NetApp

eBook

The Best Way to Back Up ONTAP Is with NetApp Cloud Backup

Fast, Secure, Block-based Backup in the Cloud

Executive Summary

When organizations rely on file-level backup to protect their ONTAP data, they often have to deal with long backup and restore windows, making it tough to meet RPOs and RTOs. There are lots of solutions out there that aim to solve that problem, but just like Apple earbuds are made to work with Apple iOS/X, and BMW engines are designed for BMW cars, when it comes to backing up ONTAP data nobody does it better than NetApp with Cloud Backup.

Cloud Backup is a NetApp service that provides backup and restore capabilities for data in your Cloud Volumes and on-premises ONTAP clusters. It uses block-level storage replication to store backups of your data in cloud-based object storage with minimal operational overhead, single-pane visibility and control, full automation, and secure and encrypted connections for transfers to the cloud.

In this ebook we'll introduce you to Cloud Backup in detail, present six customer case studies, and provide a step-by-step walkthrough on how to set up Cloud Backup using NetApp Cloud Manager.

Table of Contents

Part One

Meet Cloud Backup

NetApp Cloud Backup provides a seamless way to backup ONTAP by coupling efficiency-preserved block backups that are incremental forever with NetApp Cloud Manager's management and automation capabilities.

Why Backing Up NAS Data Isn't Easy

Traditional backup solutions often back up data on a file level. But file-level backups have unique considerations to take into account. NAS shares can be backed up with NDMP or native SMB / NFS, however, such copies are made at the file level and that means they lose all of the ONTAP storage efficiencies. File-level backups also aren't incremental forever, which means that every couple of weeks you will need to backup the data all over again—and it can take weeks to create a single full backup.

That longer backup window increases the risks involved in backing up NAS data, including file transfer failures, open files, missing permissions, and checksum issues, all of which can leave files unprotected. That can expose you to risks of data loss or inconsistencies. Organizations can also find themselves unable to meet demanding RPOs or RTOs.

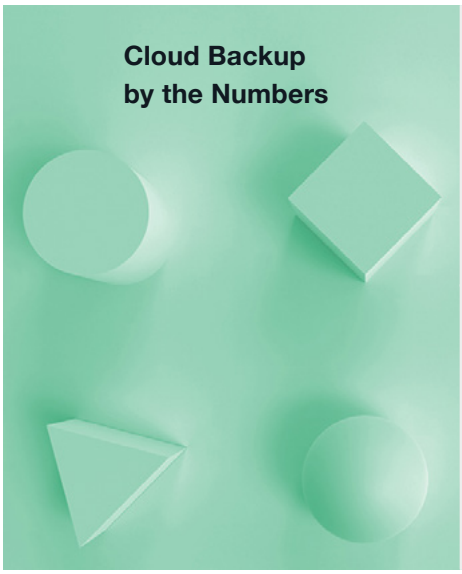
Large environments typically have many files that change frequently, which makes it even more challenging to keep data backups in sync. Spreading applications and data across hybrid and multicloud environments only compounds the problem. These file-level backup and recovery challenges started on-premises, and they persist for cloud data backup.

Another challenge is that in the cloud you can't segregate your backup network from the production network as the IOPS / throughput limit is on the instance level, and not on the individual vNICs. That means the de-facto backup will consume production resources which leads to higher infrastructure requirements and bandwidth usage.

While these file-level backup problems are universal, there is one solution designed for ONTAP that addresses these challenges and protects ONTAP data whether on-premises or in the cloud.

Challenges in File-Level Backups

- Long backup window
- Loss of ONTAP storage efficiencies
- More inconsistencies mean potential data loss
- Sync issues for large datasets
- Hybrid and multicloud complexity
- Unsegregated production and backup networks drain resources



Average

< 2 min

Setup

Exactly

x 10

Faster backups

Average

90%

Less network bandwidth

Exactly

1 click

Activation

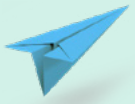
Cloud Backup: Why NetApp Block Backup Is Better for ONTAP

NetApp Cloud Backup is NetApp-native solution to back up ONTAP systems.

The service uses a block-level replication engine to bring backup and restore capabilities for protection and long-term archive to Cloud Volumes and on-premises ONTAP clusters.

Block backups with Cloud Backup offers a number of benefits over file-level backups:

- **Set and forget.** Cloud Backup manages and automates your backup schedules and policies to meet the most demanding recovery objectives with no oversight.
- **Incremental forever backups.** Cloud Backup backups are incremental forever, avoiding additional operational complexity, time, and costs.
- **Retaining storage efficiencies.** Because Cloud Backup's block-level backups preserve ONTAP storage efficiencies end-to-end, backups and restores are faster than file-level backups.



How It Works

1. **Select**
   Choose your Cloud Volumes or on-premises ONTAP cluster
2. **Activate**
   Set your backup retention policy for the selected volumes
3. **Done**
   Sit back and relax, no need to configure anything else

Challenge
Complex architecture to manage with a steep learning curve.

Solution
Simple and intuitive cloud-based backup service enabled with a click of a button.

Challenge
Your existing backup process doesn't fit the new cloud mindset.

Solution
API driven and fully integrated through Cloud Manager for unified user experience and automation.

Challenge
Performance stress and inability to meet backup windows for large data sets due to file level operation.

Solution
Block-level incremental forever backup with storage efficiencies preserved.

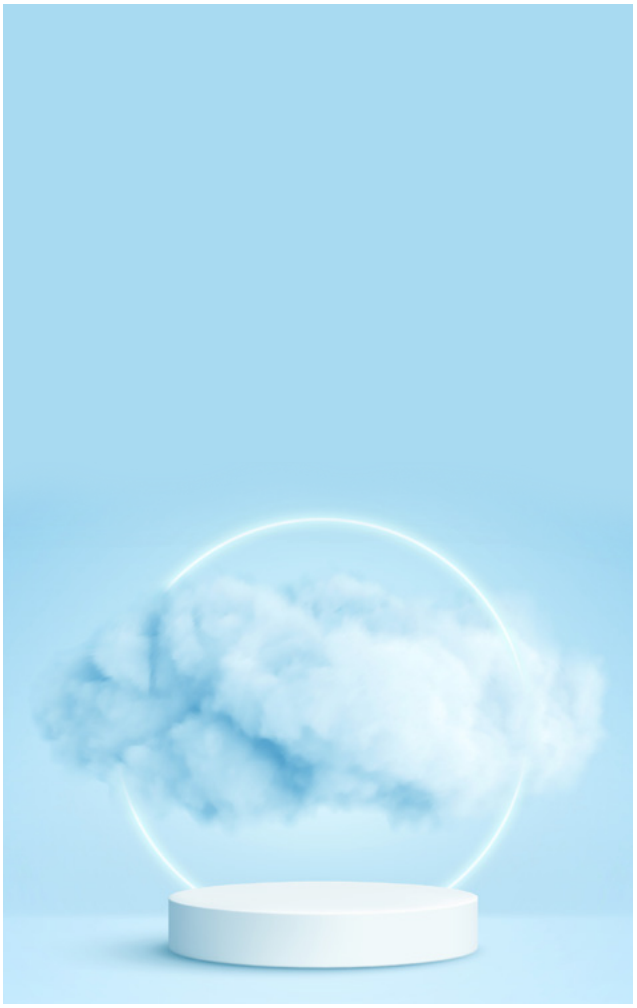
Challenge
Expensive and non-scalable.

