Restoring from EBS Snapshots

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Overview

Globomantics needs point-in-time backups for their TEST environment

Introducing EBS snapshots

- Understanding how it works
- The use cases

Creating, copying, and deleting EBS snapshots

Restoring from an EBS snapshot

Automating EBS snapshots with Amazon Data Lifecycle Manager (DLM)

Demo: Working with EBS snapshots

Summary

Globomantics' Disaster Recovery Requirements

Automatically take regular point-in-time backups from EBS volumes and save on AWS S3

The backups should be optimized to take the least S3 storage possible

Should be able to use AWS Console as well as AWS CLI/PowerShell to automate the backup and restore process

Encrypt for data at rest for the backup files

Introducing EBS Snapshots

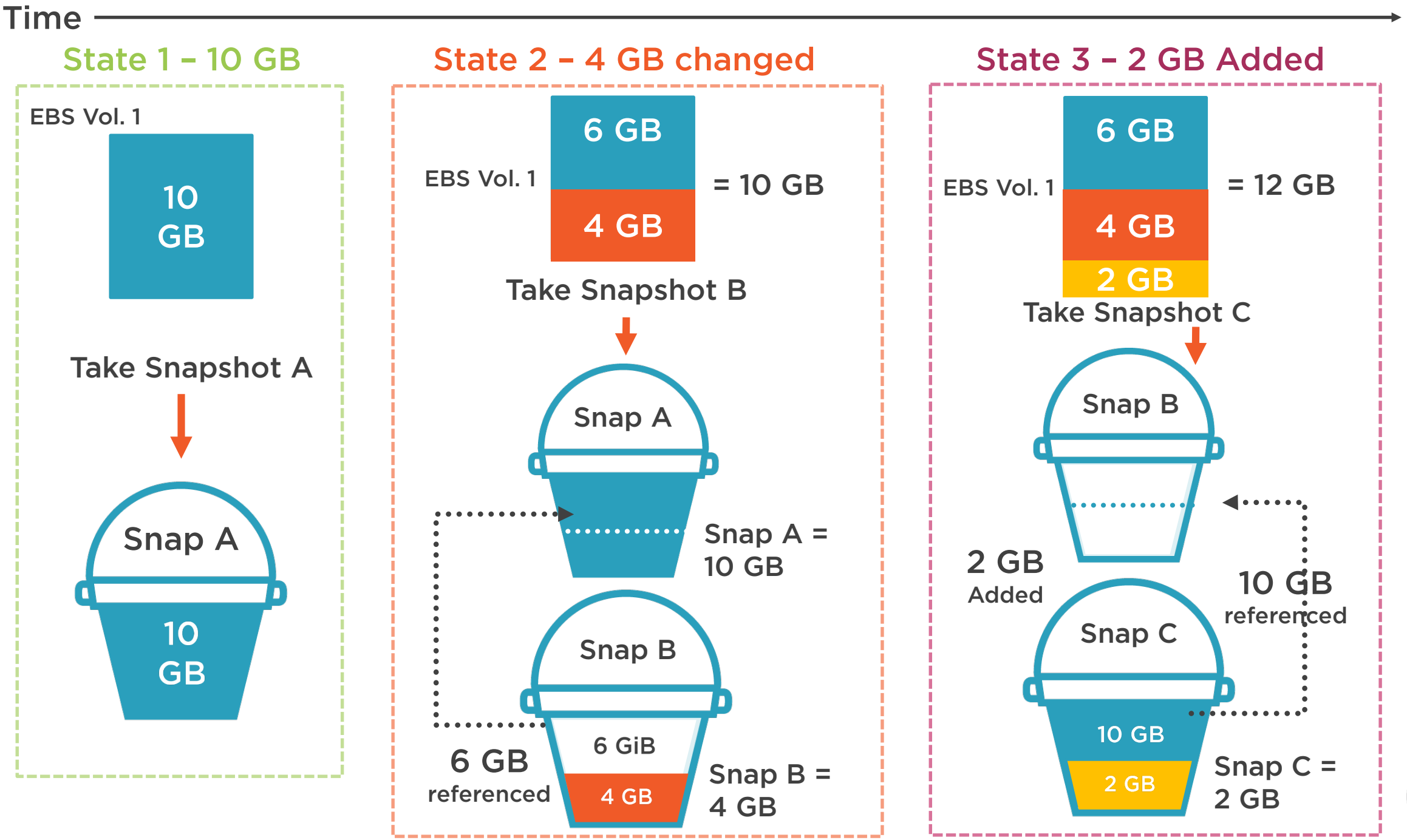
EBS Snapshots

You can back up your Amazon EBS volumes to Amazon S3 by taking point-in-time snapshots

