Deploy Cloud Volumes ONTAP

Cloud Manager

NetApp
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Before you create Cloud Volumes ONTAP systems

Before you use Cloud Manager to create and manage Cloud Volumes ONTAP systems, your Cloud Manager administrator should have prepared networking and installed and set up Cloud Manager.

The following conditions should exist before you start deploying Cloud Volumes ONTAP:

- Networking requirements were met for Cloud Manager and Cloud Volumes ONTAP.
- Cloud Manager has permissions to perform operations in your chosen cloud provider.
- Cloud Manager was installed.

> 💡 Cloud Manager should remain running at all times.

Related links
- Getting started in AWS
- Getting started in Azure
- Getting started in GCP
- Setting up Cloud Manager

Planning your Cloud Volumes ONTAP configuration

When you deploy Cloud Volumes ONTAP, you can choose a preconfigured system that matches your workload requirements, or you can create your own configuration. If you choose your own configuration, you should understand the options available to you.

Choosing a license type

Cloud Volumes ONTAP is available in two pricing options: pay-as-you-go and Bring Your Own License (BYOL). For pay-as-you-go, you can choose from three licenses: Explore, Standard, or Premium. Each license provides different capacity and compute options.

- Supported configurations for Cloud Volumes ONTAP 9.7 in AWS
- Supported configurations for Cloud Volumes ONTAP 9.7 in Azure
- Supported configurations for Cloud Volumes ONTAP 9.7 in GCP

Understanding storage limits

The raw capacity limit for a Cloud Volumes ONTAP system is tied to the license. Additional limits impact the size of aggregates and volumes. You should be aware of these limits as you plan your configuration.

- Storage limits for Cloud Volumes ONTAP 9.7 in AWS
- Storage limits for Cloud Volumes ONTAP 9.7 in Azure
- Storage limits for Cloud Volumes ONTAP 9.7 in GCP

Choosing a write speed

Cloud Manager enables you to choose a write speed setting for single node Cloud Volumes ONTAP systems. Before you choose a write speed, you should understand the differences between the normal and high settings and risks and recommendations when using high write speed.

Difference between normal write speed and high write speed

When you choose normal write speed, data is written directly to disk, thereby reducing the likelihood of data loss in the event of an unplanned system outage.

When you choose high write speed, data is buffered in memory before it is written to disk, which provides faster write performance. Due to this caching, there is the potential for data loss if an unplanned system outage occurs.

The amount of data that can be lost in the event of an unplanned system outage is the span of the last two consistency points. A consistency point is the act of writing buffered data to disk. A consistency point occurs when the write log is full or after 10 seconds (whichever comes first). However, AWS EBS volume performance can affect consistency point processing time.

When to use high write speed

High write speed is a good choice if fast write performance is required for your workload and you can withstand the risk of data loss in the event of an unplanned system outage.

Recommendations when using high write speed

If you enable high write speed, you should ensure write protection at the application layer.

Choosing a volume usage profile

ONTAP includes several storage efficiency features that can reduce the total amount of storage that you need. When you create a volume in Cloud Manager, you can choose a profile that enables these features or a profile that disables them. You should learn more about these features to help you decide which profile to use.

NetApp storage efficiency features provide the following benefits:

Thin provisioning

Presents more logical storage to hosts or users than you actually have in your physical storage pool. Instead of preallocating storage space, storage space is allocated dynamically to each volume as data is written.

Deduplication

Improves efficiency by locating identical blocks of data and replacing them with references to a single shared block. This technique reduces storage capacity requirements by eliminating redundant blocks of data that reside in the same volume.

Compression

Reduces the physical capacity required to store data by compressing data within a volume on primary, secondary, and archive storage.

AWS planning

Plan your deployment of Cloud Volumes ONTAP in AWS by sizing your system and reviewing the network information that you need to enter.

- Sizing your system in AWS
- AWS network information worksheet

Sizing your system in AWS

Sizing your Cloud Volumes ONTAP system can help you meet requirements for performance and capacity. You should be aware of a few key points when choosing an instance type, disk type, and disk size:

Instance type

- Match your workload requirements to the maximum throughput and IOPS for each EC2 instance type.
- If several users write to the system at the same time, choose an instance type that has enough CPUs to manage the requests.
- If you have an application that is mostly reads, then choose a system with enough RAM.
  - AWS Documentation: Amazon EC2 Instance Types
  - AWS Documentation: Amazon EBS–Optimized Instances

EBS disk type

General Purpose SSDs are the most common disk type for Cloud Volumes ONTAP. To view the use cases for EBS disks, refer to AWS Documentation: EBS Volume Types.

EBS disk size

You need to choose an initial disk size when you launch a Cloud Volumes ONTAP system. After that, you can let Cloud Manager manage a system's capacity for you, but if you want to build aggregates yourself, be aware of the following:

- All disks in an aggregate must be the same size.

- The performance of EBS disks is tied to disk size. The size determines the baseline IOPS and maximum burst duration for SSD disks and the baseline and burst throughput for HDD disks.

- Ultimately, you should choose the disk size that gives you the *sustained performance* that you need.

- Even if you do choose larger disks (for example, six 4 TB disks), you might not get all of the IOPS because the EC2 instance can reach its bandwidth limit.

  For more details about EBS disk performance, refer to AWS Documentation: EBS Volume Types.

Watch the following video for more details about sizing your Cloud Volumes ONTAP system in AWS:
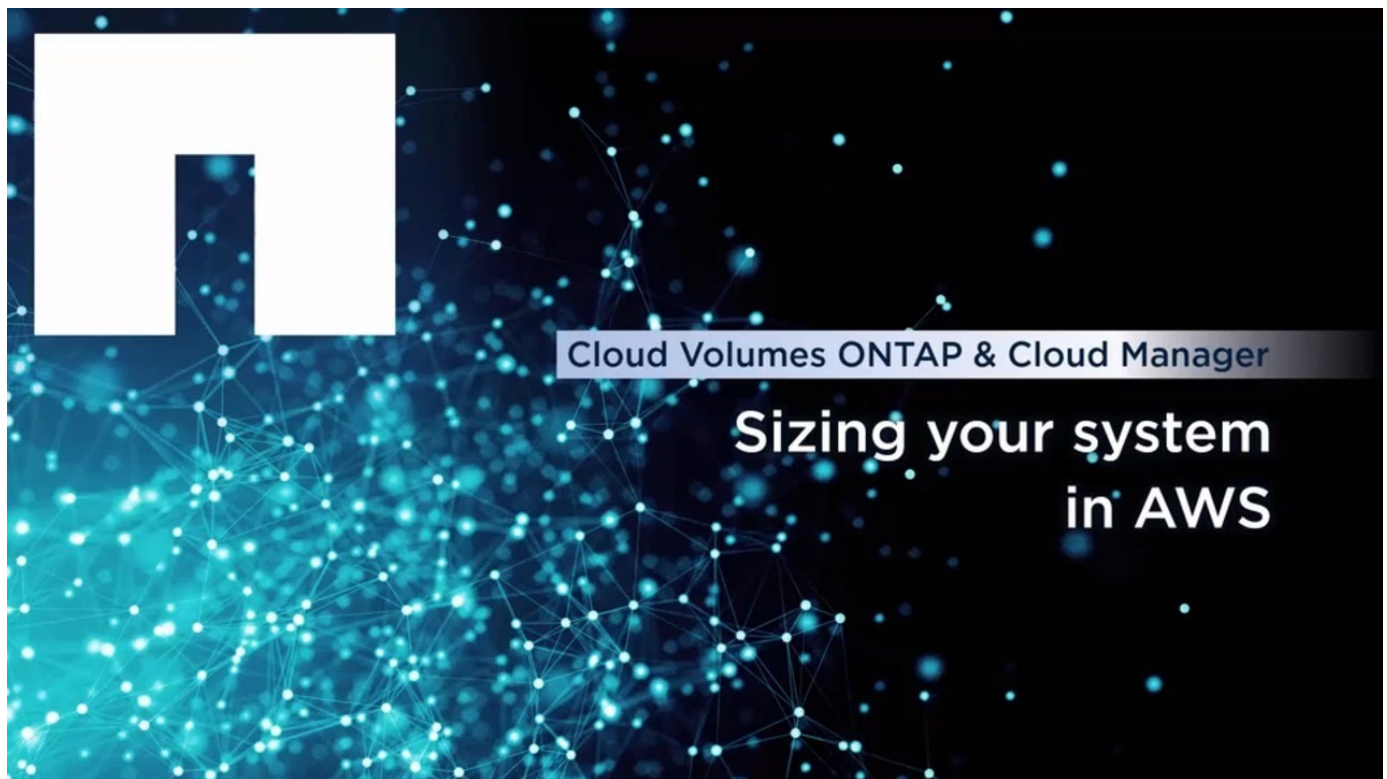
AWS network information worksheet