Solution
Automatically shifts backup data to the public cloud where it is less expensive to maintain, infinitely scalable and without any management overhead.

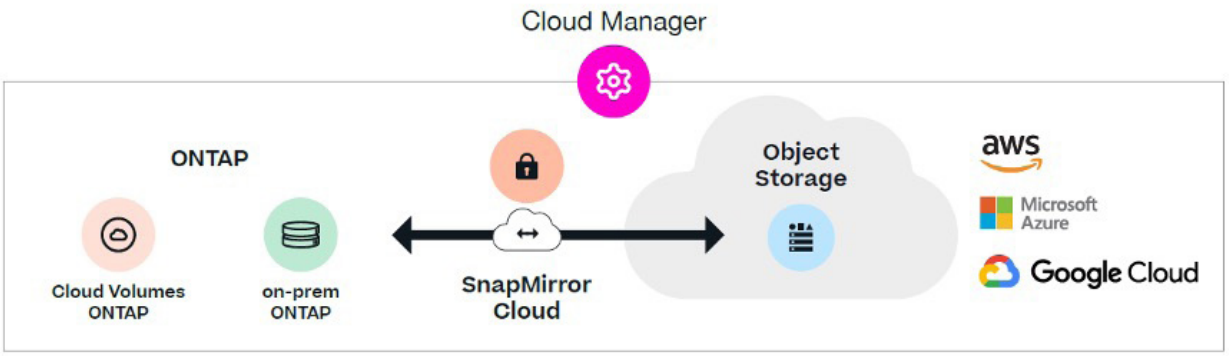
Behind the Scenes

Cloud Backup leverages several intelligent NetApp technologies:

- **Snapshot™ technology.** Block-level backups are quick, consistent, and do not affect the source Cloud Volumes ONTAP. Cloud Backup complements Cloud Volumes Snapshot copies by letting you choose data management capabilities that match your recovery time objective (RTO) and recovery point objective (RPO) requirements.
- **SnapMirror Cloud.** SnapMirror® Cloud replicates block data from Cloud Volumes ONTAP or from on-premises ONTAP directly to the cloud provider object storage on Amazon S3, Azure Blob, or Google Cloud Storage.
- **NetApp Cloud Manager.** Provides a single-pane visibility control panel from which you can manage the Cloud Backup, giving you control over the volumes that you want to back up and from where you would like to restore from. Learn how to set it up here.



NetApp's Cloud Backup is available on the major hyperscalers: Azure, GCP, or AWS.



Cloud Backup Details

Cloud Backup offers the features that you'd expect from a backup solution without the complexity. Let's delve into some of the features.

The fastest restore possible. Restores done on a block level, with no requirements for a service account, or mounting the backup data and copying it with an external client or a proxy. All restore operations are done directly from the restore target ONTAP cluster that will hydrate the data. This hydration is a direct extraction of the data, with all of the storage efficiencies preserved, fully encrypted in-flight, and completely automated.

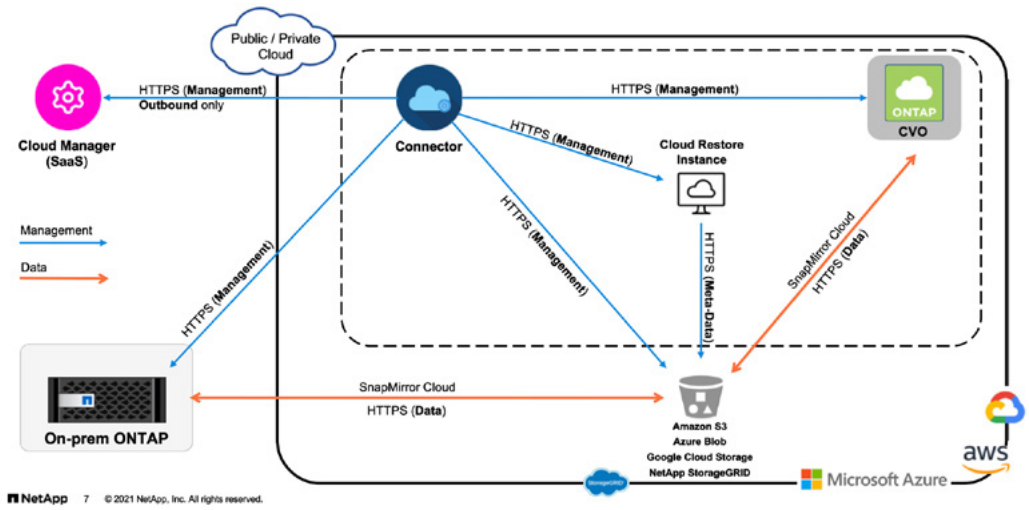
Restores can be done on a volume, folder, or file level. Other restore options in Cloud Backup include the ability to restore volume, folders, and files out-of-place. For crash-consistent and application-aware backups, Cloud Backup can integrate with NetApp SnapCenter®.

File-level Restores. By keeping metadata with the backup, Cloud Backup can build the catalog functionality on the fly without media servers and large amounts of storage for indexing and cataloging. Because the restore is done directly from ONTAP, the necessary files are quickly extracted. It's a leaner approach that does not require any complex planning or infrastructure to maintain.

Incremental Forever. Other backup solutions are incremental, but limited in the increments they can save. They also require full backups to be created periodically in order to create new baseline copies and delete previous increments. Cloud Backup is incremental forever, which simplifies processes, saves time, and reduces maintenance operations.

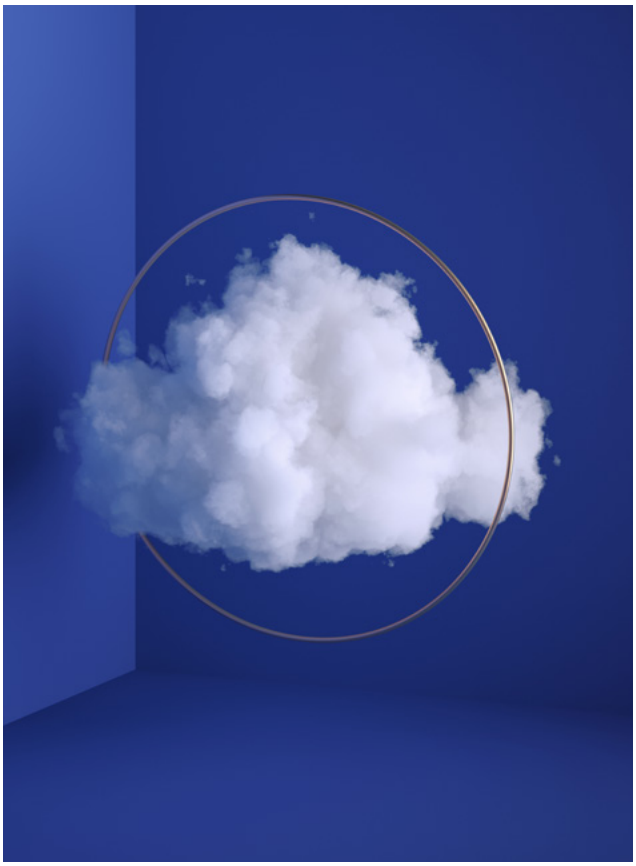
End-to-End Security. Cloud Backup offers end-to-end encryption of the Cloud Volumes data both at-rest and in-flight. Specifically, data travels across secured DirectConnect links to Cloud Backup and is protected at rest by AES 256-bit encryption. The encrypted data is written to the cloud using HTTPS TLSv1.2 connections. Any data traveling to Amazon S3 from the customer's VPC only passes through secure VPC endpoint connections.

