AWS re:Invent

NOV. 29 – DEC. 3, 2021 | LAS VEGAS, NV

STG215

Protect data and lower costs with EBS Snapshots

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Agenda

Intro to Amazon EBS Snapshots

What’s new with Snapshots

EBS direct APIs

Amazon Data Lifecycle Manager

Snapshots and AWS Outposts

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Data services

- AWS Backup
- Amazon EBS Snapshots
- Amazon EBS DLM
- AWS Transfer Family
- Amazon S3 Storage Lens
- Amazon S3 Lifecycle
- Replication
- S3 Object Lambda

Object

Amazon S3 and S3 Glacier

Block

Amazon EBS

File

Amazon FSx Family

Amazon EFS

Hybrid/edge storage

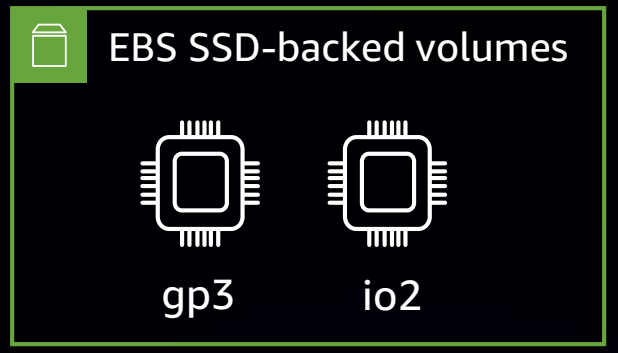
Data movement services

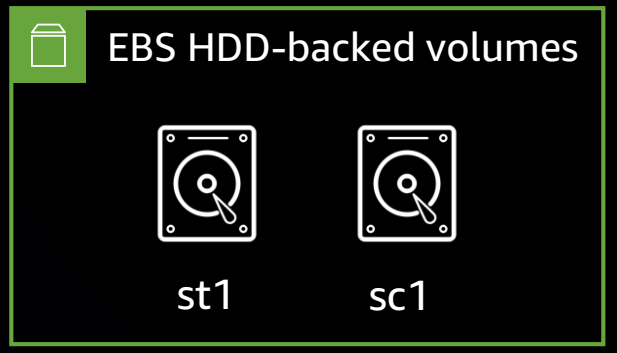
- AWS DataSync
- AWS Storage Gateway
- AWS Snow Family
- AWS Outposts

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AWS block storage offerings

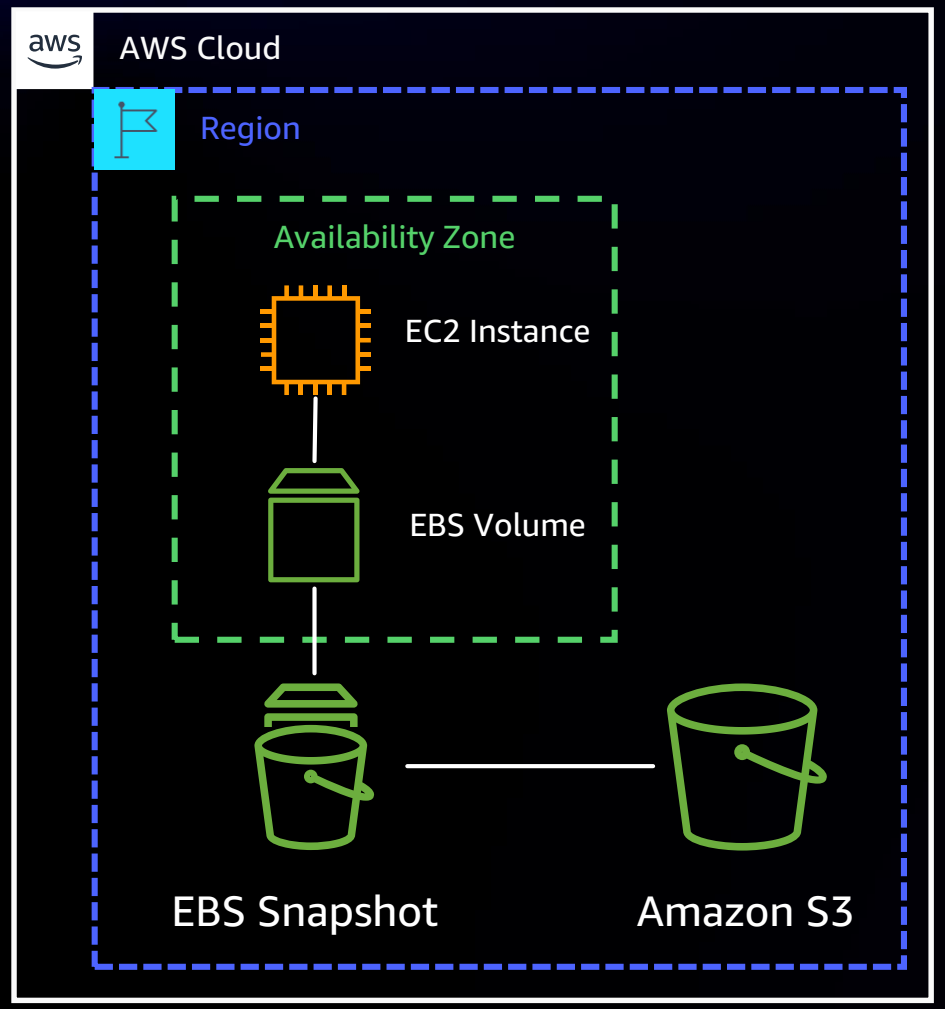






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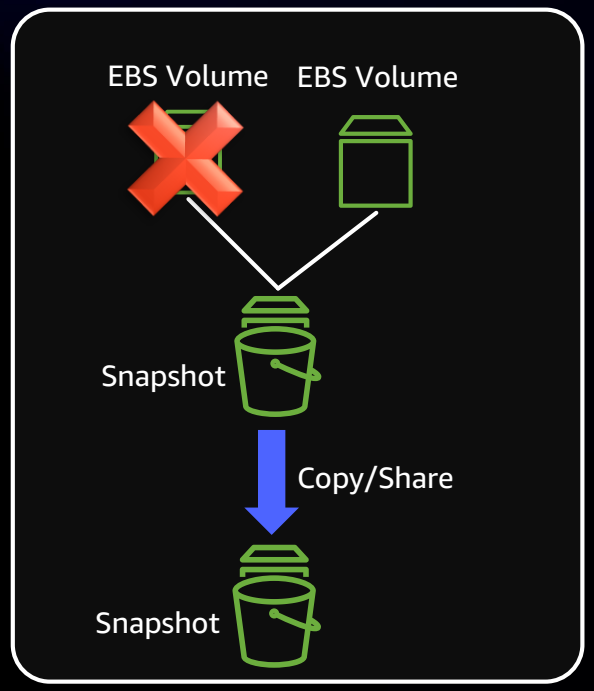
What are Amazon EBS Snapshots?



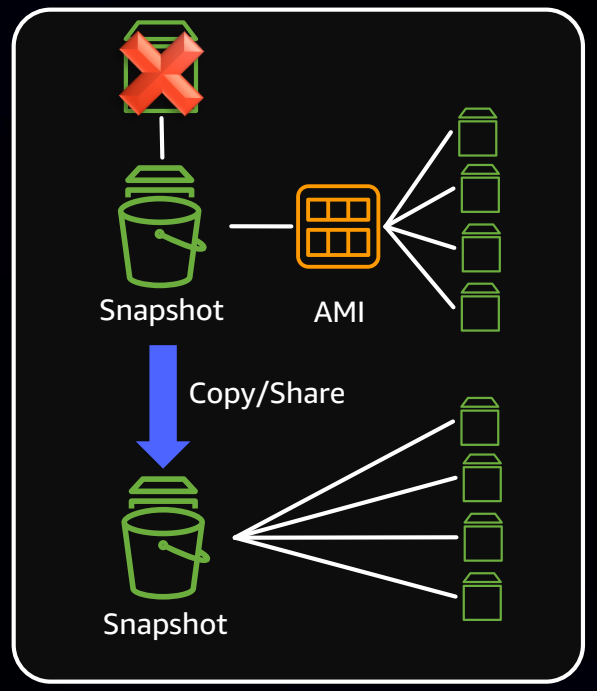
- Point-in-time backups of EBS Volumes
- Stored on Amazon S3
- Properties:
  - Incremental – only changed blocks stored
  - Crash consistent – completed I/Os persisted in next snapshot
  - Can be shared and copied across accounts and Regions

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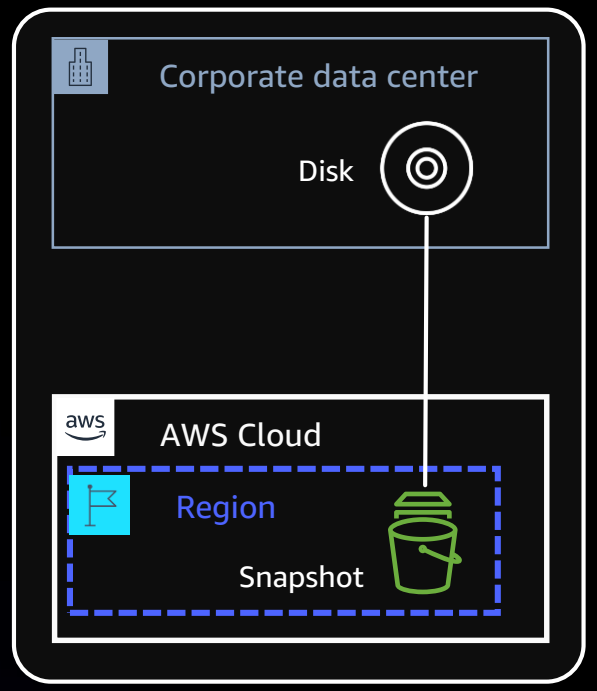
How are Snapshots used?



EBS Backup and Disaster Recovery



Refresh, scale-up, data handoff workflows



Non-EBS Backup and Migration

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Thank you, EBS Snapshots customers and partners

































































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Snapshots Basics

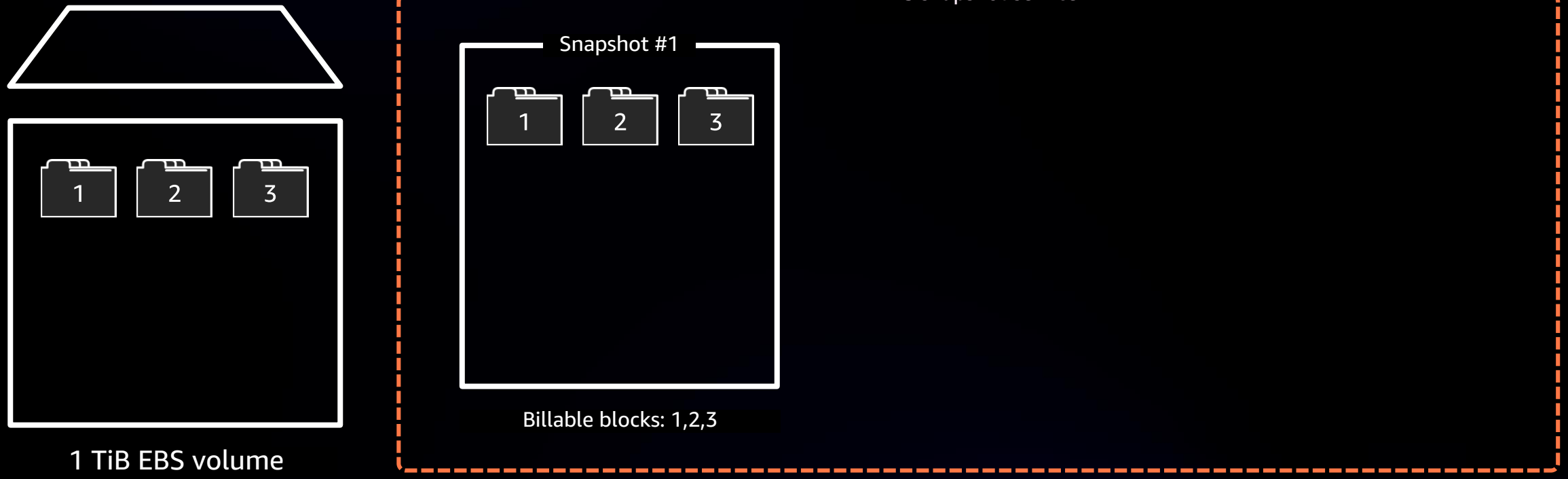
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How does an EBS snapshot work?



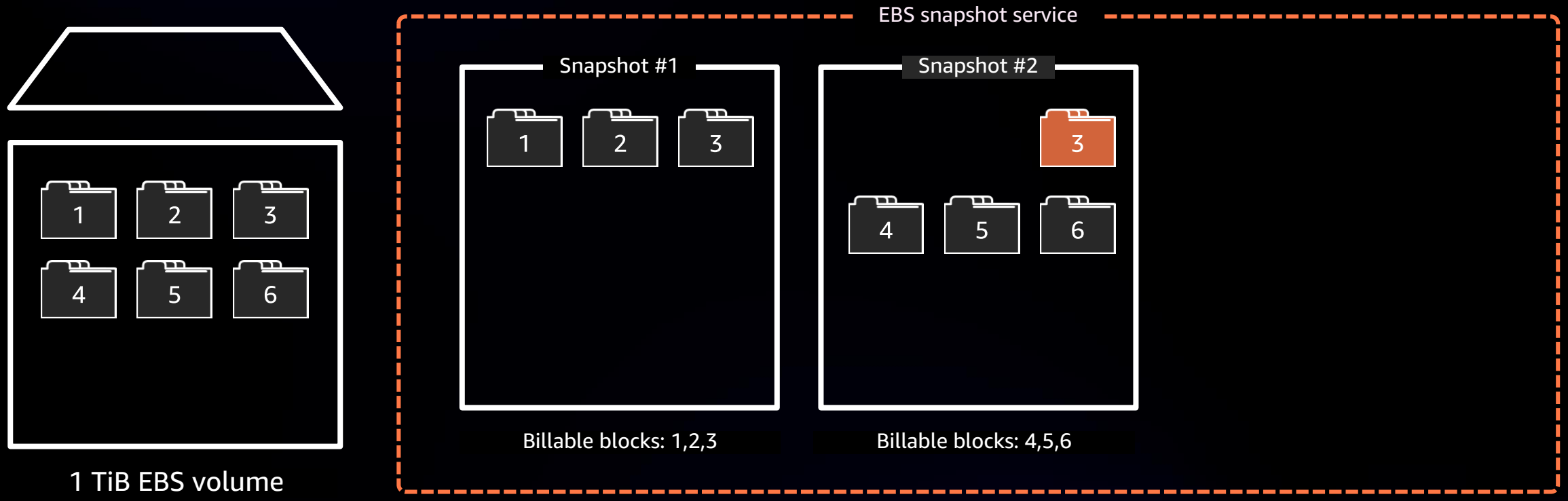
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How does an EBS snapshot work?



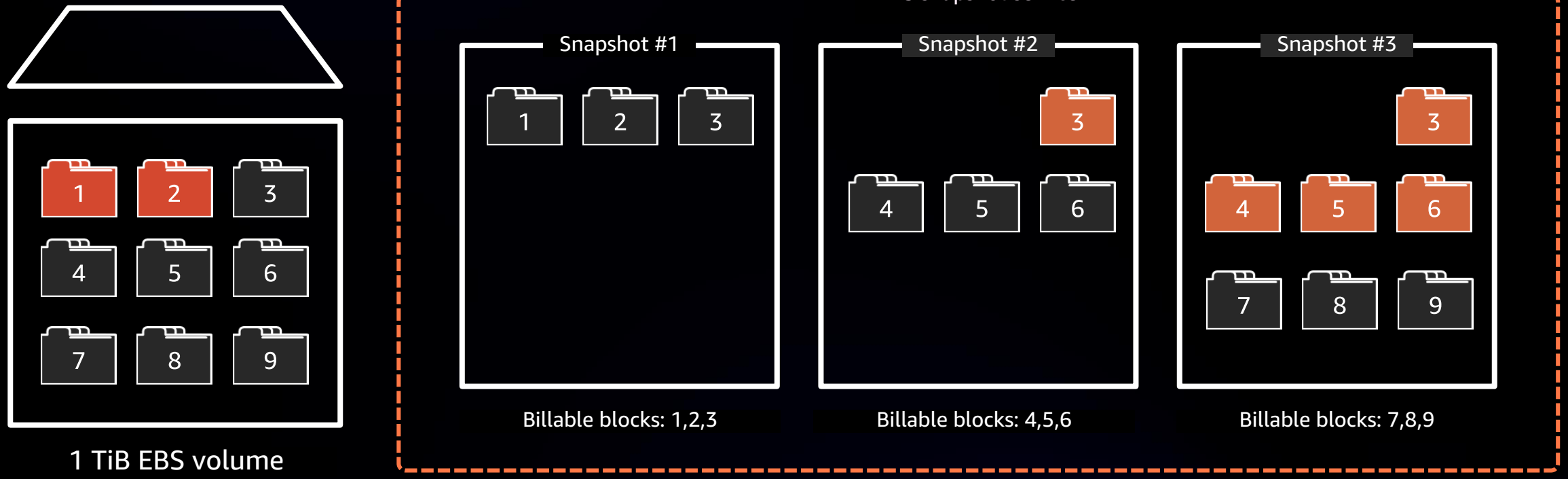
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How does an EBS snapshot work?



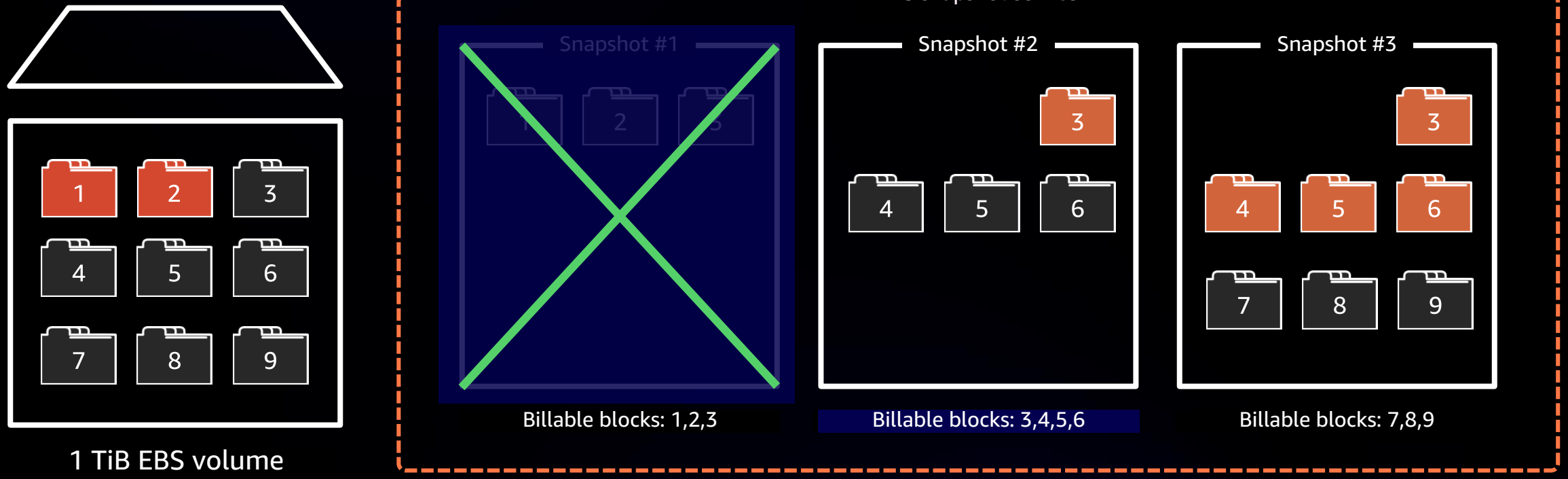
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How does an EBS snapshot work?



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How does an EBS snapshot work?



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Key things to remember

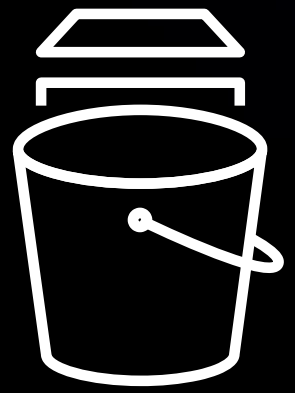
- Every EBS Snapshot functions as a full point-in-time backup
- EBS Snapshots are stored incrementally
- EBS Snapshots are charged only for storage written

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Consistency of Snapshots

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EBS Snapshots are crash consistent



Crash consistency

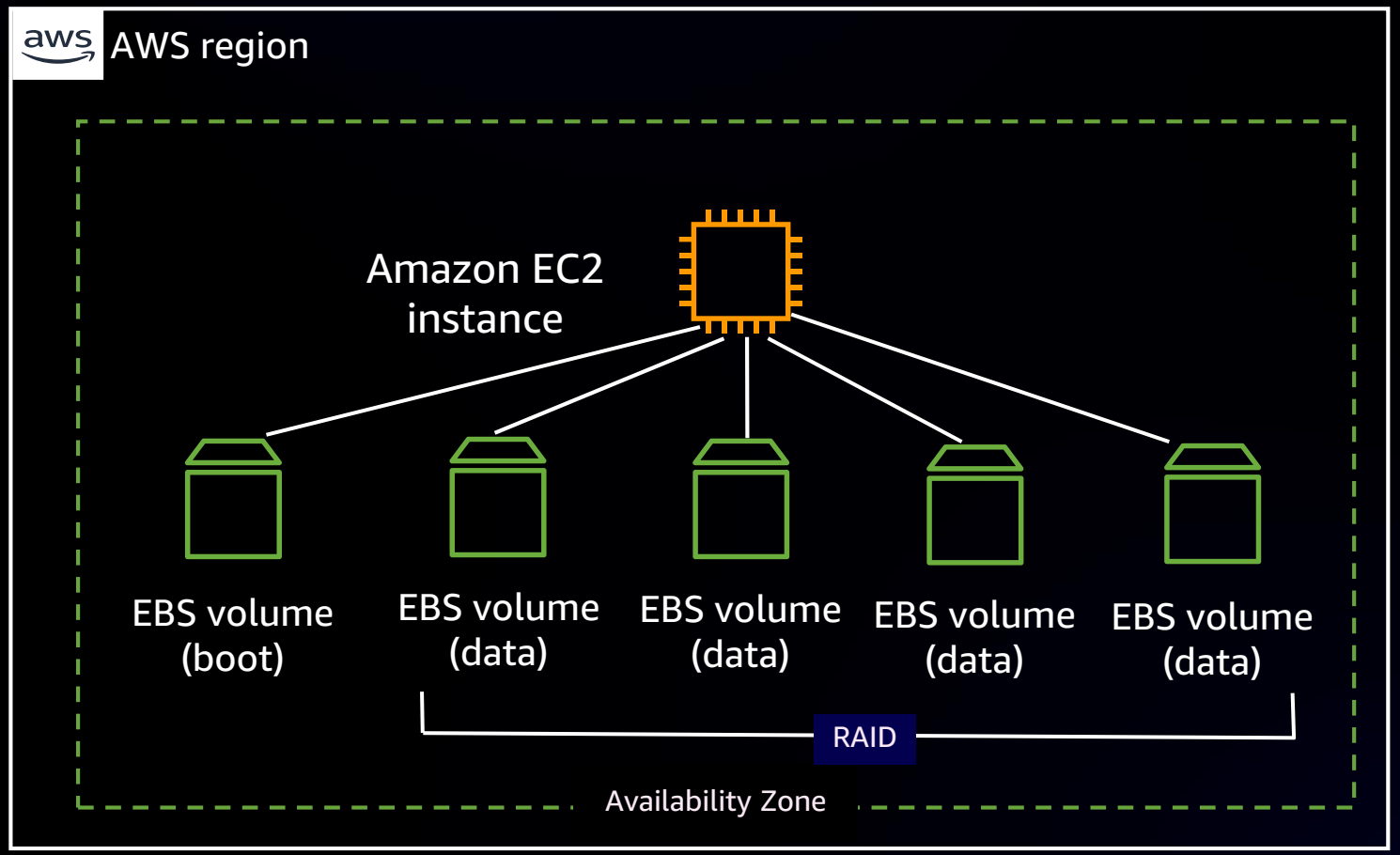
- Snapshots will contain the blocks of completed I/O operations
- Data not flushed to disk does not exist in the snapshot
- Similar to pulling the power cord of a server

Application consistency

- Application data is flushed to disk prior to snapshot creation
- New writes to application(s) are halted during the snapshot creation process
- Unfreeze/unlock as soon as snapshot creation command is successfully completed

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EBS multi-volume crash-consistent snapshots



One instance can have many volumes attached

Volumes attach to one instance

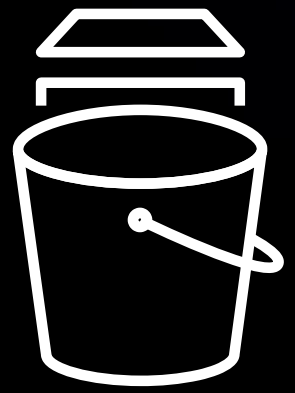
Best practice

- Separate boot and data volumes
- Snapshot regularly

https://docs.aws.amazon.com/cli/latest/reference/ec2/create-snapshots.html

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VSS support with AWS Systems Manager