When you launch Cloud Volumes ONTAP in AWS, you need to specify details about your VPC network. You can use a worksheet to collect the information from your administrator.

Network information for Cloud Volumes ONTAP

AWS information	Your value
Region	
VPC	
Subnet	
Security group (if using your own)	

Network information for an HA pair in multiple AZs

AWS information	Your value
Region	
VPC	
Security group (if using your own)	
Node 1 availability zone	
Node 1 subnet	
Node 2 availability zone	
Node 2 subnet	
Mediator availability zone	
Mediator subnet	
Key pair for the mediator	
Floating IP address for cluster management port	
Floating IP address for data on node 1	
Floating IP address for data on node 2	
Route tables for floating IP addresses	

Azure planning

Plan your deployment of Cloud Volumes ONTAP in Azure by sizing your system and reviewing the network information that you need to enter.

- Sizing your system in Azure
- Azure network information worksheet

Sizing your system in Azure

Sizing your Cloud Volumes ONTAP system can help you meet requirements for performance and capacity. You should be aware of a few key points when choosing a VM type, disk type, and disk size:

Virtual machine type

Look at the supported virtual machine types in the Cloud Volumes ONTAP Release Notes and then review details about each supported VM type. Be aware that each VM type supports a specific number of data disks.

- Azure documentation: General purpose virtual machine sizes
- Azure documentation: Memory optimized virtual machine sizes

Azure disk type

When you create volumes for Cloud Volumes ONTAP, you need to choose the underlying cloud storage that Cloud Volumes ONTAP uses as a disk.

HA systems use Premium page blobs. Meanwhile, single node systems can use two types of Azure Managed Disks:

- *Premium SSD Managed Disks* provide high performance for I/O-intensive workloads at a higher cost.
- *Standard SSD Managed Disks* provide consistent performance for workloads that require low IOPS.
- *Standard HDD Managed Disks* are a good choice if you don't need high IOPS and want to reduce your costs.

  For additional details about the use cases for these disks, see Microsoft Azure Documentation: Introduction to Microsoft Azure Storage.

Azure disk size

When you launch Cloud Volumes ONTAP instances, you must choose the default disk size for aggregates. Cloud Manager uses this disk size for the initial aggregate, and for any additional aggregates that it creates when you use the simple provisioning option. You can create aggregates that use a disk size different from the default by using the advanced allocation option.

> 💡 All disks in an aggregate must be the same size.

When choosing a disk size, you should take several factors into consideration. The disk size impacts how much you pay for storage, the size of volumes that you can create in an aggregate, the total capacity available to Cloud Volumes ONTAP, and storage performance.

The performance of Azure Premium Storage is tied to the disk size. Larger disks provide higher IOPS and throughput. For example, choosing 1 TB disks can provide better performance than 500 GB disks, at a higher cost.

There are no performance differences between disk sizes for Standard Storage. You should choose disk size based on the capacity that you need.

Refer to Azure for IOPS and throughput by disk size:

- Microsoft Azure: Managed Disks pricing
- Microsoft Azure: Page Blobs pricing

Azure network information worksheet

When you deploy Cloud Volumes ONTAP in Azure, you need to specify details about your virtual network. You can use a worksheet to collect the information from your administrator.

Azure information	Your value
Region	
Virtual network (VNet)	
Subnet	
Network security group (if using your own)	

GCP planning

Plan your deployment of Cloud Volumes ONTAP in Google Cloud Platform by sizing your system and reviewing the network information that you need to enter.

- Sizing your system in GCP
- GCP network information worksheet

Sizing your system in GCP

Sizing your Cloud Volumes ONTAP system can help you meet requirements for performance and capacity. You should be aware of a few key points when choosing a machine type, disk type, and disk size:

Machine type

Look at the supported machine types in the Cloud Volumes ONTAP Release Notes and then review details from Google about each supported machine type. Match your workload requirements to the number of vCPUs and memory for the machine type. Note that each CPU core increases networking performance.

Refer to the following for more details:

- Google Cloud documentation: N1 standard machine types
- Google Cloud documentation: Performance

GCP disk type

When you create volumes for Cloud Volumes ONTAP, you need to choose the underlying cloud storage that Cloud Volumes ONTAP uses for a disk. The disk type can be either *Zonal SSD persistent disks* or *Zonal standard persistent disks*.

SSD persistent disks are best for workloads that require high rates of random IOPS, while Standard persistent disks are economical and can handle sequential read/write operations. For more details, see Google Cloud documentation: Zonal Persistent disks (Standard and SSD).

GCP disk size

You need to choose an initial disk size when you deploy a Cloud Volumes ONTAP system. After that you can let Cloud Manager manage a system's capacity for you, but if you want to build aggregates yourself, be aware of the following:

- All disks in an aggregate must be the same size.

- Determine the space that you need, while taking performance into consideration.

- The performance of persistent disks scales automatically with disk size and the number of vCPUs available to the system.

  Refer to the following for more details:

  ◦ Google Cloud documentation: Zonal Persistent disks (Standard and SSD)
  ◦ Google Cloud documentation: Optimizing Persistent Disk and Local SSD Performance

GCP network information worksheet

When you deploy Cloud Volumes ONTAP in GCP, you need to specify details about your virtual network. You can use a worksheet to collect the information from your administrator.

GCP information	Your value
Region	
Zone	
VPC network	
Subnet	
Firewall policy (if using your own)	

Finding your Cloud Manager system ID

To help you get started, your NetApp representative might ask you for your Cloud Manager system ID. The ID is typically used for licensing and troubleshooting
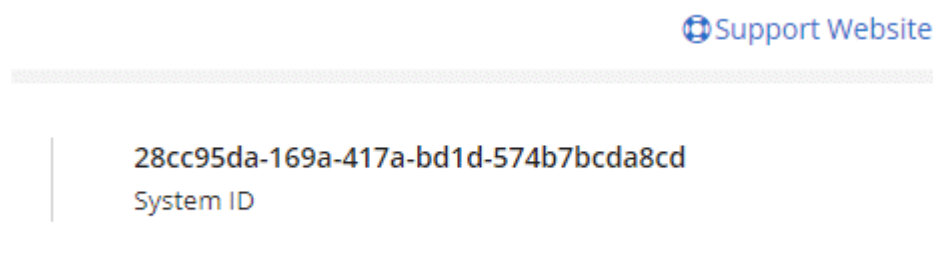
purposes.

Steps

1. In the upper right of the Cloud Manager console, click the Settings icon.

2. Click **Support Dashboard**.

   Your system ID appears in the top right.

