the deployed NAT instances. But you need to ensure that the NAT Gateway is deployed in the public subnet.



For more information on migrating to a NAT Gateway, please visit the following URL:

https://aws.amazon.com/premiumsupport/knowledge-center/migrate-nat-instance-gateway/

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Question 43 Unattempted

Domain :Design Resilient Architectures

An application consists of the following architecture:

a. EC2 Instances in multiple AZ's behind an ELB
b. The EC2 Instances are launched via an Auto Scaling Group.
c. There is a NAT instance which is used so that instances can download updates from the Internet.
Which of the following is a bottleneck in the architecture?

A. The EC2 Instances
B. The ELB
C. The NAT Instance ✓
D. The Auto Scaling Group

Explanation:

Answer – C

Since there is only one NAT instance, this is a bottleneck for the architecture. For high availability, launch NAT instances in multiple Available Zones and make it as part of an Auto Scaling Group.

For more information on NAT Instances, please visit the following URL:

https://docs.aws.amazon.com/AmazonVPC/latest/UserGuide/VPC_NAT_Instance.html

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Question 44 Unattempted

Domain :Design Cost-Optimized Architectures

A company owns an API which currently gets 1000 requests per second. The company wants to host this in a cost effective manner using AWS. Which one of the following solution is best suited for this?

A. **Use API Gateway with the backend services as it is.**

B. **Use the API Gateway along with AWS Lambda** 

C. **Use CloudFront along with the API backend service as it is.**

D. **Use ElastiCache along with the API backend service as it is.**

Explanation:

Answer – B

Since the company has full ownership of the API, the best solution would be to convert the code for the API and use it in a Lambda function. This can help save on cost, since in the case of Lambda, you only pay for the time the function runs, and not for the infrastructure.

Then, you can use the API Gateway along with the AWS Lambda function to scale accordingly.

For more information on using API Gateway with AWS Lambda, please visit the following URL:

https://docs.aws.amazon.com/apigateway/latest/developerguide/getting-started-with-lambda-integration.html

Note: With Lambda you do not have to provision your own instances; Lambda performs all the operational and administrative activities on your behalf, including capacity provisioning, monitoring fleet health, applying security patches to the underlying compute resources, deploying your code, running a web service front end, and monitoring and logging your code. AWS Lambda provides easy scaling and high availability to your code without additional effort on your part.

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Question 45 Unattempted

Domain :Define Performant Architectures

There is a requirement to host a database application having a lot of resource-intensive reads and writes. Which of the below options is most suitable?

A. EBS Provisioned IOPS

B. EBS SSD

C. EBS Throughput Optimized

D. EBS Cold Storage

Explanation:

Answer – A

Since there is a requirement for high performance with high IOPS, one needs to opt for EBS Provisioned IOPS SSD.

The below snapshot from the AWS Documentation mentions the need for using Provisioned IOPS for better IOPS performance in database-based applications.

Solid-State Drives (SSD)		
General Purpose SSD (gp2)*	Provisioned IOPS SSD (io1)	Th H
General purpose SSD volume that balances price and performance for a wide variety of workloads	Highest-performance SSD volume for mission-critical low-latency or high-throughput workloads	Lo de ac in
• Recommended for most workloads • System boot volumes • Virtual desktops • Low-latency interactive apps • Development and test environments	• Critical business applications that require sustained IOPS performance, or more than 10,000 IOPS or 160 MiB/s of throughput per volume • Large database workloads, such as: ◦ MongoDB ◦ Cassandra ◦ Microsoft SQL Server ◦ MySQL ◦ PostgreSQL ◦ Oracle	• • • • •

For more information on AWS EBS Volume types, please visit the following URL:

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/EBSVolumeTypes.html

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Question 46 Unattempted

Domain :Define Performant Architectures

An application sends images to S3. The metadata for these images needs to be saved in persistent storage and is required to be indexed. Which one of the following can be used for the underlying

metadata storage?

A. AWS Aurora

B. AWS S3

C. AWS DynamoDB

D. AWS RDS

Explanation:

Answer – C

The most efficient storage mechanism for just storing metadata is DynamoDB. DynamoDB is normally used in conjunction with the Simple Storage service. So, after storing the images in S3, you can store their metadata in DynamoDB. You can also create secondary indexes for DynamoDB Tables.

