Amazon Elastic Block Store (EBS) & Snapshots

Optimization Strategies for Better Performance and Cost Savings

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Today you will learn:

- Best Practices to maximize savings & performance with Amazon EBS
- Right-sizing EC2 and EBS for optimal cost & performance
- Tracking EBS and Snapshots usage & spend – Cost Explorer
- Best practices for Snapshot Lifecycle Management
- Monitoring EBS volumes – CloudWatch demo
- Latest features and capabilities from Amazon EBS

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Amazon EBS Overview

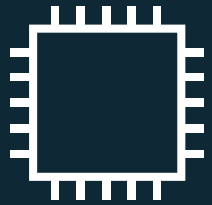
Simple, Scalable & Reliable Block Storage Solution

Amazon EBS Volumes

Easy to use, high performance block storage service

Snapshots

Incremental point-in-time copies of EBS volumes



Instance storage

Temporary block-level storage attached to host hardware

Data Services

Elastic Volumes, Data Lifecycle Management

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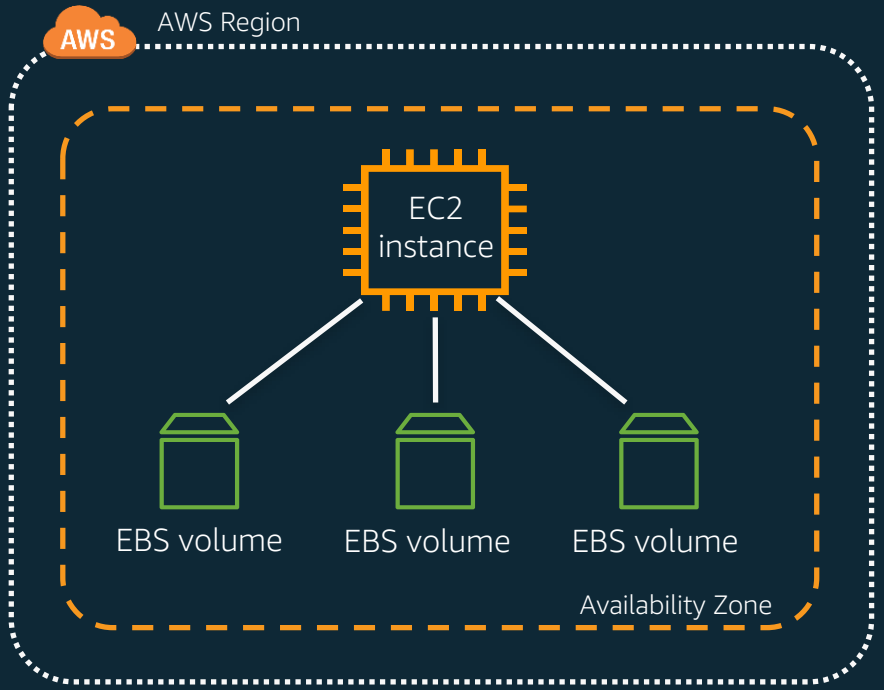
Amazon EBS - Block storage as a service



- EBS Volumes attach to EC2 instance
- Many volumes can attach to an EC2 instance
- Volumes persist independent of EC2 instance lifecycle
- New : Multi-attach io1 volume to up to 16 EC2 instances in select AWS regions

EBS is designed for a wide range of workloads

Enterprise applications

SAP ERP, Oracle ERP, Microsoft SharePoint, Microsoft Exchange

Relational databases

MySQL, PostgreSQL, SQL Server, Oracle DB, SAP HANA

Non-relational/ NoSQL databases

Cassandra, MongoDB, CouchDB

Big data analytics

Kafka, Splunk, Hadoop, Data warehousing

File/media

CIFS/NFS, transcoding, encoding, rendering

LOW LATENCY AND CONSISTENT, HIGH IOPS AND THROUGHPUT

SCALABLE WITHOUT DISRUPTION TO YOUR WORKLOAD

99.999% AVAILABILITY AND AN ANNUAL FAILURE RATE (AFR) OF BETWEEN 0.1% – 0.2%

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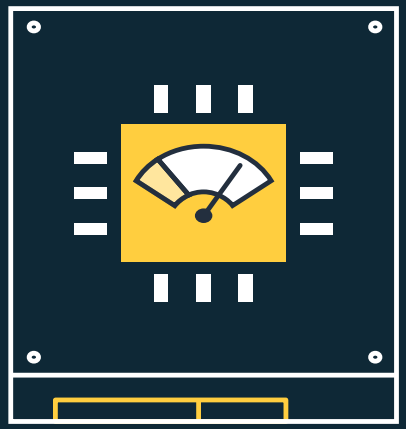
EBS Optimization

EBS optimized EC2 instances



EC2 instance

- Dedicated network bandwidth for Amazon EBS I/O
- Enabled by default on most current-generation instances
- New : Max supported EBS bandwidth for select Nitro instances is now 19Gbps, a 36% increase from 14 Gbps.