   Example

Enabling Flash Cache on Cloud Volumes ONTAP

Some Cloud Volumes ONTAP configurations in AWS and Azure include local NVMe storage, which Cloud Volumes ONTAP uses as *Flash Cache* for better performance.

What's Flash Cache?

Flash Cache speeds access to data through real-time intelligent caching of recently read user data and NetApp metadata. It is effective for random read-intensive workloads, including databases, email, and file services.

Limitations

- Compression must be disabled on all volumes to take advantage of the Flash Cache performance improvements.

- Cache rewarming after a reboot is not supported with Cloud Volumes ONTAP.

Enabling Flash Cache on Cloud Volumes ONTAP in AWS

Flash Cache is supported with Cloud Volumes ONTAP Premium and BYOL in AWS.

Steps

1. Select one of the following EC2 instance types with a new or existing Cloud Volumes ONTAP Premium or BYOL system:

   ◦ c5d.4xlarge

   ◦ c5d.9xlarge

   ◦ c5d.18xlarge

   ◦ m5d.8xlarge

   ◦ m5d.12xlarge

   ◦ r5d.2xlarge

2. Disable compression on all volumes to take advantage of the Flash Cache performance improvements.

   Choose no storage efficiency when creating a volume from Cloud Manager, or create a volume and then disable data compression by using the CLI.

Enabling Flash Cache on Cloud Volumes ONTAP in Azure

Flash Cache is supported with Cloud Volumes ONTAP BYOL on single node systems.

Steps

1. Select the Standard_L8s_v2 VM type with a single node Cloud Volumes ONTAP BYOL system in Azure.

2. Disable compression on all volumes to take advantage of the Flash Cache performance improvements.

   Choose no storage efficiency when creating a volume from Cloud Manager, or create a volume and then disable data compression by using the CLI.

Launching Cloud Volumes ONTAP in AWS

You can launch Cloud Volumes ONTAP in a single-system configuration or as an HA pair in AWS.

Launching a single-node Cloud Volumes ONTAP system in AWS

If you want to launch Cloud Volumes ONTAP in AWS, you need to create a new working environment in Cloud Manager.

Before you begin

- You should have prepared by choosing a configuration and by obtaining AWS networking

information from your administrator. For details, see Planning your Cloud Volumes ONTAP configuration.

- If you want to launch a BYOL system, you must have the 20-digit serial number (license key).

- If you want to use CIFS, you must have set up DNS and Active Directory. For details, see Networking requirements for Cloud Volumes ONTAP in AWS.

- You should be prepared to leave Cloud Manager running at all times.

About this task

Immediately after you create the working environment, Cloud Manager launches a test instance in the specified VPC to verify connectivity. If successful, Cloud Manager immediately terminates the instance and then starts deploying the Cloud Volumes ONTAP system. If Cloud Manager cannot verify connectivity, creation of the working environment fails. The test instance is either a t2.nano (for default VPC tenancy) or m3.medium (for dedicated VPC tenancy).

Steps

1. On the Working Environments page, click **Create Cloud Volumes ONTAP** and follow the prompts.

2. **Define Your Working Environment**: Select **Amazon Web Services** and **Cloud Volumes ONTAP**.

3. **Details and Credentials**: Optionally change the AWS credentials and subscription, enter a working environment name, add tags if needed, and then enter a password.

   Some of the fields in this page are self-explanatory. The following table describes fields for which you might need guidance:

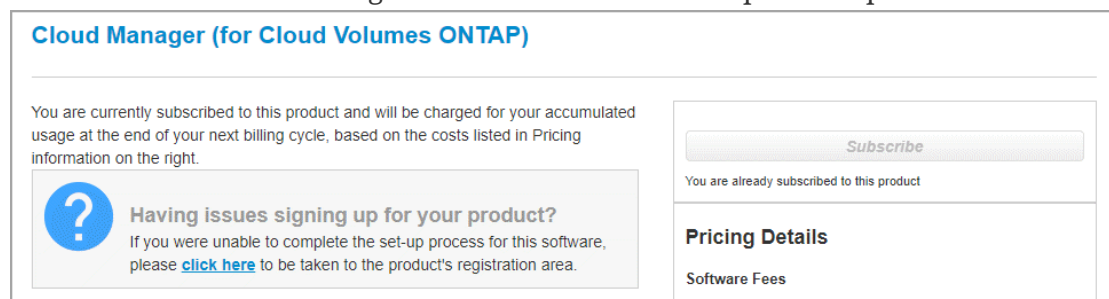| Field	Description
Working Environment Name	Cloud Manager uses the working environment name to name both the Cloud Volumes ONTAP system and the Amazon EC2 instance. It also uses the name as the prefix for the predefined security group, if you select that option.
Add tags	AWS tags are metadata for your AWS resources. Cloud Manager adds the tags to the Cloud Volumes ONTAP instance and each AWS resource associated with the instance. You can add up to four tags from the user interface when creating a working environment, and then you can add more after its created. Note that the API does not limit you to four tags when creating a working environment. For information about tags, refer to AWS Documentation: Tagging your Amazon EC2 Resources.
User name and password	These are the credentials for the Cloud Volumes ONTAP cluster admin account. You can use these credentials to connect to Cloud Volumes ONTAP through OnCommand System Manager or its CLI.

Field	Description
Edit Credentials	Choose the AWS credentials and marketplace subscription to use with this Cloud Volumes ONTAP system.

Click **Add Subscription** to associate the selected credentials with a subscription.

To create a pay-as-you-go Cloud Volumes ONTAP system, you need to select AWS credentials that are associated with a subscription to Cloud Volumes ONTAP from the AWS Marketplace. You'll be charged from this subscription for every Cloud Volumes ONTAP 9.6 and later PAYGO system that you create and each add-on feature that you enable.

[Learn how to add additional AWS credentials to Cloud Manager](). |

The following video shows how to associate a pay-as-you-go Marketplace subscription to your AWS credentials:

▶ https://docs.netapp.com/us-en/occm/media/video_subscribing_aws.mp4 *(video)*

> 💡 If multiple IAM users work in the same AWS account, then each user needs to subscribe. After the first user subscribes, the AWS Marketplace informs subsequent users that they're already subscribed, as shown in the image below. While a subscription is in place for the AWS *account*, each IAM user needs to associate themselves with that subscription. If you see the message shown below, click the **click here** link to go to Cloud Central and complete the process.
>
>

4. **Services**: Keep the services enabled or disable the individual services that you don't want to use with Cloud Volumes ONTAP.

   ◦ [Learn more about Cloud Compliance]().
   ◦ [Learn more about Backup to Cloud]().
   ◦ [Learn more about Monitoring]().

5. **Location & Connectivity**: Enter the network information that you recorded in the AWS worksheet.

   The following image shows the page filled out:

Location	Connectivity

Location

AWS Region
US West | Oregon ▾

VPC
vpc-3a01e05f - 172.31.0.0/16 ▾

Subnet
172.31.5.0/24 (OCCM subnet) ▾

Connectivity

Security Group
◉ Generated security group   ○ Use existing security group

SSH Authentication Method
◉ Password   ○ Key Pair

6. **Data Encryption**: Choose no data encryption or AWS-managed encryption.

   For AWS-managed encryption, you can choose a different Customer Master Key (CMK) from your account or another AWS account.

   > 💡 You can't change the AWS data encryption method after you create a Cloud Volumes ONTAP system.

   Learn how to set up the AWS KMS for Cloud Volumes ONTAP.

   Learn more about supported encryption technologies.

7. **License and Support Site Account**: Specify whether you want to use pay-as-you-go or BYOL, and then specify a NetApp Support Site account.

   To understand how licenses work, see Licensing.