For more information on managing indexes in DynamoDB, please visit the following URL:

https://docs.aws.amazon.com/amazondynamodb/latest/developerguide/SQLtoNoSQL.Indexes.htm

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Question 47 Unattempted

Domain :Define Performant Architectures

An application hosted on EC2 Instances has its promotional campaign due to start in 2 weeks. There is a mandate from the management to ensure that no performance problems are encountered due to traffic growth during this time. Which of the following must be done to the Auto Scaling Group to ensure this requirement can be fulfilled?

A. Configure Step scaling for the Auto Scaling Group.

B. Configure Dynamic Scaling and use Target tracking scaling Policy

C. **Configure Scheduled scaling for the Auto Scaling Group**

D. **Configure Static scaling for the Auto Scaling Group**

Explanation:

Answer – B

If you are scaling is based on a metric, which is an utilization metric that increases or decreases proportionally to the number of instances in the Auto Scaling group, we recommend that you use a target tracking scaling policy instead.

In Target tracking scaling policies you select a predefined metric or configure a customized metric, and set a target value. EC2 Auto Scaling creates and manages the CloudWatch alarms that trigger the scaling policy and calculates the scaling adjustment based on the metric and the target value. The scaling policy adds or removes capacity as required to keep the metric at, or close to, the specified target value.

Scheduled scaling works better when you can predict the load changes and also when you know how long you need to run. Here in our scenario we just know that there will be a heavy traffic during the campaign period (period is not specified) but not sure about the actual traffic. Don't have any history to predict it either.

For more information on Auto Scaling Scheduled Scaling, please visit the following URL:

https://docs.aws.amazon.com/autoscaling/ec2/userguide/schedule_time.html

https://docs.aws.amazon.com/autoscaling/ec2/userguide/as-scaling-simple-step.html

https://docs.aws.amazon.com/autoscaling/ec2/userguide/as-scaling-target-tracking.html

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Question 48 Unattempted

Domain :Design Resilient Architectures

Currently a company makes use of EBS snapshots to back up their EBS Volumes. As a part of the business continuity requirement, these snapshots need to be made available in another region. How can this be achieved?

A. **Directly create the snapshot in the other region.**

B. **Create Snapshot and copy the snapshot to a new region.**

C. **Copy the snapshot to an S3 bucket and then enable Cross-Region Replication for the bucket.**

D. **Copy the EBS Snapshot to an EC2 instance in another region.**

Explanation:

Answer - B

AWS Documentation mentions the following:

A snapshot is constrained to the region where it was created. After you create a snapshot of an EBS volume, you can use it to create new volumes in the same region. For more information, follow the link on Restoring an Amazon EBS Volume from a Snapshot below. You can also copy snapshots across regions, making it possible to use multiple regions for geographical expansion, data center migration, and disaster recovery.

For more information on EBS Snapshots, please visit the following URL:

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/EBSSnapshots.html

For more information on Restoring an Amazon EBS Volume from a Snapshot, please visit the following URL:

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ebs-restoring-volume.html

Option C is incorrect. Because, the snapshots which we are taking from the EBS are stored in AWS managed S3. We don't have the option to see the snapshot in S3. Hence, option C can't be the

correct answer.

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Question 49 Unattempted

Domain :Define Performant Architectures

A company has an application hosted in AWS. This application consists of EC2 Instances which sit behind an ELB. The following are requirements from an administrative perspective:
a) Ensure notifications are sent when the read requests go beyond 1000 requests per minute
b) Ensure notifications are sent when the latency goes beyond 10 seconds
c) Any API activity which calls for sensitive data should be monitored
Which of the following can be used to satisfy these requirements? Choose 2 answers from the options given below.

A. **Use CloudTrail to monitor the API Activity.**

B. **Use CloudWatch logs to monitor the API Activity.**

C. **Use CloudWatch metrics for the metrics that need to be monitored as per the requirement and set up an alarm activity to send out notifications when the metric reaches the set threshold limit.**

D. **Use custom log software to monitor the latency and read requests to the ELB.**

Explanation:

Answer – A and C

AWS CloudTrail can be used to monitor the API calls.