Systems Manager + VSS

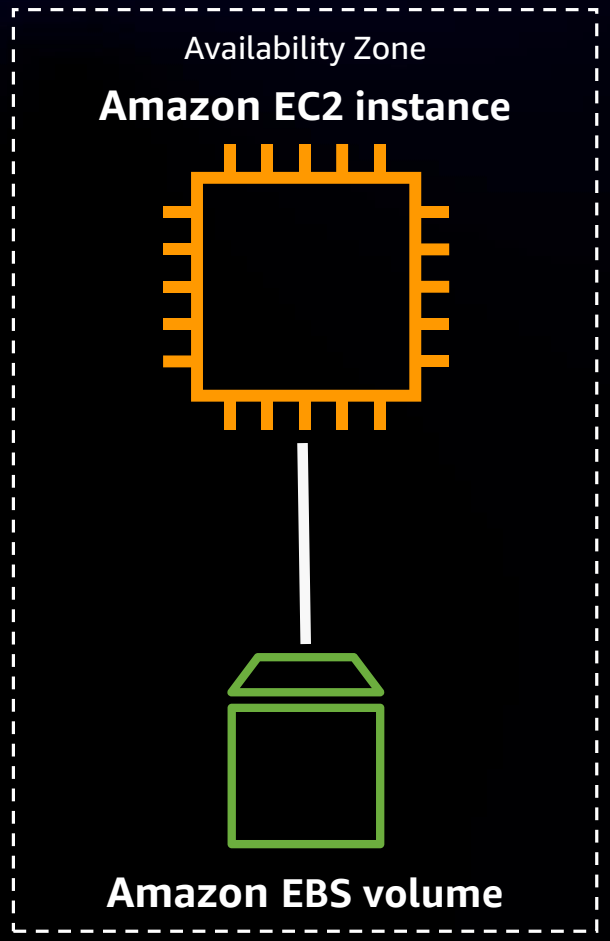
- VSS manages disk operations, such as file writes, when a backup is in progress
- VSS-enabled snapshots of Amazon EBS volumes are available through Amazon EC2 Systems Manager Run command
- With VSS, you don’t need to use application-specific backup solutions, such as native SQL backup, or develop and maintain custom scripts

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EBS Snapshot Encryption

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Encryption – Amazon EBS



- Integrates with AWS Key Management Service (AWS KMS) – AES-256 encryption
- Uses customer-managed keys (CMKs)
- Encrypted EBS volume implies the following are encrypted
  - Data at rest inside the volume
  - Data moving between the volume and instance
  - Snapshots created from the volume
  - Volumes created from such snapshots

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Amazon EBS snapshot encryption



- Snapshots of encrypted volumes are automatically encrypted
- Volumes created from encrypted snapshots are automatically encrypted
- You can encrypt an unencrypted snapshot when you copy a snapshot
- You can re-encrypt a snapshot you own with a different key when you copy a snapshot

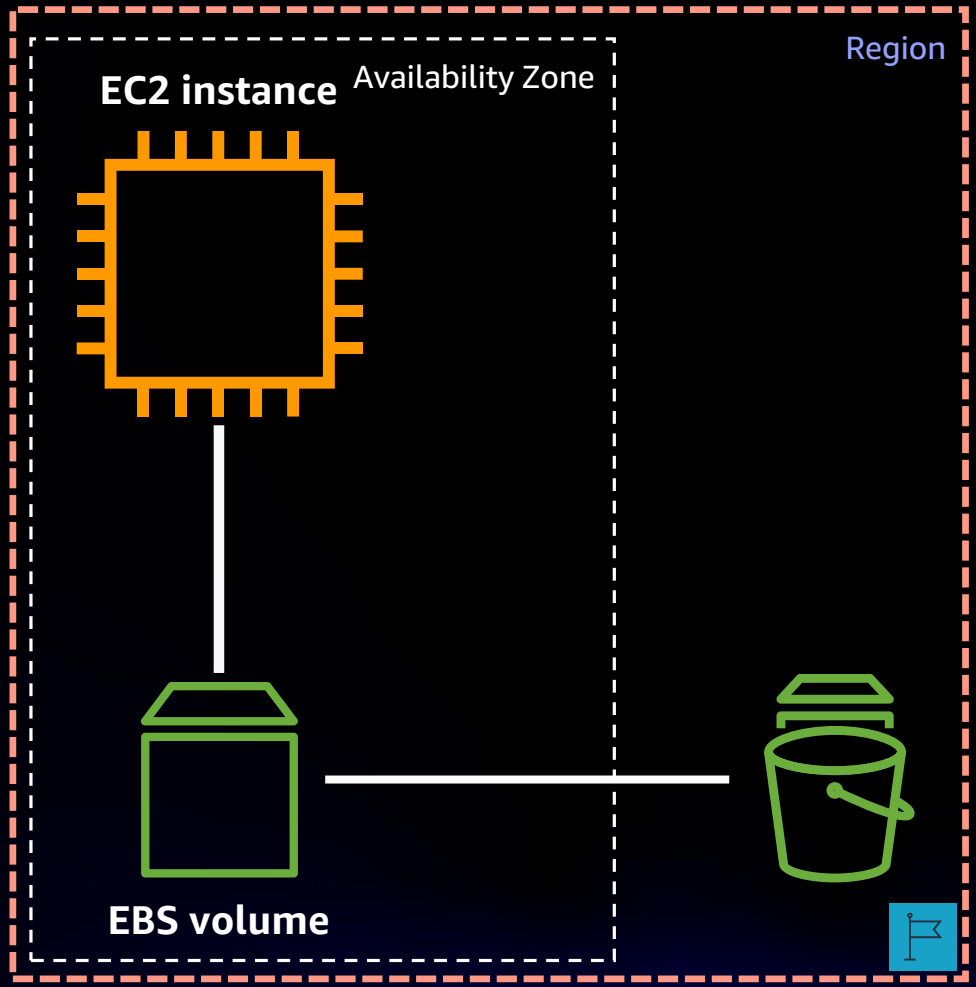
https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/EBSEncryption.html

aws

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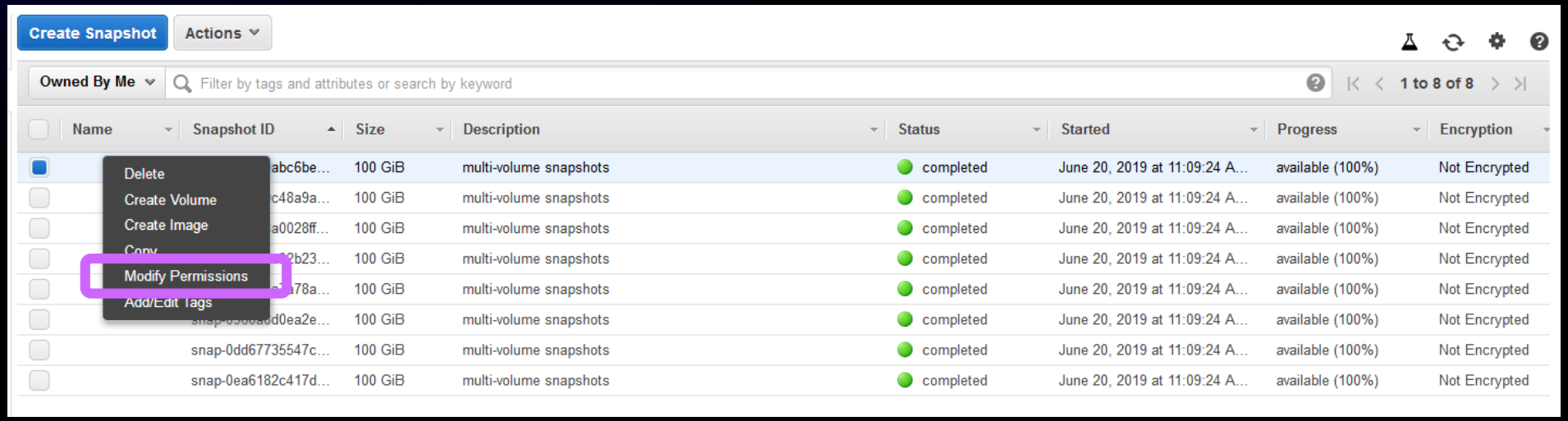
Snapshots different from EBS volumes

- Shared across accounts
- Copied across accounts
- Copied within accounts
- Copied across Regions
- Create AMIs



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Sharing Snapshots and AMIs



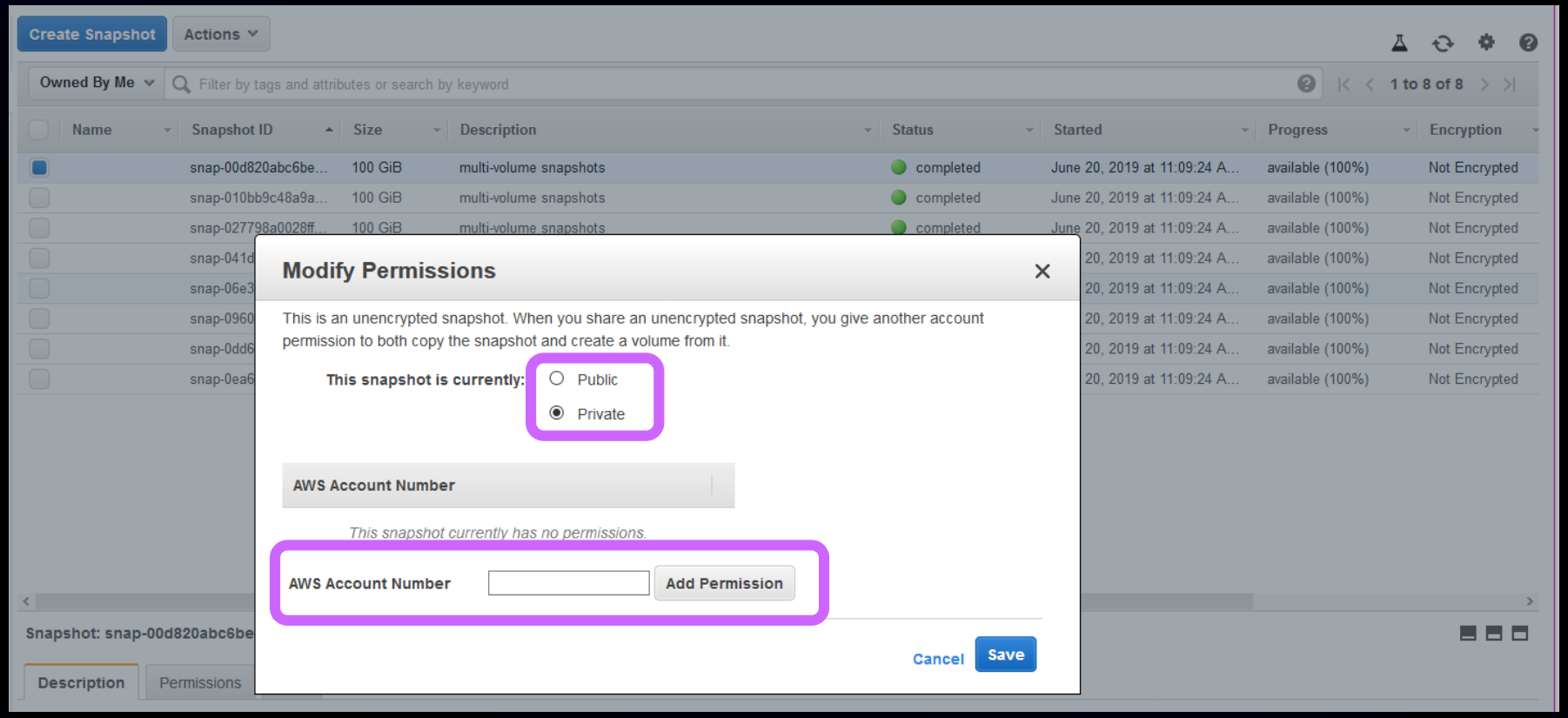

```
aws ec2 describe-snapshot-attribute --snapshot-id snap-00d820abc6be8d639 --attribute
createVolumePermission

aws ec2 modify-snapshot-attribute --snapshot-id snap-00d820abc6be8d639 --attribute
createVolumePermission

{
    "SnapshotId": "snap-00d820abc6be8d639",
    "CreateVolumePermissions": []
}
```

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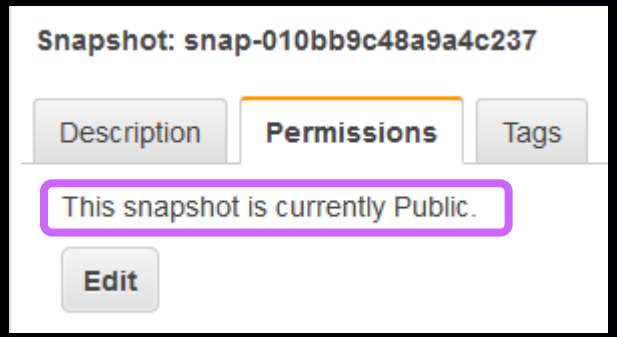
Sharing Snapshots and AMIs



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Sharing Snapshots and AMIs

- Public sharing: Reasonable use case for AMIs – AWS Marketplace AMIs
- Share non-AMI snapshots with specific accounts
- To launch a volume from a snapshot, you need a copy of snapshot in-Region




```
snap-010bb9c48a9a4c237 --attribute createVolumePermission
{
    "SnapshotId": "snap-010bb9c48a9a4c237",
    "CreateVolumePermissions": [
        {
            "Group": "all"
        }
    ]
}
```

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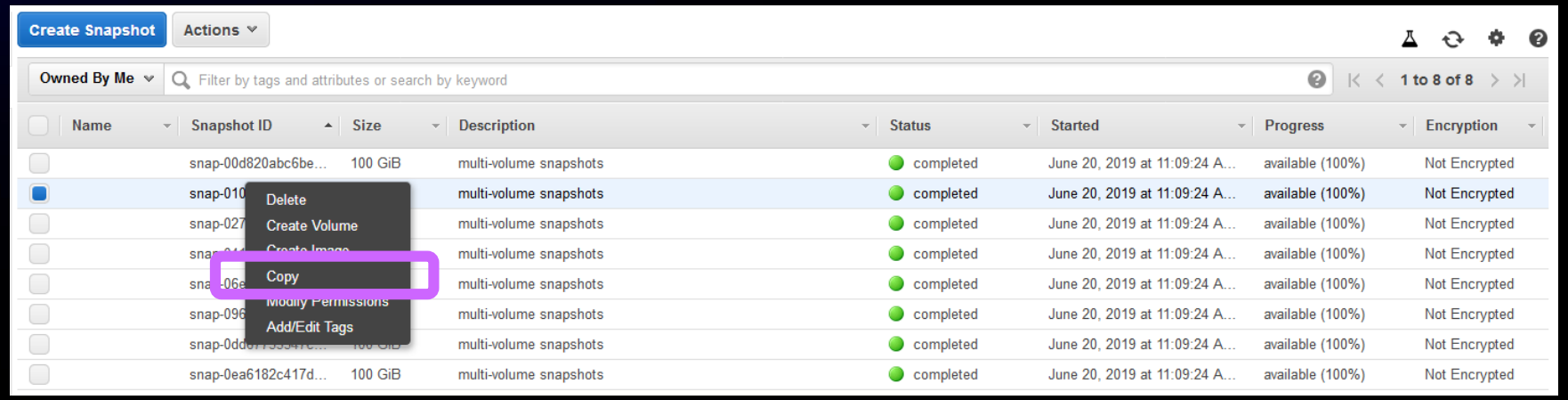
Copy Snapshots

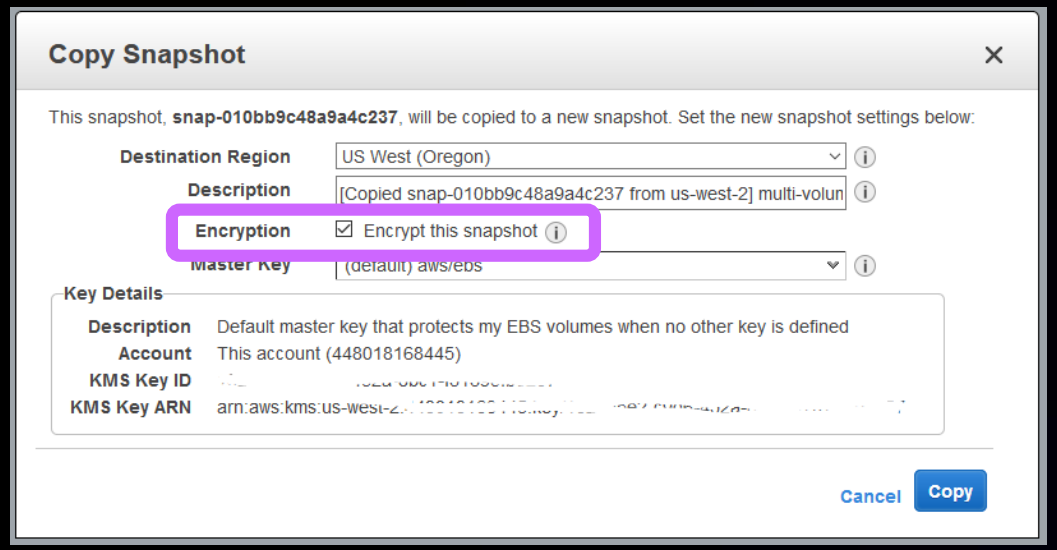


- Amazon S3 encryption protects snapshots in-transit during the copy operation
- Unencrypted snapshots can be encrypted during copy
- Encrypted snapshots can be re-encrypted during copy
- First copy across Regions is a full copy
- Snapshots are incremental after first copy
  - Same CMK needed on both ends to support incremental copies

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Copy Snapshots: Encrypt or re-encrypt

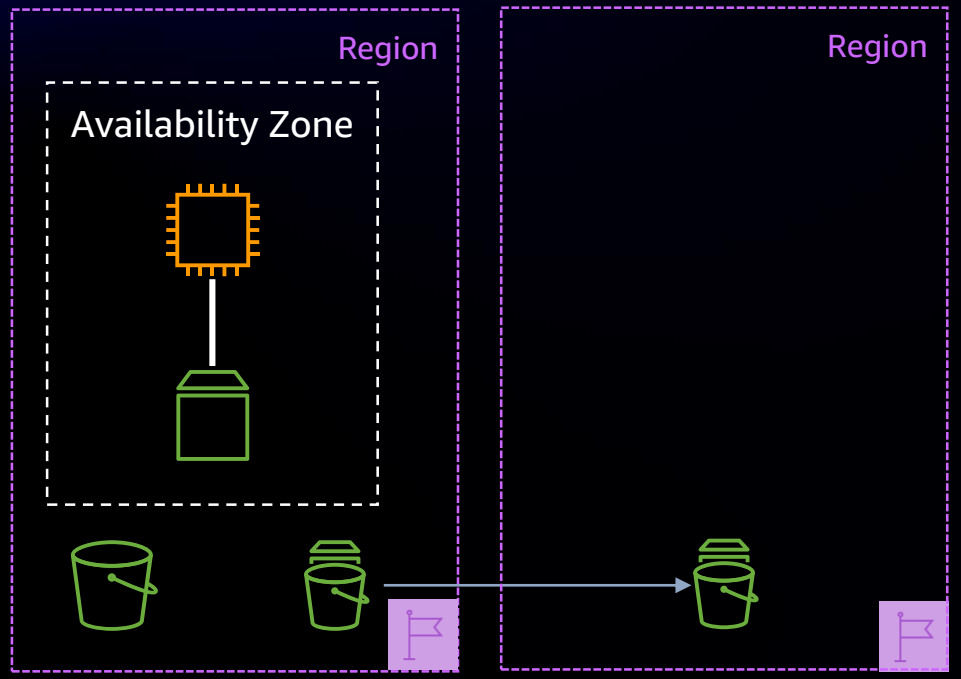





```
aws ec2 copy-snapshot --source-snapshot-id
snap-010bb9c48a9a4c237 --destination-region
us-west-1 --encrypted --kms-key-id
key/1234abcd-12ab-34cd-56ef-1234567890ab
```

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Copy Snapshots across Regions



- Copy Snapshots across accounts, across Regions
- Lock down resource-level permissions on target snapshot copy
- Multi-region = Protection against Regional events
- Permission lock down = malicious or unintentional deletes of data

aws

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Three features to make encryption easier

- Launch encrypted volumes from unencrypted snapshots / AMIs
  - Launch volumes encrypted with different CMK from encrypted snapshots / AMIs
- Share snapshots encrypted with custom CMKs across accounts
- Encryption by default for EBS for an account in a Region with a single setting

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Feature: Encrypted volumes from unencrypted Snapshots or AMIs

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Previously ...



Unencrypted Snapshot / AMI

Encrypted Snapshot / AMI

Encrypted Amazon EBS Volumes

Similar steps if you need to change encryption on a Snapshot / AMI

aws

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Now ...



Similar steps if you need to change encryption on a Snapshot / AMI

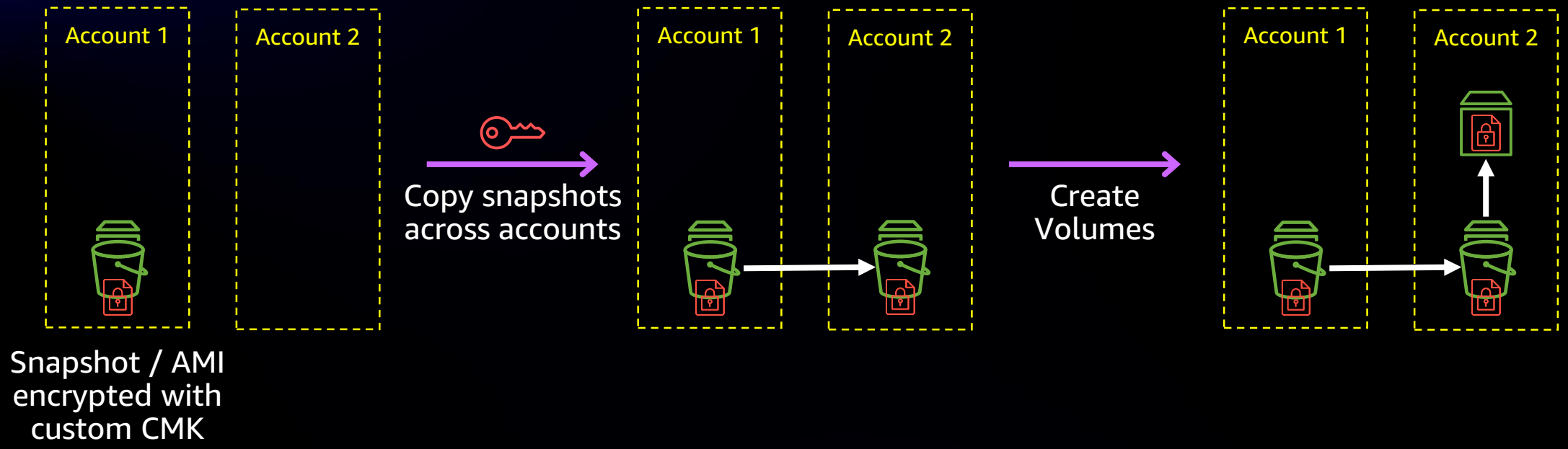
```
aws ec2 create-volume --snapshot-id snap-010bb9c48a9a4c237 --availability-zone us-
west-2a --encrypted --volume-type gp2
```

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Feature: Share encrypted Snapshots / AMIs across accounts

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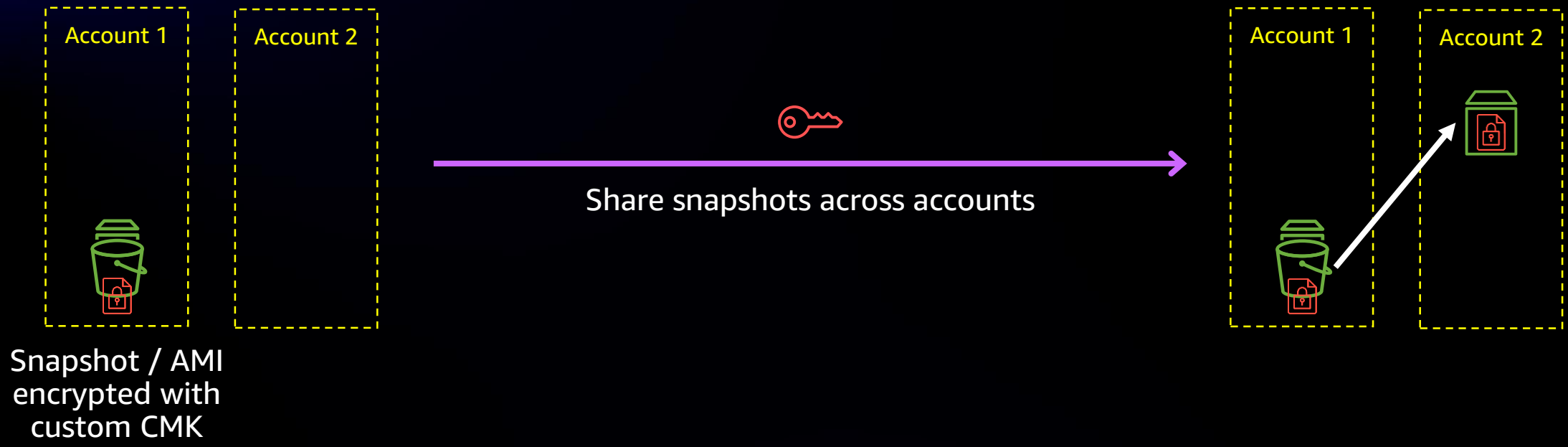
Previously ...