Snapshots are incremental, only the changed blocks after your most recent snapshot are saved

Deleting a snapshot, only removes the data unique to that snapshot , does not effect the next ones

Can be managed using AWS Console, AWS CLI and PowerShell


Time
State 1 – 10 GB
EBS Vol. 1
10 GB
Take Snapshot A
Snap A
10 GB
State 2 – 4 GB changed
EBS Vol. 1
6 GB
4 GB
= 10 GB
Take Snapshot B
Snap A
Snap A = 10 GB
Snap B
6 GiB
4 GB
6 GB referenced
Snap B = 4 GB
State 3 – 2 GB Added
EBS Vol. 1
6 GB
4 GB
2 GB
= 12 GB
Take Snapshot C
Snap B
2 GB Added
10 GB referenced
Snap C
10 GB
2 GB
Snap C = 2 GB

EBS Snapshots Use Cases

Disaster Recovery

Restore your EBS volumes to a desired point in the past using snapshots

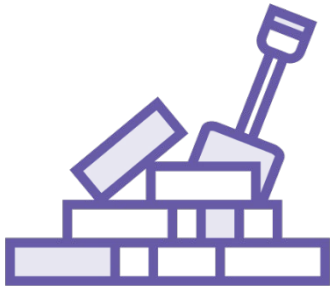
High Availability

Copy EBS snapshots across availability zones and regions to achieve high availability

Encryption

Encrypt existing EBS volumes by creating encrypted snapshots from them

Working with EBS Snapshots



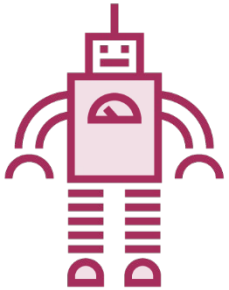
Creating snapshots

Copying snapshots

Restoring snapshots

Deleting snapshots

Encrypting snapshots



Automating snapshots

Creating EBS Snapshots

Snapshots occur asynchronously; it is created immediately, the status is *pending* until the snapshot is complete

While completing, an in-progress snapshot is not affected by ongoing volume reads and writes

Can take several hours for initial snapshots or snapshots where many blocks were changed

Limit for pending snapshots (e.g. 5 for a single gp2) *ConcurrentSnapshotLimitExceeded*

To make snapshot management easier, you can tag your snapshots during creation

Creating EBS Snapshots

Root EBS Volumes

Stop the instance before taking the snapshot

Data EBS Volumes

Unmount volume, issue the snapshot command, then remount. Remount is OK while the snapshot is pending

Copying EBS Snapshots

You can make copies of your own snapshots as well as snapshots that have been shared with you

You can copy snapshots across regions to use multiple regions for geographical expansion

Only when the snapshot status is *completed*, you can copy it

User-defined tags are not copied from the source snapshot to the new snapshot

Restoring EBS Snapshots

You can restore an Amazon EBS volume from a snapshot; you need the ID of the snapshot and access permissions for the snapshot

New volumes created from existing EBS snapshots load lazily in the background

EBS volumes restored from encrypted snapshots are automatically encrypted, encrypted volumes can only be attached to selected instance types