For more information on CloudTrail, please visit the following URL:

https://aws.amazon.com/cloudtrail/

When you use CloudWatch metrics for an ELB, you can get the amount of read requests and latency out of the box.

For more information on using Cloudwatch with the ELB, please visit the following URL:

https://docs.aws.amazon.com/elasticloadbalancing/latest/classic/elb-cloudwatch-metrics.html

Option A is correct. CloudTrail is a web service that records AWS API calls for your AWS account and delivers log files to an Amazon S3 bucket. The recorded information includes the identity of the user, the start time of the AWS API call, the source IP address, the request parameters, and the response elements returned by the service.

https://docs.aws.amazon.com/awscloudtrail/latest/APIReference/Welcome.html

Option C is correct. Use Cloudwatch metrics for the metrics that needs to be monitored as per the requirement and set up an alarm activity to send out notifications when the metric reaches the set threshold limit.

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Question 50 Unattempted

Domain :Specify Secure Applications and Architectures

A company has resources hosted in their AWS Account. There is a requirement to monitor API activity for all regions and the audit needs to be applied for future regions as well. Which of the following can be used to fulfill this requirement?

A. **Ensure CloudTrail for each region, then enable for each future region.**

B. **Ensure one CloudTrail trail is enabled for all regions.**

C. **Create a CloudTrail for each region. Use CloudFormation to enable the trail for all future regions.**

D. **Create a CloudTrail for each region. Use AWS Config to enable the trail for all future regions.**

Explanation:

Answer – B

AWS Documentation mentions the following:

You can now turn on a trail across all regions for your AWS account. CloudTrail will deliver log files from all regions to the Amazon S3 bucket and an optional CloudWatch Logs log group you specified. Additionally, when AWS launches a new region, CloudTrail will create the same trail in the new region. As a result, you will receive log files containing API activity for the new region without taking any action.

For more information on this feature, please visit the following URL:

https://aws.amazon.com/about-aws/whats-new/2015/12/turn-on-cloudtrail-across-all-regions-and-support-for-multiple-trails/

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Question 51 Unattempted

Domain :Design Resilient Architectures

There is a requirement for an iSCSI device and the legacy application needs local storage. Which of the following can be used to meet the demands of the application?

A. **Configure the Simple Storage Service.**

B. **Configure Storage Gateway Cached volume.**

C. **Configure Storage Gateway Stored volume.**

D. **Configure Amazon Glacier.**

Explanation:

Answer – C

AWS Documentation mentions the following:

If you need low-latency access to your entire dataset, first configure your on-premises gateway to store all your data locally. Then, asynchronously back up point-in-time snapshots of this data to Amazon S3. This configuration provides durable and inexpensive offsite backups that you can

recover to your local data center or Amazon EC2. For example, if you need replacement capacity for disaster recovery, you can recover the backups to Amazon EC2.

For more information on the Storage gateway, please visit the following URL:

https://docs.aws.amazon.com/storagegateway/latest/userguide/WhatIsStorageGateway.html

S3 and Glacier are not used for this purpose.
Volume gateway provides an iSCSI target, which enables you to create volumes and mount them as iSCSI devices from your on-premises or EC2 application servers. The volume gateway runs in either a cached or stored mode.

In the cached mode, your primary data is written to S3, while retaining your frequently accessed data locally in a cache for low-latency access.

In the stored mode, your primary data is stored locally and your entire dataset is available for low-latency access while asynchronously backed up to AWS.

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Question 52 Unattempted

Domain :Specify Secure Applications and Architectures

There is a requirement for EC2 Instances in a private subnet to access an S3 bucket. It is required that the traffic does not traverse to the Internet. Which of the following can be used to fulfill this requirement?

A. VPC Endpoint

B. NAT Instance

C. NAT Gateway

D. Internet Gateway

Explanation:

Answer - A

A VPC endpoint enables you to privately connect your VPC to supported AWS services and VPC endpoint services powered by PrivateLink without requiring an internet gateway, NAT device, VPN connection, or AWS Direct Connect connection. Instances in your VPC do not require public IP addresses to communicate with resources in the service. Traffic between your VPC and the other service does not leave the Amazon network.