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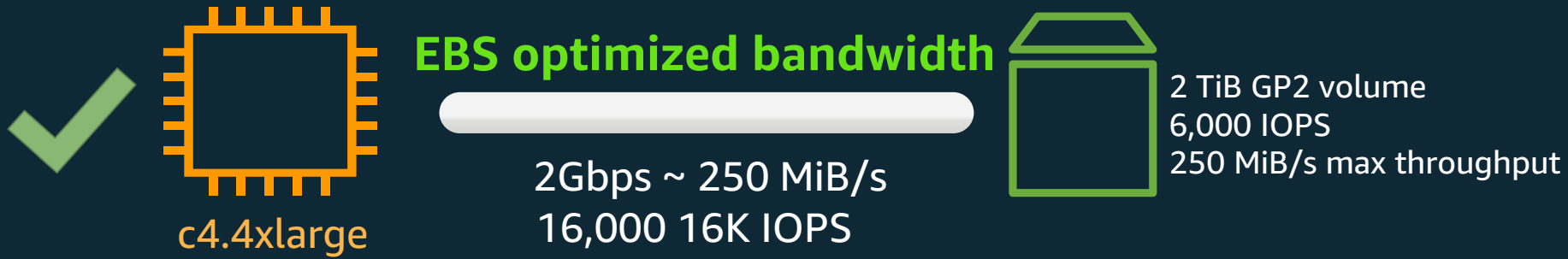
Right sizing EC2 for better performance

- EC2 instances have performance thresholds
- EBS volumes have performance thresholds
- The lesser of these will dictate your EBS max performance



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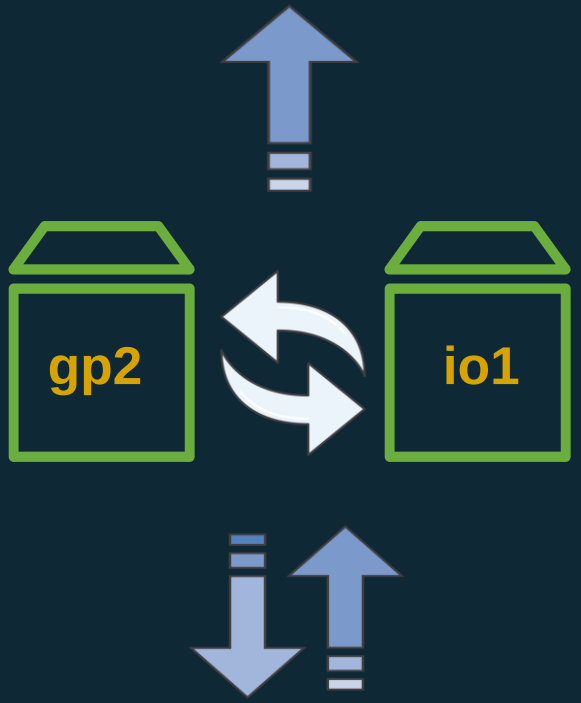
EBS Elastic Volumes



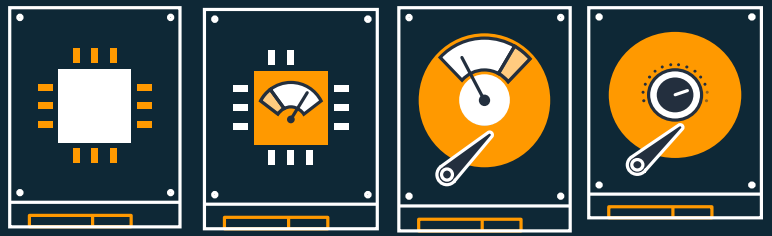
Increase volume size

Change volume type

Increase/decrease provisioned IOPS

Monitoring EBS volumes – CloudWatch

Monitoring EBS - CloudWatch metrics



Important metrics to consider

BurstBalance	gp2, st1, sc1 only
VolumeReadBytes	All
VolumeWriteBytes	All
VolumeReadOps	All
VolumeWriteOps	All
VolumeQueueLength	All
VolumeThroughputPercentage	io1 only
VolumeConsumedReadWriteOps	io1 only