Cloud Backup Architecture



Independent Backups. Cloud Backup's independent backups give greater protection from data loss. If your Cloud Volumes ONTAP cluster gets deleted, a volume snapshot alone won't let you recover your data. Cloud Backup can save your data because it's independent from the Cloud Volumes ONTAP cluster and stored in public cloud object storage that you own. Cloud Backup helps you apply a 3-2-1 backup strategy where three copies of your data are stored on two different kinds of media, with one backup copy offsite.

Customer-Owned Backups. With Cloud Backup, all the data and the infrastructure components remain completely in your environment—NetApp has no access to it. While the service orchestrates and automates the deployment and management of ONTAP backups, it's all comfortably under your control.



Cloud Backup Benefits

Seamless integration. Your ONTAP system is already plugged into the technology that fuels Cloud Backup. ONTAP's key technologies are integrated seamlessly with Cloud Backup, from dependable and cost-efficient Snapshot and storage efficiency features to the smooth orchestration capabilities of Cloud Manager and SnapMirror Cloud to manage how data moves between your ONTAP systems and the cloud. It's all already at your fingertips, now with a better way to back it all up.

Lower TCO. Thanks to operational efficiency, fewer infrastructure components to maintain and manage, preserving storage efficiencies, and replication on a block level, Cloud Backup results in less work, less storage data to consume, and less spending.

Increase operational efficiency. With incremental-forever backups, Cloud Manager automation, and built-in policies, Cloud Backup saves organizations the hassle of managing the backup infrastructure, all from the same controls at use in your ONTAP deployment. Backup expertise isn't required, and the staff can free itself for strategic operations such as dealing with architectures and workloads, rather than managing infrastructure.

Better performance. With both backup and restore data transfers preserving the storage efficiencies in the block-level replica, there is minimal performance impact on the production environment and improved RPO and RTO.

Part Two

Cloud Backup Case Studies

The ability to recover data from backup is crucial for the sustainability of any business. NetApp Cloud Backup enables native backup and restore capabilities for your data stored in the cloud and with on-premises ONTAP systems.

In this section we'll showcase six success stories of enterprises who rely on Cloud Backup.

CRM SaaS Leader Backs Up VDI and SMB Files on AWS

The world's leading provider of SaaS-based CRM solutions, ranging from application development to marketing automation and other enterprise-level customer service-focused technologies, helps guide the operations of over 150,000 companies worldwide.

Backup Challenge
The company migrated their virtual desktop infrastructure (VDI) from their on-premises data centers to AWS leveraging Cloud Volumes ONTAP as the storage platform and NetApp Snapshots for rapid backup and restore. But they also needed a solution for storing their backup data long term in a separate location.

How Cloud Backup Helped
The company leveraged Cloud Backup to address the long-term backup/restore requirements of the VDI infrastructure. As the service is integrated with Cloud Manager along with Cloud Volumes ONTAP, the onboarding process was simple. Using a simple backup policy, they were able to back up the data to S3 storage with a 30-day retention period.

Global Telecommunications and Electronics Company Backs Up Production to Azure

This major, European-headquartered multinational telecommunications, IT, and electronics company has operations in over 100 countries worldwide, employs over 100,000 individuals, and has an annual revenue in excess of €20 billion. Their operations are at the center of developing cellular technology and wireless innovation.

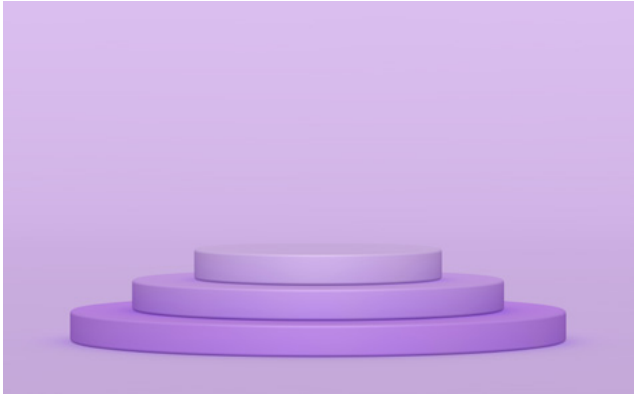
Backup Challenge
This company is an established NetApp user, and one of their major development labs was looking to reduce their data center footprint. Backing up to the cloud was the obvious choice, but the company didn't want to handle separate cloud VMs or assets. They also wanted a solution that would integrate seamlessly with their existing ONTAP systems.

How Cloud Backup Helped
With Cloud Backup, the company now has the capability to back up their on-prem ONTAP clusters directly to cloud object storage. One of the major benefits of this solution is its speed: the company was immediately able to begin backing up their data to Azure as soon as they signed up for the service.

The underlying technology is NetApp technology, so there was absolutely no learning curve for their staff. The service is fully integrated with all of the company's existing on-prem environments, and easy to use. The backup data is incremental forever and viewable through the Cloud Manager, making it easy for users to navigate through the backed-up data folder structure and restore a single file from any one of the point-in-time NetApp Snapshot™ copies.

And as a fully managed service, Cloud Backup won't require the company to maintain compute for the storage in the cloud—all of that is handled automatically by the service.

The company is expected to back up a total of 400 TB in the cloud. By offloading this data from their on-prem systems, the company expects their on-prem capacity to grow by 185%, cutting CAPEX costs and ensuring ROI.



Worldwide Convenience Store Chain Migrates and Backs Up to Azure

This Cloud Backup user is the leading convenience store chain, with operations around the globe. From its headquarters in the US, it operates with a workforce of over 50,000-people strong.

Backup Challenge
The company is working on an "all-cloud by 2024" initiative and an overall consolidation of its IT infrastructure. They had existing investments in Cloud Volumes ONTAP and used it in their initial cloud project to replicate data from on-premises to Azure. More recently, they were looking into decommissioning their on-premises storage system and migrating their primary workloads to Azure. They wanted to ensure resiliency and data protection for their business-critical applications in the cloud.

Cloud Volumes ONTAP fit the bill, as it has all the capabilities the company was looking for in their cloud storage solution. It also allowed them to continue using their existing processes and storage automation tools. Cloud Manager and Cloud Volumes ONTAP helped in easy and smooth migration of the data, and the company was eventually able to decommission their on-premises storage thereby reducing their overall CAPEX spending.

How Cloud Backup Helped
In addition, the company deployed Cloud Backup for their NFS data protection in new applications introduced on Azure cloud. Cloud Backup was chosen thanks to its easy adaptability, configuration, and integration with existing storage efficiency features.

IT Consulting Company Backs Up VMware Cloud Workload Data

With more than 5000 employees, this research and consulting company advises their enterprise clients by using a range of analytics tools and information technology solutions.

