

# Exam Session - Knowledge Check: High Availability (SAA-C03)

 [cloudacademy.com/quiz/exam/3792069/results](https://cloudacademy.com/quiz/exam/3792069/results)

#1

Which statement regarding the replication of DynamoDB partition data is correct?



The data stored on DynamoDB partitions is replicated synchronously across Availability Zones.



The data stored on DynamoDB partitions is replicated asynchronously across Availability Zones.



The data stored on DynamoDB partitions can be replicated synchronously or asynchronously across Availability Zones, depending on the database configuration.



The data stored on DynamoDB partitions is not replicated across availability zones.

Explanation

A DynamoDb partition is a dedicated area of SSD storage allocated to a table and for which is automatically replicated synchronously across 3 availability zones within a particular region. DynamoDB being a managed service takes care of performing both the partition management and replication for you, therefore you can remain focused on your application design and not be distracted by the needs of data replication requirements. The synchronous AZ replication provides protection against any single node outage and/or a full availability zone outage - which although is a rare event should never be assumed to not happen. The synchronous replication takes place using low latency interconnects between each of the availability zones within a region and ensures high-speed sub second replication.



[/course/amazon-dynamodb-high-availability/aws-dynamodb-ha-options/](#)

Covered in this lecture

AWS DynamoDB HA Options

Course:Amazon DynamoDB High Availability

4m



#2



Which statement regarding DynamoDB's point-in-time recovery is incorrect?



It allows you to restore data back to a specific date and time.



Tables can only restore to a point in time within the last 35 days.



Point-in-time recovery is disabled by default.



Tables can only be restored in the same region as the original table.

Explanation

Point In Time Recovery operates at the table level, and when enabled provides you with the ability to perform a point in time recovery for any time between the current time and the last 35 days. This feature needs to be enabled as it is disabled by default. Once enabled you can request a recovery by specifying a date and time with second precision or granularity. The restoration will always be performed into a new table - of which you specify the new table name at the time of the restoration request. Table restoration can be performed in the same region as the original table, or into a different region altogether.

</course/amazon-dynamodb-high-availability/point-in-time-recovery/>

Covered in this lecture

Point in Time Recovery

Course:Amazon DynamoDB High Availability



1m



#3

Which statement best describes the AWS Snowball as a data migration service?



Data is sent encoded (forward error correction) via a high speed network connection.



Data is sent compressed via a high speed network connection.



Data is sent via hardware appliances shipped on dry ice.



Data is transferred via a physical appliance to AWS.

Explanation

The Snow family uses secure appliances to transfer large amounts of data into and out of the AWS cloud; this is fast and cheaper than high-speed Internet.

 <https://aws.amazon.com/snowball/>

#4

Which of the following should you use as a backup solution in case an S3 bucket storage object is accidentally deleted?



Multi-Factor Authentication Delete



Lifecycle Policies



Versioning



Bucket Policies


Explanation

Enabling versioning on an S3 bucket ensures you can recover from misuse of an object or accidental deletion, and revert back to an older version of the same data object.

Multi-Factor Authentication Delete ensures that a user has to enter a 6 digit MFA code to delete an object, which prevents accidental deletion due to human error.

Lifecycle Policies allow you to automatically manage and move data between classes, allowing specific data to be relocated based on compliance and governance controls you might have in place.

Bucket Policies are JSON policies assigned to individual buckets. These Bucket Policies can also define who or what has access to that bucket's contents, but they do not control versioning of objects within buckets.

 [/course/using-aws-storage-for-on-premise-backup/using-amazon-s3-as-a-data-backup-solution-1/](#)

#5

Which of the following Storage Gateway configurations can assist you in recovering data in your local application and storage layers when using Amazon Machine Image templates?



Cached volume gateways



Stored volume gateways



Virtual Tape Library



File gateways

Explanation

Store volume gateways allow you to back up lost local data when using AMI templates which you could provision as EC2 instances within AWS. You could then attach EBS volumes to these instances which could be created from the storage gateway volume snapshots which would be stored on S3 giving you access to your production data required. Your applications storage infrastructure could potentially be up and running again in a matter of minutes within a VPC with connectivity from your on-premise data center.