Encrypted snapshots could only be copied across accounts

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Now ...

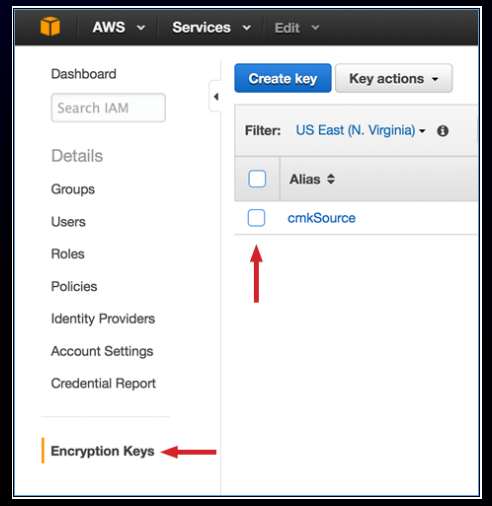


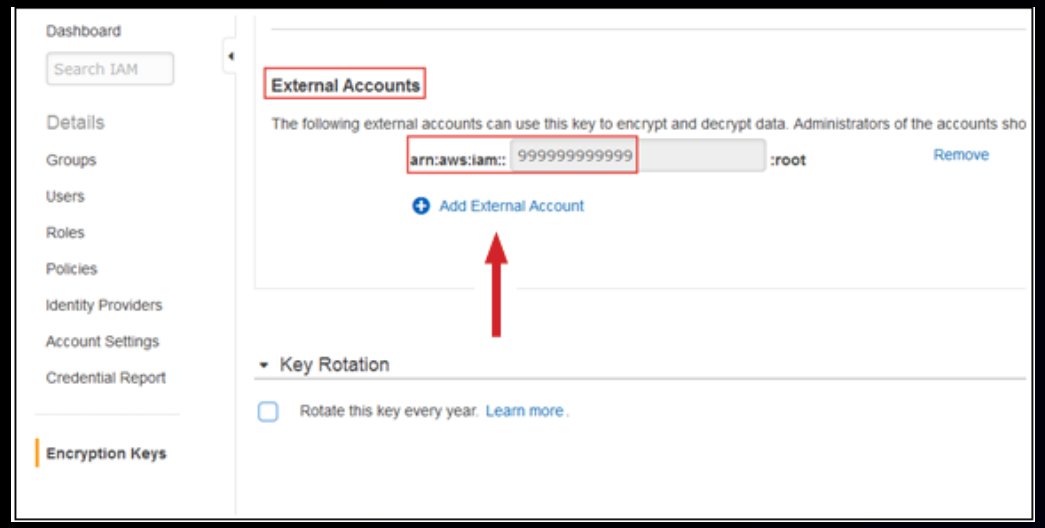
Share Snapshots/AMIs encrypted with custom CMKs across accounts

[NOTE: Snapshots / AMIs encrypted with Default CMKs cannot be shared across accounts]

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How to do this






```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "kms:DescribeKey",
                "kms:ReEncrypt*",
                "kms:CreateGrant",
                "kms:Decrypt"
            ],
            "Resource": [
                "arn:aws:kms:us-east-
1:<111111111111>:key/<key-id of cmkSource>"
            ]
        }
    ]
}
```

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How to do this

```
$> aws ec2 run-instances
    --image-id ami-XXXXX
    --count 1
    --instance-type m4.large
    --region us-east-1
    --subnet-id subnet-aec2fc86
    --key-name 2016KeyPair
    --security-group-ids sg-f7dbc78e
subnet-id subnet-aec2fc86
    --block-device-mappings
file://mapping.json
```

mapping.json

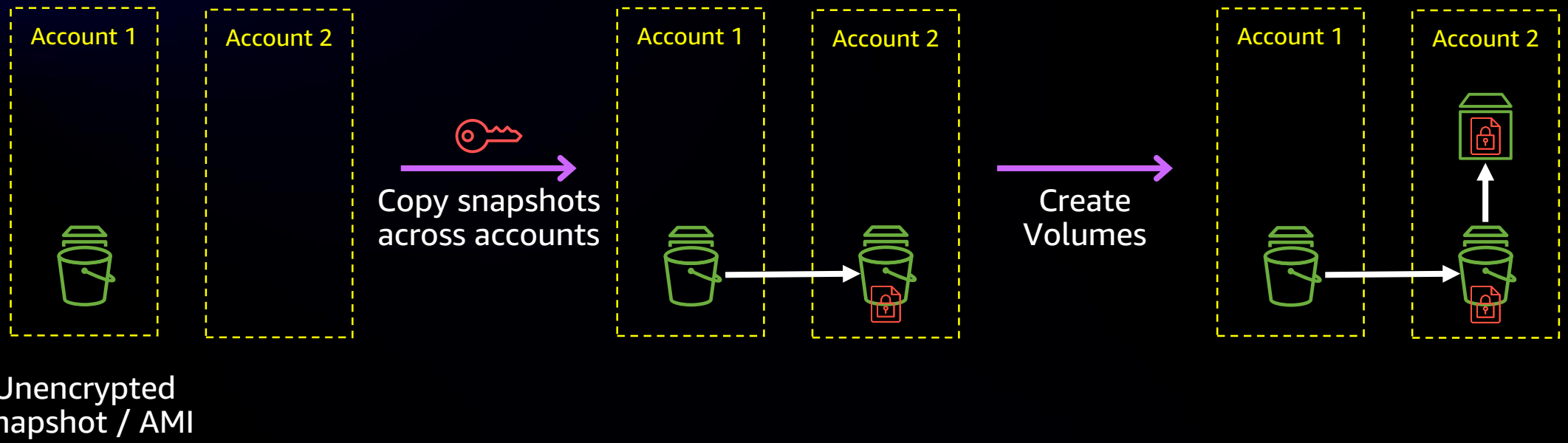
```
[
    {
        "DeviceName": "/dev/xvda",
        "Ebs": {
                "Encrypted": true,
                "KmsKeyId":
"arn:aws:kms:us-east-
1:<999999999999>:key/<abcd1234-a123-
456a-a12b-a123b4cd56ef>"
        }
    }
]
```

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Combining the two features

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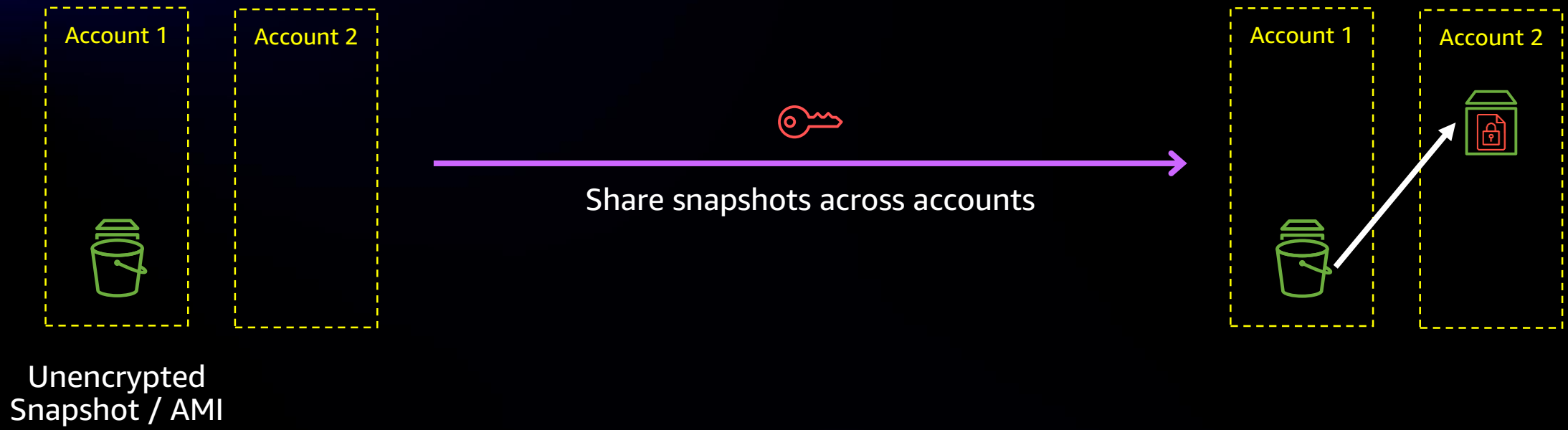
Previously ...



Unencrypted
Snapshot / AMI

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Now ...



Launch encrypted volumes across accounts from unencrypted Snapshots / AMIs

[NOTE: Snapshots / AMIs encrypted with default CMKs cannot be shared across accounts]

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Feature: Enable Amazon EBS account-level encryption by default

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Previously ...



With AWS Identity and Access Management (IAM) policies, you can prevent unencrypted volumes from launching

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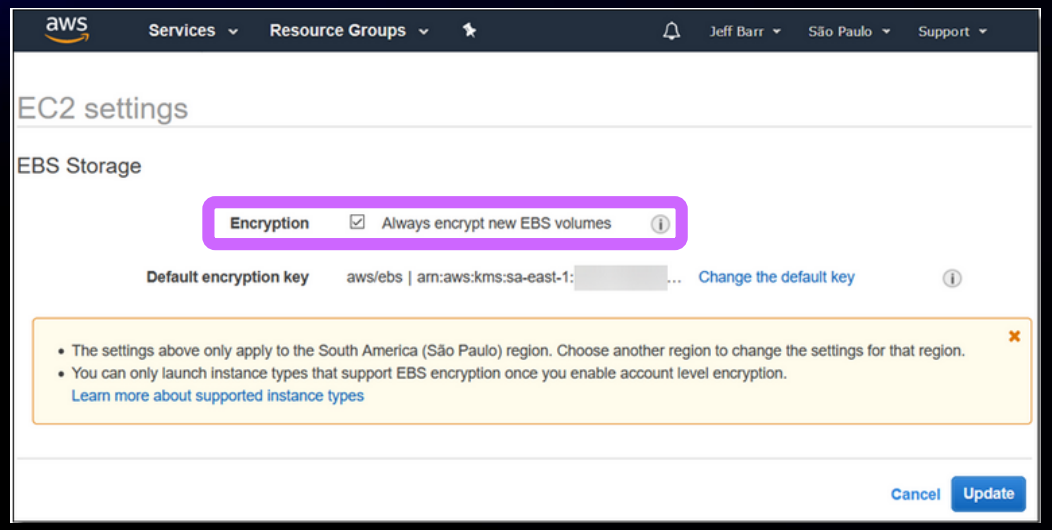
Now …

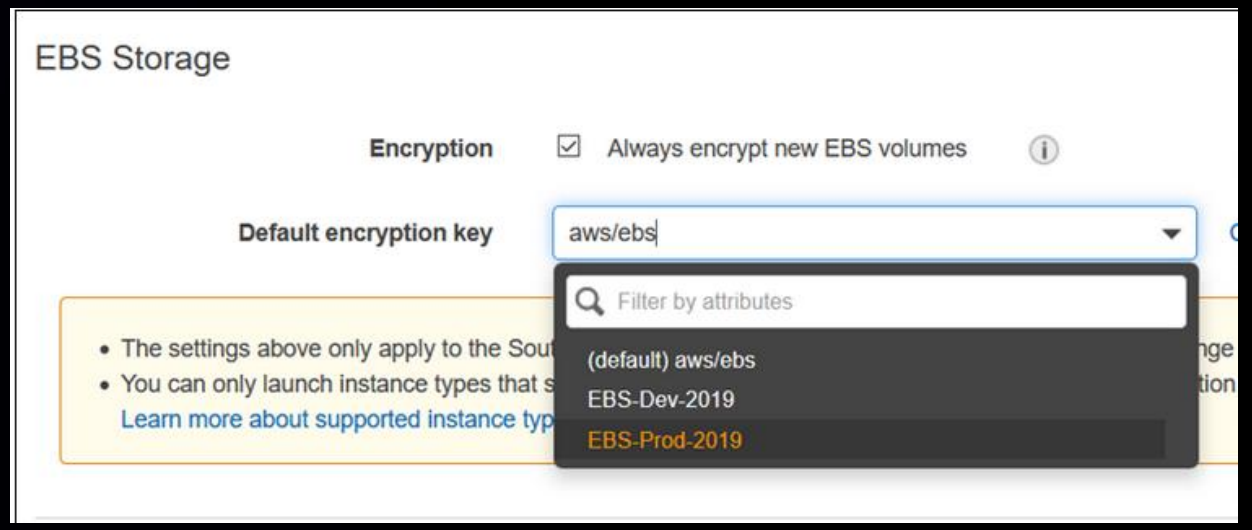


Without change to workflows, newly launched volumes + snapshots are encrypted

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How to do this





And that's it!

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Recycle Bin for EBS Snapshots

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Why Recycle bin?



- Users often accidentally delete their EBS Snapshots
- There is no way to un-delete a snapshot
- Checks before deletions help, but are not foolproof

Recycle Bin automatically retains deleted EBS Snapshots and allows recovery within a user-specified retention period

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New: Recycle Bin for EBS Snapshots

QUICK RECOVERY OF DELETED SNAPSHOTS



Automatically retain deleted snapshots for a retention period you specify

Use Retention Rules to specify retention periods for all or some tagged snapshots in your account

Recover deleted snapshots before retention time expiry

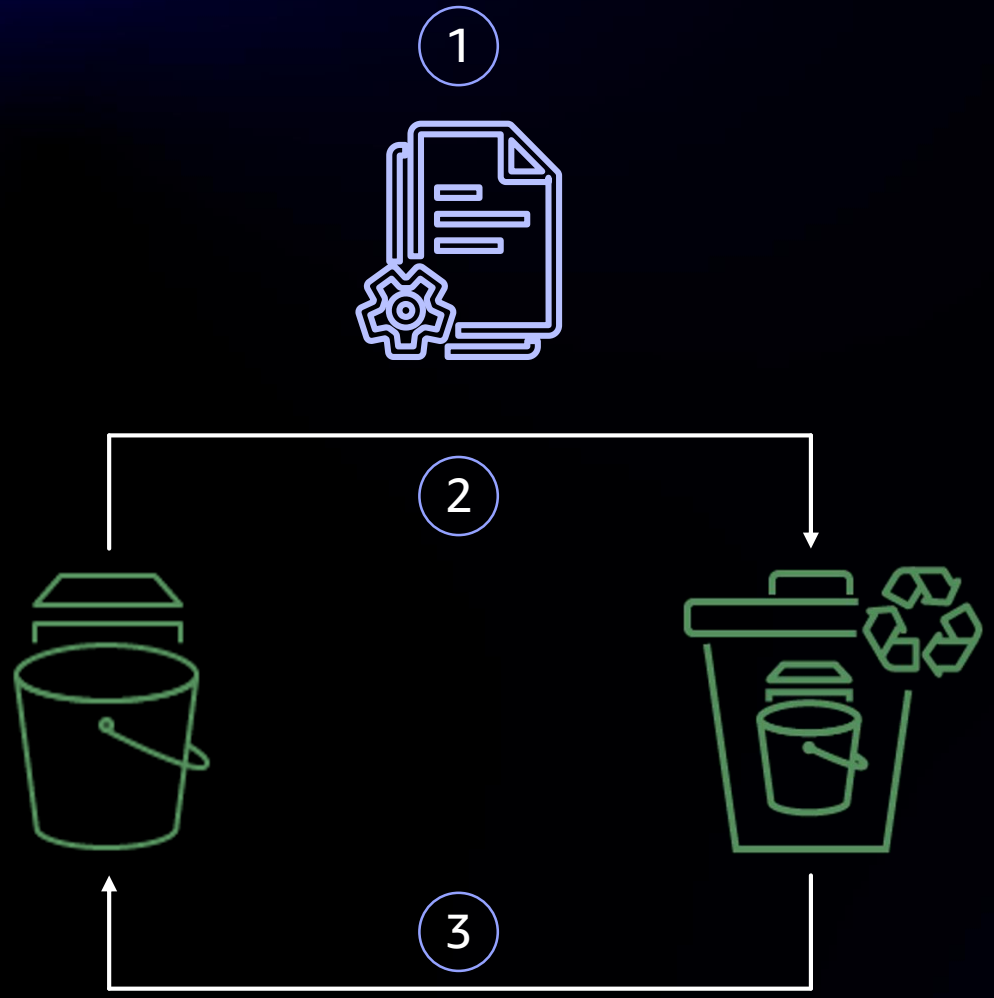
Pay EBS Snapshot price for snapshots in Recycle Bin

Restrict access to Recycle Bin Rules and resources using Administrator IAM Role

aws

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Recycle Bin: How it works



1 Set up Retention Rules

a. Account-level rules per Region
b. Tag-based rules per Region

2 Retain deleted snapshots in Recycle Bin

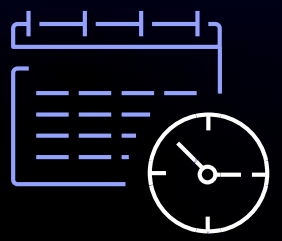
3 Recover deleted snapshots before expiry of retention period

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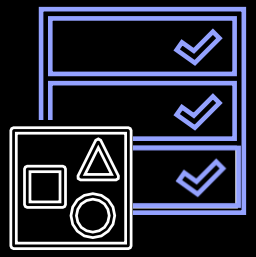
Managing Retention Rules

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Recycle Bin Retention Rules



- Retention time: How you want to retain snapshots in Recycle Bin
- Permanent deletion after expiry of retention period



- Account-level Rule: Applies to all snapshots in your account per Region
- Protect all snapshots in critical accounts



- Tag-based Rules: Apply to tagged snapshots in your account in a Region
- Protect critical snapshots in your account to optimize costs

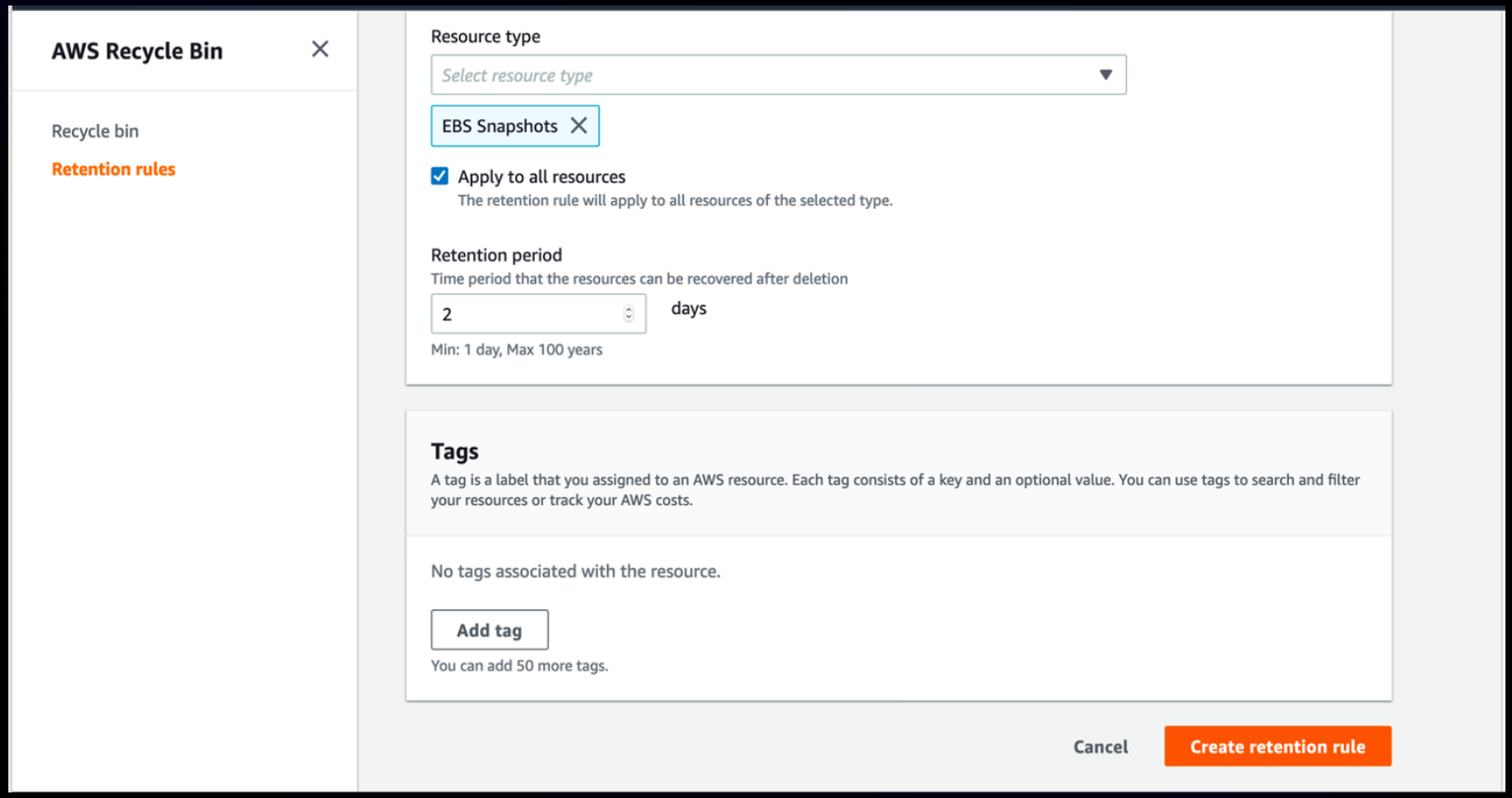
aws

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Setting up Retention Rules without tags

Rules will apply to all EBS Snapshots in the account in the Region





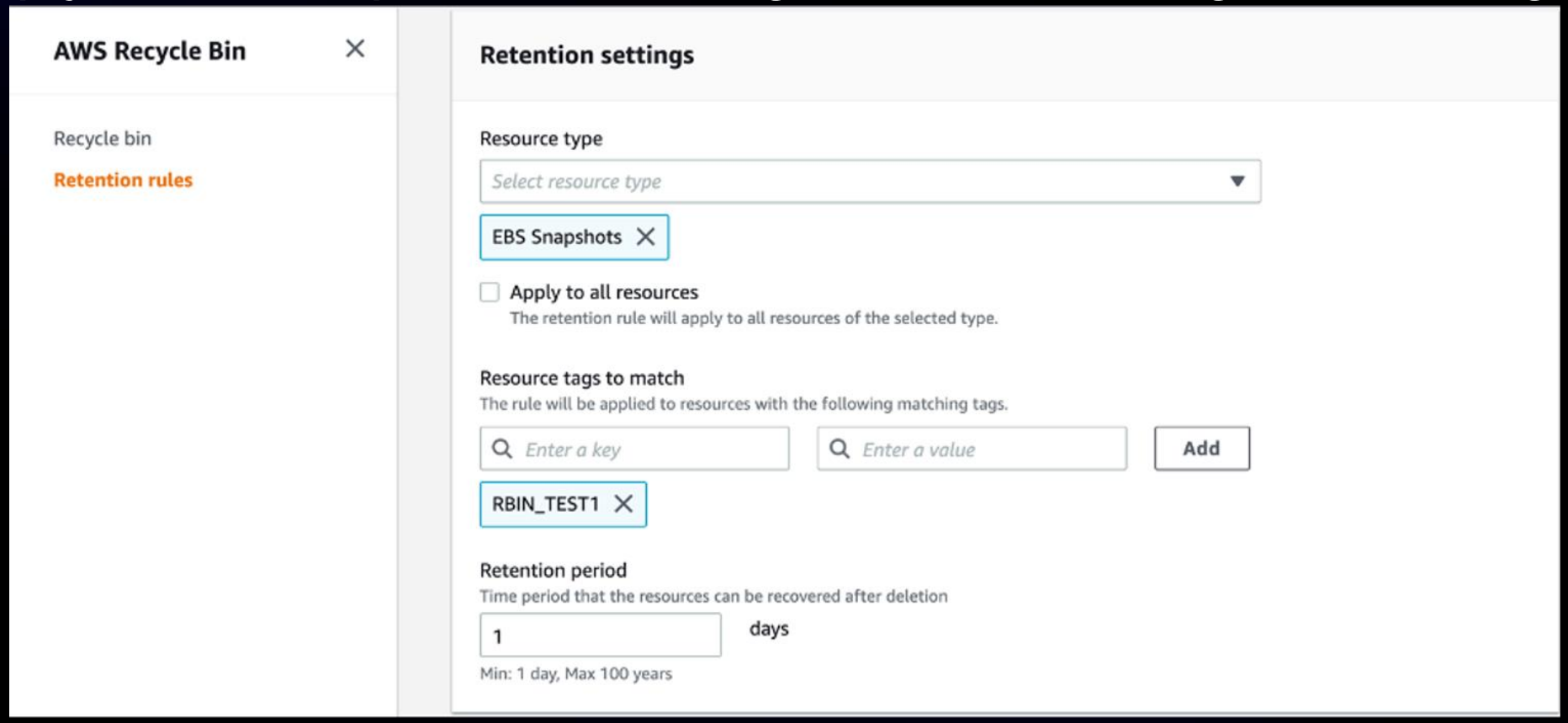

```
aws rbin create-rule --retention-period
RetentionPeriodValue=2,RetentionPeriodUnit=DAYS --resource-type
EBS_SNAPSHOT --description "Match all snapshots" —region us-west-2
```

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Setting up Retention Rules with tags