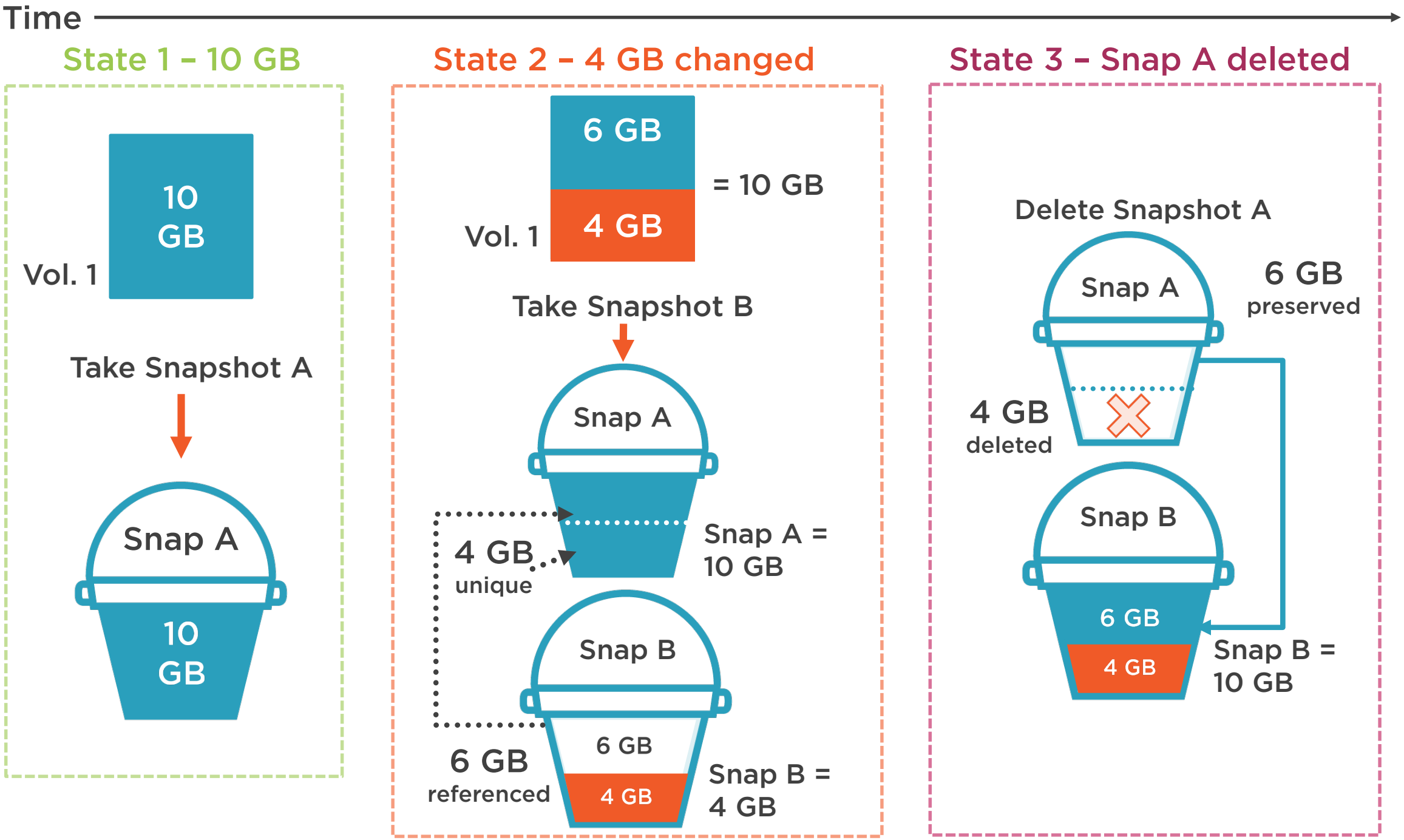
Storage blocks on volumes restored from snapshots must be initialized, performance is restored after the data is accessed once

Deleting EBS Snapshots

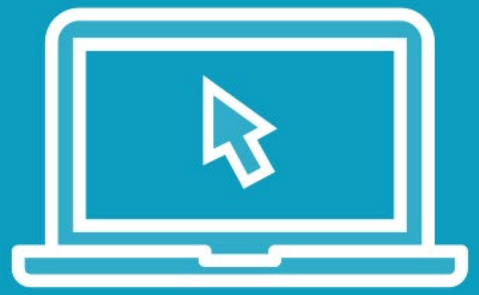
Snapshots can be deleted to save AWS S3 storage costs