Cached volume gateways are configured with the result that the primary data storage is actually Amazon S3 rather than your own local storage solution.

Virtual Tape Library is essentially a cloud-based tape backup solution replacing physical components with virtual ones, so they would not be applicable in a situation where you were using AMIs to recover local data.

File gateways allow you to securely store your files as objects within S3. Using as a type of file share which allows you to mount on map drives to an S3 bucket as if the share was held locally on your own corporate network.

 [/course/using-aws-storage-for-on-premise-backup/using-aws-storage-gateway-for-on-premise-data-bkup-1/](#)

#6

When using Amazon Glacier's bulk retrieval option for petabytes, which of the following is correct?



Amazon Glacier takes 3-5 hours to retrieve data.



Amazon Glacier takes 1-5 minutes to retrieve data.




Amazon Glacier takes 5-12 hours to retrieve data.



Amazon Glacier 1 hour to retrieve data.

Explanation

Amazon Glacier is an extremely low-cost storage service that provides secure and durable storage for data archiving and backup. To keep costs low, Amazon Glacier is optimized for data that is infrequently accessed and for which retrieval times of several hours are suitable. The standard retrieval option, which is the default option, takes 3-5 hours to complete. The other options are expedited, which downloads a small amount of data (250 MB maximum) in 5 minutes, and bulk, which downloads large amounts of data (petabytes) in 5-12 hours.

 <https://docs.aws.amazon.com/amazonglacier/latest/dev/downloading-an-archive-two-steps.html#api-downloading-an-archive-two-steps-retrieval-options>

Covered in this lecture

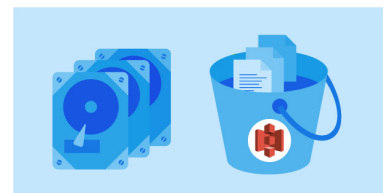
Storage Classes

Course:Storage Fundamentals for AWS

13m



#7



Amazon RDS offers read replicas. They also offer secondary databases through the multi-AZ configuration. What are two distinct differences between read replicas and secondary databases? (Choose 2 answers)



Read replicas can process read requests for the primary database. Secondary databases cannot.



Secondary databases can replace primary databases when they fail. Read replicas cannot.



Secondary bases can process write requests for the primary database. Read replicas cannot.



Secondary databases are designed to minimize data loss during failover. Read replicas are not.

#### Explanation

A secondary database's entire purpose is to minimize data loss when the primary database fails. They do not process any traffic - neither reads nor writes.

A read replica only processes read traffic for the primary database, not write traffic. It can be promoted to replace the primary database, if the primary fails. However, it will not minimize the data loss or potential service outage as effectively as a secondary database would.



[/course/using-rds-multi-az-read-replicas/rds-multi-az/](#)

#8

In which of the following circumstances will Amazon Aurora offer six-way replicated storage across three availability zones?



AWS provides this for all Aurora databases.



AWS provides this only for databases in regions with three availability zones. The storage availability will differ in a region with fewer zones.



AWS provides this when desired for a higher cost.

✗

AWS provides this level of storage availability depending on the compute layer selected

Explanation

Regardless of the compute layer setup - always provides 6 way replicated storage across 3 availability zones.

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Covered in this lecture

Amazon Aurora HA Options

Course:Amazon Aurora High Availability

6m



#9



Which of the following statements about DynamoDB Accelerator (DAX) is incorrect?

✓

DAX can process table operation requests, such as CreateTable or DeleteTable.

✗

Client write requests are written to DynamoDB first, and then DAX.

✗

Client read requests are directed to DAX first, and then DynamoDB.

✗


DAX nodes are located with VPC subnets, while standard DynamoDB endpoints are located outside the VPC.