Rules will apply to EBS Snapshots in the Region with matching resource tags





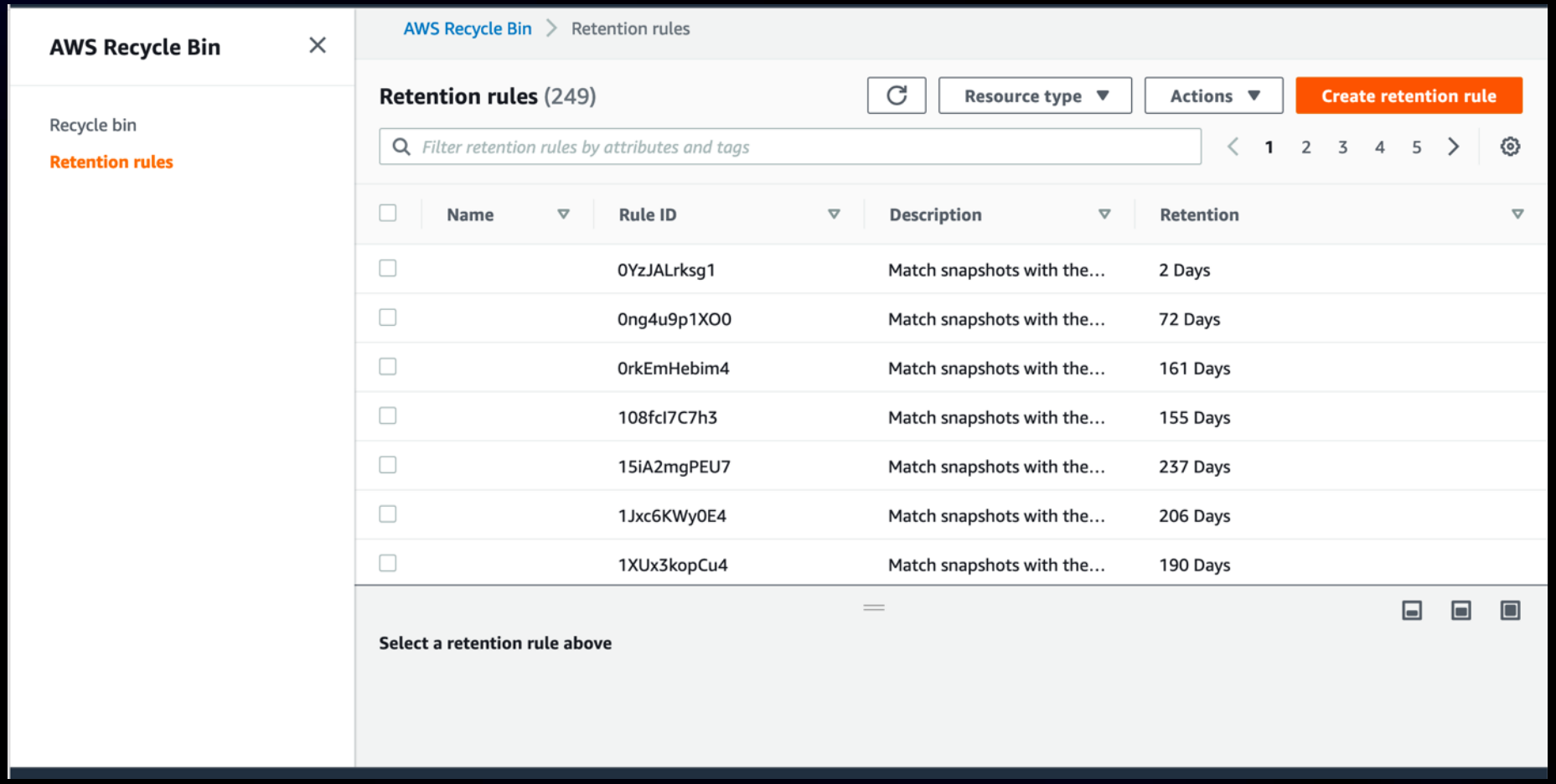

```
aws rbin create-rule --retention-period RetentionPeriodValue=1,
RetentionPeriodUnit=DAYS --resource-type EBS_SNAPSHOT --description "Match
snapshots with the RBIN_TEST1" --resource-tags ResourceTagKey=RBIN_TEST1,
ResourceTagValue="" —region us-west-2
```

aws

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Listing Retention Rules






```
aws rbin get-rule --identifier <id>
```

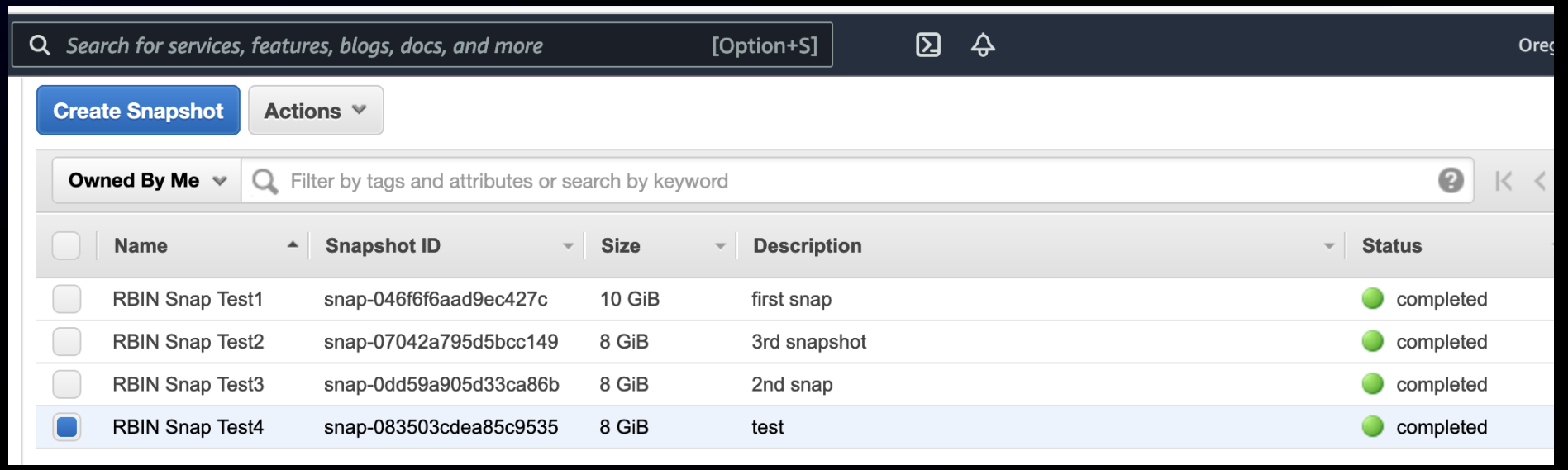
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Managing Recycle Bin Snapshots

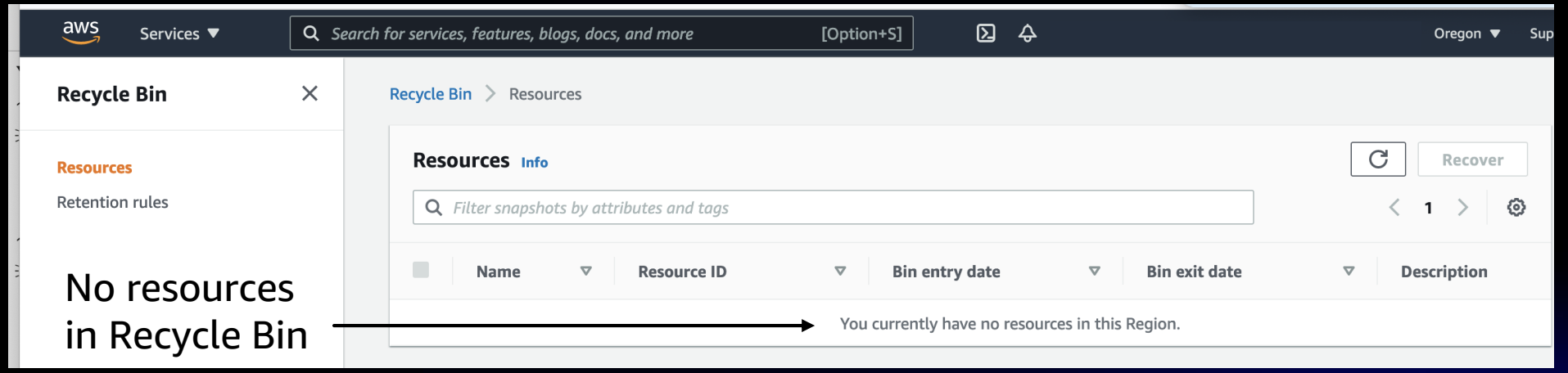
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What happens on a snapshot deletion?







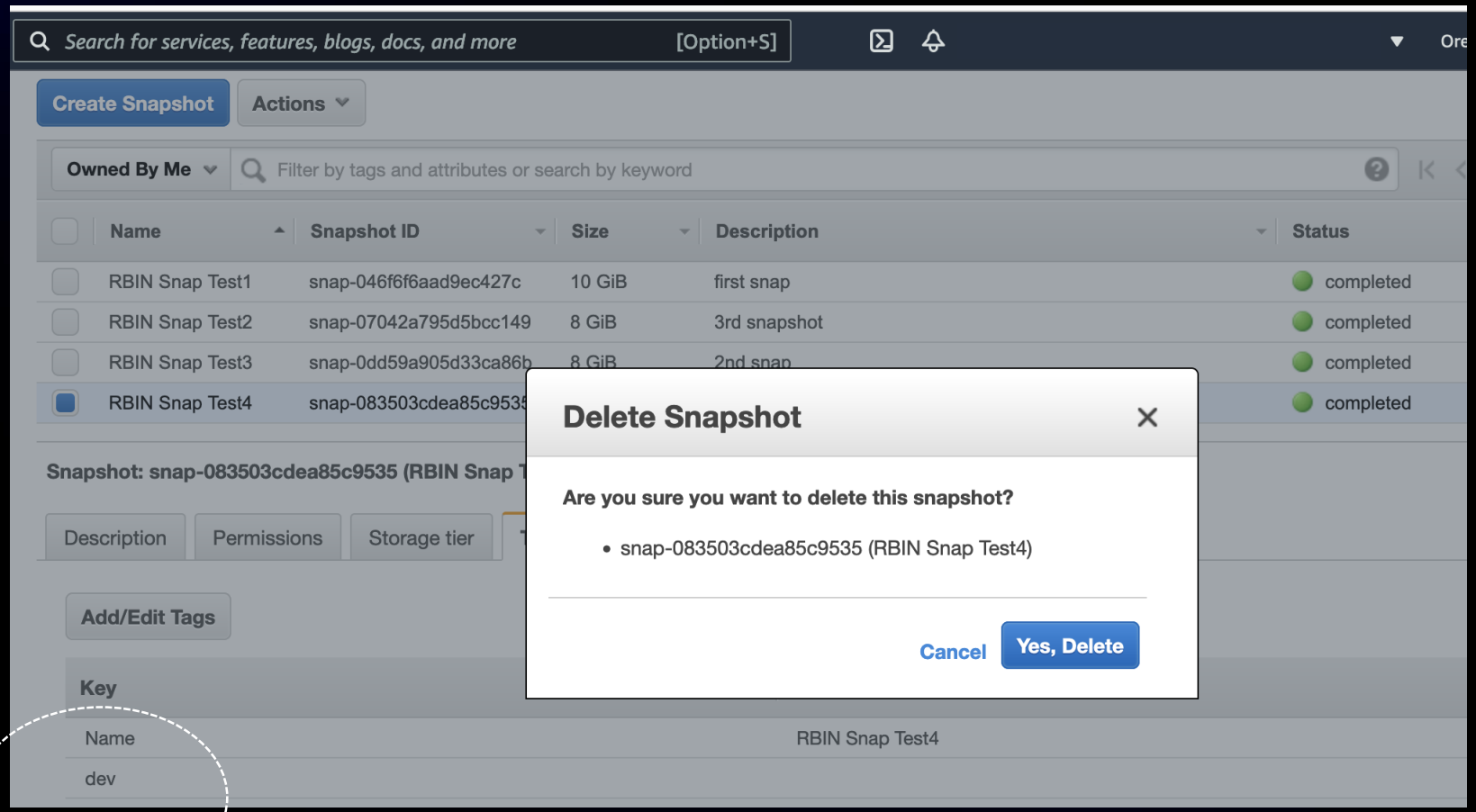


No resources in Recycle Bin

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Snapshot gets deleted...





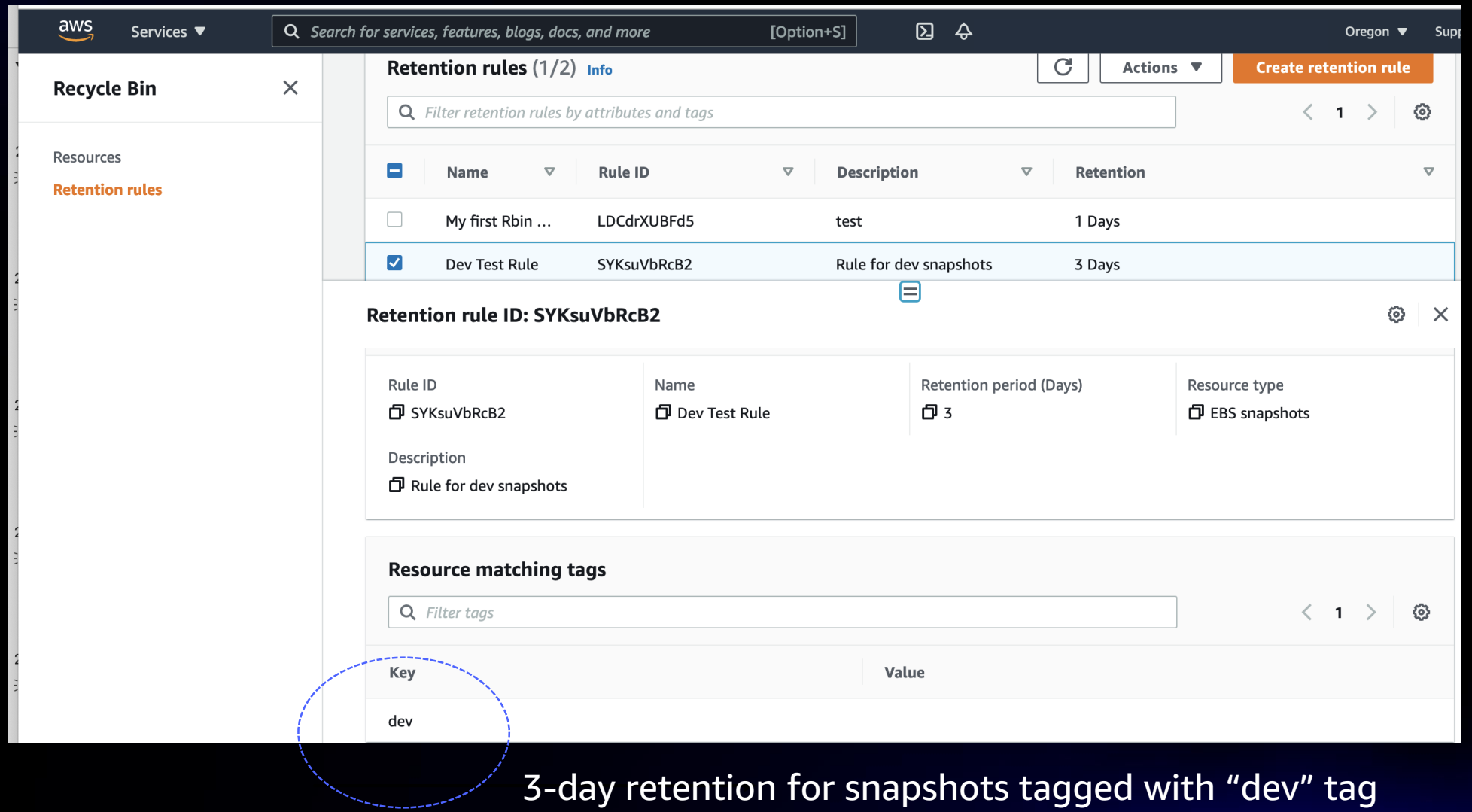
"dev" Resource tag

```
aws ec2 delete-snapshot --region us-west-2 --snap-083503cdea85c9535
```

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Tag-based Retention Rule kicks in…



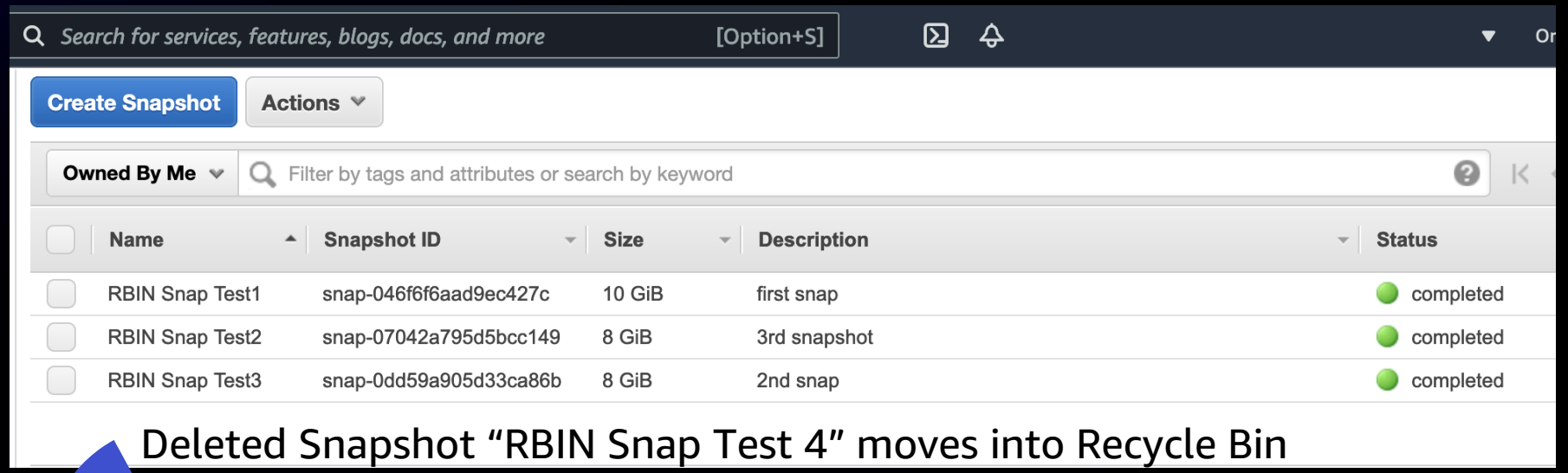


3-day retention for snapshots tagged with “dev” tag

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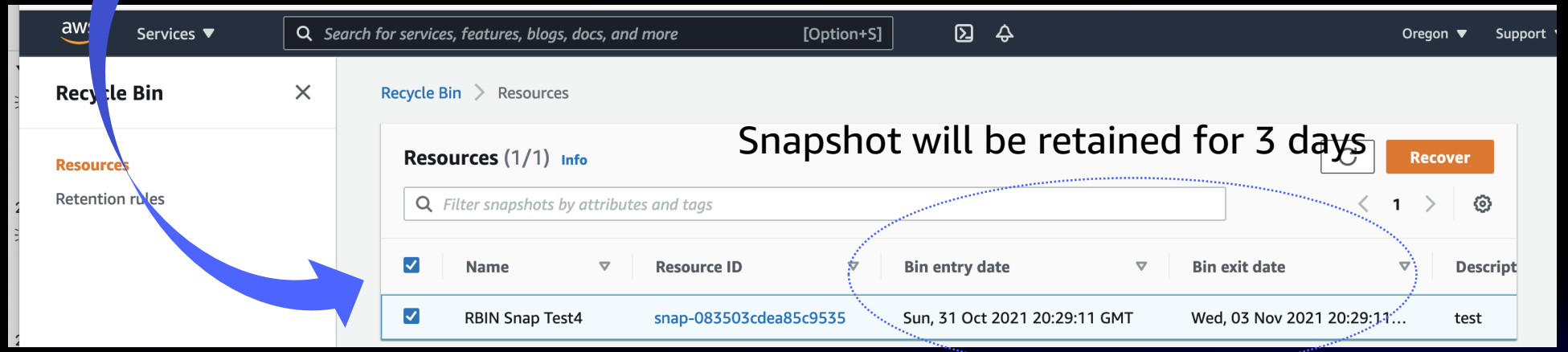
Deleted Snapshot moves into Recycle Bin





Deleted Snapshot “RBIN Snap Test 4” moves into Recycle Bin





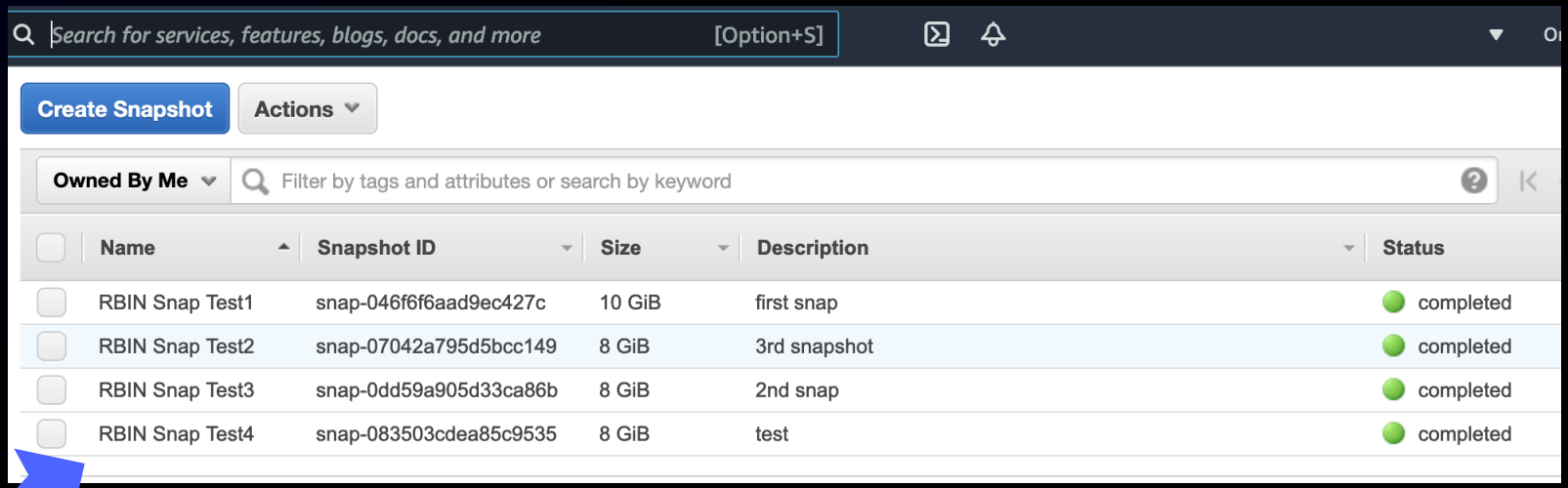
Snapshot will be retained for 3 days

```
aws ec2 list-snapshots-in-recycle-bin --region us-west-2
```

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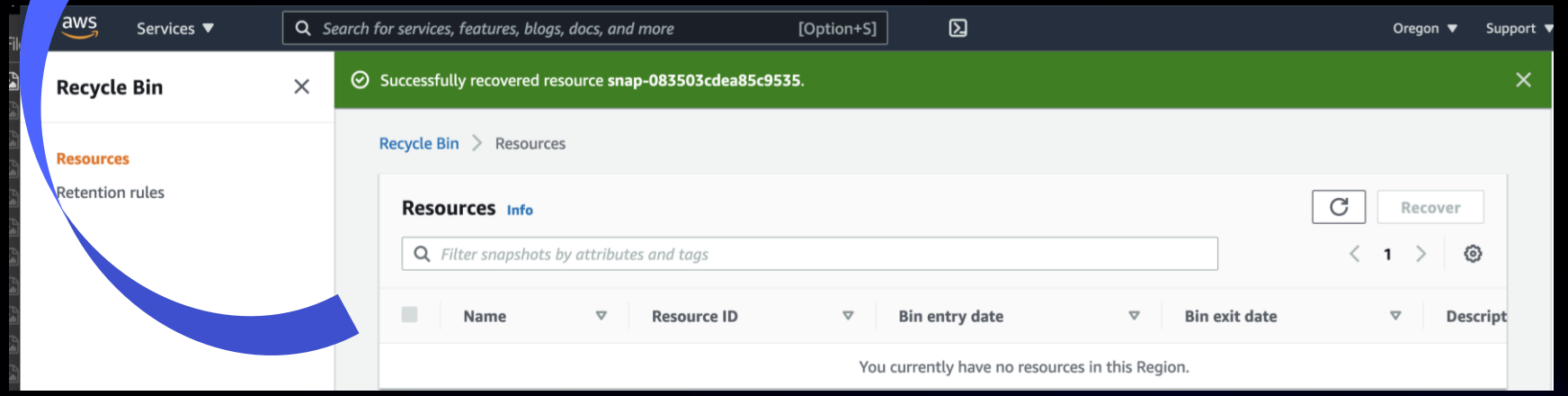
Recovering a Snapshot from Recycle Bin





Snapshot “RBIN Snap Test 4” is instantaneously restored from Recycle Bin






```
aws ec2 restore-snapshot-from-recycle-bin --snapshot-id snap-083503cdea859535
```

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Recovered Snapshots can be used immediately