Backup Challenge

The company was already using NetApp storage solutions on-premises and decided to go ahead with Cloud Volumes ONTAP as part of a transition to a hybrid cloud deployment. The company chose to lift and shift their workloads to VMware Cloud on AWS and Cloud Volumes ONTAP. Compared to the native VMC storage, Cloud Volumes ONTAP is more cost effective, more resilient, and provides superior performance and agility for managing unstructured data. It also allows users to scale storage independent of application compute, which helps to optimize the overall cost of the solution.

The company leveraged Cloud Volumes ONTAP for production, DR, and DevOps workloads. SnapMirror® was used to migrate the data along with virtual machines to VMC as part of the cloud adoption. With Cloud Volumes ONTAP, they get instant cost-saving Snapshots and FlexClone® copies which are essential for their DevOps environments. The company automated the entire storage management process through Cloud Manager APIs, which helped in enabling a single-click self-service option for its application team users. They also wanted to enable a similar process for backup for the application data on Cloud Volumes ONTAP through existing VMware orchestration tools.

How Cloud Backup Helped

Cloud Backup helped in delivering a simple backup solution integrated with Cloud Manager and Cloud Volumes ONTAP. Using Cloud Backup, the users were able to easily activate backup whenever needed for their volumes using the VMware orchestration tools.

International Music Company Backs Up NFS Files and Kubernetes Clusters on Google Cloud

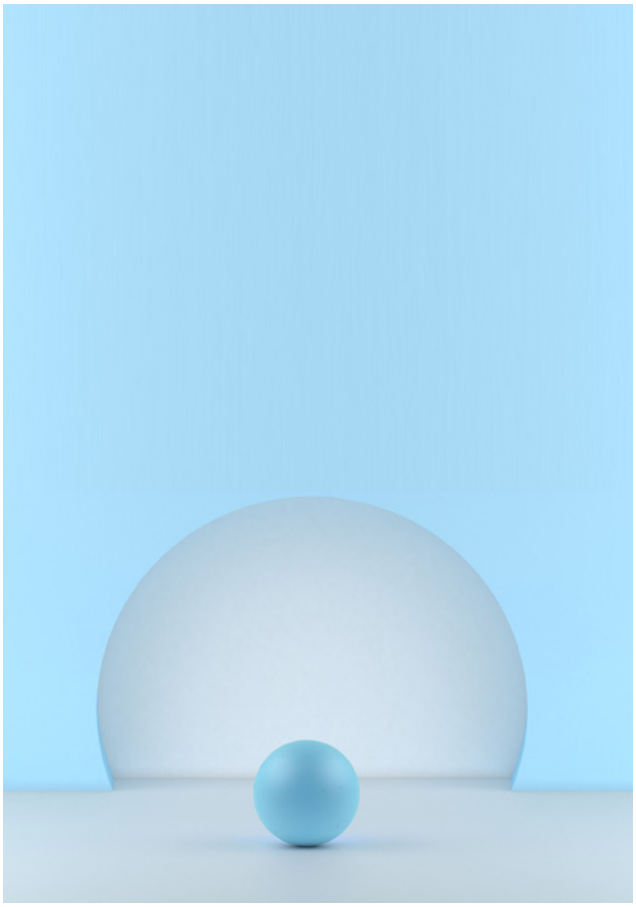
This music company based in Berlin, Germany has operations throughout western Europe combining the activities of a music publisher and a record label. The company was established in 2008 and grew quickly over the span of a few years, acquiring the music publishing rights for some of the world's largest musical acts and becoming the single largest publisher of world music globally.

Backup Challenge

Being an international music publisher, the company had products for managing and delivering audio and video content to Digital Service Providers (DSPs) such as Spotify, iTunes and Netflix. As part of their digital transformation, they decided to move these applications from on-premises datacenter to cloud. They also required a data management platform that is robust and flexible to support their applications and decided to use Cloud Volumes ONTAP on Google Cloud for the same.

While providing NFS support for VMs and Kubernetes clusters where the applications were hosted, Cloud Volumes ONTAP ensured storage efficiency through NetApp proprietary features like data compression and deduplication. Further cost reductions were enabled through tiering of data to object storage. The volume-level encryption offered by Cloud Volumes ONTAP provided an additional layer of security over Google Cloud's disk-level encryption. The company also leveraged NetApp Global File Cache along with Cloud Volumes ONTAP for their SMB file server consolidation. They were also looking for a backup solution to take care of all the application data hosted on Cloud Volumes ONTAP.

How Cloud Backup Helped
The company leveraged Cloud Backup to back up Cloud Volumes ONTAP data to Google Cloud Storage. NetApp Cloud Manager worked as a single management pane for Cloud Volumes ONTAP and the backup and it was easy to start using the service, define backup policies, and automate the process. By utilizing storage efficiencies, cross-region replication, NFS and SMB Caching, data encryption, enterprise governance, and multi-tenancy, they benefit from a wealth of unique innovative advantages that NetApp Cloud Volumes ONTAP delivers to its customers. Adding Cloud Backup to the mix provided the data protection capabilities for their business-critical applications.



e-Commerce SaaS Developer Meets Strict Backup Policies on AWS

This software company offers a SaaS solution focused on ecommerce customer experience and engagement. Hundreds of companies in verticals as diverse as hi-tech, healthcare, finance, and more use this SaaS as a central part of their businesses.

Backup Challenge
To achieve more flexibility, this company decided to move their application to AWS and integrated Cloud Volumes ONTAP as the storage layer for their SaaS solutions. Resiliency was a key requirement from the company's clients, so Cloud Volumes ONTAP was used to set up a highly available architecture across AWS Availability Zones for their production environments. They also used a single node Cloud Volumes ONTAP for cross-region disaster recovery.

The company also needed a way to rapidly restore files in the event of data corruption or file deletion. But the native backup solutions and third-party solutions that had been considered were less efficient, too expensive, or not secure enough by their requirements.

How Cloud Backup Helped
To solve this problem, the company turned to Cloud Backup, which was able to meet their strict internal policies for data management. The data was backed up to a separate AWS account that helped meet their security requirements to protect data in the event of an account compromise. The block-level incremental-forever backup feature helped in achieving the storage efficiency the company was looking for. On top of that, easy integration with Cloud Manager made the adoption process very easy.