Explanation

If a request received by DAX from your client is a read request, such as a GetItem, BatchGetItem, Query or Scan, then the DAX cluster will try and process the request if it has the data cached. If DAX does not have the request in its cache (a cache miss) then the request will be sent to DynamoDB for the results to be returned to the client. These results will also then be stored by DAX within its cache and distributed to the remaining read replicas in the DAX cluster.

With regards to any write requested made by the client, the data is first written to DynamoDB before it is written to the cache of the DAX cluster.

One final point I want to make is that DAX does not process any requests relating to table operations and management, for example, if you wanted to create, update or delete tables.

 [/course/using-amazon-dynamodb-accelerator-dax-to-enhance-performance/dynamodb-accelerator-dax/](#)  
Covered in this lecture

DynamoDB Accelerator (DAX)

Course: Using Amazon DynamoDB Accelerator (DAX) to Enhance Performance



6m



#10

In regards to disaster recovery, what is a recovery point objective (RPO)?



The time it takes after a disruption to restore a system to its service level.



It is the acceptable amount of data loss measured in time.



The time it takes to scale a functioning resource horizontally to adapt to increased demand.



The time it takes to scale a functioning resource vertically to adapt to increased demand.

Explanation

The recovery point objective (RPO) is the amount of acceptable data loss measured in time. For example, a transactional business cannot afford a great deal of data loss, so its RPO is likely less than one hour because an hour is a great expense in terms of data loss. However, for a more isolated website with minimal customer interaction, an RPO of a day may be acceptable because this represents a tolerable amount of data loss.



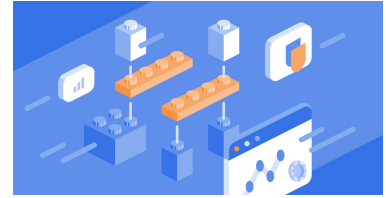
[https://d1.awsstatic.com/whitepapers/Storage/Backup\\_and\\_Recovery\\_Approaches\\_Using\\_AWS.pdf](https://d1.awsstatic.com/whitepapers/Storage/Backup_and_Recovery_Approaches_Using_AWS.pdf)



Covered in this lecture

Disaster Recovery

Course:Architecture Fundamentals of AWS for Cloud Practitioner



8m



#11

\_\_\_\_\_ improves upon high availability to offer a greater level of protection should components begin to fail in your infrastructure.



A service level agreement



Automation



Redundancy



Fault tolerance

Explanation

Let's look at fault tolerance, which expands on high availability to offer a greater level of protection should components begin to fail in your infrastructure. However, there are usually additional cost implications due to the greater level of resiliency offered.



[/course/difference-between-ha-ft-1269/](#)

#12

In regards to disaster recovery, what is the recovery time objective (RTO)?



The time it takes after a disruption to restore a system back to its desired service level.



The acceptable amount of data loss measured in time.



The time it takes to scale a functioning resource horizontally to adapt to increased demand.

✗

The time it takes to scale a functioning resource vertically to adapt to increased demand.

Explanation

The recovery time objective or RTO is the time it takes after a disruption to restore a system back to service level. Ideally, a business has established an official recovery procedure which ensures that the method of recovery allows the particular system to recover in a predetermined amount of time, and any lapse in service will have little to no negative effect on the business. AWS recommends multiple established methods of disaster recovery that balance cost with the time needed to re-establish service.

 <https://d1.awsstatic.com/whitepapers/aws-disaster-recovery.pdf>

#13

Which disaster recovery method generally has the highest RTO and RPO, but requires the least cost, in terms of resources, to restore service?

✓

Backup and restore

✗

Pilot light

✗

Warm standby

✗

Multi-site

Explanation

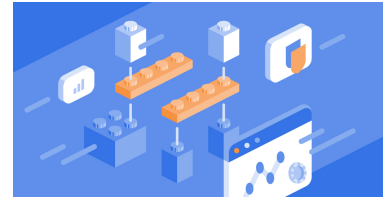
With the backup and restore method of recovery, data is backed up to an AWS storage service, such as Amazon S3. The data can be imported into AWS using a variety of options such as storage gateway, AWS Snowball (import/export), Direct Connect, VPN or the internet. In the event of a disaster, archives can be recovered from Amazon S3, and the data can then be restored directly to cloud resources. This method takes the longest time, but requires the least investment because it is essentially a system of archiving data consistently and retrieving it when needed. Aside from data transfer and storage, no complex applications or smaller version of your service needs to be kept running offsite.