EC2 > Volumes > vol-036221c0df8cf272f

vol-036221c0df8cf272f

Actions ▼ | Delete | Modify

Details

Volume ID vol-036221c0df8cf272f	Size 10 GiB	Type gp2	Volume status Okay
Volume state Available	IOPS 100	Throughput -	Encryption Not encrypted
KMS key ID -	KMS key alias -	KMS key ARN -	Snapshot snap-083503cdea85c9535
Availability Zone us-west-2a	Created Sun Oct 31 2021 14:15:44 GMT-0700 (Pacific Daylight Time)	Multi-Attach enabled No	Attached Instances -
Outposts ARN -			

```
aws ec2 create-volume --snapshot-id snap-083503cd3a85c9535 --availability-zone us-west-2a
```

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Managing Recycle Bin Permissions

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Managing Recycle Bin Permissions

Use Identity Access Management (IAM) to restrict access to Recycle Bin Rules and Resources



Use IAM Administrator Role for managing Recycle Bin Rule APIs



Use (default) Snapshot User Role to manage access to Snapshot APIS

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Recycle Bin Administrator IAM Role Example



```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "rbin:GetRule",
                "rbin:ListRules",
                "rbin:CreateRules",
                "rbin:UpdateRules",
                "rbin:DeleteRules",
                "rbin:TagResource",
                "rbin:UntagResource",
                "rbin:ListTagsForResource"
            ],
            "Resource": "*"
        }
    ]
}
```

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Snapshot User IAM Role Example



```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "ec2:CreateSnapshot",
                "ec2:CreateSnapshots",
                "ec2:CreateVolume",
                "ec2:DescribeVolumes",
                "ec2:DeleteSnapshot",
                "ec2:DeleteVolume",
                "ec2:ModifySnapshotAttribute",
                "ec2:DescribeSnapshots",
                "ec2:ListSnapshotsInRecycleBin",
                "ec2:RestoreSnapshotFromRecycleBin",
                "ec2:CreateTags",
                "ec2:DescribeTags"
            ],
            "Resource": "*"
        }
    ]
}
```

Optionally move these to Recycle Bin Administrator Role for stricter protection

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Considerations for using Recycle Bin

250 Rules per account and 50 tags per Rule

Tag-level Retention Rule >> Account-level Retention Rule

Tag-level Retention Rule with longest retention wins

Fast Snapshot Restore disabled for Recycle Bin Snapshots; re-enable on recovery

Sharing disabled for Recycle Bin Snapshots; permissions retained for recovery

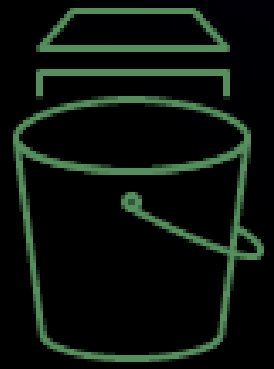
Add/delete/modify tags allowed for Recycle Bin snapshots

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EBS Snapshots Archive

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Need for Archive Tier for EBS Snapshots



- Long-term retention (ex: months, years)
  - Regulatory and compliance, end-of-project snapshots
- Rarely accessed (ex: once a year)
- Lower storage cost
  - Slower restore performance is ok

Customer ask: lower storage cost tier for long-term retention of rarely accessed snapshots

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New: EBS Snapshots Archive Tier



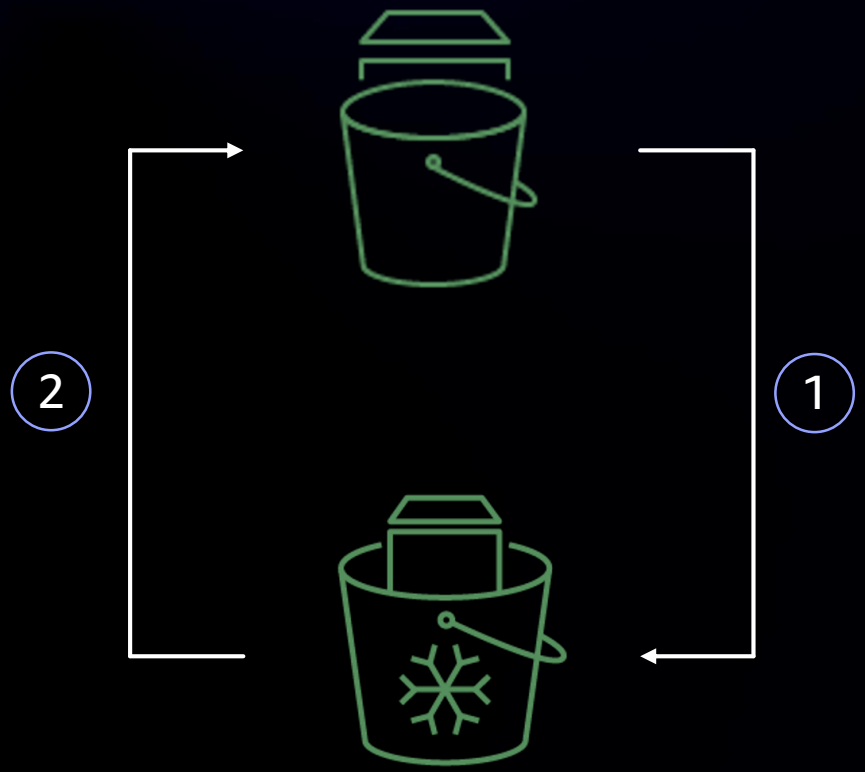
- Long-term snapshot retention
  - 90-day minimum retention period
- Full, point-in-time backups
- Retrieve snapshot before use
  - Retrieval time of hours
- 75% lower storage costs at 1.25c/GB-mo
  - 3c/GB additional retrieval charges

EBS Snapshots Archive Tier provides low storage cost for long-term retention of rarely accessed EBS Snapshots

aws

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EBS Snapshots Archive: How it works



Archive Snapshot

1

- Creates full version of snapshot and moves it into Archive tier

Restore Snapshot

2

- Restores full version of snapshot to Standard tier
- Can be temporary or permanent

Simple APIs for archiving and restoring snapshots

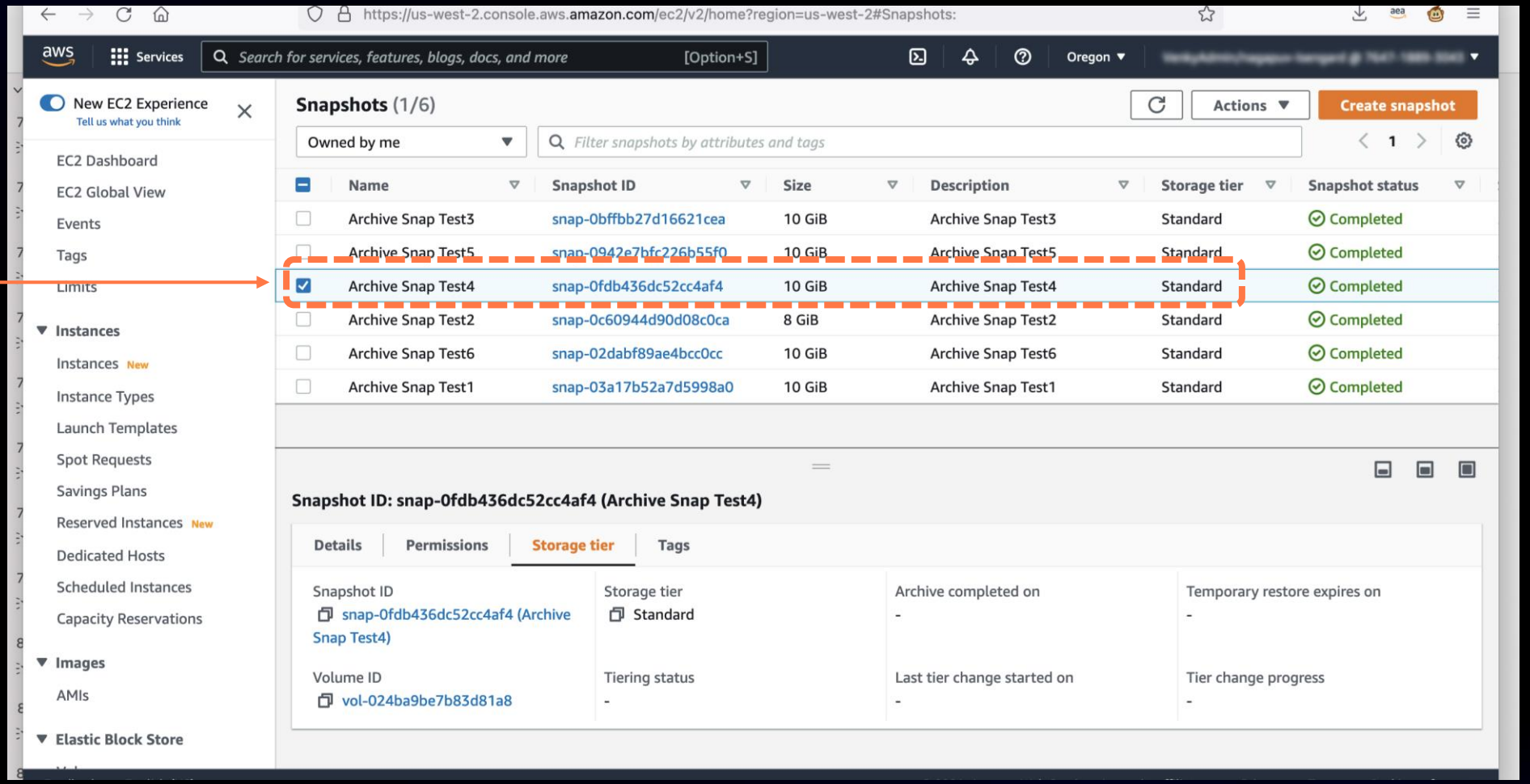
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Archiving EBS Snapshots

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Archiving EBS Snapshots





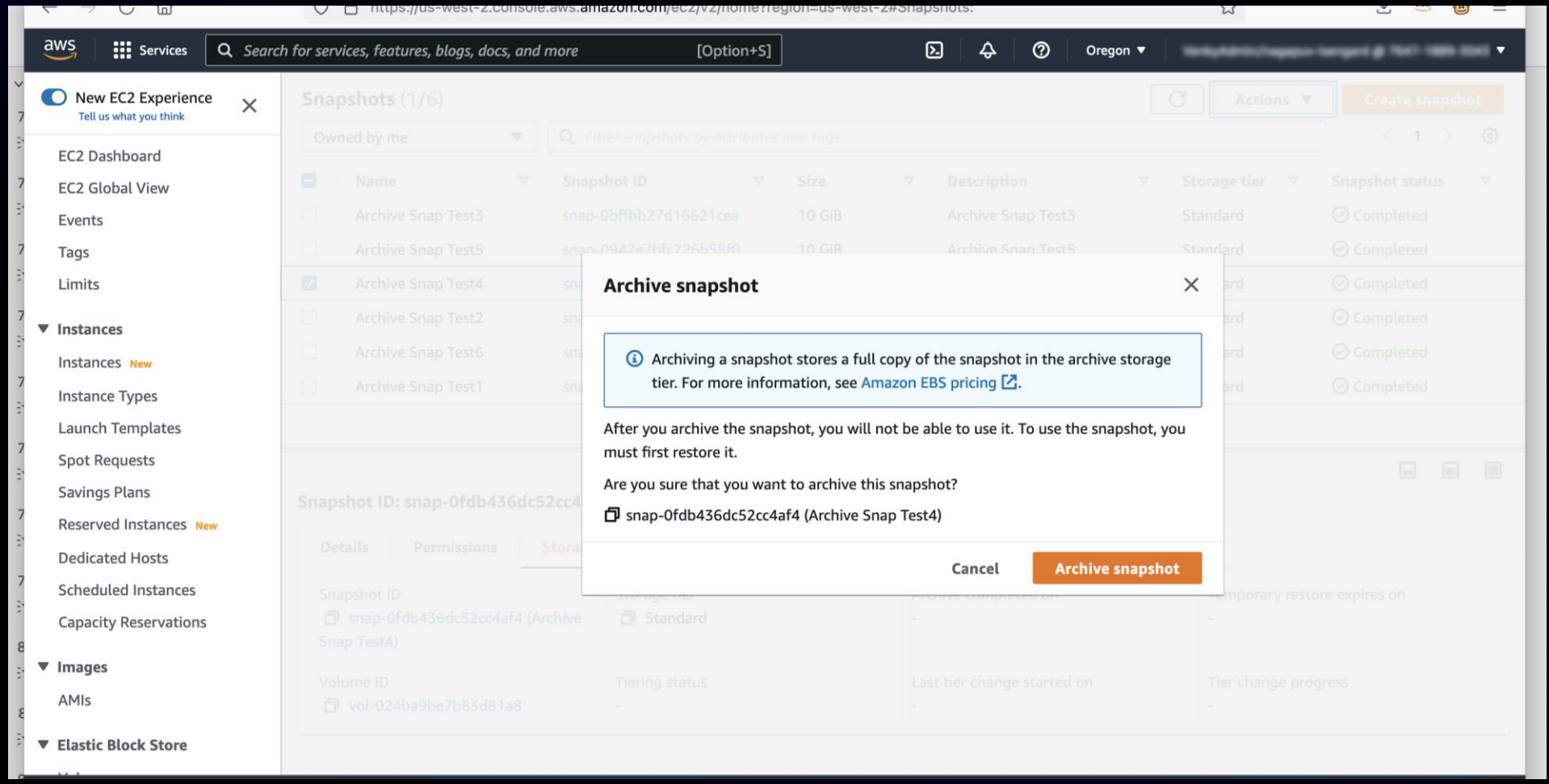
Archiving EBS Snapshot snap-0fdb436dc52cc4af4 in Standard tier

aws

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Call ModifySnapshotTier to archive snapshot



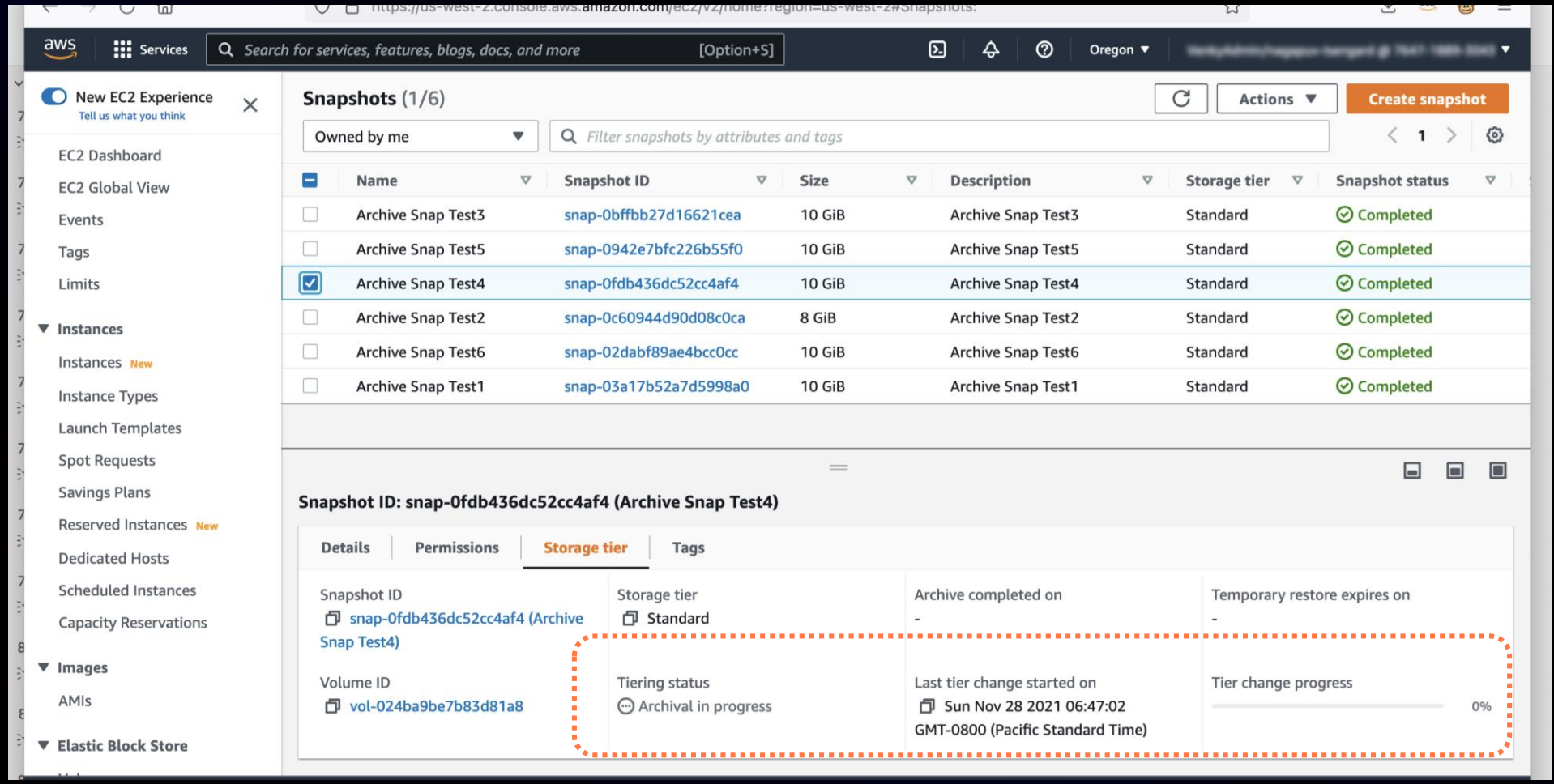



```
aws ec2 modify-snapshot-tier --snapshot-id snap-0fdb436dc52cc4af4 --
region us-west-2 —storage-tier archive
```

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Call ModifySnapShotTierStatus to check progress



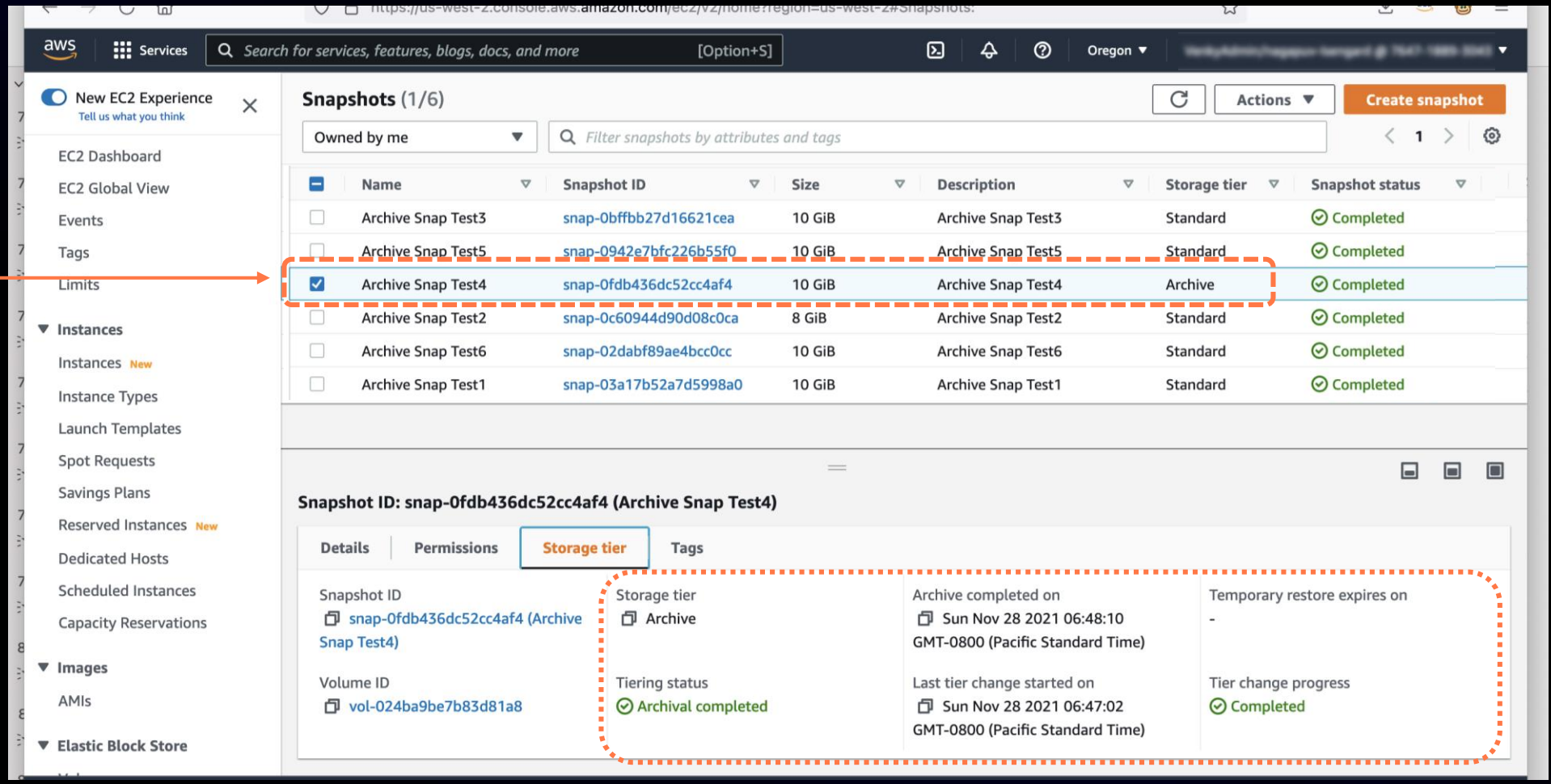



```
aws ec2 describe-snapshot-tier-status –region us-west-2 –snapshot-id
snap-0fdb436dc52cc4af4
```

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Snapshot is tiered to Archive





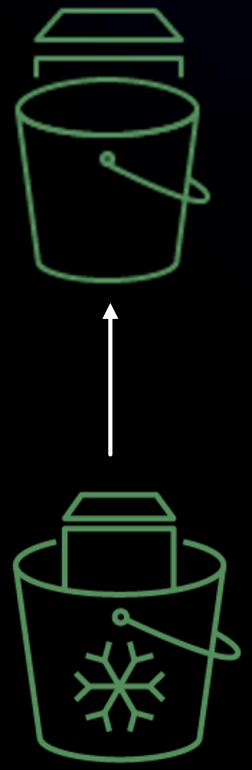

```
aws ec2 describe-snapshot-tier-status –region us-west-2 –snapshot-id
snap-0fdb436dc52cc4af4
```

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Restoring EBS Snapshots from Archive

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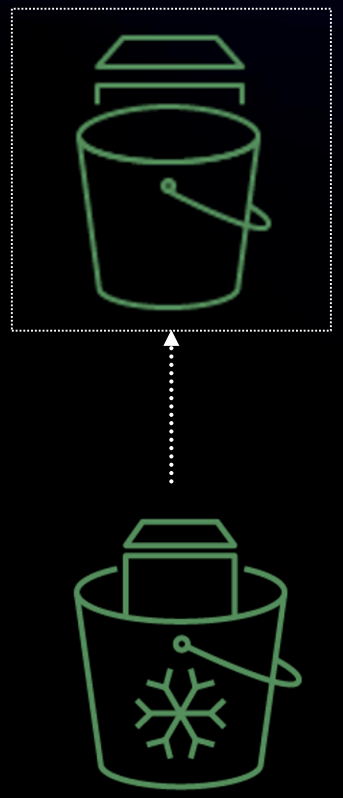
Restoring Snapshots from Archive



- Retrieve snapshot from archive for regular use
- Retrieval time of hours
  - Based on snapshot size (24-72 hours max)
- Temporary Restore:
  - Restore temporarily for up to 180 days to Standard tier
  - Permanent copy stays in Archive tier
- Permanent Restore:
  - Change snapshot tier to Standard from Archive
  - No copy in Archive tier
  - Remember 90-day minimum retention in Archive

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Choose archived snapshot to restore



aws | Services | Search for services, features, blogs, docs, and more [Option+S] | Oregon

New EC2 Experience
Tell us what you think

EC2 Dashboard
EC2 Global View
Events
Tags
Limits

Instances
Instances New
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances New
Dedicated Hosts
Scheduled Instances
Capacity Reservations

Images
AMIs

Elastic Block Store

Snapshots (1/6)

Actions | Create snapshot

Owned by me | Filter snapshots by attributes and tags | 1

Name	Snapshot ID	Size	Description	Storage tier	Snapshot status
Archive Snap Test3	snap-0bffbb27d16621cea	10 GiB	Archive Snap Test3	Standard	Completed
Archive Snap Test5	snap-0942e7bfc226b55f0	10 GiB	Archive Snap Test5	Standard	Completed
Archive Snap Test4	snap-0fdb436dc52cc4af4	10 GiB	Archive Snap Test4	Archive	Completed
Archive Snap Test2	snap-0c60944d90d08c0ca	8 GiB	Archive Snap Test2	Standard	Completed
Archive Snap Test6	snap-02dabf89ae4bcc0cc	10 GiB	Archive Snap Test6	Standard	Completed
Archive Snap Test1	snap-03a17b52a7d5998a0	10 GiB	Archive Snap Test1	Standard	Completed

Snapshot ID: snap-0fdb436dc52cc4af4 (Archive Snap Test4)

Details | Permissions | Storage tier | Tags

Snapshot ID
snap-0fdb436dc52cc4af4 (Archive Snap Test4)

Storage tier
Archive

Archive completed on
Sun Nov 28 2021 06:48:10 GMT-0800 (Pacific Standard Time)