   A NetApp Support Site Account is optional for pay-as-you-go, but required for BYOL systems. Learn how to add NetApp Support Site accounts.

8. **Preconfigured Packages**: Select one of the packages to quickly launch Cloud Volumes ONTAP, or click **Create my own configuration**.

   If you choose one of the packages, you only need to specify a volume and then review and approve the configuration.

9. **IAM Role**: You should keep the default option to let Cloud Manager create the role for you.

   If you prefer to use your own policy, it must meet policy requirements for Cloud Volumes ONTAP nodes.

10. **Licensing**: Change the Cloud Volumes ONTAP version as needed, select a license, an instance type, and the instance tenancy.

If your needs change after you launch the instance, you can modify the license or instance type later.

> If a newer Release Candidate, General Availability, or patch release is available for the selected version, then Cloud Manager updates the system to that version when creating the working environment. For example, the update occurs if you select Cloud Volumes ONTAP 9.6 RC1 and 9.6 GA is available. The update does not occur from one release to another—for example, from 9.6 to 9.7.

11. **Underlying Storage Resources**: Choose settings for the initial aggregate: a disk type, a size for each disk, and whether data tiering should be enabled.

    Note the following:

    ◦ The disk type is for the initial volume. You can choose a different disk type for subsequent volumes.

    ◦ The disk size is for all disks in the initial aggregate and for any additional aggregates that Cloud Manager creates when you use the simple provisioning option. You can create aggregates that use a different disk size by using the advanced allocation option.

      For help choosing a disk type and size, see Sizing your system in AWS.

    ◦ You can choose a specific volume tiering policy when you create or edit a volume.

    ◦ If you disable data tiering, you can enable it on subsequent aggregates.

      Learn how data tiering works.

12. **Write Speed & WORM**: Choose **Normal** or **High** write speed, and activate write once, read many (WORM) storage, if desired.

    Learn more about write speed.

    Learn more about WORM storage.

13. **Create Volume**: Enter details for the new volume or click **Skip**.

    You might skip this step if you want to create a volume for iSCSI. Cloud Manager sets up volumes for NFS and CIFS only.

    Some of the fields in this page are self-explanatory. The following table describes fields for which you might need guidance:

Field	Description
Size	The maximum size that you can enter largely depends on whether you enable thin provisioning, which enables you to create a volume that is bigger than the physical storage currently available to it.

Field	Description
Access control (for NFS only)	An export policy defines the clients in the subnet that can access the volume. By default, Cloud Manager enters a value that provides access to all instances in the subnet.
Permissions and Users / Groups (for CIFS only)	These fields enable you to control the level of access to a share for users and groups (also called access control lists or ACLs). You can specify local or domain Windows users or groups, or UNIX users or groups. If you specify a domain Windows user name, you must include the user's domain using the format domain\username.
Snapshot Policy	A Snapshot copy policy specifies the frequency and number of automatically created NetApp Snapshot copies. A NetApp Snapshot copy is a point-in-time file system image that has no performance impact and requires minimal storage. You can choose the default policy or none. You might choose none for transient data: for example, tempdb for Microsoft SQL Server.
Advanced options (for NFS only)	Select an NFS version for the volume: either NFSv3 or NFSv4.

The following image shows the Volume page filled out for the CIFS protocol:

14. **CIFS Setup**: If you chose the CIFS protocol, set up a CIFS server.

Field	Description
DNS Primary and Secondary IP Address	The IP addresses of the DNS servers that provide name resolution for the CIFS server. The listed DNS servers must contain the service location records (SRV) needed to locate the Active Directory LDAP servers and domain controllers for the domain that the CIFS server will join.
Active Directory Domain to join	The FQDN of the Active Directory (AD) domain that you want the CIFS server to join.

Field	Description
Credentials authorized to join the domain	The name and password of a Windows account with sufficient privileges to add computers to the specified Organizational Unit (OU) within the AD domain.
CIFS server NetBIOS name	A CIFS server name that is unique in the AD domain.
Organizational Unit	The organizational unit within the AD domain to associate with the CIFS server. The default is CN=Computers. If you configure AWS Managed Microsoft AD as the AD server for Cloud Volumes ONTAP, you should enter **OU=Computers,OU=corp** in this field.
DNS Domain	The DNS domain for the Cloud Volumes ONTAP storage virtual machine (SVM). In most cases, the domain is the same as the AD domain.
NTP Server	Select **Use Active Directory Domain** to configure an NTP server using the Active Directory DNS. If you need to configure an NTP server using a different address, then you should use the API. See the Cloud Manager API Developer Guide for details.

15. **Usage Profile, Disk Type, and Tiering Policy**: Choose whether you want to enable storage efficiency features and edit the volume tiering policy, if needed.

    For more information, see Understanding volume usage profiles and Data tiering overview.

16. **Review & Approve**: Review and confirm your selections.

    a. Review details about the configuration.

    b. Click **More information** to review details about support and the AWS resources that Cloud Manager will purchase.

    c. Select the **I understand...** check boxes.

    d. Click **Go**.

Result

Cloud Manager launches the Cloud Volumes ONTAP instance. You can track the progress in the timeline.

If you experience any issues launching the Cloud Volumes ONTAP instance, review the failure message. You can also select the working environment and click Re-create environment.

For additional help, go to NetApp Cloud Volumes ONTAP Support.

After you finish

- If you provisioned a CIFS share, give users or groups permissions to the files and folders and verify that those users can access the share and create a file.

- If you want to apply quotas to volumes, use System Manager or the CLI.

  Quotas enable you to restrict or track the disk space and number of files used by a user, group, or qtree.

Launching a Cloud Volumes ONTAP HA pair in AWS

If you want to launch a Cloud Volumes ONTAP HA pair in AWS, you need to create an HA working environment in Cloud Manager.

Before you begin
- You should have prepared by choosing a configuration and by obtaining AWS networking information from your administrator. For details, see Planning your Cloud Volumes ONTAP configuration.
- If you purchased BYOL licenses, you must have a 20-digit serial number (license key) for each node.
- If you want to use CIFS, you must have set up DNS and Active Directory. For details, see Networking requirements for Cloud Volumes ONTAP in AWS.
- You should be prepared to leave Cloud Manager running at all times.

About this task

Immediately after you create the working environment, Cloud Manager launches a test instance in the specified VPC to verify connectivity. If successful, Cloud Manager immediately terminates the instance and then starts deploying the Cloud Volumes ONTAP system. If Cloud Manager cannot verify connectivity, creation of the working environment fails. The test instance is either a t2.nano (for default VPC tenancy) or m3.medium (for dedicated VPC tenancy).

Steps
1. On the Working Environments page, click **Create Cloud Volumes ONTAP** and follow the prompts.
2. **Define Your Working Environment**: Select **Amazon Web Services** and **Cloud Volumes ONTAP HA**.
3. **Details and Credentials**: Optionally change the AWS credentials and subscription, enter a working environment name, add tags if needed, and then enter a password.

   Some of the fields in this page are self-explanatory. The following table describes fields for which you might need guidance:

Field	Description
Working Environment Name	Cloud Manager uses the working environment name to name both the Cloud Volumes ONTAP system and the Amazon EC2 instance. It also uses the name as the prefix for the predefined security group, if you select that option.