Part Three

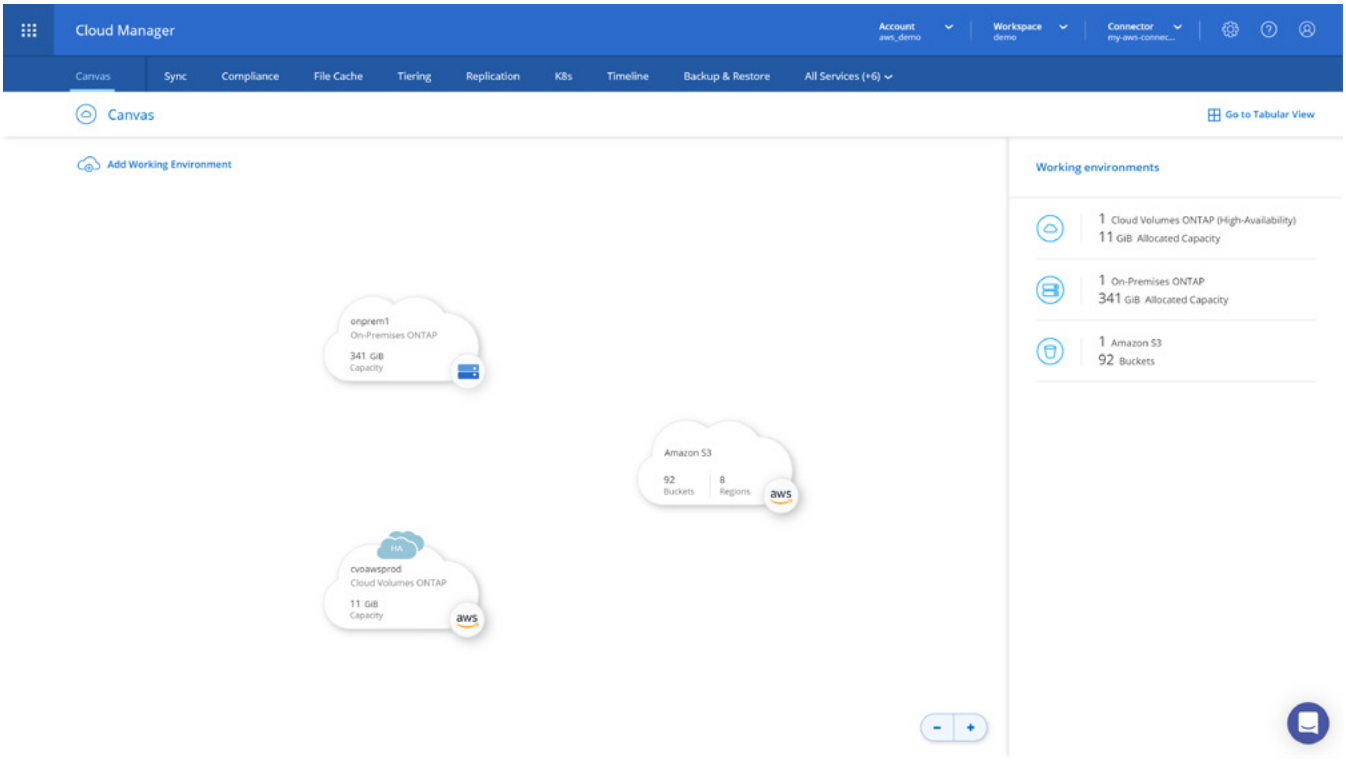
How to Use Cloud Backup

Backing up data with Cloud Backup is very straightforward and can be achieved with a few quick and simple steps.

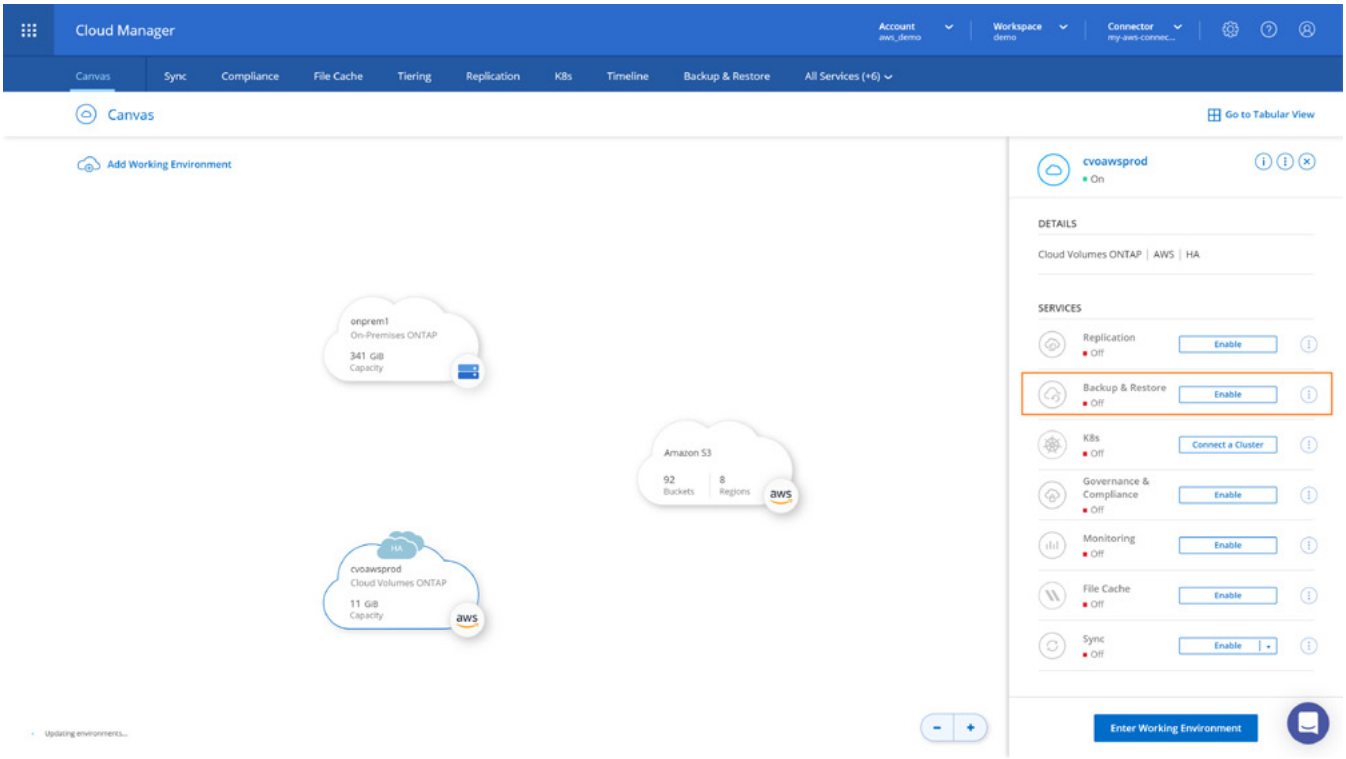
For this example, we are going to show you how to back up data using Cloud Backup in a Cloud Volumes ONTAP deployment. If you don't have a Cloud Volumes ONTAP working environment set up, follow the instructions described in Getting Started with Cloud Volumes ONTAP in AWS: The Setup Walkthrough to start one.