 <https://d1.awsstatic.com/whitepapers/aws-disaster-recovery.pdf>

Covered in this lecture

Disaster Recovery

Course: Architecture Fundamentals of AWS for Cloud Practitioner



8m



#14

What is an AWS region?



A small group of AWS-managed data centers located relatively close together



A single physical data center hosting AWS virtual resources



A large data cache in a highly populated area that delivers CDN content



A large, defined geographic area that contains multiple availability zones.

Explanation

A region is a collection of availability zones that are geographically located close to one other. This is generally indicated by AZs within the same city. AWS has deployed them across the globe to allow its worldwide customer base to take advantage of low latency connections. Every Region will act independently of the others, and each will contain at least three Availability Zones.

The other answers describe an availability zone, a common misconception for an availability zone, and an edge location.

 </course/designing-failure-global-infrastructure-level-2948/designing-for-failure-at-the-global-infrastructure-level/>

#15

What is an AWS Availability Zone?



An isolated location that contains multiple AWS-managed data centers



An isolated location that contains a single AWS-managed data center



A single AWS-managed server that customers host on-premises



A large cache located in highly populated areas to deliver CDN content


Explanation

An availability zone is an isolated location containing multiple physical data centers located close together hosting AWS virtual resources.

An availability zone is often mistaken for a single physical data center hosting AWS virtual resources. A common misconception is that a single availability zone equals a single data center. This is not the case. Multiple data centers located close together can form a single availability zone.

AWS Outposts offers a single AWS-managed server that customers host on-premises.

An edge location is a cache in a highly populated area where AWS stores data for CDN services.

 [/course/designing-failure-global-infrastructure-level-2948/designing-for-failure-at-the-global-infrastructure-level/](#)  
#16

Which type of Amazon Aurora connection endpoint load balances connections across the read replica fleet within the cluster?



Cluster Endpoints



Custom Endpoints



Reader Endpoints



## Instance Endpoints

### Explanation

- **Cluster Endpoint:** The cluster endpoint points to the current master database instance. Using the Cluster endpoint allows your application to perform read and writes against the master instance.
- **Reader Endpoint:** The reader endpoint load balancers connections across the read replica fleet within the cluster.
- **Custom Endpoint:** A custom endpoint load balancer's connections across a set of cluster instances that you choose and register within the custom endpoint. Custom endpoints can be used to group instances based on instance size or maybe group them on a particular db parameter group. You can then dedicate the custom endpoint for a specific role or task within your organization - for example, you may have a requirement to generate month-end reports - therefore you connect to a custom endpoint that has been specifically set up for this task.
- **Instance Endpoint:** An instance endpoint maps directly to a cluster instance. Each and every cluster instance has its own instance endpoint. You can use an instance endpoint when you want fine-grained control over which instance you need to service your requests.



</course/amazon-aurora-high-availability/amazon-aurora-ha-options/>

Covered in this lecture

Amazon Aurora HA Options

Course: Amazon Aurora High Availability

6m



#17



What choice best describes how Amazon Aurora maintains current data between its master database and each database replica?



The master database sends updates to the replica databases using **synchronous replication**.



The master database sends updates to the replica databases using **asynchronous replication**.

✗

The master database sends updates to the replica databases using either **synchronous or asynchronous replication**, depending on the database configuration.

✓

The master database and the replicas share the same storage layer, **so no replication is needed**.

Explanation

The storage layer is presented to the compute layer as a single logical volume. This same single logical volume is shared across all compute instances involved in the compute layer whether it be a master or read replica - allowing the read replicas to accomplish the near-identical query performance as the master itself.