Field	Description
Add tags	AWS tags are metadata for your AWS resources. Cloud Manager adds the tags to the Cloud Volumes ONTAP instance and each AWS resource associated with the instance. You can add up to four tags from the user interface when creating a working environment, and then you can add more after its created. Note that the API does not limit you to four tags when creating a working environment. For information about tags, refer to AWS Documentation: Tagging your Amazon EC2 Resources.
User name and password	These are the credentials for the Cloud Volumes ONTAP cluster admin account. You can use these credentials to connect to Cloud Volumes ONTAP through OnCommand System Manager or its CLI.
Edit Credentials	Choose the AWS credentials and marketplace subscription to use with this Cloud Volumes ONTAP system. Click **Add Subscription** to associate the selected credentials with a subscription. To create a pay-as-you-go Cloud Volumes ONTAP system, you need to select AWS credentials that are associated with a subscription to Cloud Volumes ONTAP from the AWS Marketplace. You'll be charged from this subscription for every Cloud Volumes ONTAP 9.6 and later PAYGO system that you create and each add-on feature that you enable. Learn how to add additional AWS credentials to Cloud Manager.

The following video shows how to associate a pay-as-you-go Marketplace subscription to your AWS credentials:

▶ https://docs.netapp.com/us-en/occm/media/video_subscribing_aws.mp4 *(video)*

> If multiple IAM users work in the same AWS account, then each user needs to subscribe. After the first user subscribes, the AWS Marketplace informs subsequent users that they're already subscribed, as shown in the image below. While a subscription is in place for the AWS *account*, each IAM user needs to associate themselves with that subscription. If you see the message shown below, click the **click here** link to go to Cloud Central and complete the process.

4. **Services**: Keep the services enabled or disable the individual services that you don't want to use

with this Cloud Volumes ONTAP system.

- Learn more about Backup to S3.

- Learn more about Cloud Compliance.

- Learn more about Monitoring.

5. **HA Deployment Models**: Choose an HA configuration.

   For an overview of the deployment models, see Cloud Volumes ONTAP HA for AWS.

6. **Region & VPC**: Enter the network information that you recorded in the AWS worksheet.

   The following image shows the page filled out for a multiple AZ configuration:

7. **Connectivity and SSH Authentication**: Choose connection methods for the HA pair and the mediator.

8. **Floating IPs**: If you chose multiple AZs, specify the floating IP addresses.

   The IP addresses must be outside of the CIDR block for all VPCs in the region. For additional details, see AWS networking requirements for Cloud Volumes ONTAP HA in multiple AZs.

9. **Route Tables**: If you chose multiple AZs, select the route tables that should include routes to the floating IP addresses.

   If you have more than one route table, it is very important to select the correct route tables. Otherwise, some clients might not have access to the Cloud Volumes ONTAP HA pair. For more information about route tables, refer to AWS Documentation: Route Tables.

10. **Data Encryption**: Choose no data encryption or AWS-managed encryption.

    For AWS-managed encryption, you can choose a different Customer Master Key (CMK) from your account or another AWS account.

You can't change the AWS data encryption method after you create a Cloud Volumes ONTAP system.

Learn how to set up the AWS KMS for Cloud Volumes ONTAP.

Learn more about supported encryption technologies.

11. **License and Support Site Account**: Specify whether you want to use pay-as-you-go or BYOL, and then specify a NetApp Support Site account.

    To understand how licenses work, see Licensing.

    A NetApp Support Site Account is optional for pay-as-you-go, but required for BYOL systems. Learn how to add NetApp Support Site accounts.

12. **Preconfigured Packages**: Select one of the packages to quickly launch a Cloud Volumes ONTAP system, or click **Create my own configuration**.

    If you choose one of the packages, you only need to specify a volume and then review and approve the configuration.

13. **IAM Role**: You should keep the default option to let Cloud Manager create the roles for you.

    If you prefer to use your own policy, it must meet policy requirements for Cloud Volumes ONTAP nodes and the HA mediator.

14. **Licensing**: Change the Cloud Volumes ONTAP version as needed, select a license, an instance type, and the instance tenancy.

    If your needs change after you launch the instances, you can modify the license or instance type later.

    > If a newer Release Candidate, General Availability, or patch release is available for the selected version, then Cloud Manager updates the system to that version when creating the working environment. For example, the update occurs if you select Cloud Volumes ONTAP 9.6 RC1 and 9.6 GA is available. The update does not occur from one release to another—for example, from 9.6 to 9.7.

15. **Underlying Storage Resources**: Choose settings for the initial aggregate: a disk type, a size for each disk, and whether data tiering should be enabled.

    Note the following:

    ◦ The disk type is for the initial volume. You can choose a different disk type for subsequent volumes.

- The disk size is for all disks in the initial aggregate and for any additional aggregates that Cloud Manager creates when you use the simple provisioning option. You can create aggregates that use a different disk size by using the advanced allocation option.

  For help choosing a disk type and size, see Sizing your system in AWS.

- You can choose a specific volume tiering policy when you create or edit a volume.
- If you disable data tiering, you can enable it on subsequent aggregates.

  Learn how data tiering works.

16. **WORM**: Activate write once, read many (WORM) storage, if desired.

    Learn more about WORM storage.

17. **Create Volume**: Enter details for the new volume or click **Skip**.

    You might skip this step if you want to create a volume for iSCSI. Cloud Manager sets up volumes for NFS and CIFS only.

    Some of the fields in this page are self-explanatory. The following table describes fields for which you might need guidance:

Field	Description
Size	The maximum size that you can enter largely depends on whether you enable thin provisioning, which enables you to create a volume that is bigger than the physical storage currently available to it.
Access control (for NFS only)	An export policy defines the clients in the subnet that can access the volume. By default, Cloud Manager enters a value that provides access to all instances in the subnet.
Permissions and Users / Groups (for CIFS only)	These fields enable you to control the level of access to a share for users and groups (also called access control lists or ACLs). You can specify local or domain Windows users or groups, or UNIX users or groups. If you specify a domain Windows user name, you must include the user's domain using the format domain\username.
Snapshot Policy	A Snapshot copy policy specifies the frequency and number of automatically created NetApp Snapshot copies. A NetApp Snapshot copy is a point-in-time file system image that has no performance impact and requires minimal storage. You can choose the default policy or none. You might choose none for transient data: for example, tempdb for Microsoft SQL Server.
Advanced options (for NFS only)	Select an NFS version for the volume: either NFSv3 or NFSv4.

The following image shows the Volume page filled out for the CIFS protocol:

18. **CIFS Setup**: If you selected the CIFS protocol, set up a CIFS server.

Field	Description
DNS Primary and Secondary IP Address	The IP addresses of the DNS servers that provide name resolution for the CIFS server. The listed DNS servers must contain the service location records (SRV) needed to locate the Active Directory LDAP servers and domain controllers for the domain that the CIFS server will join.
Active Directory Domain to join	The FQDN of the Active Directory (AD) domain that you want the CIFS server to join.
Credentials authorized to join the domain	The name and password of a Windows account with sufficient privileges to add computers to the specified Organizational Unit (OU) within the AD domain.
CIFS server NetBIOS name	A CIFS server name that is unique in the AD domain.
Organizational Unit	The organizational unit within the AD domain to associate with the CIFS server. The default is CN=Computers. If you configure AWS Managed Microsoft AD as the AD server for Cloud Volumes ONTAP, you should enter **OU=Computers,OU=corp** in this field.
DNS Domain	The DNS domain for the Cloud Volumes ONTAP storage virtual machine (SVM). In most cases, the domain is the same as the AD domain.
NTP Server	Select **Use Active Directory Domain** to configure an NTP server using the Active Directory DNS. If you need to configure an NTP server using a different address, then you should use the API. See the Cloud Manager API Developer Guide for details.

19. **Usage Profile, Disk Type, and Tiering Policy**: Choose whether you want to enable storage efficiency features and edit the volume tiering policy, if needed.

For more information, see [Understanding volume usage profiles](#) and [Data tiering overview](#).

20. **Review & Approve**: Review and confirm your selections.

    a. Review details about the configuration.

    b. Click **More information** to review details about support and the AWS resources that Cloud Manager will purchase.

    c. Select the **I understand...** check boxes.

    d. Click **Go**.