For more information on AWS VPC endpoints, please visit the following URL:

https://docs.aws.amazon.com/AmazonVPC/latest/UserGuide/vpc-endpoints.html

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Question 53 Unattempted

Domain :Define Performant Architectures

There is an application which consists of EC2 Instances behind a classic ELB. An EC2 proxy is used for content management to backend instances. The application might not be able to scale properly.
Which of the following can be used to scale the proxy and backend instances appropriately?
Choose 2 answers from the options given below.

A. **Use Auto Scaling for the proxy servers.**

B. **Use Auto Scaling for the backend instances.**

C. **Replace the Classic ELB with Application ELB.**

D. **Use Application ELB for both the front end and backend instances.**

Explanation:

Answer – A and B

When you see a requirement for scaling, consider the Auto Scaling service provided by AWS. This can be used to scale both proxy servers and backend instances.

For more information on Auto Scaling, please visit the following URL:

https://docs.aws.amazon.com/autoscaling/plans/userguide/what-is-aws-auto-scaling.html

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Question 54 Unattempted

Domain :Design Resilient Architectures

There is a website hosted in AWS that might get a lot of traffic over the next couple of weeks. If the application experiences a natural disaster at this time, which of the following can be used to reduce potential disruption to users?

A. **Use an ELB to divert traffic to an Infrastructure hosted in another region.**

B. **Use an ELB to divert traffic to an Infrastructure hosted in another AZ.**

C. **Use CloudFormation to create backup resources in another AZ.**

D. **Use Route53 to route to a static web site.**

Explanation:

Answer – D

In a disaster recovery scenario, the best choice out of all given options is to divert the traffic to a static website.

Option A is wrong because ELB can only balance traffic in one region and not across multiple regions.

Options B and C are incorrect because using backups across AZ's is not enough for disaster recovery purposes.

For more information on disaster recovery in AWS, please visit the following URL:

https://aws.amazon.com/premiumsupport/knowledge-center/fail-over-s3-r53/

https://aws.amazon.com/disaster-recovery/

The wording "to reduce the potential disruption in case of issues" is pointing to a disaster recovery situation. There is more than 1 way to manage this situation. However, we need to choose the best option from the list given here. Out of this, the most suitable one is Option D.

Most organizations try to implement High Availability (HA) instead of DR to guard them against any downtime of services. In case of HA, we ensure there exists a fallback mechanism for our services. The service that runs in HA is handled by hosts running in different availability zones but in the same geographical region. This approach, however, does not guarantee that our business will be up and running in case the entire region goes down. DR takes things to a completely new level, wherein you need to be able to recover from a different region that's separated by over 250 miles. Our DR implementation is an Active/Passive model, meaning that we always have minimum critical services running in different regions, but a major part of the infrastructure is launched and restored when required

https://aws.amazon.com/blogs/startups/large-scale-disaster-recovery-using-aws-regions/

Note:
Usually, when we discuss a disaster recovery scenario we assume that the entire region is affected due to some disaster. So we need the service to be provided from yet another region. So in that case setting up a solution in another AZ will not work as it is in the same region. Option A is incorrect though it mentions yet another region because ELB's cannot span across regions. So out of the options provided Option D is the suitable solution.

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Question 55 Unattempted

Domain :Define Operationally-Excellent Architectures

You have a requirement to host a static website for a domain called mycompany.com in AWS. It is required to ensure that the traffic is distributed properly.
How can this be achieved? Choose 2 answers from the options given below.

A. Host the static site on an EC2 Instance.

B. Use Route53 with static web site in S3. ✓

C. Enter the NS records from Route53 in the domain registrar. ✓

D. Place the EC2 instance behind the ELB.

Explanation:

Answer – B and C

You can host a static website in S3. You need to ensure that the nameserver records for the Route53 hosted zone are entered in your domain registrar.