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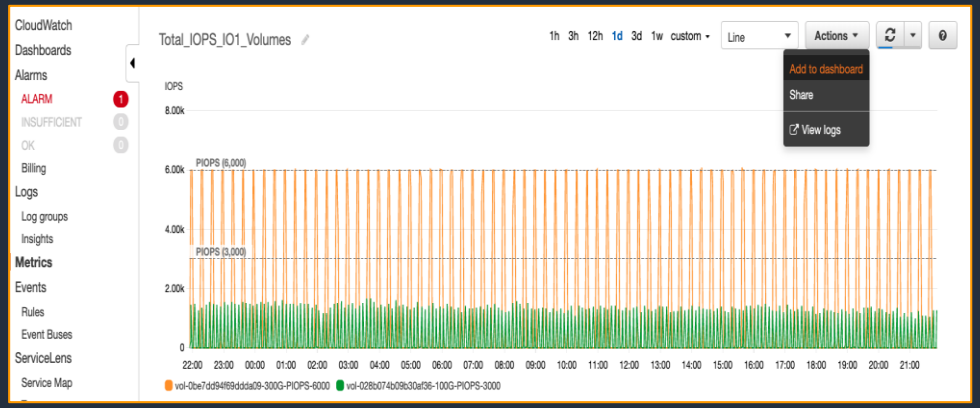
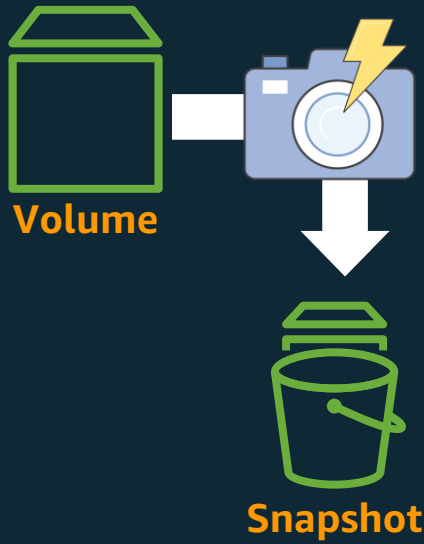
CloudWatch **Demo**
Total IOPS for EBS volume



EBS Snapshots and Data Lifecycle Manager (DLM)

EBS Snapshots



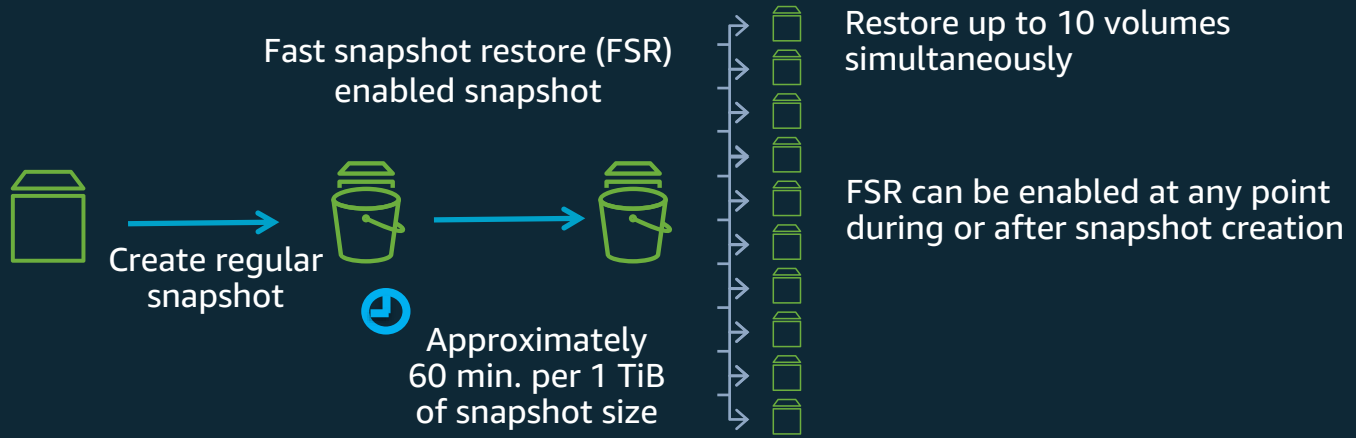
- Point-in-time copy of an EBS volume
- Incremental – only changed blocks are saved
- Stored in S3 (11x 9's of durability)
- Crash consistent
- Contains all information necessary to restore a volume