Result

Cloud Manager launches the Cloud Volumes ONTAP HA pair. You can track the progress in the timeline.

If you experience any issues launching the HA pair, review the failure message. You can also select the working environment and click Re-create environment.

For additional help, go to [NetApp Cloud Volumes ONTAP Support](#).

After you finish

- If you provisioned a CIFS share, give users or groups permissions to the files and folders and verify that those users can access the share and create a file.

- If you want to apply quotas to volumes, use System Manager or the CLI.

  Quotas enable you to restrict or track the disk space and number of files used by a user, group, or qtree.

Launching Cloud Volumes ONTAP in Azure

You can launch a single node system or an HA pair in Azure by creating a Cloud Volumes ONTAP working environment in Cloud Manager.

Before you begin

- Make sure that your Azure account has the required permissions, especially if you upgraded from a previous release and are deploying an HA system for the first time.

  The latest permissions are in the [NetApp Cloud Central policy for Azure](#).

- You should have chose a configuration and obtained Azure networking information from your administrator. For details, see [Planning your Cloud Volumes ONTAP configuration](#).

- To deploy a BYOL system, you need the 20-digit serial number (license key) for each node.

- [You should be prepared to leave Cloud Manager running at all times](#).

About this task

When Cloud Manager creates a Cloud Volumes ONTAP system in Azure, it creates several Azure objects, such as a resource group, network interfaces, and storage accounts. You can review a summary of the resources at the end of the wizard.

Steps

1. On the Working Environments page, click **Create Cloud Volumes ONTAP** and follow the prompts.

2. **Define Your Working Environment**: Select **Microsoft Azure** and then choose a single node or HA pair.

3. **Details and Credentials**: Optionally change the Azure credentials and subscription, specify a cluster name and resource group name, add tags if needed, and then specify credentials.

   The following table describes fields for which you might need guidance:

Field	Description
Working Environment Name	Cloud Manager uses the working environment name to name both the Cloud Volumes ONTAP system and the Azure virtual machine. It also uses the name as the prefix for the predefined security group, if you select that option.
Resource Group Name	If you uncheck **Use Default**, you can enter the name of a new resource group. If you want to use an existing resource group, then you must use the API.
Tags	Tags are metadata for your Azure resources. Cloud Manager adds the tags to the Cloud Volumes ONTAP system and each Azure resource associated with the system. You can add up to four tags from the user interface when creating a working environment, and then you can add more after its created. Note that the API does not limit you to four tags when creating a working environment. For information about tags, refer to Microsoft Azure Documentation: Using tags to organize your Azure resources.
User name and password	These are the credentials for the Cloud Volumes ONTAP cluster admin account. You can use these credentials to connect to Cloud Volumes ONTAP through OnCommand System Manager or its CLI.
Edit Credentials	You can choose different Azure credentials and a different Azure subscription to use with this Cloud Volumes ONTAP system. You need to associate an Azure Marketplace subscription with the selected Azure subscription in order to deploy a pay-as-you-go Cloud Volumes ONTAP system. Learn how to add credentials.

   The following video shows how to associate a Marketplace subscription to an Azure subscription:

▶ https://docs.netapp.com/us-en/occm/media/video_subscribing_azure.mp4 *(video)*

4. **Services**: Keep the services enabled or disable the individual services that you don't want to use with Cloud Volumes ONTAP.

   ◦ [Learn more about Cloud Compliance](#).

   ◦ [Learn more about Backup to Cloud](#).

5. **Location & Connectivity**: Select a location and security group and select the checkbox to confirm network connectivity between Cloud Manager and the target location.

6. **License and Support Site Account**: Specify whether you want to use pay-as-you-go or BYOL, and then specify a NetApp Support Site account.

   To understand how licenses work, see [Licensing](#).

   A NetApp Support Site Account is optional for pay-as-you-go, but required for BYOL systems. [Learn how to add NetApp Support Site accounts](#).

7. **Preconfigured Packages**: Shelect one of the packages to quickly deploy a Cloud Volumes ONTAP system, or click **Create my own configuration**.

   If you choose one of the packages, you only need to specify a volume and then review and approve the configuration.

8. **Licensing**: Change the Cloud Volumes ONTAP version as needed, select a license, and select a virtual machine type.

   If your needs change after you launch the system, you can modify the license or virtual machine type later.

   > ⓘ   If a newer Release Candidate, General Availability, or patch release is available for the selected version, then Cloud Manager updates the system to that version when creating the working environment. For example, the update occurs if you select Cloud Volumes ONTAP 9.6 RC1 and 9.6 GA is available. The update does not occur from one release to another—for example, from 9.6 to 9.7.

9. **Subscribe from the Azure Marketplace**: Follow the steps if Cloud Manager could not enable programmatic deployments of Cloud Volumes ONTAP.

10. **Underlying Storage Resources**: Choose settings for the initial aggregate: a disk type, a size for each disk, and whether data tiering to Blob storage should be enabled.

    Note the following:

    ◦ The disk type is for the initial volume. You can choose a different disk type for subsequent volumes.

- The disk size is for all disks in the initial aggregate and for any additional aggregates that Cloud Manager creates when you use the simple provisioning option. You can create aggregates that use a different disk size by using the advanced allocation option.

  For help choosing a disk type and size, see Sizing your system in Azure.

- You can choose a specific volume tiering policy when you create or edit a volume.

- If you disable data tiering, you can enable it on subsequent aggregates.

  Learn more about data tiering.

11. **Write Speed & WORM** (single node systems only): Choose **Normal** or **High** write speed, and activate write once, read many (WORM) storage, if desired.

    > **i**   Choosing a write speed is supported with single node systems only.

    Learn more about write speed.

    Learn more about WORM storage.

12. **Secure Communication to Storage & WORM** (HA only): Choose whether to enable an HTTPS connection to Azure storage accounts, and activate write once, read many (WORM) storage, if desired.

    The HTTPS connection is from a Cloud Volumes ONTAP 9.7 HA pair to Azure storage accounts. Note that enabling this option can impact write performance. You can't change the setting after you create the working environment.

    Learn more about WORM storage.

13. **Create Volume**: Enter details for the new volume or click **Skip**.

    You should skip this step if you want to use iSCSI. Cloud Manager enables you to create volumes for NFS and CIFS only.

    Some of the fields in this page are self-explanatory. The following table describes fields for which you might need guidance:

Field	Description
Size	The maximum size that you can enter largely depends on whether you enable thin provisioning, which enables you to create a volume that is bigger than the physical storage currently available to it.
Access control (for NFS only)	An export policy defines the clients in the subnet that can access the volume. By default, Cloud Manager enters a value that provides access to all instances in the subnet.

Field	Description
Permissions and Users / Groups (for CIFS only)	These fields enable you to control the level of access to a share for users and groups (also called access control lists or ACLs). You can specify local or domain Windows users or groups, or UNIX users or groups. If you specify a domain Windows user name, you must include the user's domain using the format domain\username.
Snapshot Policy	A Snapshot copy policy specifies the frequency and number of automatically created NetApp Snapshot copies. A NetApp Snapshot copy is a point-in-time file system image that has no performance impact and requires minimal storage. You can choose the default policy or none. You might choose none for transient data: for example, tempdb for Microsoft SQL Server.
Advanced options (for NFS only)	Select an NFS version for the volume: either NFSv3 or NFSv4.

The following image shows the Volume page filled out for the CIFS protocol:

14. **CIFS Setup**: If you chose the CIFS protocol, set up a CIFS server.