For more information on website hosting in S3, please visit the following URL:

https://docs.aws.amazon.com/AmazonS3/latest/dev/WebsiteHosting.html

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Question 56 Unattempted

Domain :Define Performant Architectures

A database hosted using the AWS RDS service is getting a lot of database queries and has now become a bottleneck for the associating application. What action will ensure that the database is not a performance bottleneck?

A. Setup a CloudFront distribution in front of the database.

B. Setup an ELB in front of the database.

C. Setup ElastiCache in front of the database. ✓

D. Setup SNS in front of the database.

Explanation:

Answer – C

ElastiCache is an in-memory solution which can be used in front of a database to cache the common queries issued against the database. This can reduce the overall load on the database.

Option A is incorrect because this is normally used for content distribution.

Option B is partially correct, but you need to have one more database as an internal load balancing solution.

Option D is incorrect because SNS is a simple notification service.

For more information on ElastiCache, please visit the following URL:

https://aws.amazon.com/elasticache/

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Question 57 Unattempted

Domain :Design Resilient Architectures

A database is being hosted using the AWS RDS service. This database is to be made into a production database and is required to have high availability. Which of the following can be used to achieve this requirement?

A. Use Multi-AZ for the RDS instance to ensure that a secondary database is created in another region.

B. Use the Read Replica feature to create another instance of the DB in another region.

C. Use Multi-AZ for the RDS instance to ensure that a secondary database is created in another Availability Zone.

D. Use the Read Replica feature to create another instance of the DB in another Availability Zone.

Explanation:

Answer - C

Option A is incorrect because the Multi-AZ feature allows for high availability across Availability Zones and not regions.

Options B and D are incorrect because Read Replicas can be used to offload database reads. But if you want high availability then opt for the Multi-AZ feature.

AWS Documentation mentions the following:

Amazon RDS Multi-AZ deployments provide enhanced availability and durability for Database (DB) Instances, making them a natural fit for production database workloads. When you provision a Multi-AZ DB Instance, Amazon RDS automatically creates a primary DB Instance and synchronously replicates the data to a standby instance in a different Availability Zone (AZ).

For more information on AWS RDS Multi-AZ, please visit the following URL:

https://aws.amazon.com/rds/details/multi-az/

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Question 58 Unattempted

Domain :Specify Secure Applications and Architectures

A company wants to host a web application and a database layer in AWS. This will be done with the use of subnets in a VPC.
Which of the following is a proper architectural design for supporting the required tiers of the application?