Cloud Volumes ONTAP Backup Walkthrough

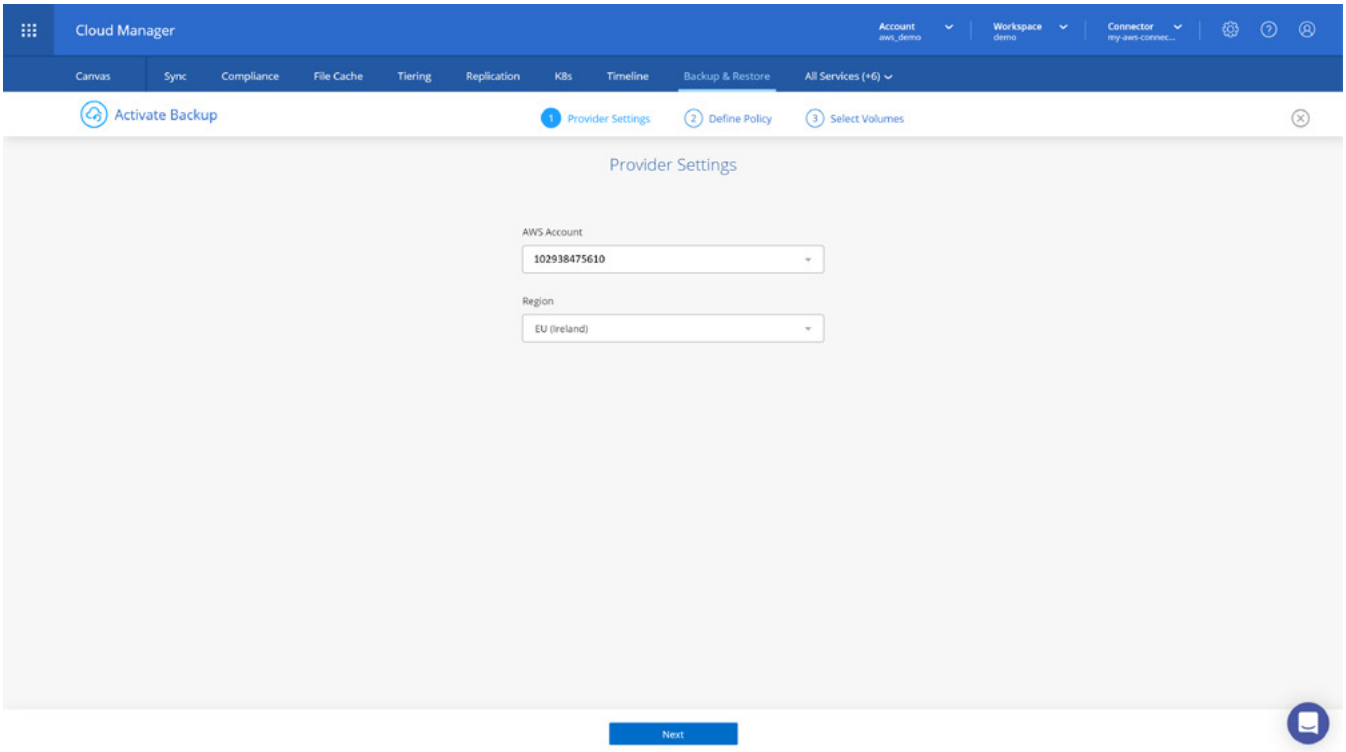
1. Start by opening Cloud Manager and click on the Cloud Volumes ONTAP working environment you want to backup with the Cloud Backup.



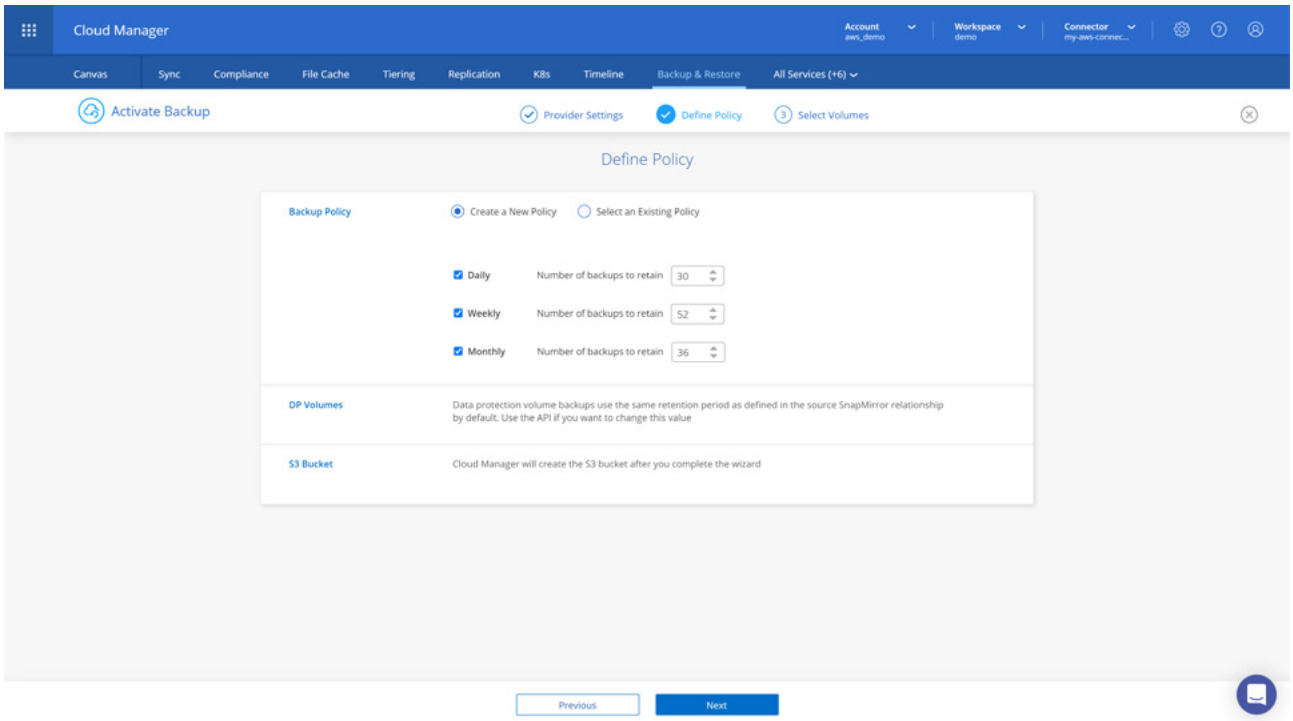
2 On the opened right-side panel, under **SERVICES**, locate **Backup & Restore** and click on **Enable**.



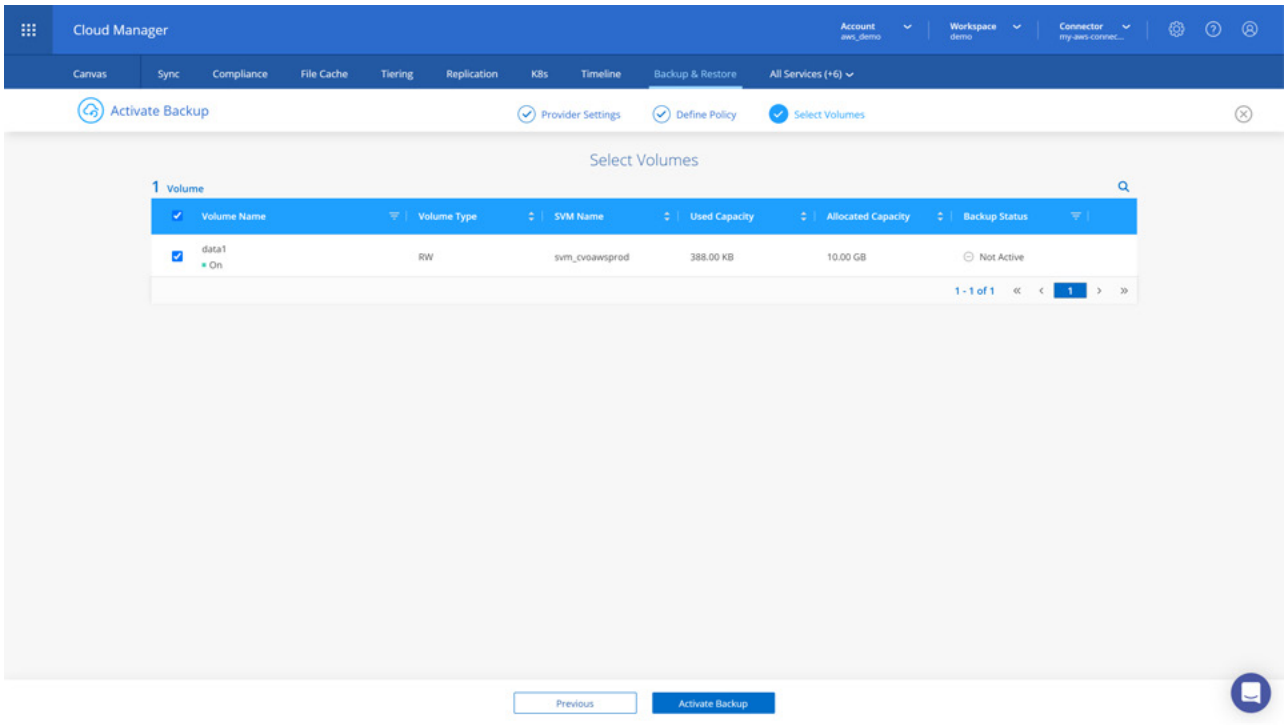
3 On the **Provider Settings** step, based on the cloud provider used, select the appropriate **AWS account / Azure subscription / Google project** and the **Region** where the object storage bucket will be created. Click **Next**.



