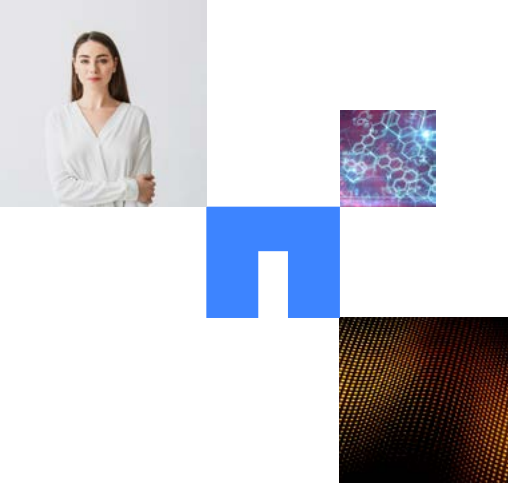eBook

Spend Less on AWS: Optimize EBS Costs

NetApp®

Introduction

Amazon Elastic Block Storage (Amazon EBS) is the highly-performant block storage option that Amazon Web Services offers for use with Amazon Elastic Compute Cloud (Amazon EC2) compute instances. This reliable storage platform is an integral part of deploying numerous, high-demand workloads in the cloud on AWS. However, growing storage demands can make EBS use a cost concern.

In this solution brief you'll see how NetApp Cloud Volumes ONTAP can help reduce the overall costs of storing data on Amazon EBS volumes by around 70%, while also adding crucial performance and data protection enhancements to cloud applications.

In addition to looking at the cost drivers of use of EBS and the features that make Cloud Volumes ONTAP effective at optimizing AWS costs, you'll also read about the savings enterprise users of Cloud Volumes ONTAP have received by leveraging NetApp cloud technology.

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Storage Deployment with AWS EBS: Costs, Challenges, and Choices

Amazon Elastic Block Store: A Performant Disk Storage for AWS

Amazon Elastic Block Store (Amazon EBS) offers high performance block storage options on AWS. This block storage service works with Amazon Elastic Compute Cloud (Amazon EC2) instances for the most transaction-heavy, IOPS-intensive workloads.

Use Cases

- Enterprise applications
- Relational and NoSQL Databases
- Application testing and development
- Persistent volumes for containerized applications

- Big Data analytics
- Media and Entertainment
- File systems

There are two types of Amazon EBS volumes: Solid state drives (SSDs) and hard disk drives (HDDs). SSD-backed volumes are ideal for transactional workloads, where the volume is required to perform a high number of small read/write operations. The performance of such volumes is measured in IOPS (input/output operations per second). HDD-backed volumes are designed for large sequential workloads where throughput is much more important (and the performance is measured with MiB/s). Each category has two subsets.

Knowing which one applies best for your workload will help optimize your AWS storage usage. Costs for each are mainly based on their performance rates (e.g., Cold HDD is the least-expensive option, but not suitable for intensive workloads).

Solid State Drives (SSD)

- **General Purpose SSD (gp2)**
  Balanced for economy and performance
- **Provisioned IOPS SSD (io1)**
  High performance, for important applications

Hard Disk Drives (HDD)

- **Throughput Optimized HDD (st1)**
  Inexpensive, for high use, intensive workloads
- **Cold HDD (sc1)**
  Cheap, used for infrequent access

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Growing Demands, and Growing Costs

Initially, the cloud was largely seen as an inexpensive place to store data that wasn't needed often, such as secondary copies and archive data. In some cases, this is still the model used by organizations that are taking a first step into the cloud. But in the last few years the cloud has become much more than just a cost-cutting measure to switch from on-prem CAPEX storage costs to a more attractive OPEX model. Thanks to storage types such as Amazon EBS, the cloud is now a destination for entire operations, as the all-cloud strategy is increasingly embraced.

The cloud is only going to grow.

Gartner puts the total revenue that the cloud will generate at $81.5 billion by 2022, nearly double its returns in 2019. According to a recent survey that was conducted among major industry leaders, cloud adoption was predicted to account for 83% off the enterprise IT landscape being located entirely in the cloud in 2020. The findings also point out the future drivers to the cloud, which include workloads that demand huge amounts of resources, such as DevOps, machine learning, artificial intelligence, and data mobility. Another recent survey of IT leaders found that 48% of the respondents had production operations completely in the cloud, with 38% saying that some portion of their production was in the cloud.
The growing demands of these applications mean more cloud

storage being consumed. By 2025, IDC predicts public cloud storage will consume close to half of the 175 zettabytes (175 ZB) of data in use worldwide.