A. Use a public subnet for the web tier and a public subnet for the database layer.

B. Use a public subnet for the web tier and a private subnet for the database layer.

C. Use a private subnet for the web tier and a private subnet for the database layer.

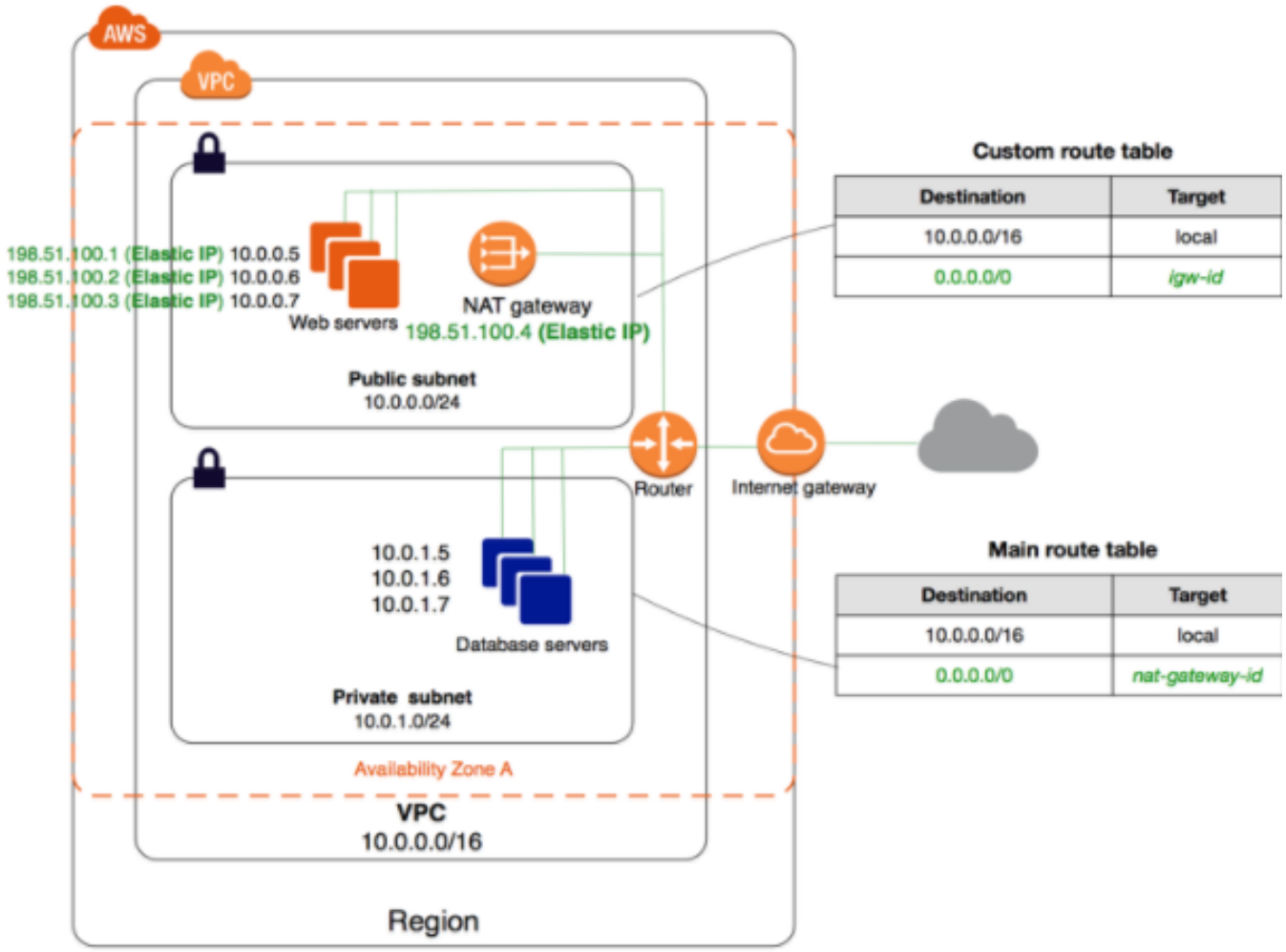
D. Use a private subnet for the web tier and a public subnet for the database layer.

Explanation:

Answer – B

The ideal setup is to ensure that the web server is hosted in the public subnet so that it can be accessed by users on the internet. The database server can be hosted in the private subnet.

The below diagram shows how this can be set up:



For more information on public and private subnets in AWS, please visit the following URL:

https://docs.aws.amazon.com/AmazonVPC/latest/UserGuide/VPC_Scenario2.html

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Question 59 Unattempted

Domain :Design Resilient Architectures

You require the ability to analyze a customer's clickstream data on a website so they can do a behavioral analysis. Your customer needs to know what sequence of pages and ads their customer clicked on. This data will be used in real time to modify the page layouts as customers click through the site to increase stickiness and advertising click-through. Which option meets the requirements for capturing and analyzing this data?

A. **Log clicks in weblogs by URL store to Amazon S3, and then analyze with Elastic MapReduce.**

B. **Push web clicks by session to Amazon Kinesis and analyze behavior using Kinesis workers.** ✓

C. **Write click events directly to Amazon Redshift and then analyze with SQL.**

D. **Publish web clicks by session to an Amazon SQS queue. Then send the events to AWS RDS for further processing.**

Explanation:

Answer – B

The AWS Documentation mentions the following

Amazon Kinesis Data Streams enables you to build custom applications that process or analyze streaming data for specialized needs. Kinesis Data Streams can continuously capture and store terabytes of data per hour from hundreds of thousands of sources such as website clickstreams, financial transactions, social media feeds, IT logs, and location-tracking events.

