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EXAM PROFESSIONAL DATA ENGINEER TOPIC 1 QUESTION 241 DISCUSSION

Actual exam question from Google's Professional Data Engineer

Question #: 241

Topic #: 1

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You are designing the architecture of your application to store data in Cloud Storage. Your application consists of pipelines that read data from a Cloud Storage bucket that contains raw data, and write the data to a second bucket after processing. You want to design an architecture with Cloud Storage resources that are capable of being resilient if a Google Cloud regional failure occurs. You want to minimize the recovery point objective (RPO) if a failure occurs, with no impact on applications that use the stored data. What should you do?

- A. Adopt multi-regional Cloud Storage buckets in your architecture.
- B. Adopt two regional Cloud Storage buckets, and update your application to write the output on both buckets.
- C. Adopt a dual-region Cloud Storage bucket, and enable turbo replication in your architecture.
- D. Adopt two regional Cloud Storage buckets, and create a daily task to copy from one bucket to the other.

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by [scaenry](#) at Jan. 3, 2024, 2:06 p.m.

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 **raaad** Highly Voted 1 year, 4 months ago

Selected Answer: C

- Dual-region buckets are a specific type of storage that automatically replicates data between two geographically distinct regions.
- Turbo replication is an enhanced feature that provides faster replication between the two regions, thus minimizing RPO.
- This option ensures that your data is resilient to regional failures and is replicated quickly, meeting the needs for low RPO and no impact on application performance.

   upvoted 12 times

 **CGS22** Highly Voted 1 year ago

Selected Answer: A

A. Adopt multi-regional Cloud Storage buckets in your architecture.

Why A is the best choice:

Automatic Cross-Region Replication: Multi-regional buckets automatically replicate data across multiple geographically separated regions within a selected multi-region location (e.g., us). This ensures data redundancy and availability even if one region experiences an outage.

Minimal RPO: Data written to a multi-regional bucket is synchronously replicated to at least two regions. This means that in the event of a regional failure, the RPO is essentially zero, as the data is already available in other regions.

No Application Changes: Applications can continue reading and writing data to the multi-regional bucket without any modifications, as the cross-region replication is handled transparently by Cloud Storage

   upvoted 5 times

 **mdell** 4 months, 2 weeks ago

Minimal yet, but not minimized as stated in the question. That's why C is correct.

Turbo replication provides faster redundancy across regions for data in your dual-region buckets, which reduces the risk of data loss exposure and helps support uninterrupted service following a regional outage. When enabled, turbo replication is designed to replicate 100% of newly written objects to the two regions that constitute a dual-region within the recovery point objective of 15 minutes, regardless of object size.

Note that even for default replication, most objects finish replication within minutes.

<https://cloud.google.com/storage/docs/availability-durability#turbo-replication>

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 **petulda** Most Recent 5 months, 1 week ago

Why not A

<https://cloud.google.com/storage/docs/locations>

multi regional location has cross region redundancy

   upvoted 1 times

 **petulda** 5 months, 1 week ago

Sorry, it is about minimizing RPO, where Turbo replication is a factor..

   upvoted 1 times

 **hanoverquay** 1 year, 1 month ago

Selected Answer: C

vote c

   upvoted 2 times

 **ricardovazz** 1 year, 1 month ago

Selected Answer: C

<https://cloud.google.com/storage/docs/availability-durability#turbo-replication>

"Default replication in Cloud Storage is designed to provide redundancy across regions for 99.9% of newly written objects within a target of one hour and 100% of newly written objects within a target of 12 hours"

"When enabled, turbo replication is designed to replicate 100% of newly written objects to both regions that constitute the dual-region within the recovery point objective of 15 minutes, regardless of object size."

Thus, since they want to minimize RPO, should use turbo replication

   upvoted 3 times

 **JyoGCP** 1 year, 2 months ago

Selected Answer: C

Option C

   upvoted 2 times

 **Matt 108** 1 year, 3 months ago

 **matt_100** 1 year, 5 months ago

Selected Answer: C

Option C: <https://cloud.google.com/storage/docs/dual-regions> + <https://cloud.google.com/storage/docs/managing-turbo-replication>

   upvoted 5 times

 **therealsohail** 1 year, 4 months ago

Selected Answer: C

Turbo replication provides faster redundancy across regions for data in your dual-region buckets, which reduces the risk of data loss exposure and helps support uninterrupted service following a regional outage.

   upvoted 5 times

 **scaenrui** 1 year, 4 months ago

Selected Answer: A


A. Adopt multi-regional Cloud Storage buckets in your architecture.

   upvoted 2 times

 **datapassionate** 1 year, 3 months ago

It wont be a correct answer. Correct is C. It is required "no impact on applications that use the stored data"

   upvoted 3 times

 **ashdam** 1 year, 2 months ago

But multi-region is completely transparent for the application if one fails. it would need to fail all EU or US regions. I dont undertand why multi-region would have impact on that

   upvoted 1 times

 **datapassionate** 1 year, 3 months ago

Whereas with multi-region " it can also introduce unpredictable latency into the response time and higher network egress charges for cloud workloads when multi-region data is read from remote regions"
<https://cloud.google.com/blog/products/storage-data-transfer/choose-between-regional-dual-region-and-multi-region-cloud-storage>

   upvoted 4 times

 **ashdam** 1 year, 2 months ago

There is no requirment on latency, just RPO which it would be 0 since multi-region.

   upvoted 2 times



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