Temporary restore expires on
-

Volume ID
vol-024ba9be7b83d81a8

Tiering status
Archival completed

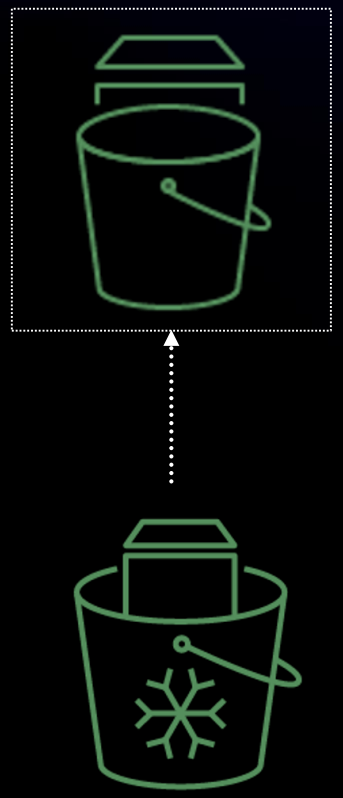
Last tier change started on
Sun Nov 28 2021 06:47:02 GMT-0800 (Pacific Standard Time)

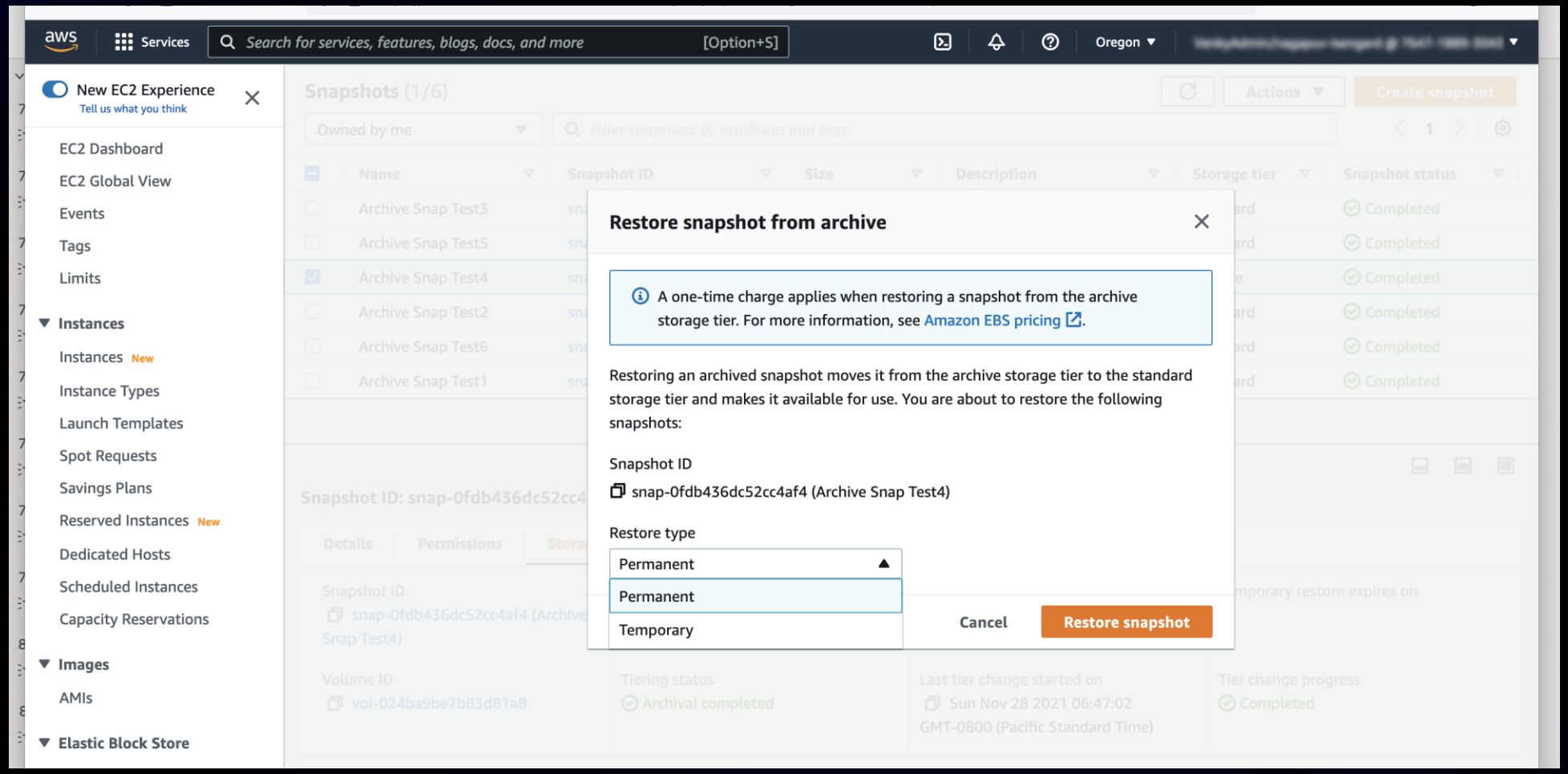
Tier change progress
Completed

Only archived snapshots can be restored

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Restore Snapshot permanently

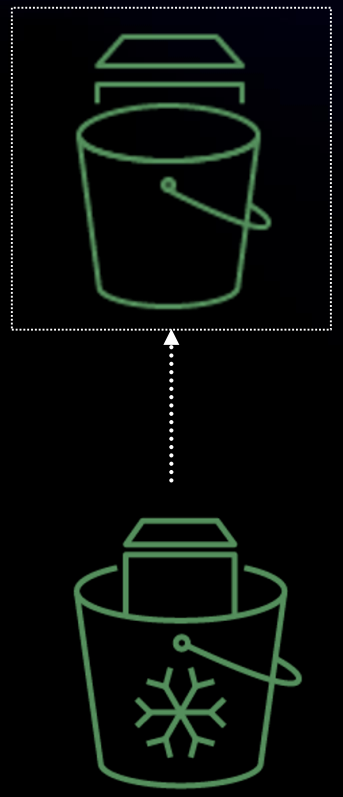


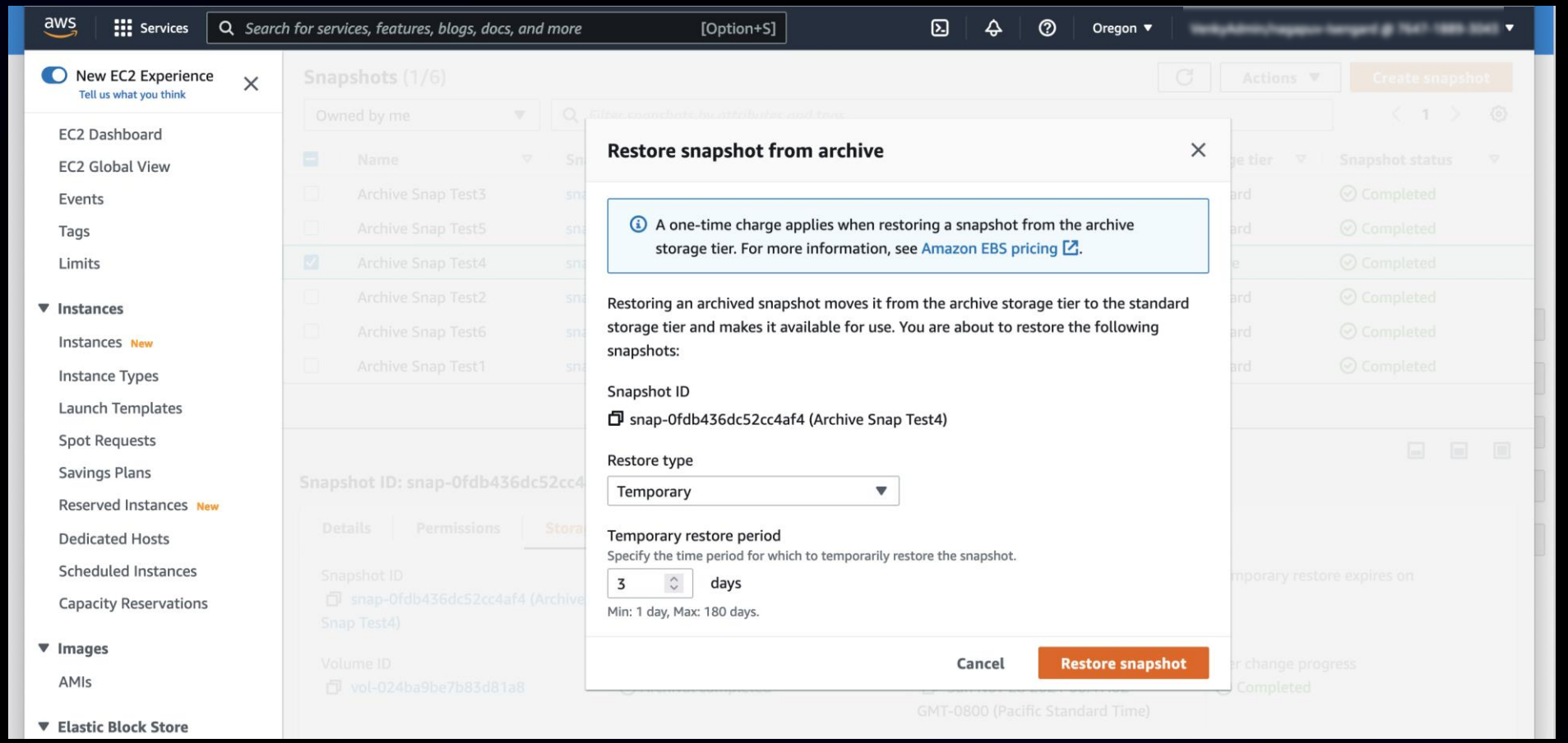



```
aws ec2 restore-snapshot-tier --snapshot-id snap-0fdb436dc52cc4af4 --
permanent-restore —region us-west-2
```

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Restore snapshot temporarily

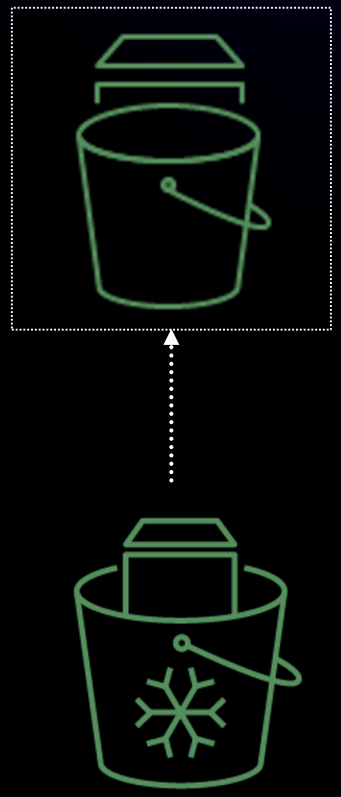


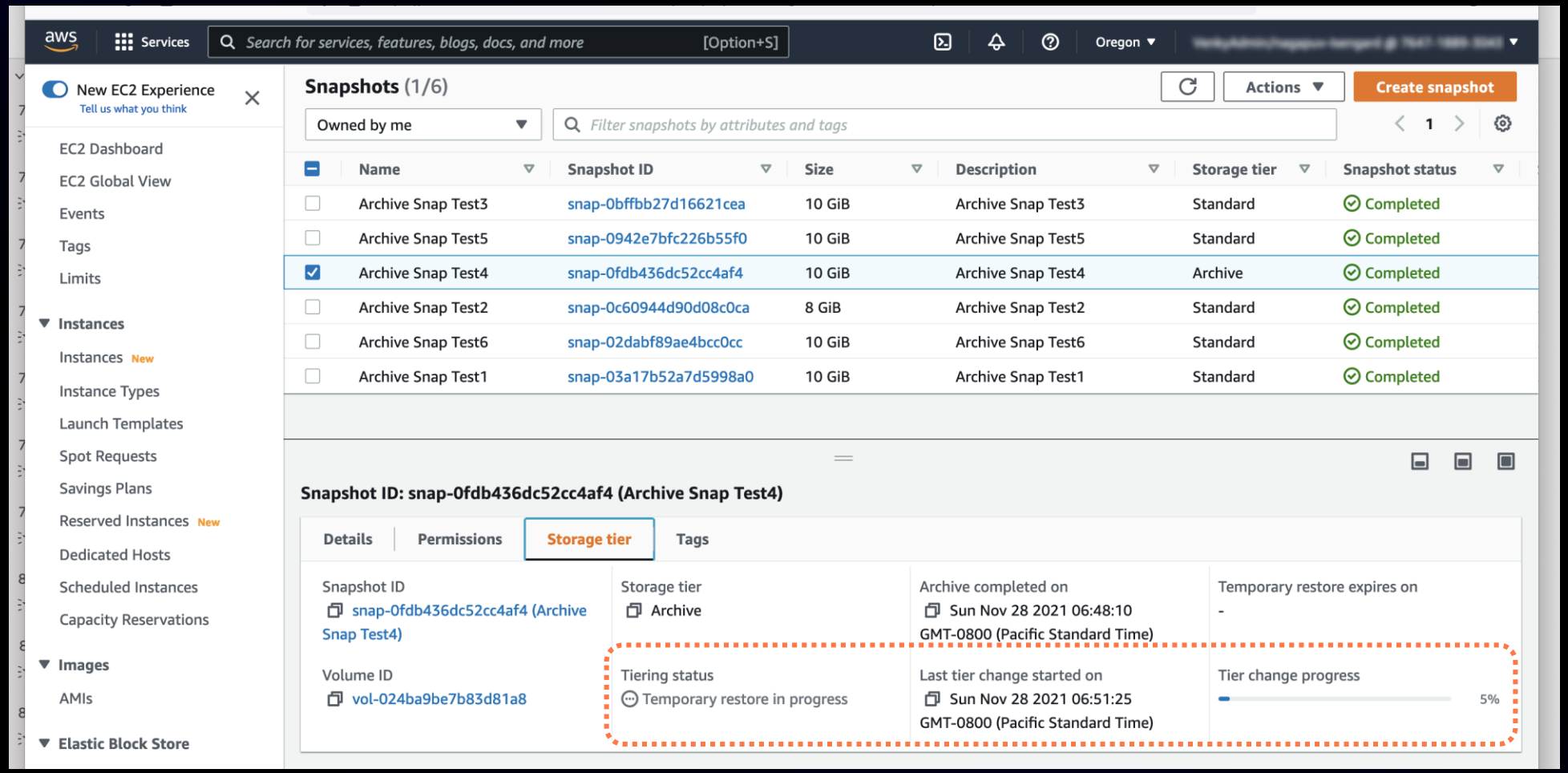



```
aws ec2 restore-snapshot-tier --snapshot-id snap-0fdb436dc52cc4af4 --
temporary-restore-days 3 —region us-west-2
```

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Call DescribeSnapshotTierStatus to check progress

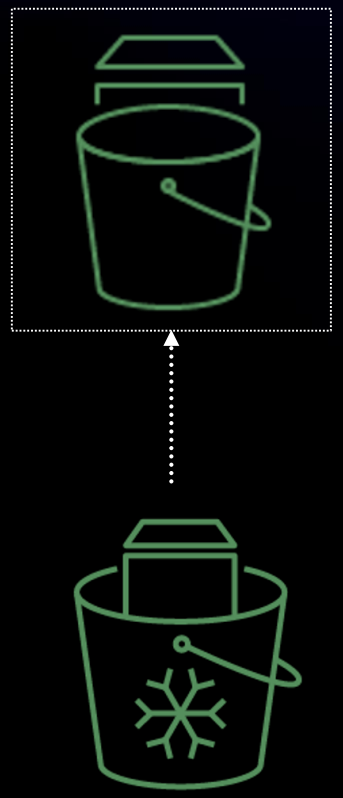


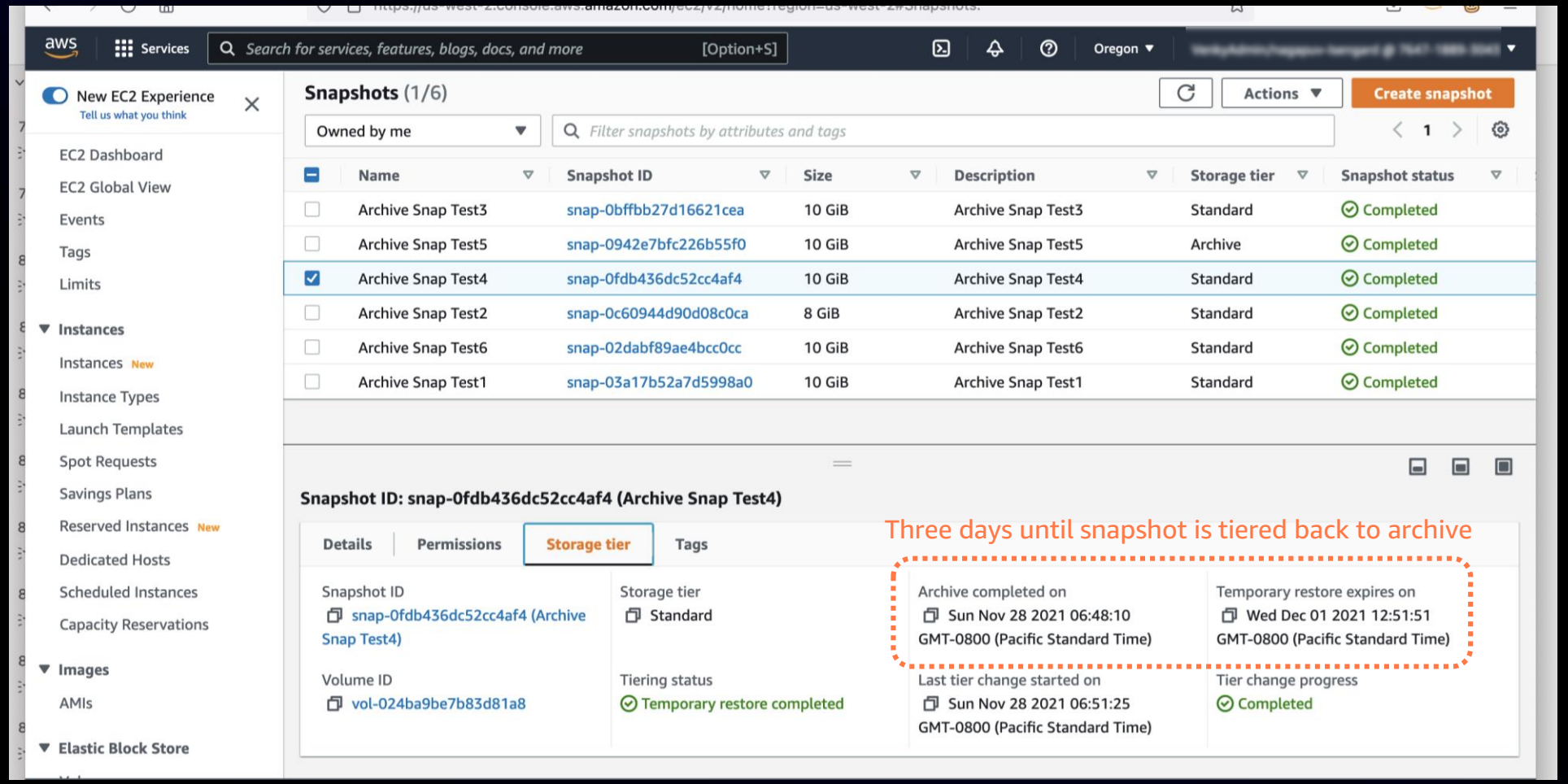



```
aws ec2 describe-snapshot-tier-status –region us-west-2 –snapshot-id
snap-0fdb436dc52cc4af4
```

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Snapshot is now restored to standard tier





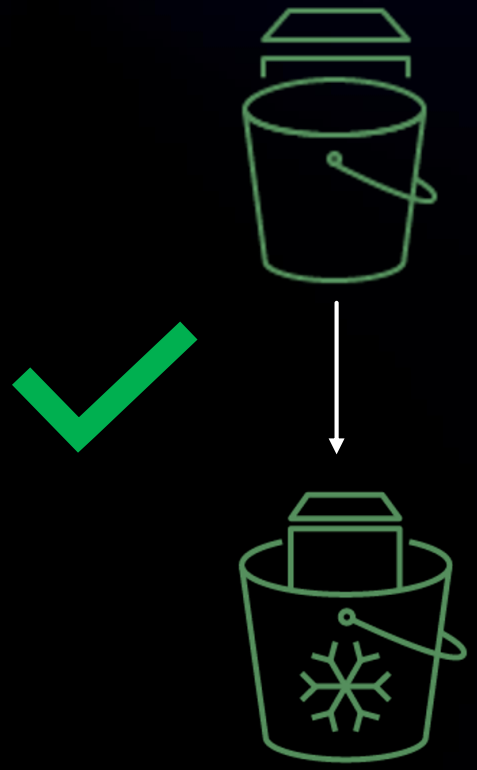

```
aws ec2 describe-snapshot-tier-status –region us-west-2 –snapshot-id
snap-0fdb436dc52cc4af4
```

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Considerations for using EBS Snapshots Archive

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Considerations for archiving snapshots

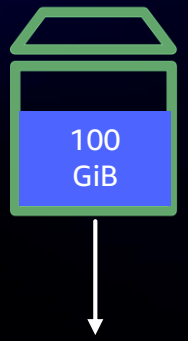


What snapshots to archive?

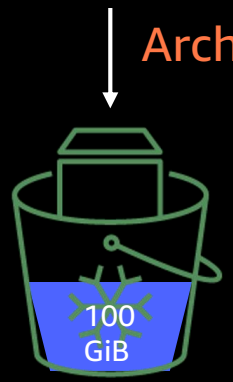
- Last snapshots of inactive lineages
- Full snapshots for compliance
- Snapshots > 25% change rates

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Last Snapshots of an inactive lineage



- Last snapshot is a “full” snapshot
  - contains all blocks written into volume



- Archive has the same size as snapshot
  - 75% cheaper if you want to retain for 90+ days

Archiving last snapshots of an inactive lineage is cost-effective

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Full snapshots for compliance

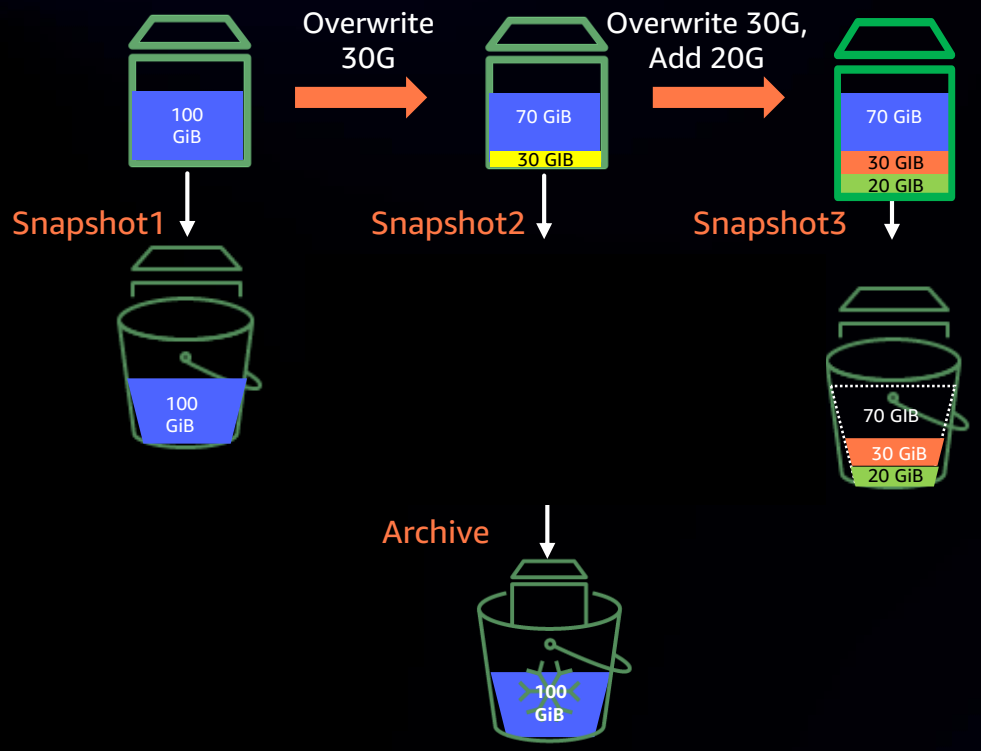


- Compliance use cases need
  - Full snapshots
  - Long-term retention of years
  - Monthly, quarterly, yearly schedule
- EBS Snapshots Archive for compliance
  - Full snapshot archives with no backward references
  - 90+ day retention
  - Lower costs for full snapshots

Archive snapshots if you want full snapshots for compliance

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Snapshots with >25% change rates



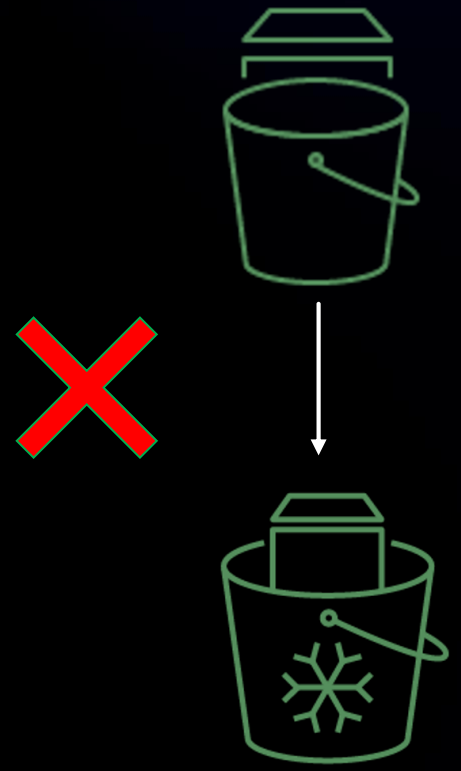
- Unique Bytes size: 30GiB
- Snapshot cost: 150c/GB-mo
- Change Rate: 30/100 = 30%

- Archive size: 100GiB
- Archive cost: 125c/GB-mo
- 30% cost savings

Archiving snapshots >25% change rate is cost-effective

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Considerations for archiving snapshots

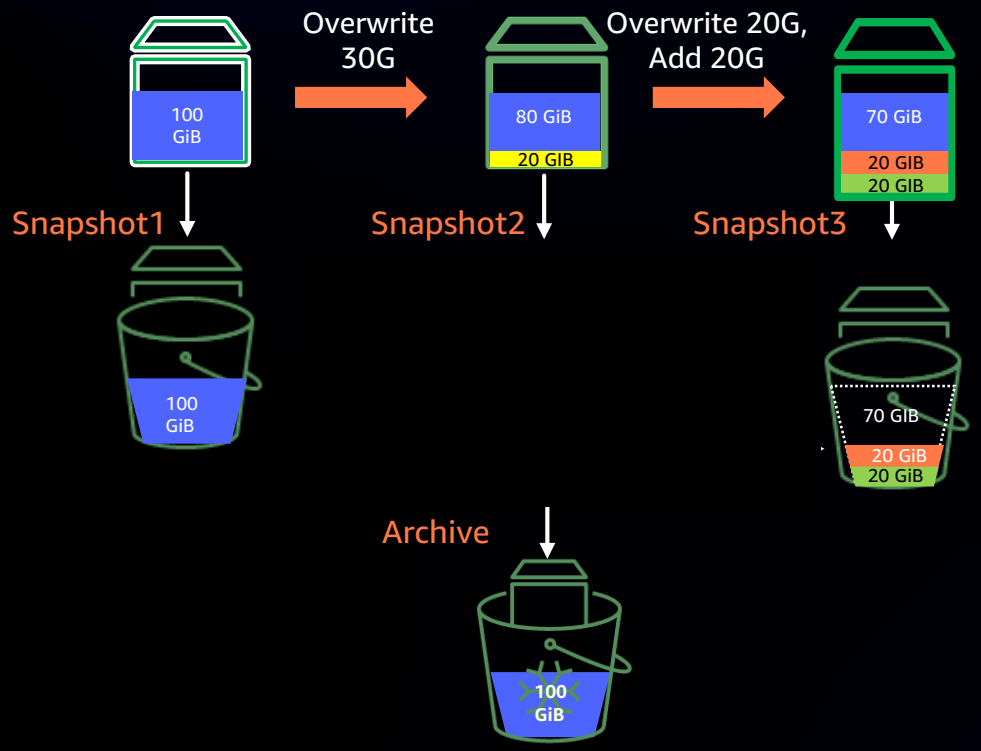


What snapshots not to archive for cost reasons?