4 Then, on the **Define Policy** step select an **existing backup policy** or **create a new policy** and define the **schedule and retention** and click **Next**.

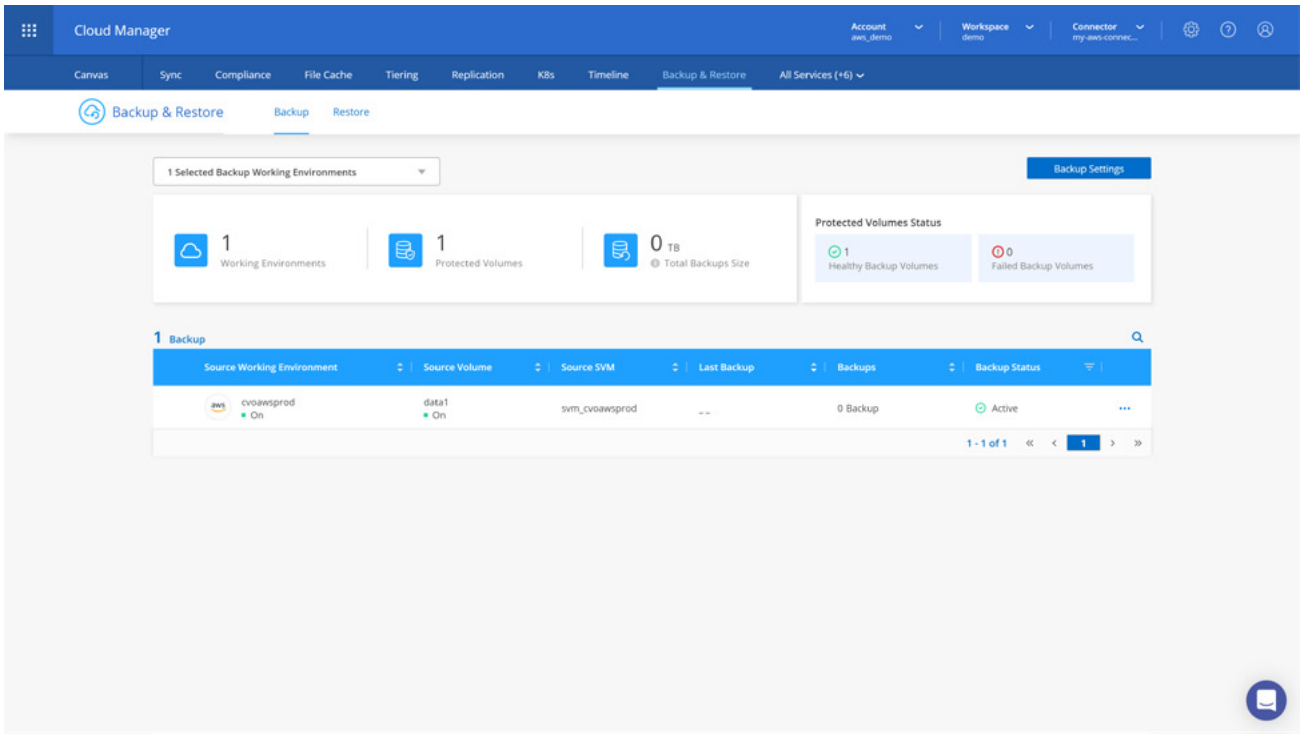


5 Choose the Cloud Volumes ONTAP volumes to be backed up by Cloud Backup, on the **Select Volumes** step, and click **Activate Backup**.

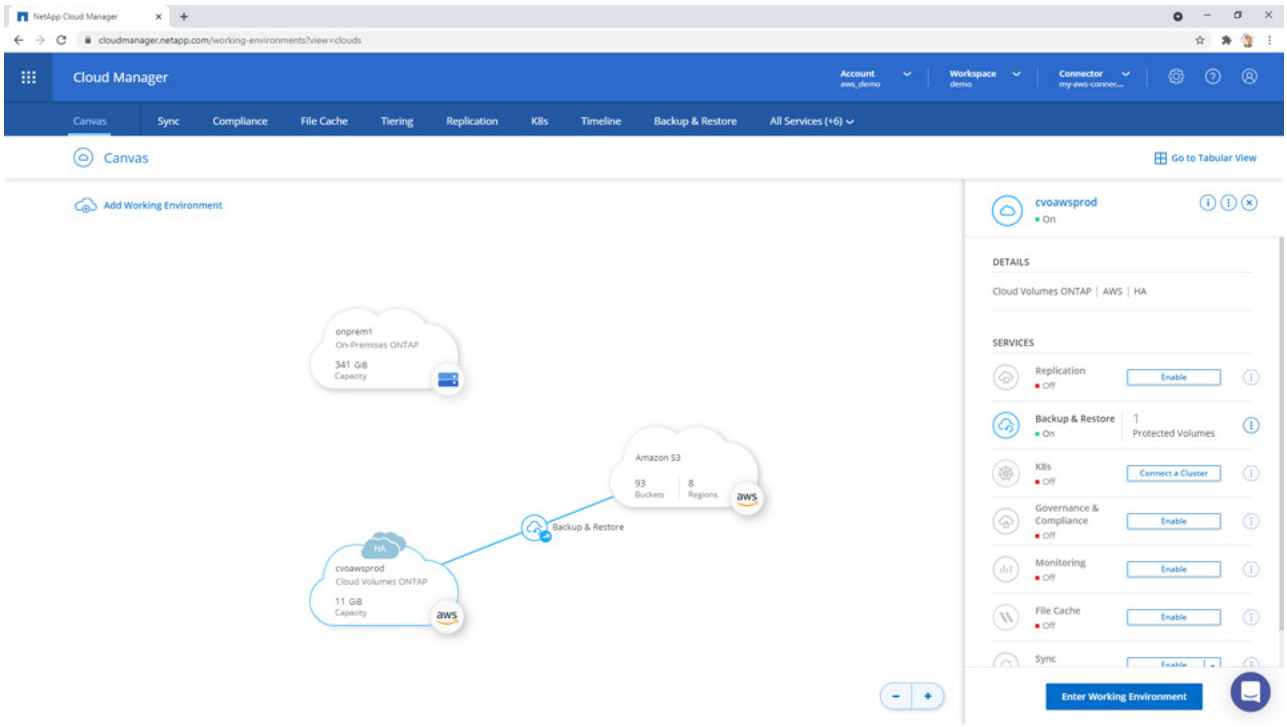


Note: Upon clicking Activate Backup, Cloud Manager creates the object storage bucket (Amazon S3, Azure Block Blob, Google Cloud Storage) and the backup relationship and performs an initial data transfer for the selected volumes.