EBS Fast Snapshot Restore (FSR)

New

6x lower recovery time objective

Predictability	Speed	Scale	Cost
Manage RTO based on size and credits	Instant access to volume from snapshots	Up to 10 volume restores instantly	No need for additional EC2 instances



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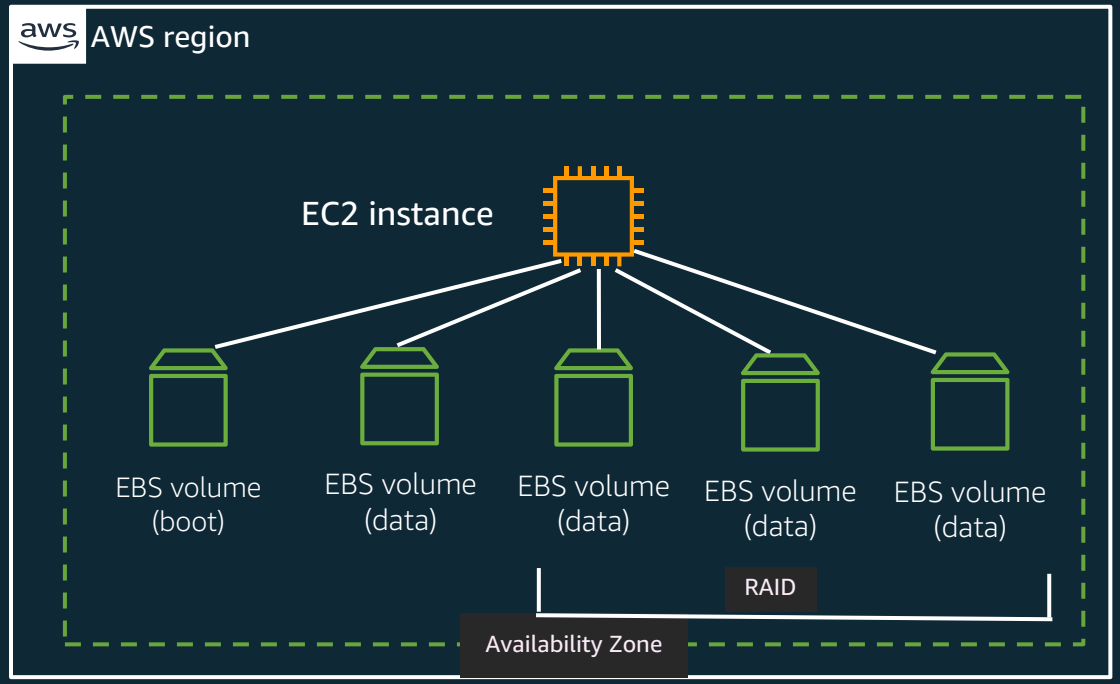
Multi-volume crash consistent Snapshots