On AWS, all of this means more EBS storage being used without much ability to rein in those costs without sacrificing on performance. While it would be possible in theory to switch to less-expensive HDD volume types, throughput will not be sufficient for the most high-transaction workloads.

Luckily, NetApp has a solution: Cloud Volumes ONTAP for AWS.

Quick Facts

More workloads are migrating to the cloud.	Data is growing fast and costs need to be controlled.	Intensive workloads can't be stored on low-performance volume types.	There is a way to lower EBS costs while preserving performance: Cloud Volumes ONTAP.

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Lowering AWS EBS Costs with NetApp Cloud Volumes ONTAP

Solution Overview

Cloud Volumes ONTAP is a NetApp's leading data management platform that runs natively on cloud-based resources. With Cloud Volumes ONTAP companies are able to significantly reduce cloud storage costs, plus add some enterprise-grade data management features such as data protection, security, and performance enhancements to their deployments.

> "Using NetApp data management technology has led to an 85% reduction in production data over three years. In budget terms, that's savings of seven figures."
> — Iain Rouse, R&D Group Director Cloud, TechnologyOne

> "When the bill for Cloud Volumes ONTAP came at the end of the month, I couldn't believe my eyes. We're actually able to offer more features that customers need while maintaining our margins. It's a win for everyone."
> — Eric Tuley, Director of Cloud Platform Operations, Concerto Cloud Services

> "With compression, deduplication, thin provisioning, and FlexClones, we get additional cost savings that we can turn around and invest into new innovations."
> — John Esser, Senior Director of IT and Data Center Operations, AdvancedMD

How It Works

Cloud Volumes ONTAP is a virtual appliance that runs on an Amazon EC2 instance within your Amazon Virtual Private Cloud (VPC). It acts as a data and storage management layer between your applications and the underlying Amazon EBS disks.
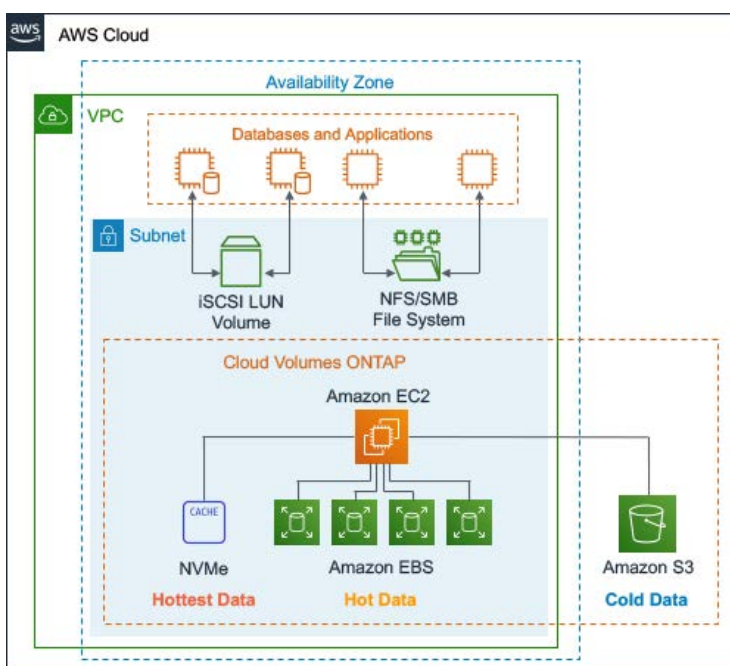
Cloud Volumes ONTAP on AWS: Architecture Diagram

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How It Optimizes AWS Costs

The cost reduction comes from the use of NetApp's signature storage efficiency features, which include thin provisioning, data compression, deduplication, compaction, and auto-tiering infrequently-used, cold data from Amazon EBS to low-cost Amazon S3 object storage. Copying your data is also more space- and infrequently-used on Cloud Volumes ONTAP through the use of zero capacity NetApp Snapshot™ copies for data protection and Flexclone® data clones for rapid dev/test cycles.

These aren't features that AWS provides out of the box for Amazon EBS. Through the combined use of all Cloud Volumes ONTAP's cost-efficiency features, your total data footprint shrinks. And additional savings come from lower network traffic costs. The result, at the end of the month, is a much smaller bill from AWS. These cost-efficiency features run automatically and transparently, with no reduction in volume or application performance.

> The result, at the end of the month,
> is a much smaller bill from AWS.

△ Data Tiering

Data tiering automatically tiers infrequently-used data from block to lower-cost object storage on Amazon S3.

⚙ Thin Provisioning

Thin provisioning allocates storage only when data is being written to a volume rather than allocating ahead of time based on peak demand.