When compared with RDS - the management of data from a replication viewpoint is fundamentally different. With RDS data needs to be replicated from the master to each of its replicas. Aurora, on the other hand, has no need for replication since it uses and shares a single logical volume amongst all compute instances.

 [/course/amazon-aurora-high-availability/amazon-aurora-ha-options/](#)

Covered in this lecture

Aurora Single Master - Multiple Read Replicas DEMO

Course: Amazon Aurora High Availability

6m



#18



When considering the four general disaster recovery methods, which choice lists them in order from slowest to fastest based on the time required to reach their recovery time objective (RTO)?

✓

1. Backup and Restore
2. Pilot Light
3. Warm Standby
4. Multi-Site

✗

1. Pilot Light
2. Backup and Restore

3. Multi-Site
4. Warm Standby



1. Pilot Light
2. Warm Standby
3. Backup and Restore
4. Multi-Site



1. Multi-Site
2. Pilot Light
3. Warm Standby
4. Backup and Restore

### Explanation

The general DR scenarios listed by their estimated RTO in descending order is as follows:

1. Backup and Restore - this option has the highest RTO, but the generally lowest maintenance cost.
2. Pilot Light - this option has a lower RTO than Backup and Restore, but will be more expensive to maintain.
3. Warm Standby - this option keeps a scaled-down version of your complete environment on standby, so it has a lower RTO than Pilot Light, but is more expensive to maintain.
4. Multi-Site - this option keeps a copy of your production environment live at all times, so you can failover to it very quickly, but it is the most expensive DR choice of the four listed here.



</course/architecture-fundamentals-of-aws-for-cloud-practitioner/disaster-recovery-2/>

### Covered in this lecture

#### Introduction

Course:Architecture Fundamentals of AWS for Cloud Practitioner

3m



#19



How can AWS Snowball assist you in migrating on-premises data to S3 if the process will take more than a week using your existing connection?



By transferring data from S3 via a high-speed network connection



By compressing data on one device for transfer to S3 via a high-speed network connection



By using on-premises hardware that is then shipped to AWS for transfer to a Snowball device



By saving data to multiple AWS Snowball devices and shipping them to AWS for transfer to S3

Explanation

As a general rule, if your data retrieval will take longer than a week using your existing connection method, then you should consider using AWS Snowball. AWS snowball is a physical device shipped to you from AWS. It does not use Internet connections to migrate data to S3, and it is not a hard-drive component that you ship to AWS for data transfer to S3.



[/course/using-aws-storage-for-on-premise-backup/using-aws-snowball-for-data-transfer-1/](#)

#20

What is DynamoDB Accelerator (DAX)?



DAX is an in-memory cache designed to improve the read performance of your DynamoDB service.



DAX is a data stream analysis service that processes incoming data to your DynamoDB tables in real time.



DAX is a managed, high-performance computing (HPC) cluster designed to improve the write performance of your DynamoDB service.



DAX is a managed data backup service that minimizes data loss exponentially for your applications using DynamoDB tables.



## Explanation

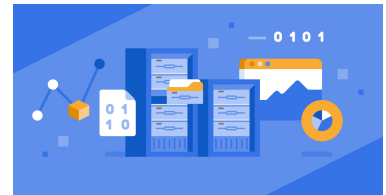
DAX is an in-memory cache delivering a significant performance enhancement, up to 10 times as fast as the default DynamoDB settings, allowing response times to decrease from milliseconds to microseconds. It is a fully managed feature offered by AWS and as a result, is also highly available.

[!\[\]\(919a2cb85b99741a73c0c31a427236a8\_img.jpg\) /course/using-amazon-dynamodb-accelerator-dax-to-enhance-performance/dynamodb-accelerator-dax/](#)

Covered in this lecture

DynamoDB Accelerator (DAX)

Course:Using Amazon DynamoDB Accelerator (DAX) to Enhance Performance



6m



#21

When using Amazon Glacier Flexible Retrieval's expedited retrieval option, which of the following is correct?