Field	Description
DNS Primary and Secondary IP Address	The IP addresses of the DNS servers that provide name resolution for the CIFS server. The listed DNS servers must contain the service location records (SRV) needed to locate the Active Directory LDAP servers and domain controllers for the domain that the CIFS server will join.
Active Directory Domain to join	The FQDN of the Active Directory (AD) domain that you want the CIFS server to join.
Credentials authorized to join the domain	The name and password of a Windows account with sufficient privileges to add computers to the specified Organizational Unit (OU) within the AD domain.

Field	Description
CIFS server NetBIOS name	A CIFS server name that is unique in the AD domain.
Organizational Unit	The organizational unit within the AD domain to associate with the CIFS server. The default is CN=Computers. To configure Azure AD Domain Services as the AD server for Cloud Volumes ONTAP, you should enter **OU=AADDC Computers** or **OU=AADDC Users** in this field. Azure Documentation: Create an Organizational Unit (OU) in an Azure AD Domain Services managed domain
DNS Domain	The DNS domain for the Cloud Volumes ONTAP storage virtual machine (SVM). In most cases, the domain is the same as the AD domain.
NTP Server	Select **Use Active Directory Domain** to configure an NTP server using the Active Directory DNS. If you need to configure an NTP server using a different address, then you should use the API. See the Cloud Manager API Developer Guide for details.

15. **Usage Profile, Disk Type, and Tiering Policy**: Choose whether you want to enable storage efficiency features and change the volume tiering policy, if needed.

   For more information, see Understanding volume usage profiles and Data tiering overview.

16. **Review & Approve**: Review and confirm your selections.

   a. Review details about the configuration.

   b. Click **More information** to review details about support and the Azure resources that Cloud Manager will purchase.

   c. Select the **I understand...** check boxes.

   d. Click **Go**.

Result

Cloud Manager deploys the Cloud Volumes ONTAP system. You can track the progress in the timeline.

If you experience any issues deploying the Cloud Volumes ONTAP system, review the failure message. You can also select the working environment and click **Re-create environment**.

For additional help, go to NetApp Cloud Volumes ONTAP Support.

After you finish

- If you provisioned a CIFS share, give users or groups permissions to the files and folders and verify that those users can access the share and create a file.

- If you want to apply quotas to volumes, use System Manager or the CLI.

Quotas enable you to restrict or track the disk space and number of files used by a user, group, or qtree.

Launching Cloud Volumes ONTAP in GCP

You can launch a single node Cloud Volumes ONTAP system in GCP by creating a working environment.

Before you begin

- You should have chose a configuration and obtained GCP networking information from your administrator. For details, see Planning your Cloud Volumes ONTAP configuration.

- To deploy a BYOL system, you need the 20-digit serial number (license key) for each node.

- You should be prepared to leave Cloud Manager running at all times.

Steps

1. On the Working Environments page, click **Create Cloud Volumes ONTAP** and follow the prompts.

2. **Define Your Working Environment**: Click **Continue**.

3. **Details & Credentials**: Select a project, specify a cluster name, optionally add labels, and then specify credentials.

   The following table describes fields for which you might need guidance:

Field	Description
Working Environment Name	Cloud Manager uses the working environment name to name both the Cloud Volumes ONTAP system and the GCP VM instance. It also uses the name as the prefix for the predefined security group, if you select that option.
Add Labels	Labels are metadata for your GCP resources. Cloud Manager adds the labels to the Cloud Volumes ONTAP system and GCP resources associated with the system. You can add up to four labels from the user interface when creating a working environment, and then you can add more after its created. Note that the API does not limit you to four labels when creating a working environment. For information about labels, refer to Google Cloud Documentation: Labeling Resources.
User name and password	These are the credentials for the Cloud Volumes ONTAP cluster admin account. You can use these credentials to connect to Cloud Volumes ONTAP through System Manager or its CLI.

Field	Description
Edit Project	Select the project where you want Cloud Volumes ONTAP to reside. The default project is the project where Cloud Manager resides.
	If you don't see any additional projects in the drop-down list, then you haven't yet associated the Cloud Manager service account with other projects. Go to the Google Cloud console, open the IAM service, and select the project. Add the service account with the Cloud Manager role to that project. You'll need to repeat this step for each project.
	This is the service account that you set up for Cloud Manager, as described in step 2b on this page.
	Click **Add Subscription** to associate the selected credentials with a subscription.
	To create a pay-as-you-go Cloud Volumes ONTAP system, you need to select a GCP project that's associated with a subscription to Cloud Volumes ONTAP from the GCP Marketplace.

The following video shows how to associate a pay-as-you-go Marketplace subscription to your GCP project:

▶ https://docs.netapp.com/us-en/occm/media/video_subscribing_gcp.mp4 *(video)*

4. **Location & Connectivity**: Select a location, choose a firewall policy, and select the checkbox to confirm network connectivity to Google Cloud storage for data tiering.

   If you want to tier cold data to a Google Cloud Storage bucket, the subnet in which Cloud Volumes ONTAP resides must be configured for Private Google Access. For instructions, refer to Google Cloud Documentation: Configuring Private Google Access.

5. **License & Support Site Account**: Specify whether you want to use pay-as-you-go or BYOL, and then specify a NetApp Support Site account.

   To understand how licenses work, see Licensing.

   A NetApp Support Site Account is optional for pay-as-you-go, but required for BYOL systems. Learn how to add NetApp Support Site accounts.

6. **Preconfigured Packages**: Select one of the packages to quickly deploy a Cloud Volumes ONTAP system, or click **Create my own configuration**.

   If you choose one of the packages, you only need to specify a volume and then review and approve the configuration.

7. **Licensing**: Change the Cloud Volumes ONTAP version as needed, select a license, and select a virtual machine type.

If your needs change after you launch the system, you can modify the license or virtual machine type later.

> ℹ️ If a newer Release Candidate, General Availability, or patch release is available for the selected version, then Cloud Manager updates the system to that version when creating the working environment. For example, the update occurs if you select Cloud Volumes ONTAP 9.6 RC1 and 9.6 GA is available. The update does not occur from one release to another—for example, from 9.6 to 9.7.

8. **Underlying Storage Resources**: Choose settings for the initial aggregate: a disk type and the size for each disk.

The disk type is for the initial volume. You can choose a different disk type for subsequent volumes.

The disk size is for all disks in the initial aggregate and for any additional aggregates that Cloud Manager creates when you use the simple provisioning option. You can create aggregates that use a different disk size by using the advanced allocation option.

For help choosing a disk type and size, see Sizing your system in GCP.

9. **Write Speed & WORM**: Choose **Normal** or **High** write speed, and activate write once, read many (WORM) storage, if desired.

Learn more about write speed.

Learn more about WORM storage.

10. **Data Tiering in Google Cloud Platform**: Choose whether to enable data tiering on the initial aggregate, choose a storage class for the tiered data, and then either select a service account that has the predefined Storage Admin role (required for Cloud Volumes ONTAP 9.7), or select a GCP account (required for Cloud Volumes ONTAP 9.6).

Note the following:

   ◦ Cloud Manager sets the service account on the Cloud Volumes ONTAP instance. This service account provides permissions for data tiering to a Google Cloud Storage bucket. Be sure to add the Cloud Manager service account as a user of the tiering service account, otherwise, you can't select it from Cloud Manager.

   ◦ For help with adding a GCP account, see Setting up and adding GCP accounts for data tiering with 9.6.

   ◦ You can choose a specific volume tiering policy when you create or edit a volume.

- If you disable data tiering, you can enable it on subsequent aggregates, but you'll need to turn off the system and add a service account from the GCP console.

  Learn more about data tiering.

11. **Create Volume**: Enter details for the new volume or click **Skip**.

    You should skip this step if you want to use iSCSI. Cloud Manager enables you to create volumes for NFS and CIFS only.