Data Deduplication

Data deduplication eliminates duplicate data blocks by saving a pointer to the original block, reducing storage usage as much as 90%, depending on the application.

Data Compaction

Data compaction automatically combines remaining small chunks of data into single 4 KB physical blocks.

Data Compression

Data compression automatically compresses data blocks, reducing the amount of storage space consumed, saving up to 70%, depending on the application.

NetApp Snapshot Copies

NetApp Snapshot technology creates point-in-time snapshots that are extremely space efficient, saving only data changes.

Data Clones

FlexClone writable data clones are created instantaneously, consuming storage only for changes that are made to the clone, saving on dev/test costs.

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How Much Can You Expect to Save?

The savings you can achieve by adding Cloud Volumes ONTAP as a data management layer depends on your storage capacity. At 10 TB, your savings over native Amazon EBS use will completely cover the cost of the Cloud Volumes ONTAP license and infrastructure. And the more data you store, the more savings you'll see.

> At 10 TB the service is effectively free of charge.

For example, if the total capacity of the data you store is 100 TB, the savings are around $15,000 per month:
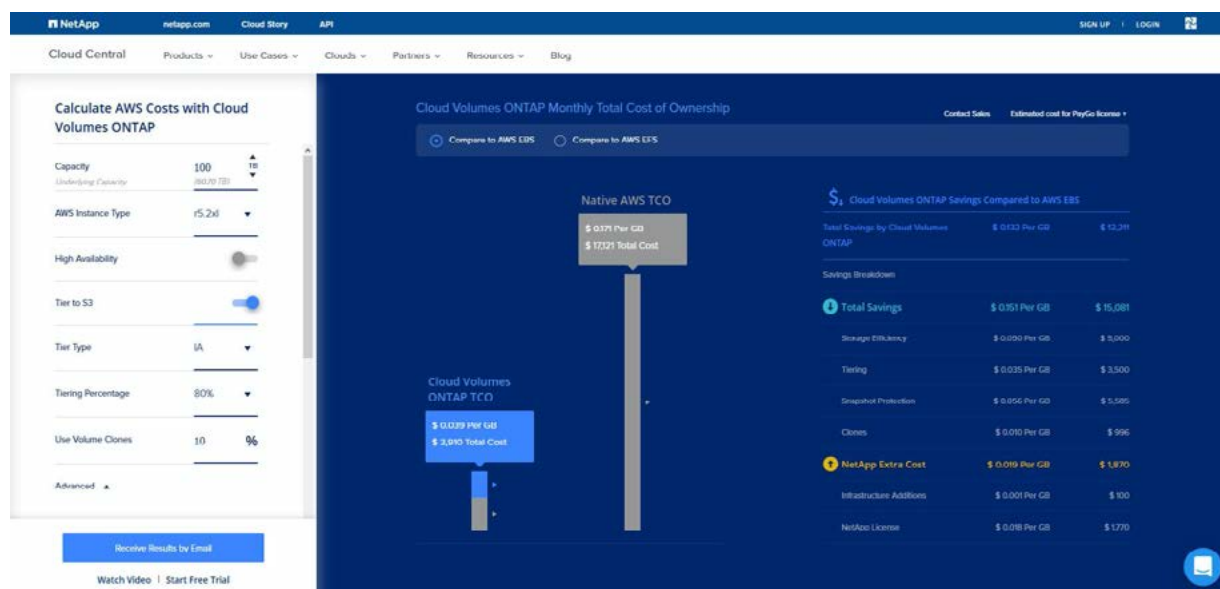
That's paying **77% less** than running natively on AWS and a total annual savings of close to $200,000.