For more information on Amazon Kinesis, please visit the following URL:

https://aws.amazon.com/kinesis/data-streams/

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Question 60 Unattempted

Domain :Design Resilient Architectures

A company has an infrastructure that consists of machines which keep sending log information every 5 minutes. The number of these machines can run into thousands and it is required to ensure that the data can be analyzed at a later stage. Which of the following would help in fulfilling this requirement?

A. **Use Kinesis Firehose with S3 to take the logs and store them in S3 for furtherprocessing.** ✓

B. **Launch an Elastic Beanstalk application to take the processing job of the logs.**

C. **Launch an EC2 instance with enough EBS volumes to consume the logs which can be usedfor further processing.**

D. **Use CloudTrail to store all the logs which can be analyzed at a later stage.**

Explanation:

Answer – A

AWS Documentation mentions the following which is perfectly in accordance with this requirement:

Amazon Kinesis Data Firehose is the easiest way to load streaming data into data stores and analytics tools. It can capture, transform, and load streaming data into Amazon S3, Amazon Redshift, Amazon Elasticsearch Service, and Splunk, enabling near real-time analytics with existing business intelligence tools and dashboards you're already using today.

For more information on Amazon Kinesis firehose, please visit the following URL:

https://aws.amazon.com/kinesis/data-firehose/

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Question 61 Unattempted

Domain :Define Operationally-Excellent Architectures

An application hosted in AWS allows users to upload videos to an S3 bucket. A user is required to be given access to upload some videos for a week based on the profile. How can be this be accomplished in the best way possible?

A. Create an IAM bucket policy to provide access for a week's duration.

B. Create a pre-signed URL for each profile which will last for a week's duration. ✓

C. Create an S3 bucket policy to provide access for a week's duration.

D. Create an IAM role to provide access for a week's duration.

Explanation:

Answer – B

Pre-signed URL's are the perfect solution when you want to give temporary access to users for S3 buckets. So, whenever a new profile is created, you can create a pre-signed URL to ensure that the URL lasts for a week and allows users to upload the required objects.

For more information on pre-signed URL's, please visit the following URL:

https://docs.aws.amazon.com/AmazonS3/latest/dev/PresignedUrlUploadObject.html

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Question 62 Unattempted

Domain :Design Cost-Optimized Architectures

A company is planning to use Docker containers and necessary container orchestration tools for their batch processing requirements. There is a requirement for batch processing for both critical and non-critical data. Which of the following is the best implementation step for this requirement, to ensure that cost is effectively managed?

A. Use Kubernetes for container orchestration and Reserved instances for all underlying instances.

B. Use ECS orchestration and Reserved Instances for all underlying instances.

C. Use Docker for container orchestration and a combination of Spot and Reserved Instances for the underlying instances.

D. **Use ECS for container orchestration and a combination of Spot and Reserved Instances for the underlying instances.** ✓

Explanation:

Answer – D

The Elastic Container service from AWS can be used for container orchestration. Since there are both critical and non-critical loads, one can use Spot instances for the non-critical workloads for ensuring cost is kept at a minimum.

For more information on AWS ECS, please visit the following URL:

https://docs.aws.amazon.com/AmazonECS/latest/developerguide/Welcome.html

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Question 63 Unattempted

Domain :Design Resilient Architectures

A company has a requirement for archival of 6TB of data. There is an agreement with the stakeholders for an 8-hour agreed retrieval time. Which of the following can be used as the MOST cost-effective storage option?

A. **AWS S3 Standard**

B. **AWS S3 Infrequent Access**

C. **AWS Glacier** ✓

D. **AWS EBS Volumes**

Explanation:

Answer - C

Amazon Glacier is the perfect solution for this. Since the agreed time frame for retrieval is met at 8 hours, this will be the most cost effective option.

For more information on AWS Glacier, please visit the following URL:

https://aws.amazon.com/documentation/glacier/

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Question 64 Unattempted

Domain :Specify Secure Applications and Architectures

A company hosts 5 web servers in AWS. They want to ensure that Route53 can be used to route user traffic to random web servers when they request for the underlying web application. Which routing policy should be used to fulfill this requirement?