Amazon Glacier takes 3-5 hours to retrieve data.



Amazon Glacier takes 1-5 minutes to retrieve data.



Amazon Glacier takes 5-12 hours to retrieve data.



Amazon Glacier takes 1 hour to retrieve data.

## Explanation

Amazon Glacier is an extremely low-cost storage service that provides secure and durable storage for data archiving and backup. To keep costs low, Amazon Glacier is optimized for data that is infrequently accessed and for which retrieval times of several hours are suitable. The standard retrieval option, which is the default option, takes 3-5 hours to complete. The other options are expedited, which downloads a small amount of data (250 MB maximum) in 5 minutes, and bulk, which downloads large amounts of data (petabytes) in 5-12 hours.

<https://docs.aws.amazon.com/amazonglacier/latest/dev/downloading-an-archive-two-steps.html#api-downloading-an-archive-two-steps-retrieval-options>

Covered in this lecture

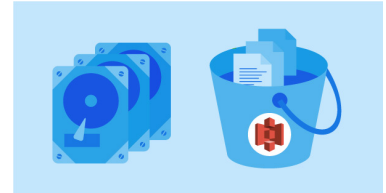
Storage Classes

Course:Storage Fundamentals for AWS

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#22



What is beneficial about deploying resources to multiple availability zones in AWS?



It gives you the ability to separate out your cost controls.



If one fails there is another still running.



Your app can be accessed anywhere in the world.



It reduces latency for customers on different continents.

Explanation

The nice thing about having two separate availability zones is that if there really ever is a problem with AWS and one of the availability zones go down, then you've got that connectivity going to each one and you're not gonna lose connectivity from those.

</course/managing-networking-at-scale-aviatrix/aviatrix-three/>

Covered in this lecture

Designing a Transitive VPC Architecture

Course:Managing Cloud Networking at Scale - Chalk Talk with Aviatrix

19m



#23



\_\_\_\_\_ can be defined as maintaining a percentage of uptime, which maintains operational performance.



Redundancy



A service level agreement



Fault tolerance



High availability

Explanation

High availability can be defined by maintaining a percentage of uptime, which maintains operational performance, and so this can closely be aligned to an SLA.

 [/course/difference-between-ha-ft-1269/](#)

#24

What are ideal uses for DynamoDB's on-demand backup feature?



During long-term auditing requirements



In case of table corruption



As part of a testing scenario



On-demand backups are ideal for each of these situations.

Explanation

On demand backups allow you to request a full backup of a table, as it is at the very moment the backup request is made. On demand backups are manually requested, and can be performed either through the AWS DynamoDB console or by using the AWS CLI.

On demand backups are useful in the following situations:

1. Table corruption - rare but possible
2. Long term regulatory, compliance, and/or auditing data requirements
3. Testing scenarios

[!\[\]\(2bdfe261b986065ee0ac76460d6528c9\_img.jpg\)/course/amazon-dynamodb-high-availability/on-demand-backup-and-restore/](#)

Covered in this lecture

On-Demand Backup and Restore

Course:Amazon DynamoDB High Availability

3m



#25



Which AWS disaster recovery method has the lowest RTO and RPO, but the highest cost required to maintain resources?



Backup and restore



Pilot light



Warm standby



Multi-site

Explanation

Multi-site is the quickest disaster recovery method, with minimal time to recover and minimal data loss, but with the highest overall cost in comparison to backup and restore, pilot light or warm standby methods. This method is ideal for highly transactional online businesses, whose potential losses in terms of revenue and reputation far outweigh any costs required to maintain a duplicate production environment in a separate AWS region.



[https://d1.awsstatic.com/whitepapers/Storage/Backup\\_and\\_Recovery\\_Approaches\\_Using\\_AWS.pdf](https://d1.awsstatic.com/whitepapers/Storage/Backup_and_Recovery_Approaches_Using_AWS.pdf)

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## Course Summary

### Course:Architecture Fundamentals of AWS for Cloud Practitioner

7m