New



Multi-volumes are chosen by specifying an instance

Boot volume can be excluded

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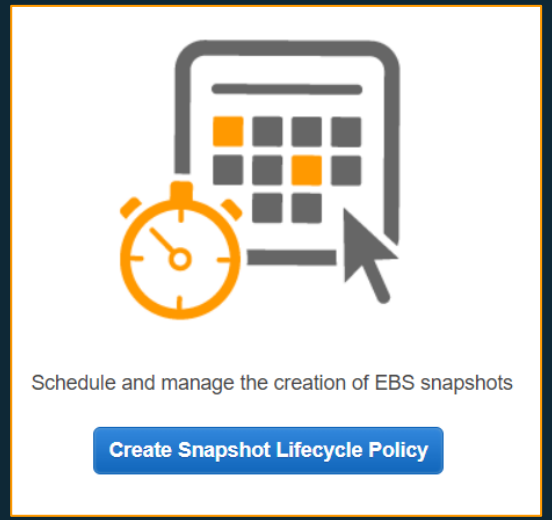
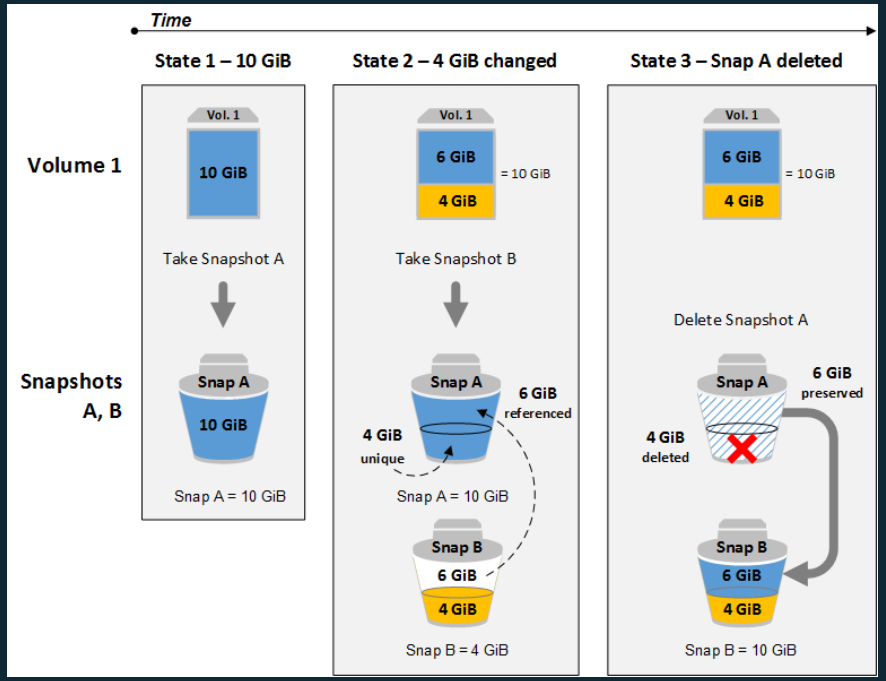
Amazon Data Lifecycle Manager (DLM)

- Policy and tag-based snapshot management solution
- Automated scheduling
- Automated snapshot retention management
- No cost to use
- New: Cross region copy of snapshots to meet DR and compliance
- New: Set your remote region retention independent of source region policy



Deleting EBS snapshots



When a snapshot for a volume is deleted, data referenced exclusively by that snapshot is removed. But data referenced by other snapshots is preserved.

To delete multi-volume snapshots, retrieve all of the snapshots for your multi-volume group using the tag you applied to the group when you created the snapshots. Then, delete the snapshots individually.

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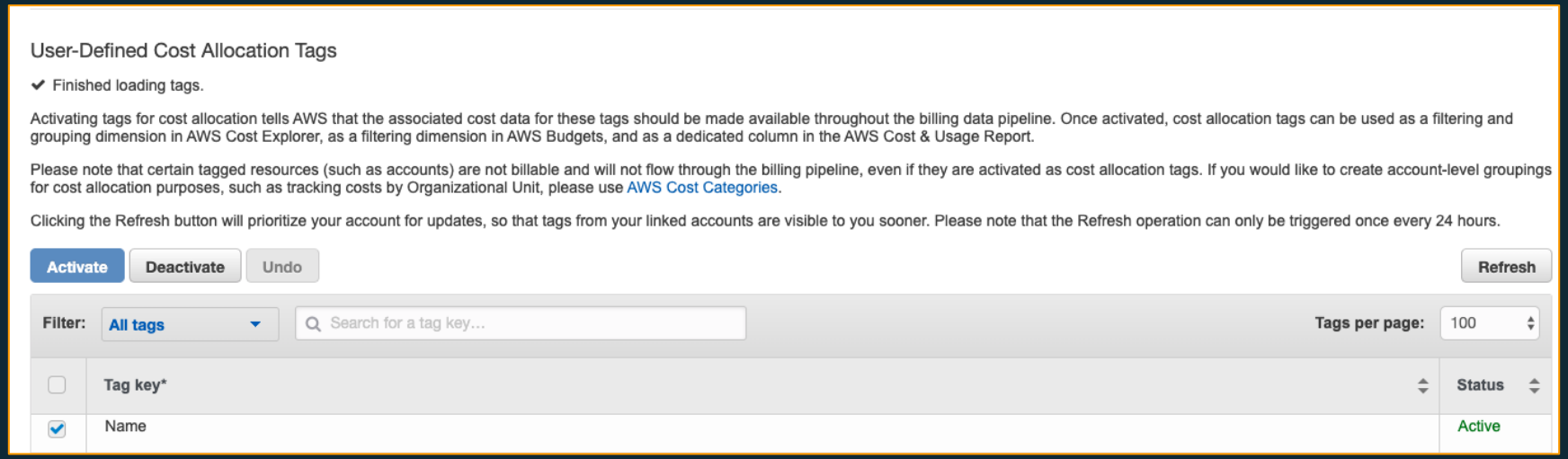
Cost Explorer