6 Next, you will be redirected to the **Backup** section of the **Backup & Restore tab**. After a short while you should see that you have a number of **protected volumes**, based on the amount of volumes selected, with a **healthy status**.



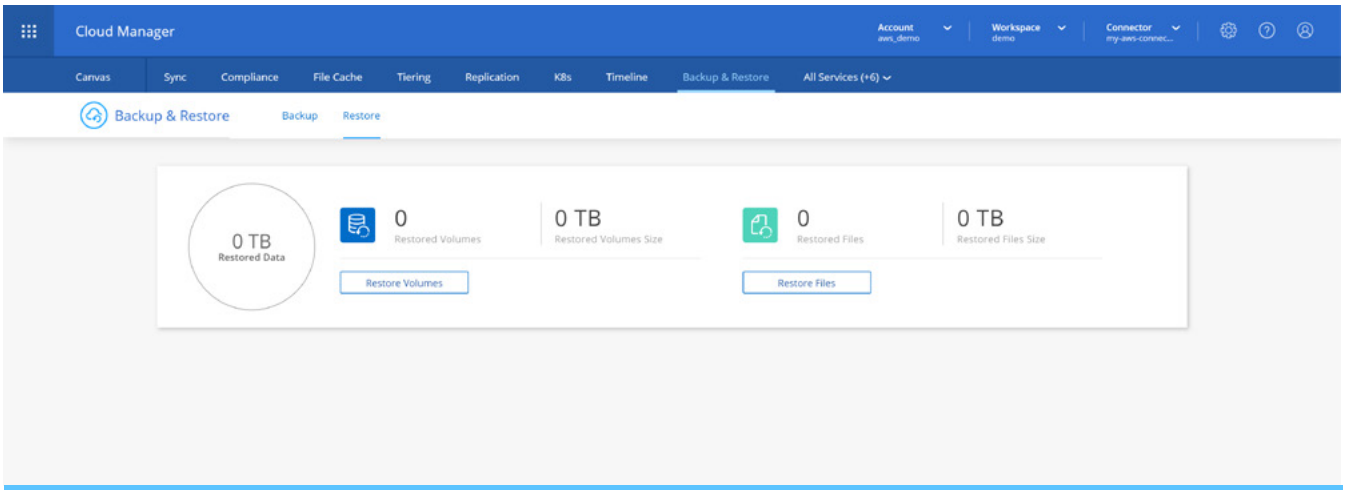
7 On Cloud Manager's Canvas, the backup relationship is shown (where applicable) and on the right-side panel **Backup & Restore** is **On** and the number of protected volumes is displayed.



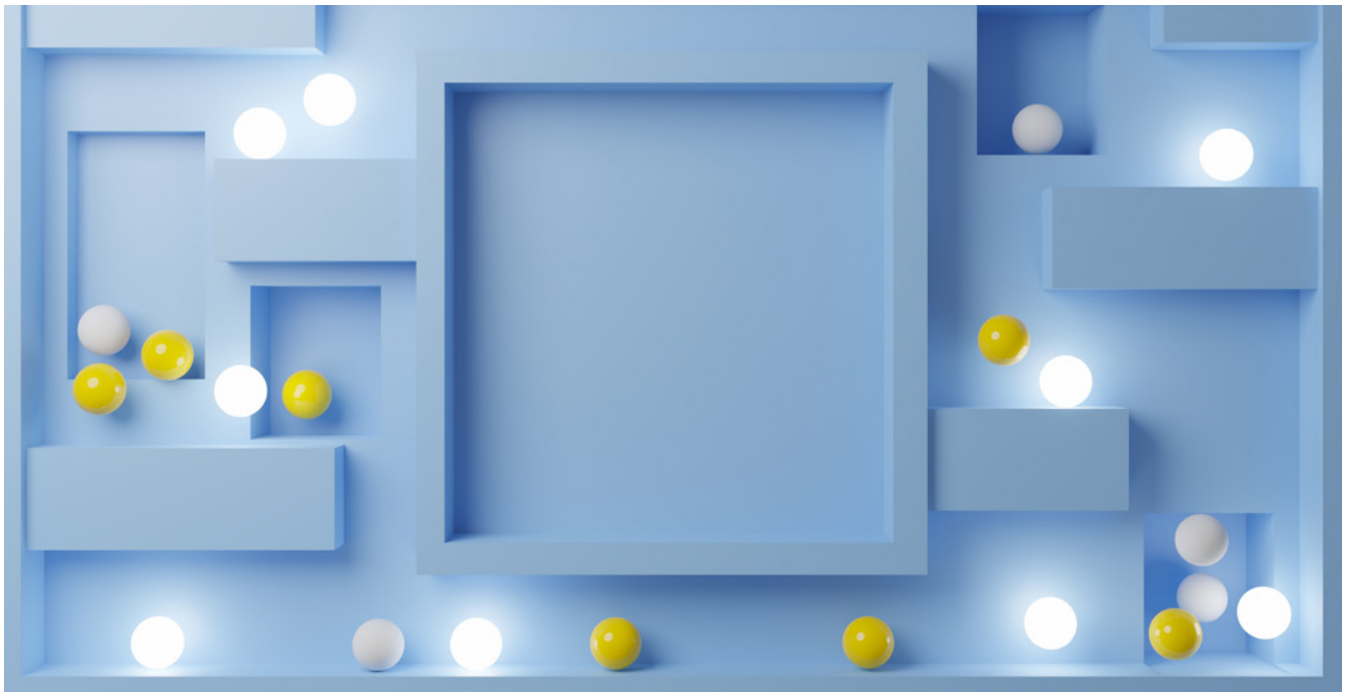
And that's it. You're now protected by NetApp's fully managed backup service, ensuring that you have the highest level of protection with no added effort on your part.

Restoring Your Data

When you need to recover your data, you can go into the **Restore** section in the **Backup & Restore tab** and perform restore at either the volume or file granularity through the **Restore Volumes** and **Restore Files**.



To see how to set this up in action,
watch the webinar on Cloud Backup here.



Cloud Data Backup for ONTAP Is Better with NetApp

When it comes to backing up ONTAP data to the cloud, nobody does it better than NetApp. With Cloud Backup, ONTAP users now have a familiar, easy-to-use solution for backing up to the cloud automatically that is seamlessly integrated with ONTAP, fully automated with Cloud Manager, and incremental forever.

Having an independent, reliable backup in the cloud can be the difference between recovering with minimal data loss or having all of your data unsalvageable. That's easier than ever for ONTAP users thanks to Cloud Backup.

It is the essence of the NetApp data fabric.

Start a free trial on AWS, Azure, or Google Cloud

Start now

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.

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