- Snapshots <25% change rates
- First snapshots of active lineages
- Last snapshots of active lineages

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Snapshots with <25% change rates



- Unique Bytes size: 20GiB
- Snapshot cost: 100c/GB-mo
- Change Rate: 20/100 = 20%

- Archive size: 100GiB
- Archive cost: 125c/GB-mo
- Higher costs if archived

Archiving snapshots <25% change rate is not cost-effective

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Archiving first and last snapshots of active lineages

First Snapshot

- Properties
  - Full
  - Most referenced
- If archived
  - Next snapshot is full
  - Lose backward references

Last Snapshot

- Properties
  - Latest
  - Most accessed
- If archived
  - Retrieval for volume create
  - Lose forward references

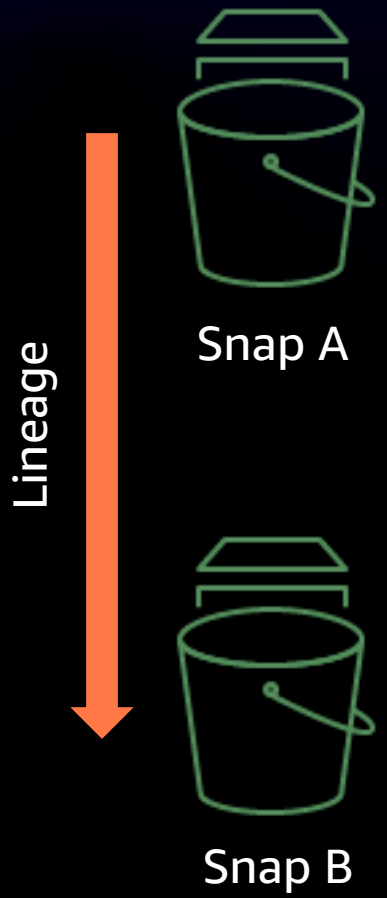
Archiving first and last snapshots not recommended

aws

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Finding Change Rates of Snapshots

USE EBS DIRECT APIS



Size_A : *ListSnapshotBlocks* (SnapA)

Size_B : *ListSnapshotBlocks* (SnapB)
Change_B: *ListChangedBlocks* (SnapA, SnapB)

Change Rate: Change_B/Size_B

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Other considerations for EBS Snapshots Archive

- Only owner can archive snapshots
- FSR and Sharing are disabled on archival
- Cannot archive AMI Snapshots
- Recycle Bin supported for snapshot archives

For more details, visit: https://aws.amazon.com/ebs/snapshots/

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Customer and Partner use cases

WHY USE EBS SNAPSHOTS ARCHIVE?



"Ease-of-use and low cost for long-term retention of data for regulatory requirements."



"Eliminates the need to maintain scripts and enables creation of secure end-to-end flows for cost effective archival."



"An innovative, cost-effective alternative for archiving EBS Snapshots that maintains reliable access for recovery."

aws

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Amazon Data Lifecycle Manager (DLM)



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Amazon Data Lifecycle Manager

SIMPLE AUTOMATED WAY TO BACK UP DATA STORED ON AMAZON EBS VOLUMES



Policy and tag-based backup solution



Automated backup scheduling



Automated backup retention management

Identify instances and volumes to backup/create AMIs using tags

Define policies for regular backup schedules

Retain backups for compliance / audit purposes

Control snapshot costs by automatically deleting old backups

Use AWS Identity and Access Management (IAM) to control Amazon DLM policy access

No cost to use

aws

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Amazon DLM: The Basics

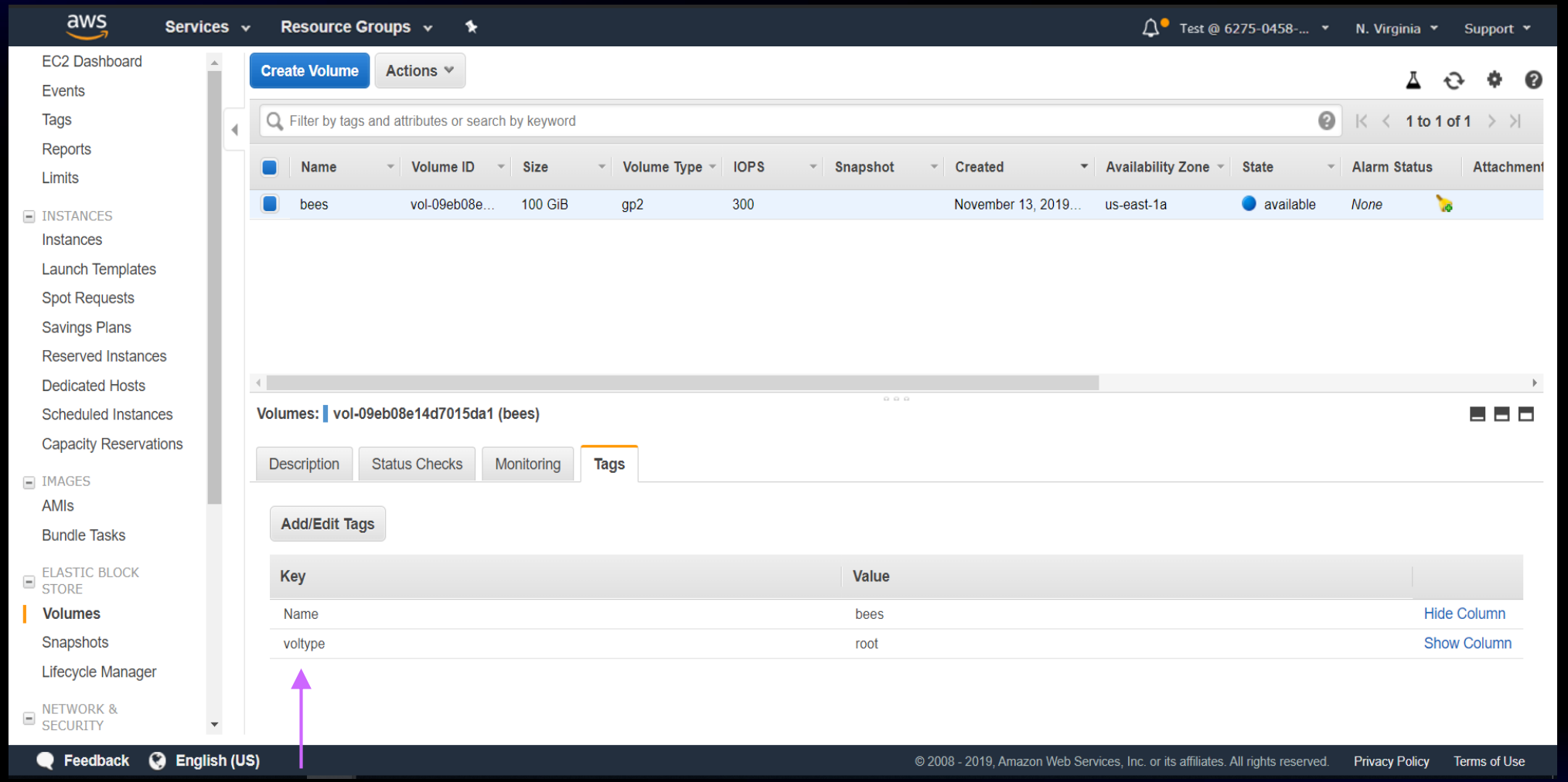
Use policies to set backup and retention schedules

User requirement	Data lifecycle policy

"All EBS data volumes attached to an EC2 instance will be backed up once per day, saved for 7 days."	`Tags: voltype:root`
	`Create: every 24 hours`
	`Start Time: 0700 UTC`
	`Retention: most recent 7`

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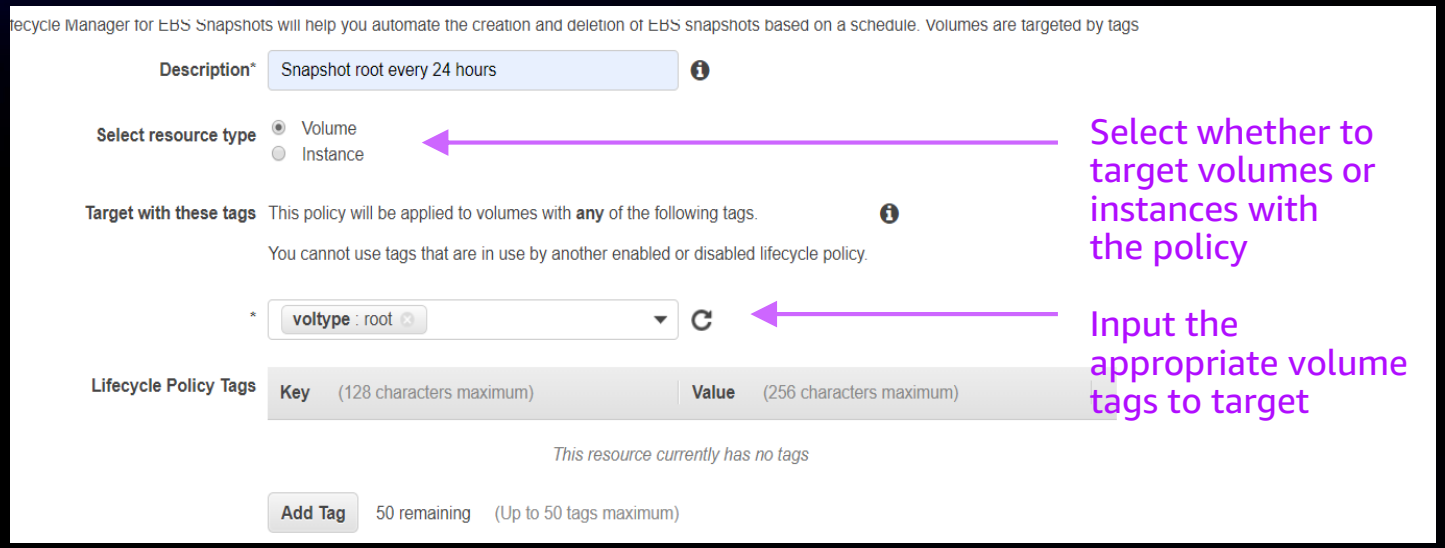
Amazon DLM



Add tags to the volumes you want to associate with Amazon DLM policies

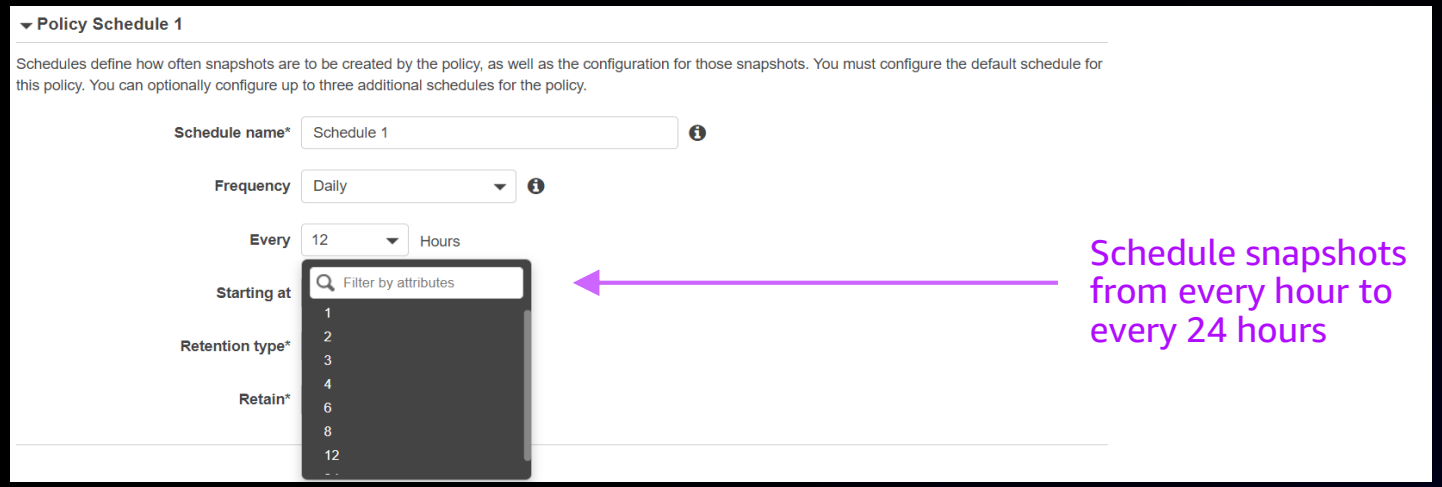
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Amazon DLM scheduling features



Select whether to target volumes or instances with the policy

Input the appropriate volume tags to target

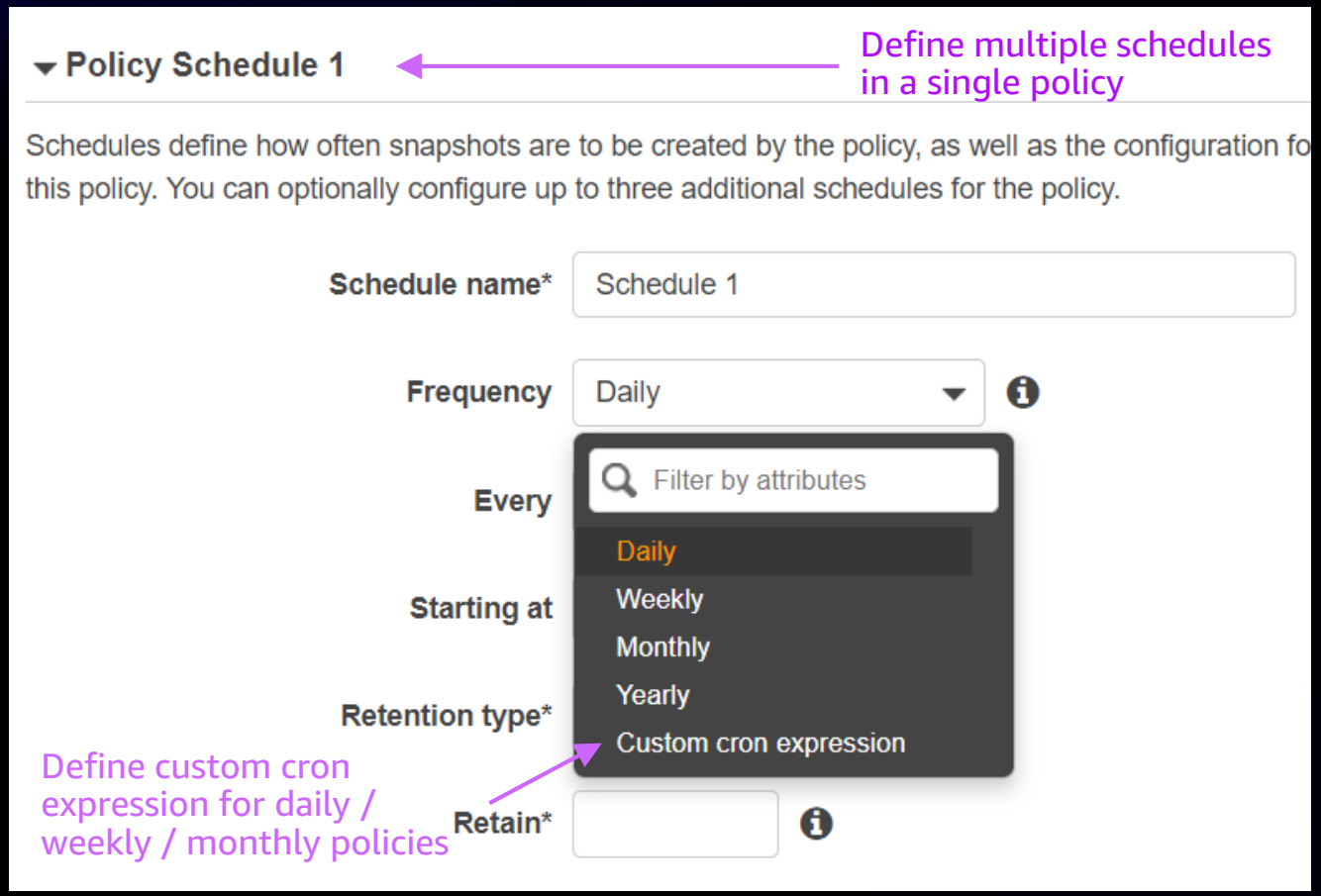


Schedule snapshots from every hour to every 24 hours

Reduce RPO on your Amazon DLM policy up to 1 hour

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Amazon DLM scheduling features

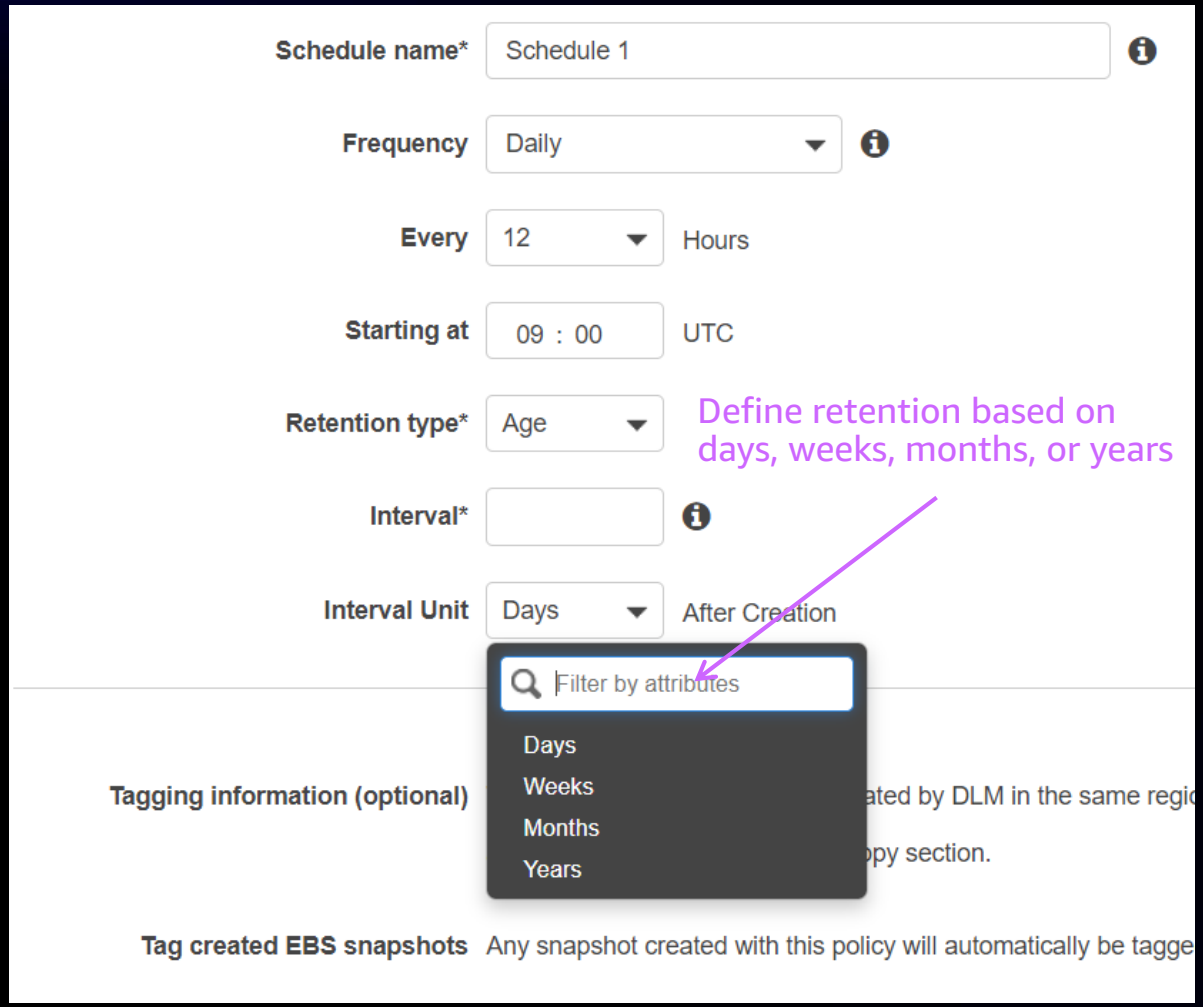


Simplify meeting your RPO needs

Flexible scheduling

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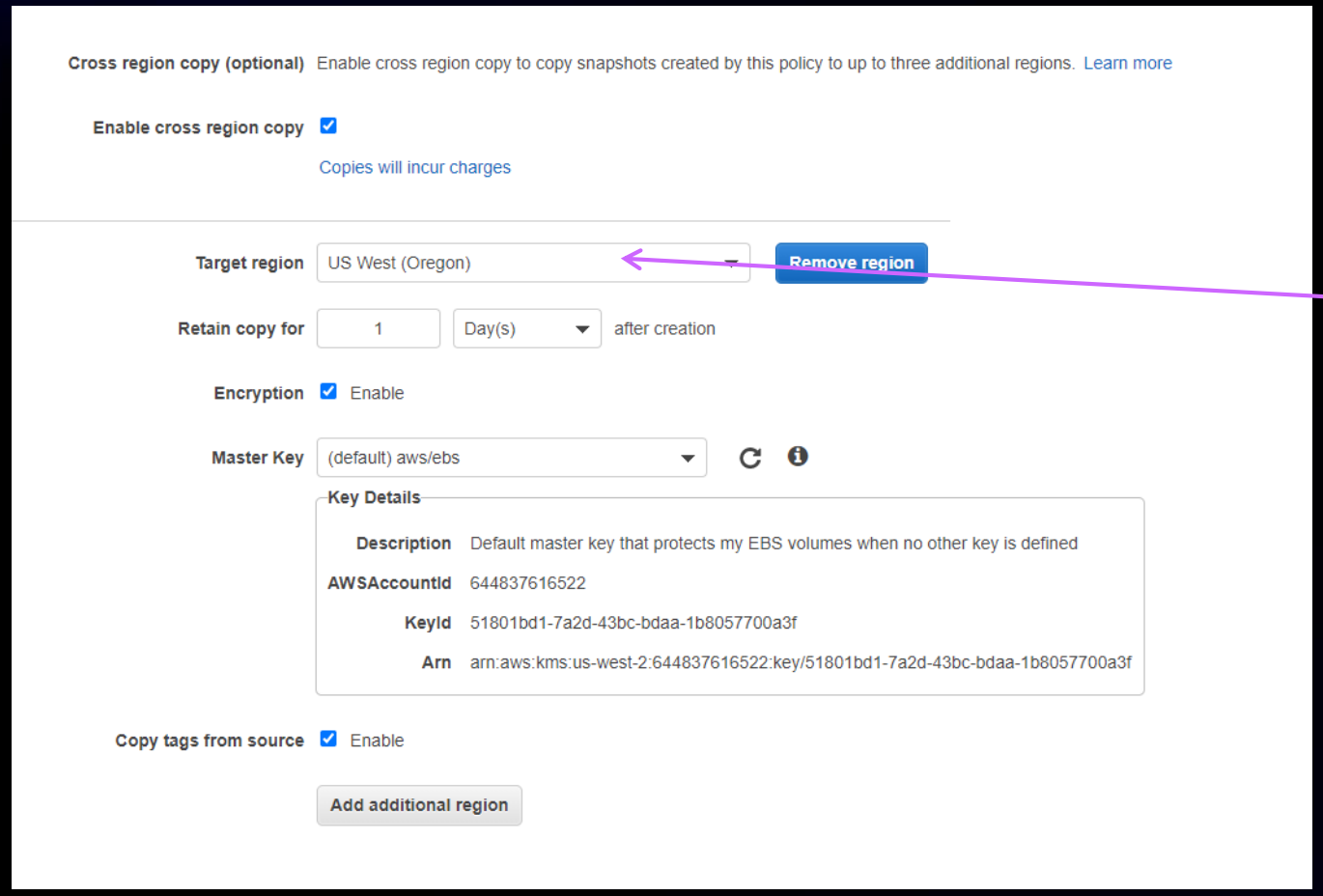
Amazon DLM retention features



