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USERS PROGRAM

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Core Compete

Abstract

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Backups are an important part of any application, and the ability to recover quickly with the least data loss is critical. In this e-poster, we will discuss how to use cloud-native options for back up and restore for SAS® Viya® using SAS Backup Manager, command-line interface (CLI), and the different cloud offerings. We will also discuss the considerations before deployment and installation to recover SAS Viya using these cloud-native features. We have performed multiple backups and restore exercises across Amazon Web Services (AWS), Google Cloud Platorm (GCP), and Microsoft Azure.

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Introduction

This presentation is useful for SAS architects to design a well-architected environment of SAS® Viya on cloud and, in turn, have a robust system of backup and restore for SAS® Viya. We will be discussing cloud-based features, so you should have an understanding of different cloud offerings from different providers.

Objective

Explore Backup and Restore on GCP, AWS, and Azure. We will explore each cloud provider one by one in the next slides and how their services can help with different SAS Viya deployments with pros and cons.

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Scenarios

We have worked with both Single-machine deployment and Distributed deployment of SAS Viya and performed both binary and default backups and restores for these deployments using the CLI and SAS Backup Manager application. We have used RHEL as the OS and SAS Viya 3.4 software.

We will explain the cloud storage options that are to be used for the following, taking into consideration retention period, recovery point objective (RPO), recovery time objective (RTO), encryption, and costs.

- Local vault
- Shared vault
- Alternate shared vault

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Storage Options

CLOUD FILESTORE

- Filestore is an NFS fileshare
- Filestore has zonal redundancy.
- Filestore can be made available across regions.
- Data is encrypted by default but no CMEK, hence not suitable for Financial clients.

Zonal persistent disks and SSDs

- Performance is predictable and scales linearly with an increase in disk size.
- Disks support all types of encryption.
- Disks represent single point of failure.

GCS Fuse

- An open-source fuse adapter that allows users to mount google cloud buckets as filesystems on Linux or MacOS.
- Encryption supports CMEK.
- Pricing is as per google cloud storage access.
- Authorization is governed by cloud storage permissions.
- Fuse is an open-source adapter and not supported by Google officially.
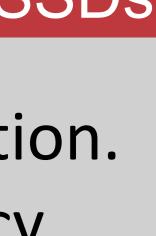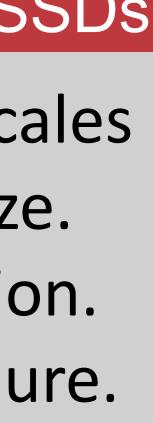
Regional persistent disks and SSDs

- Disks support all types of encryption.
- GCP provides regional redundancy.

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Storage Options

Elastic File Storage (EFS)

- EFS is an NFS fileshare
- EFS has zonal redundancy.
- EFS can be made available across regions.
- All types of data encryptions are available even CMEK.

S3 Fuse

- An open-source fuse adapter allows users to mount S3 buckets as filesystems Linux or MacOS.
- Fuse supports encryption of data.
- Authorization is governed by IAM permissions.
- Multiple edits are not available for S3 Fuse.

Zonal persistent disks and SSDs

- Performance is predictable and scales linearly with an increase in disk size.
- Disks support all types of encryption.
- Disks represent a single point of failure.

Regional persistent disks and SSDs

- Disks support all types of encryption.
- AWS provides regional redundancy.

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Fileshare

- Azure Fileshare is an NFS fileshare
- Fileshare has zonal redundancy.
- Fileshare can be made available across regions. It is useful for alternate backups and restore, when you have blue- green environments of SAS Viya.
- All types of data encryptions are available even CMEK.

Azure Managed Disks HDDs and SSDs

- Performance is predictable and scales linearly with an increase in disk size.
- Disks support all types of encryption.
- Both Local redundancy and Zonal redundancy are available.

BLOB

- Encryptions are available for BLOB storage.
- SAS backups can be later moved to BLOB storage to reduce the cost for the environment.

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Conclusion

We suggest the following approaches for each cloud vendor:

- GCP :

For alternate vault and shared vault, Cloud Filestore, is our preferred solution, assuming there is no need for CMEK. For retention of backups, using cloud storage buckets (GCS Fuse) helps in reducing overhead costs for the entire environment. SSD persistent disk is optimal for the local vault. SSD is not recommended to use as shared vault/alternate shared vault, SSD persistent disk represents a single point of failure.

- AWS:

EFS is the preferred option for shared and alternate backups. For cost optimizations, backup files can be retained for the long term in S3 buckets through fuse option. Zonal and regional persistent disks can be used for the local vault. Considering costs, performance and point of failures we suggest not using persistent disks for alternate vault/shared vault.

- Azure:

Azure Fileshare is the preferred option for shared vault and alternate shared vault. They come with both Azure managed and Customer managed encryption keys. Blob services can be used for retaining backups in the long term. Azure managed HDDs and SSDs can be used for the local vault.

References

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