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As a general rule, the higher your capacity, the more that you'll save by deploying on AWS with Cloud Volumes ONTAP. For example, if you're storing 500 TB, the savings are even bigger than the 100 TB case: around $75,000 per month, and some $900,000 per year. That's a total **savings of 87%**:
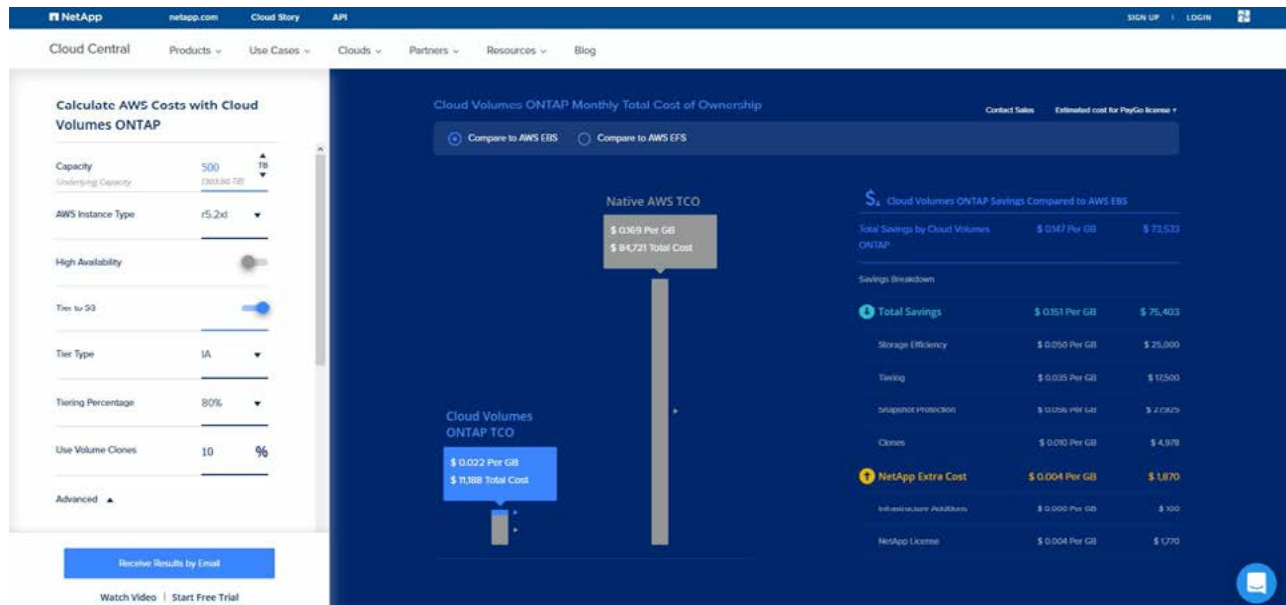
If you want to see how this works for yourself, give the TCO calculator a try now. Just enter in the details of your current deployment on AWS and you'll see automatically what you could be saving using the same deployment with Cloud volumes ONTAP installed. You can also calculate your future storage growth and see how much you will save over time using Cloud Volumes ONTAP.

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Cloud Volumes ONTAP Case Studies

See How Cloud Volumes ONTAP Saves Money for These AWS Customers

Visit our Success Stories page to read these customer case studies in full.

Storage Efficiencies

D2L (Desire2Learn)

An e-learning and online teaching services provider with PBs of data to store.

60%
Storage Reduction

Concerto Cloud

A managed cloud service provider with massive amounts of client data.

96%
Storage Reduction

TechnologyOne

Australian software giant with intensive production data.

85%
Storage Reduction

Data Tiering

Reach PLC

Media giant from the UK with extensive media library requirements.

50%
Storage Reduction

Officeworks

Retail giant looking for inexpensive cold data storage and dev/test flexibility.

Major savings by tiering huge amounts of capacity to Amazon S3 and using FlexClone for dev/test.

Mellanox

Ethernet and internet services provider with globally dispersed operations.

69%
Storage Reduction

90%
of DR Data Tiered

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Conclusion:
Lower Costs Are Just the Beginning

Amazon Elastic Block Store: A Performant Disk Storage for AWS

Amazon EBS is a powerful storage resource for enterprise deployment in the cloud. Now with NetApp Cloud Volumes ONTAP's storage efficiency features and data tiering, AWS deployment doesn't have to be a drain on your IT budget.

Optimize your AWS storage footprint and costs on average by 70% or, in some cases, higher	Lower network transfer costs and faster network transfer times	Automatically tier infrequently-used active data to Amazon S3 until it's needed for performant use on Amazon EBS

These are the major cost-cutting possibilities of Amazon EBS deployment with Cloud Volumes ONTAP, but there's much more that this powerful data management solution has to offer that will save you money in the long run:

- Cloud Volumes ONTAP in a high availability configuration uses dual-nodes to ensure enterprise business continuity with RPO=0 and RTO<60 seconds.
- Prevent costly data loss with NetApp Snapshots and automatic failover and disaster recovery processes.
- Infrastructure-as-code (IAC) and storage automation via NetApp Cloud Manager.
- Full integration with Kubernetes to automate the provisioning of persistent volumes for containers.

Don't pay more than you have to for AWS. Optimize your costs today with Cloud Volumes ONTAP.

Try the AWS TCO Calculator >

Start a 30-Day Free Trial of Cloud Volumes ONTAP >

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Refer to the Interoperability Matrix Tool (IMT) on the NetApp Support site to validate that the exact product and feature versions described in this document are supported for your specific environment. The NetApp IMT defines the product components and versions that can be used to construct configurations that are supported by NetApp. Specific results depend on each customer's installation in accordance with published specifications.