Deleting an snapshot does not affect the depending snapshots or original volume

Deleting a snapshot might not reduce your organization's storage costs


Time
State 1 – 10 GB
Vol. 1
10 GB
Take Snapshot A
Snap A
10 GB
State 2 – 4 GB changed
6 GB
4 GB
Vol. 1
= 10 GB
Take Snapshot B
Snap A
4 GB
unique
Snap A = 10 GB
Snap B
6 GB
4 GB
6 GB
referenced
Snap B = 4 GB
State 3 – Snap A deleted
Delete Snapshot A
Snap A
6 GB
preserved
4 GB
deleted
Snap B
6 GB
4 GB
Snap B = 10 GB

Demo



Create EBS snapshots from *Globomantics* TEST machine

Manage EBS snapshots (copy, delete)

Restoring EBS snapshots to a new EBS volume

Installing AWS CLI on Windows

Managing EBS snapshots using AWS CLI

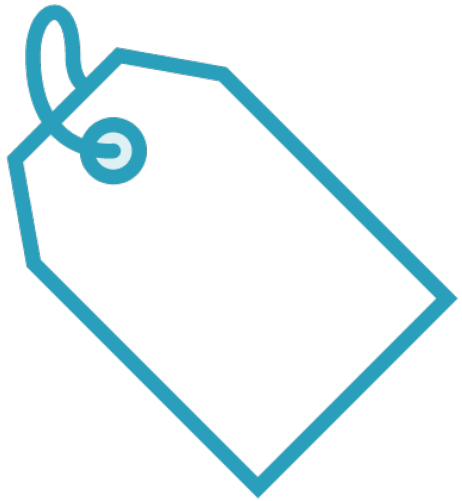
Amazon Data Lifecycle Manager (DLM)

Amazon Data Lifecycle Manager (DLM)

"Amazon Data Lifecycle Manager (DLM) for EBS Snapshots provides a simple, automated way to back up data stored on Amazon EBS volumes."

- Amazon

Configuring DLM for EBS Snapshots



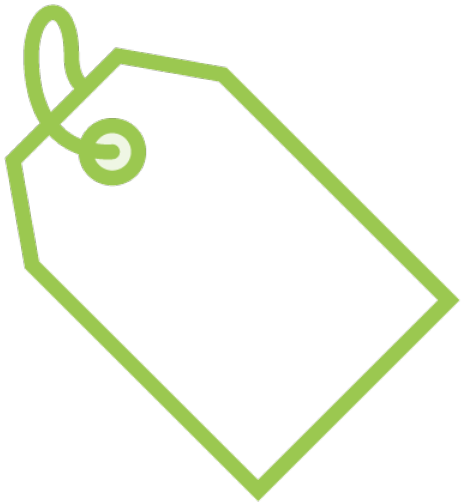
**To get started,
tag your EBS volumes**

**Start creating lifecycle policies via
Amazon Data Lifecycle Manager**

DLM Lifecycle Policy Core Settings

Resource type

The AWS resource managed by the policy (EBS volumes)



Target tag

The tag associated with an EBS volume for it to be managed by the policy

Schedule

How often to create snapshots and the number of snapshots to keep

DLM Considerations

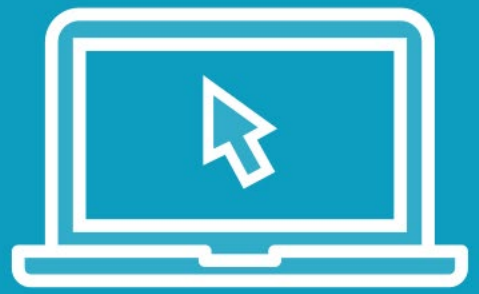
A policy does not begin creating snapshots until you set its activation status to *enabled*

Snapshots “begin” to be created by a policy within *one hour* following the specified start time

You can create multiple policies to back up an EBS volume, as long as each policy targets a unique tag on the volume; tags cannot be reused

When you copy a snapshot created by a policy, the retention schedule is not carried over to the copy

Demo



Helping *Globomantics* to regularly create point-in-time backups from its EBS volumes using AWS DLM

Summary

How EBS snapshots work, the use cases

Creating, copying, and deleting EBS snapshots

Restoring from an EBS snapshot

Automating EBS snapshots with Amazon Data Lifecycle Manager (DLM)

Demo: Working with EBS snapshots using AWS Console and AWS CLI