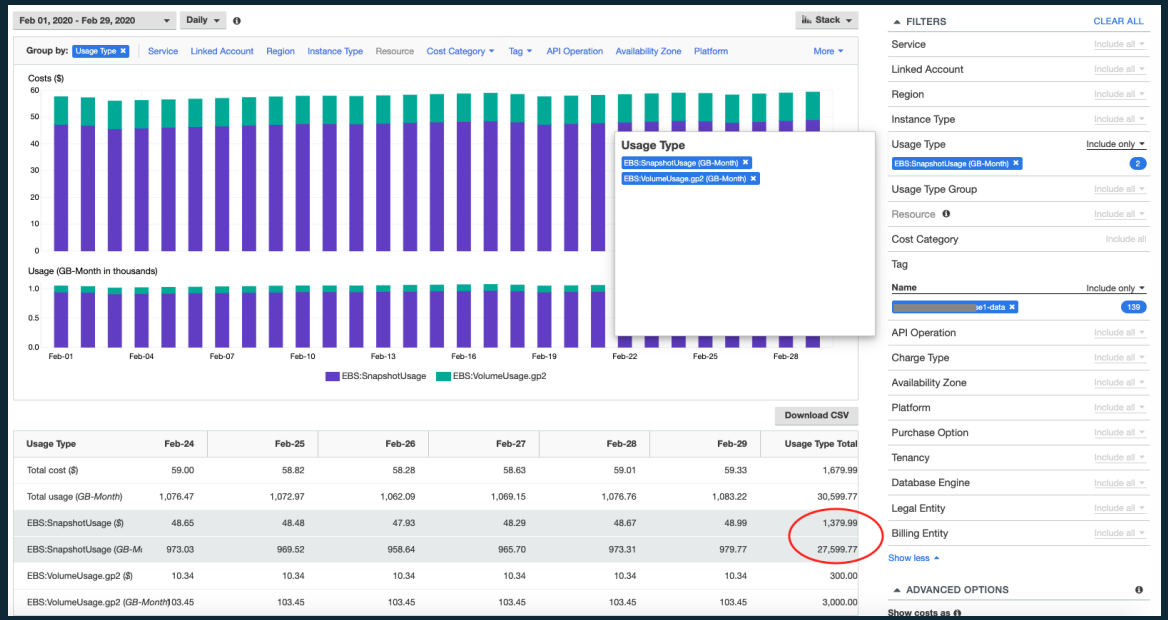
Tracking EBS and Snapshots usage & spend

Cost Allocation Tags



Activate user-defined tags for cost allocation

Cost Explorer - EBS & Snapshot Usage & costs



Usage Type	Feb-24	Feb-25	Feb-26	Feb-27	Feb-28	Feb-29	Usage Type Total
Total cost ($)	59.00	58.82	58.28	58.63	59.01	59.33	1,679.99
Total usage (*GB-Month*)	1,076.47	1,072.97	1,062.09	1,069.15	1,076.76	1,083.22	30,599.77
EBS:SnapshotUsage ($)	48.65	48.48	47.93	48.29	48.67	48.99	1,379.99
EBS:SnapshotUsage (*GB-Mo*	973.03	969.52	958.64	965.70	973.31	979.77	27,599.77
EBS:VolumeUsage.gp2 ($)	10.34	10.34	10.34	10.34	10.34	10.34	300.00
EBS:VolumeUsage.gp2 (*GB-Month*)	103.45	103.45	103.45	103.45	103.45	103.45	3,000.00

Console view - Usage and costs broken down by "Name" tag value for an EBS Volume and its associated snapshots

Same data you can extract programmatically using Cost Explorer get-cost-and-usage APIs or Cost and Usage Report (CUR)

In summary

Use right choice of EBS volume type to match your application need

Use the EBS Optimized EC2 instances to prevent performance bottlenecks

Tag everything & establish cost visibility

Understand where the low-hanging fruit is in your case for optimization

Leverage tools for finding unused resources and optimize cost

Increase elasticity to avoid waste

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Call to Action

To learn more about Amazon EBS, visit: https://aws.amazon.com/ebs/

View EBS optimized EC2 instances & select the right fit for your workloads - https://a.co/d9ZJ2L9

Start creating EBS Snapshots using CLI, AWS SDKs, or EC2 Console

Automate Snapshot Management using DLM - https://a.co/7ajACH5

Learn how you can benchmark EBS Volumes for your specific workloads - https://a.co/5HvgY0c

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Q & A

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