A. Simple

B. Weighted

C. Multivalue Answer

D. Latency

Explanation:

Answer - C

The AWS Documentation mentions the following to support this:

If you want to route traffic approximately randomly to multiple resources such as web servers, you can create one multivalue answer record for each resource and, optionally, associate an Amazon Route 53 health check with each record. For example, suppose you manage an HTTP web service with a dozen web servers that each have their own IP address, no one web server could handle all of the traffic, but if you create a dozen multivalue answer records, Amazon Route 53 responds to DNS queries with up to eight healthy records in response to each DNS query. Amazon Route 53 gives different answers to different DNS resolvers. If a web server becomes unavailable after a resolver caches a response, client software can try another IP address in the response.

For more information on this option, please visit the following URL:

https://aws.amazon.com/about-aws/whats-new/2017/06/amazon-route-53-announces-support-for-multivalue-answers-in-response-to-dns-queries/

Simple routing policy – Use for a single resource that performs a given function for your domain, for example, a web server that serves content for the example.com website.

Latency routing policy – Use when you have resources in multiple locations and you want to route traffic to the resource that provides the best latency.

Weighted routing policy – Use to route traffic to multiple resources in proportions that you specify.

Multivalue answer routing policy – Use when you want Route 53 to respond to DNS queries with up to eight healthy records selected at random.

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Question 65 Unattempted

Domain :Define Performant Architectures

As an AWS Solutions Architect for large banking organizations, you have been assigned a task to design a solution on AWS cloud platform, such that under normal business hours, there will be always 24 web servers up and running in a provided region. It will be a three tier architecture connecting to the databases. The solution offered should be highly available, secure, cost effective, should be able to assume the heavy requests in peak hours and tolerant up to one AZ failures.
What would be your best solution to the above customer requirement?

A. In a given region, use ELB behind two different AZ's, with minimum or desired 24 web servers hosted in a public subnet. And Multi-AZ database architecture in a private subnet.

B. In a given region, use ELB behind three different AZ's, each AZ having ASG, with minimum or desired 12 web servers hosted in a public subnet. And Multi-AZ database architecture in a private subnet.

C. In a given region, use ELB behind two different AZ's, each AZ having ASG, with minimum or desired 12 web servers hosted in a public subnet. And Multi AZ database architecture in a private subnet.

D. **In a given region, use ELB behind three different AZ's, each AZ having ASG, with minimum or desired 8 web servers hosted in public subnet. And Multi AZ database architecture in a different public subnet.**

Explanation:

Answer: B

A. In a given region, use ELB behind two different AZ's, with minimum or desired 24 web servers hosted in public subnet. And Multi-AZ database architecture in a private subnet.

This option is incorrect, as everything looks good, but the designed architecture does not look to be cost effective as all the time 48 servers will be running and it does not have ASG to cater to additional load on servers, however it is fault tolerant to one AZ failure.

Besides, it's always a good practice to use multiple AZ's to make the application highly available.

B.In a given region, use ELB behind three different AZ's, each AZ having ASG, with minimum or desired 12 web servers hosted in public subnet. And Multi-AZ database architecture in a private subnet.

This option is correct, as the solution needs to be tolerant up to one AZ failure it means there are always 36 web servers to cater the service requests. If one AZ fails then still there will be 24 servers running all the time, and in case two AZ fails there will always be 12 servers running and ASG can be utilised to scale out the required number of servers.

C.In a given region, use ELB behind two different AZ's, each AZ having ASG, with minimum or desired 12 web servers hosted in public subnet. And Multi AZ database architecture in a private subnet.

This option is incorrect, as it will not be a suitable solution in case when there will be one AZ failure the other AZ will have only 12 web servers running. One might think ASG is always there to take care when the second AZ fails but think of scenario when other AZ fails and at the same time traffic is at its peak, then the application will not be further scalable and users might face slow responses.

D. In a given region, use ELB behind three different AZ's, each AZ having ASG, with minimum or desired 8 web servers hosted in public subnet. And Multi AZ database architecture in a different public subnet.

This option is incorrect. Remember the design principle of keeping the databases in private subnet. As this solution mentions to place databases in other public subnet, the data can be exposed over the internet and hence it's insecure application.

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