Time-based retention

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Amazon DLM cross-Region copy features



Automate copy
across Region

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EBS direct APIs

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Amazon EBS direct APIs: Read and write access to snapshots

With a set of APIs, you can

Write

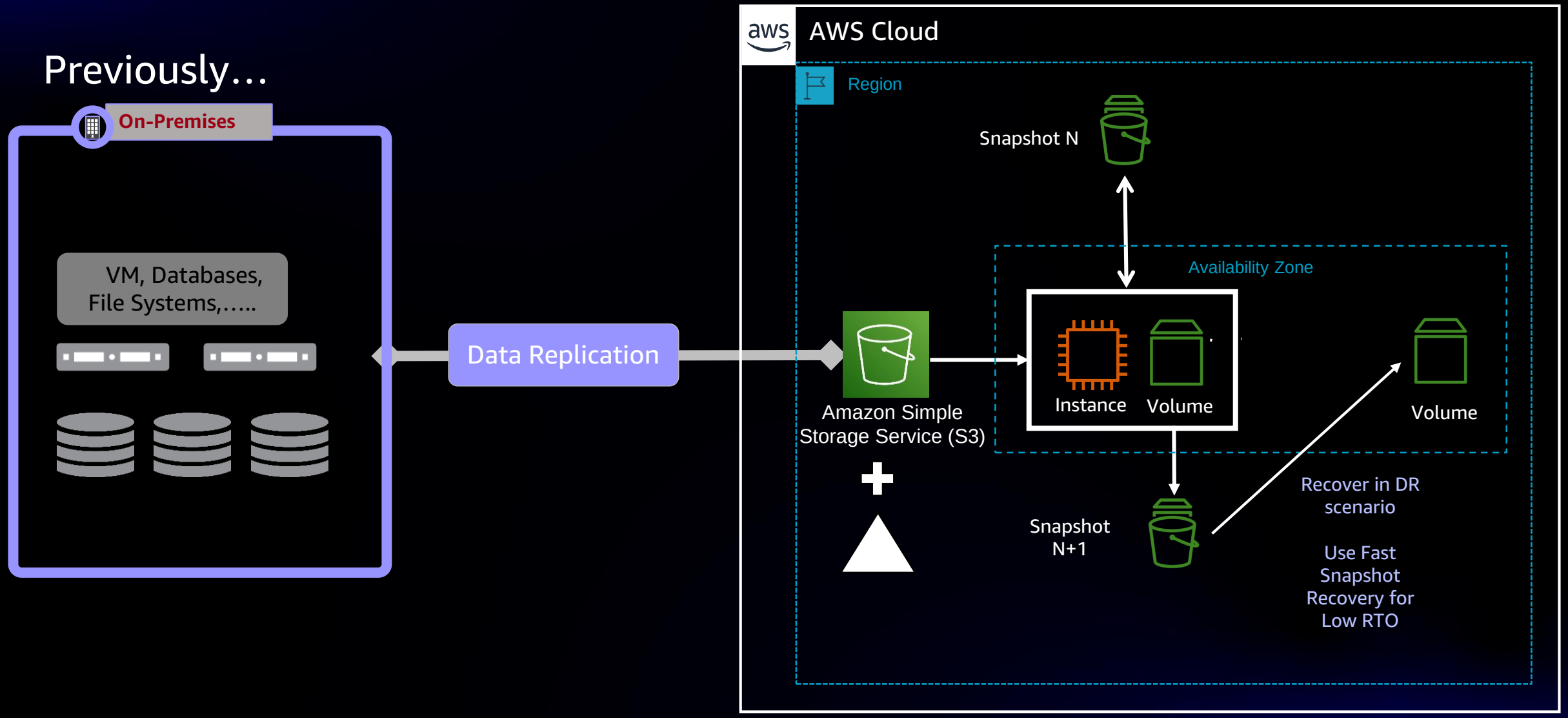
Create snapshots from any source

Read

- List blocks in a snapshot
- Read blocks in parallel
- Compare snapshots and read changed blocks

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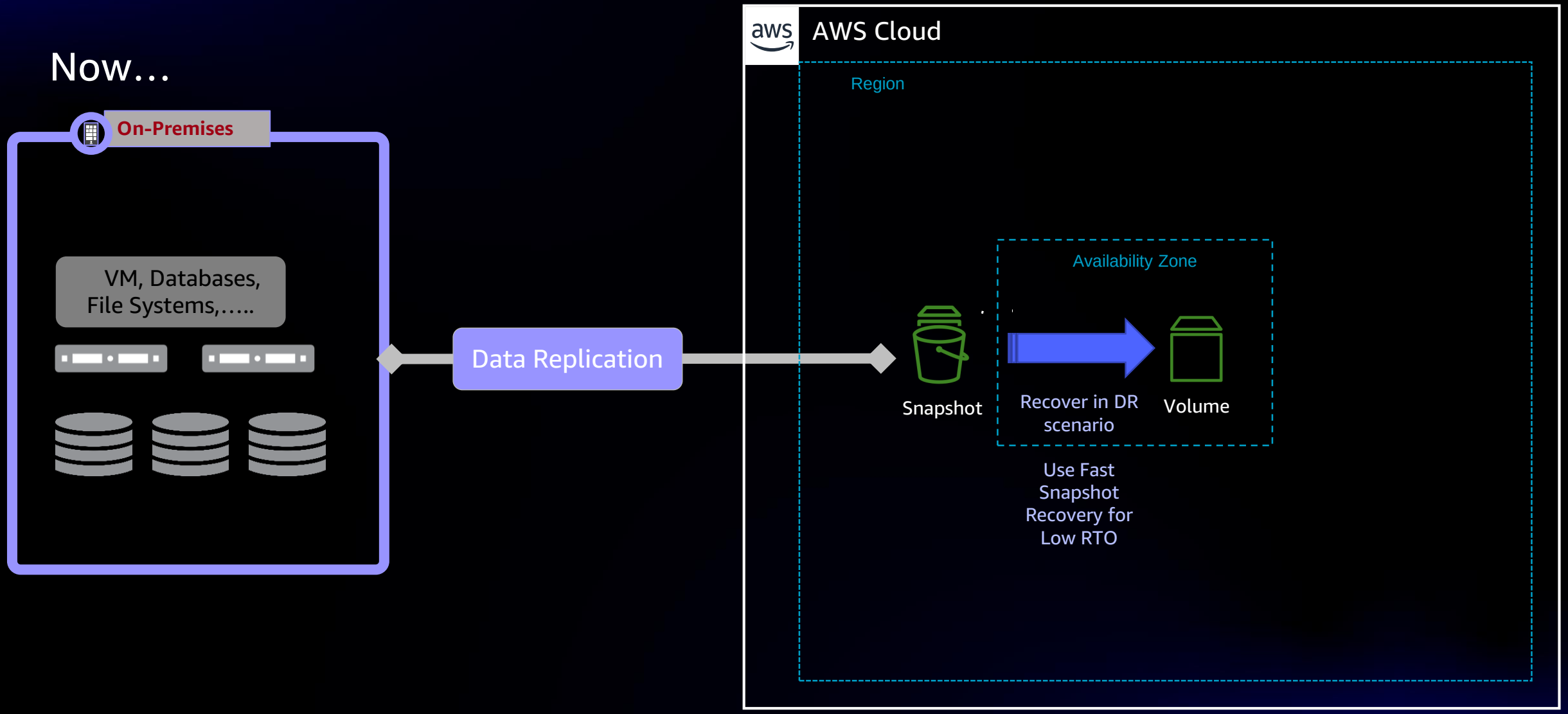
Amazon EBS direct write APIs



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EBS direct write APIs

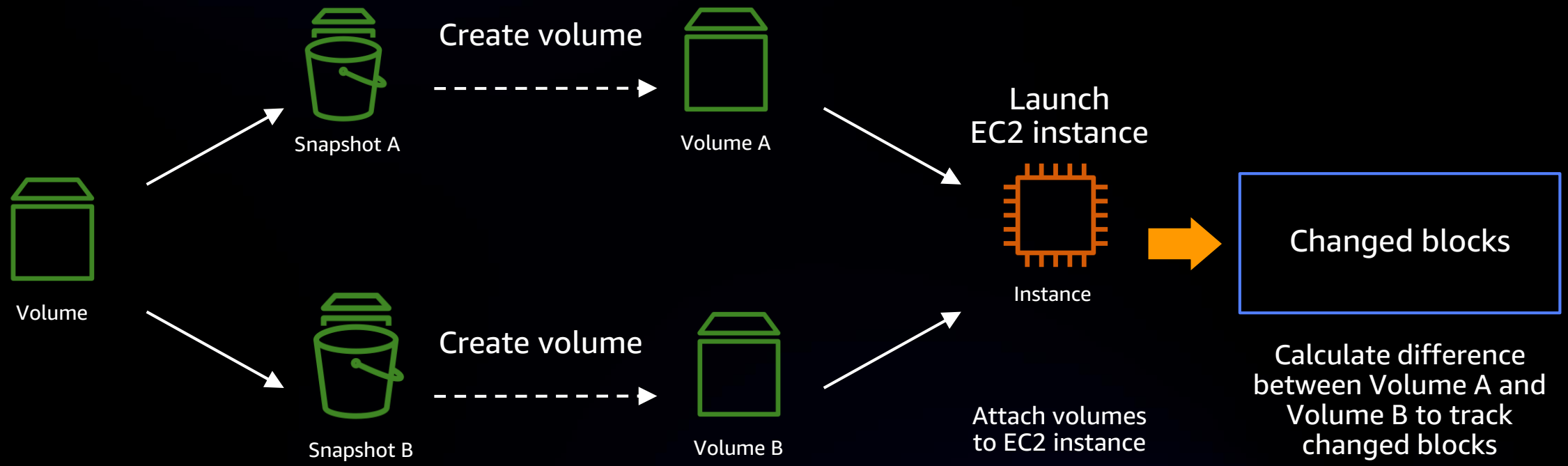
Now…



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Amazon EBS direct read APIs

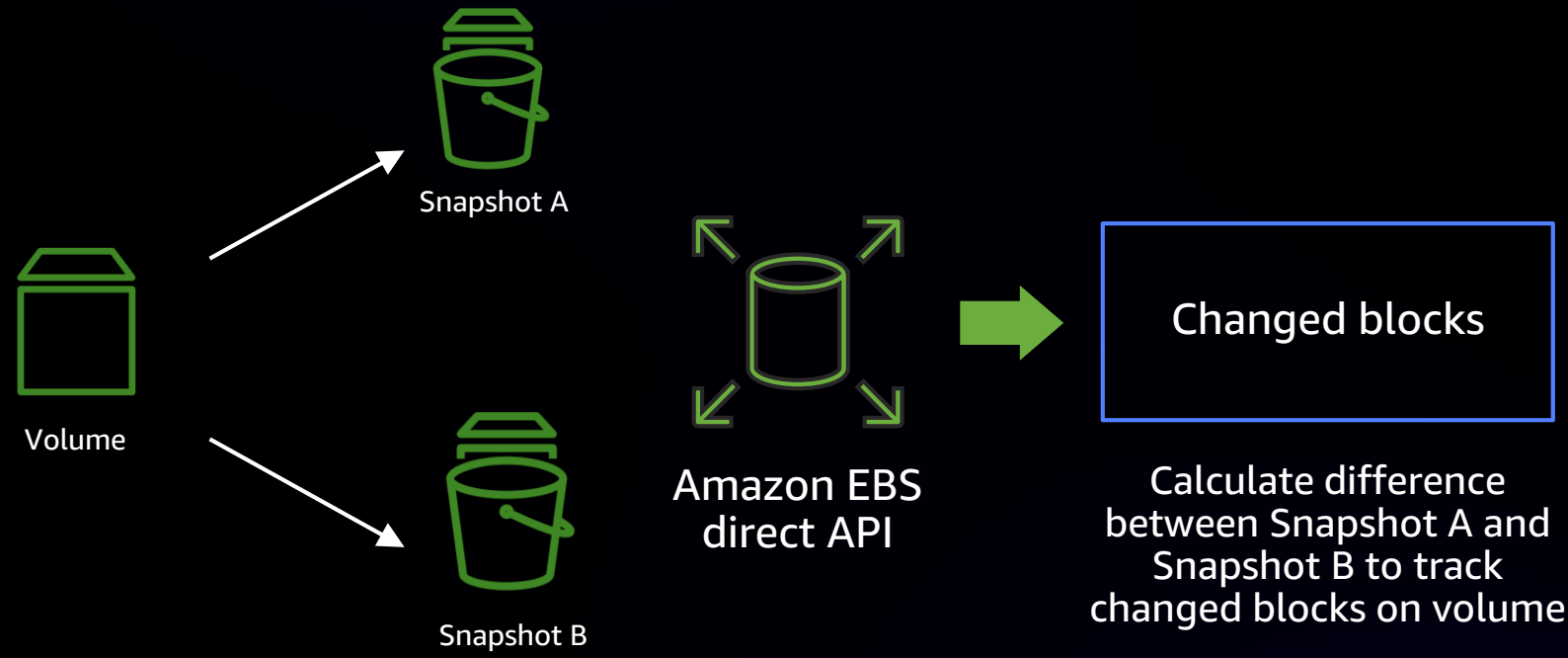
Previously …



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Amazon EBS direct read APIs

Now …



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Write snapshot API

- StartBlockSnapshot – use this API to create a snapshot with or without a parent snapshot
- PutSnapshotBlock – once you receive the snapshot ID, use this API to add data, in the form of individual blocks (size = 512K), to the specific snapshot
- CompleteBlockSnapshot – once all blocks have been added, API seals the snapshot

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ebs-accessing-snapshot.html

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Write snapshot API

Sample startsnapshot command

```
{
    "VolumeSize": 8,
    "ParentSnapshot": snap-123EXAMPLE1234567,
    "ClientToken": "550e8400-e29b-41d4-a716-446655440000",
    "Timeout": 60
}
```

Output

```
{
    "BlockSize": 524288,
    "Description": null,
    "OwnerId": "138695307491",
    "Progress": null,
    "SnapshotId": "snap-052EXAMPLEc85d8dd",
    "StartTime": null,
    "Status": "pending",
    "Tags": null,
    "VolumeSize": 8
}
```

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ebs-accessing-snapshot.html

aws

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Listing changed blocks

Sample **list-changed-blocks** command with output

```
aws ebs list-changed-blocks --first-snapshot-id snap-0987654321 --second-snapshot-id snap-
1234567890 --starting-block-index 0 --max-results 6004
```


```
{
    "ChangedBlocks": [
        {
            "BlockIndex": 0,
            "FirstBlockToken": "AAABAVahm9SO60DyiOORySzn2ZjGjW/KN3uygGlSOQOYWesbzBbDnX2dGpmC",
            "SecondBlockToken": "AAABAf8oOo6UFi1rDbSZGIRaCEdDyBu9TlvtCQxxoKV8qrUPQP7vcM6iWGSr"
        },
        {
            "BlockIndex": 6001,
            "FirstBlockToken": "AAABASBpSJ2UAD3PLxJnCt6zun4/T4sU25Bnb8jB5Q6FRXHFqAIAqEO4hJoR"
        },
        {
            "BlockIndex": 6003,
            "FirstBlockToken": "AAABASmJOO5JxAOce25rF4P1sdRtyIDsX12tFEDunnePYUKOf4PBROuICb2A"
        }
        ...
    ],
    "ExpiryTime": 1576308931.973,
    "VolumeSize": 32212254720,
    "BlockSize": 524288,
    "NextToken": "AAADARqElNng/sV98CYk/bJDCXeLJmLJHnNSkHvLzVaOOzsPH/QM3Bi3zF//O6Mdi/BbJarBnp8h"
}
```


https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ebs-accessing-snapshot.html

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Read snapshot API

Sample get-snapshot-block command with output

```
aws ebs get-snapshot-block --snapshot-id snap-01234567890 --block-index 6001 --block-
token AAABASBpSJ2UAD3PLxJnCt6zun4/T4sU25Bnb8jB5Q6FRXHFqAIAqEO4hJoR C:/Temp/output.txt

{
    "DataLength": "524288",
    "Checksum": "cfOY6/FnOoFa4VyjQPOa/iDOzhTflPTKzxGv2OKowXc=",
    "ChecksumAlgorithm": "SHA256"
}
```

The binary data is output to the “output.txt” file in the C:/Temp/ directory

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ebs-accessing-snapshot.html

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EBS Local Snapshots on AWS Outposts

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Cloud continuum

DELIVER CLOUD WHERE CUSTOMERS NEED IT

AWS REGIONS



On premises

Metro centers

5G networks

IoT

Rugged edge

For most use cases

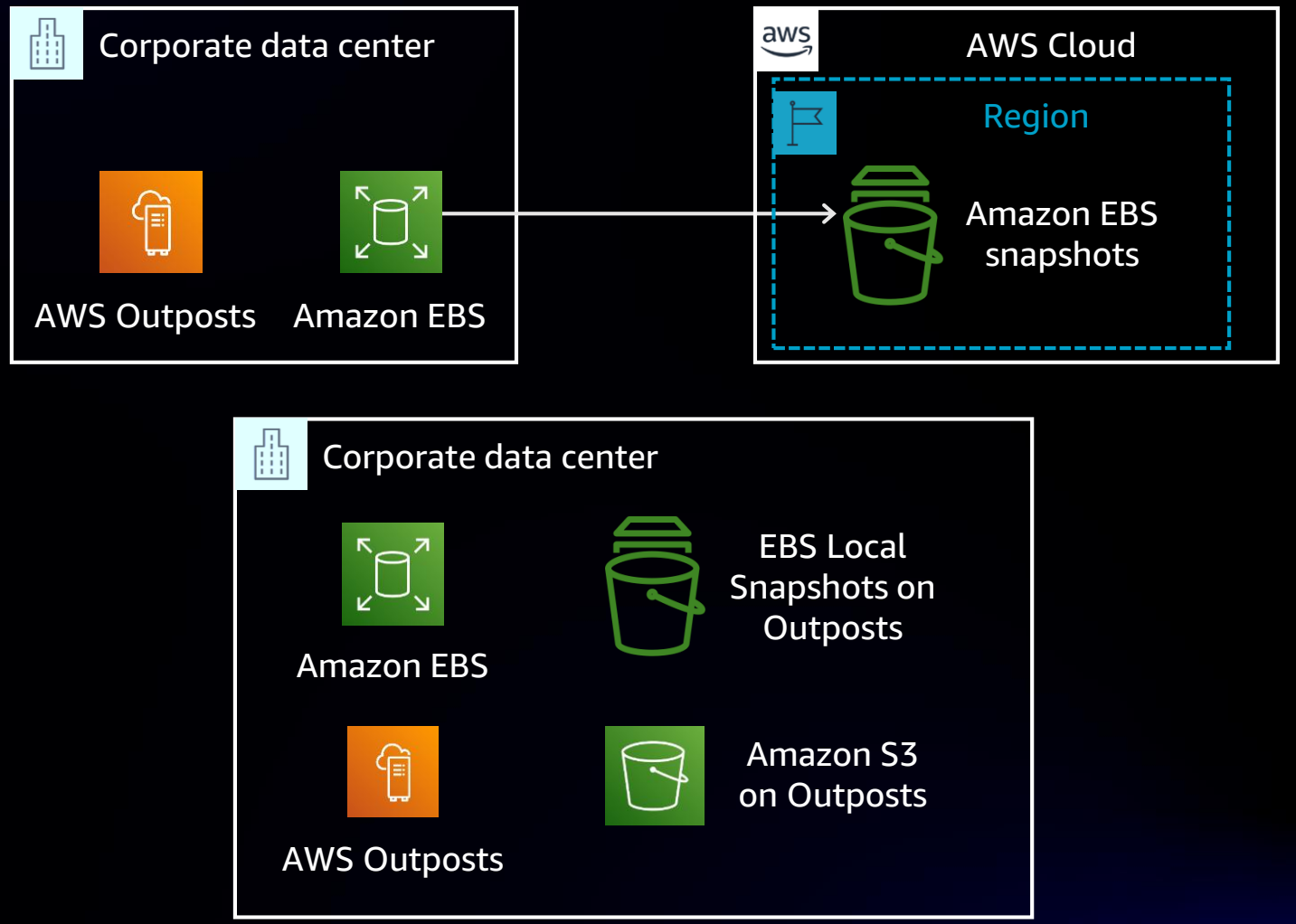
For low latency, local data processing, data residency

CLOUD CONTINUUM

aws

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EBS Local Snapshots on AWS Outposts



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EBS Local Snapshots on AWS Outposts



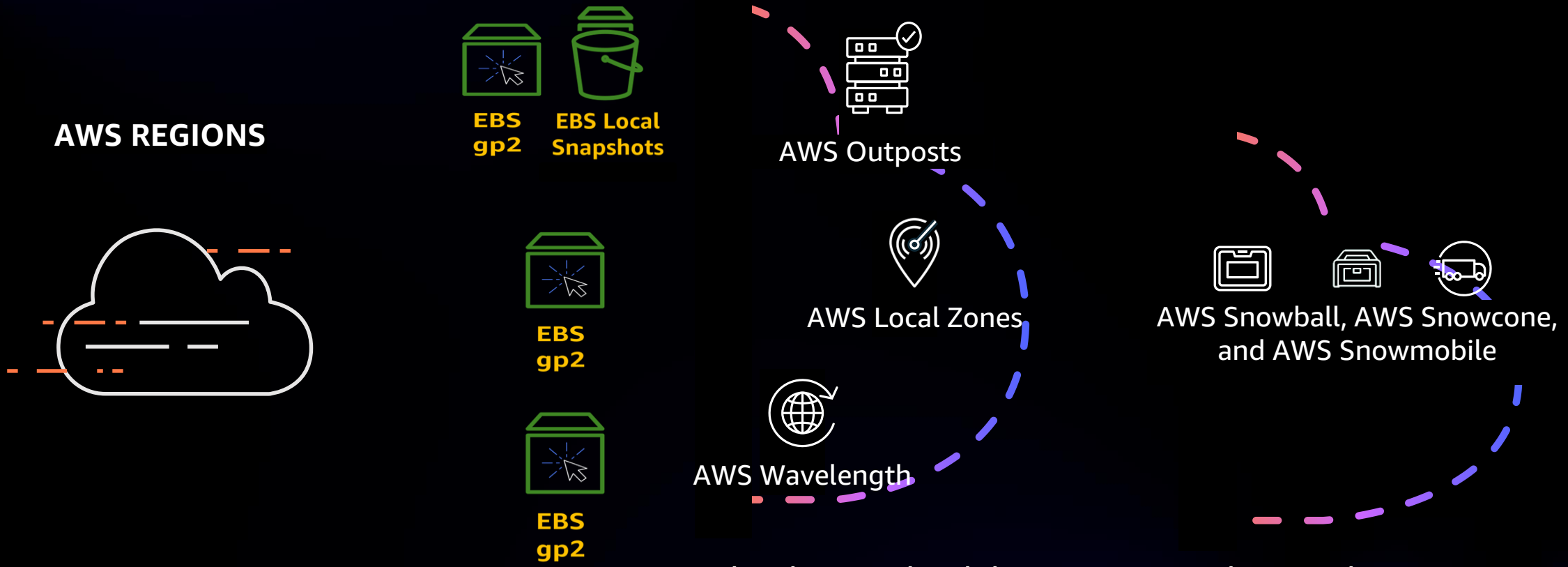
- Store snapshots of EBS Volumes on Amazon S3 on AWS Outposts
- Create snapshots of EBS on AWS Outposts with the same API/CLI
- Copy snapshots/AMIs from Region to Outposts
- Set policies and automate snapshot creation and deletion with Amazon Data Lifecycle Manager (DLM)
- Control data access AWS Identity and Access Management (IAM) to meet data residency requirements
- Encrypted by default

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/snapshots-outposts.html

aws

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Bring the cloud closer to you



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Thank you!

Venky Nagapudi

Ashish Palekar

@logicalblock

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