    Some of the fields in this page are self-explanatory. The following table describes fields for which you might need guidance:

Field	Description
Size	The maximum size that you can enter largely depends on whether you enable thin provisioning, which enables you to create a volume that is bigger than the physical storage currently available to it.
Access control (for NFS only)	An export policy defines the clients in the subnet that can access the volume. By default, Cloud Manager enters a value that provides access to all instances in the subnet.
Permissions and Users / Groups (for CIFS only)	These fields enable you to control the level of access to a share for users and groups (also called access control lists or ACLs). You can specify local or domain Windows users or groups, or UNIX users or groups. If you specify a domain Windows user name, you must include the user's domain using the format domain\username.
Snapshot Policy	A Snapshot copy policy specifies the frequency and number of automatically created NetApp Snapshot copies. A NetApp Snapshot copy is a point-in-time file system image that has no performance impact and requires minimal storage. You can choose the default policy or none. You might choose none for transient data: for example, tempdb for Microsoft SQL Server.
Advanced options (for NFS only)	Select an NFS version for the volume: either NFSv3 or NFSv4.

The following image shows the Volume page filled out for the CIFS protocol:

Details & Protection

Volume Name: `vol1` Size (GB): ⓘ `50`

Snapshot Policy: `default`
ⓘ Default Policy

Protocol

○ NFS Protocol ● CIFS Protocol

Share name: `vol1_share` Permissions: `Full Control ▾`

Users / Groups: `engineering`
Valid users and groups separated by a semicolon

12. **CIFS Setup**: If you chose the CIFS protocol, set up a CIFS server.

Field	Description
DNS Primary and Secondary IP Address	The IP addresses of the DNS servers that provide name resolution for the CIFS server. The listed DNS servers must contain the service location records (SRV) needed to locate the Active Directory LDAP servers and domain controllers for the domain that the CIFS server will join.
Active Directory Domain to join	The FQDN of the Active Directory (AD) domain that you want the CIFS server to join.
Credentials authorized to join the domain	The name and password of a Windows account with sufficient privileges to add computers to the specified Organizational Unit (OU) within the AD domain.
CIFS server NetBIOS name	A CIFS server name that is unique in the AD domain.
Organizational Unit	The organizational unit within the AD domain to associate with the CIFS server. The default is CN=Computers.
DNS Domain	The DNS domain for the Cloud Volumes ONTAP storage virtual machine (SVM). In most cases, the domain is the same as the AD domain.
NTP Server	Select **Use Active Directory Domain** to configure an NTP server using the Active Directory DNS. If you need to configure an NTP server using a different address, then you should use the API. See the Cloud Manager API Developer Guide for details.

13. **Usage Profile, Disk Type, and Tiering Policy**: Choose whether you want to enable storage efficiency features and change the volume tiering policy, if needed.

    For more information, see Understanding volume usage profiles and Data tiering overview.

14. **Review & Approve**: Review and confirm your selections.

a. Review details about the configuration.

b. Click **More information** to review details about support and the GCP resources that Cloud Manager will purchase.

c. Select the **I understand…** check boxes.

d. Click **Go**.

Result

Cloud Manager deploys the Cloud Volumes ONTAP system. You can track the progress in the timeline.

If you experience any issues deploying the Cloud Volumes ONTAP system, review the failure message. You can also select the working environment and click **Re-create environment**.

For additional help, go to NetApp Cloud Volumes ONTAP Support.

After you finish

- If you provisioned a CIFS share, give users or groups permissions to the files and folders and verify that those users can access the share and create a file.

- If you want to apply quotas to volumes, use System Manager or the CLI.

  Quotas enable you to restrict or track the disk space and number of files used by a user, group, or qtree.

Registering pay-as-you-go systems

Support from NetApp is included with Cloud Volumes ONTAP Explore, Standard, and Premium systems, but you must first activate support by registering the systems with NetApp.

Steps

1. If you have not yet added your NetApp Support Site account to Cloud Manager, go to **Account Settings** and add it now.

   Learn how to add NetApp Support Site accounts.

2. On the Working Environments page, double-click the name of the system that you want to register.

3. Click the menu icon and then click **Support registration**:
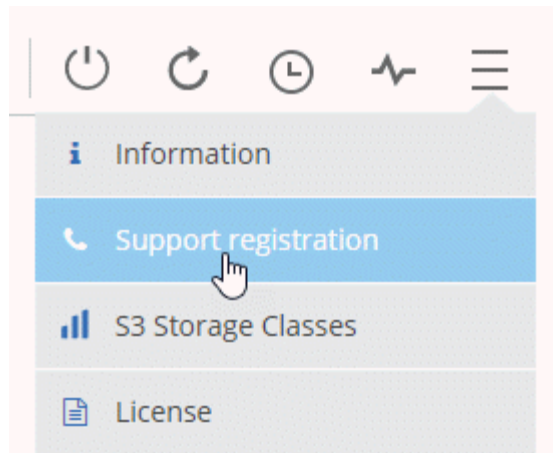
4. Select a NetApp Support Site account and click **Register**.

Result

Cloud Manager registers the system with NetApp.

Setting up Cloud Volumes ONTAP

After you deploy Cloud Volumes ONTAP, you can set it up by synchronizing the system time using NTP and by performing a few optional tasks from either System Manager or the CLI.

Task	Description
Synchronize the system time using NTP	Specifying an NTP server synchronizes the time between the systems in your network, which can help prevent issues due to time differences. Specify an NTP server using the Cloud Manager API or from the user interface when you set up a CIFS server. • Modifying the CIFS server • Cloud Manager API Developer Guide For example, here's the API for a single-node system in AWS:
Optional: Configure AutoSupport	AutoSupport proactively monitors the health of your system and automatically sends messages to NetApp technical support by default. If the Account Admin added a proxy server to Cloud Manager before you launched your instance, Cloud Volumes ONTAP is configured to use that proxy server for AutoSupport messages. You should test AutoSupport to ensure that it can send messages. For instructions, see the System Manager Help or the ONTAP 9 System Administration Reference.
Optional: Configure Cloud Manager as the AutoSupport proxy	If your environment requires a proxy server to send AutoSupport messages, you can configure Cloud Manager to act as the proxy. No configuration for Cloud Manager is required, other than internet access. You simply need to go to the CLI for Cloud Volumes ONTAP and run the following command: ``` system node autosupport modify -proxy-url <cloud-manager-ip-address> ```

Task	Description
Optional: Configure EMS	The Event Management System (EMS) collects and displays information about events that occur on Cloud Volumes ONTAP systems. To receive event notifications, you can set event destinations (email addresses, SNMP trap hosts, or syslog servers) and event routes for a particular event severity. You can configure EMS using the CLI. For instructions, see the ONTAP 9 EMS Configuration Express Guide.
Optional: Create an SVM management network interface (LIF) for HA systems in multiple AWS Availability Zones	A storage virtual machine (SVM) management network interface (LIF) is required if you want to use SnapCenter or SnapDrive for Windows with an HA pair. The SVM management LIF must use a *floating* IP address when using an HA pair across multiple AWS Availability Zones. Cloud Manager prompts you to specify the floating IP address when you launch the HA pair. If you did not specify the IP address, you can create the SVM Management LIF yourself from System Manager or the CLI. The following example shows how to create the LIF from the CLI: ```\nnetwork interface create -vserver svm_cloud -lif svm_mgmt\n-role data -data-protocol none -home-node cloud-01 -home\n-port e0a -address 10.0.2.126 -netmask 255.255.255.0 -status\n-admin up -firewall-policy mgmt\n```
Optional: Change the backup location of configuration files	Cloud Volumes ONTAP automatically creates configuration backup files that contain information about the configurable options that it needs to operate properly. By default, Cloud Volumes ONTAP backs up the files to the Cloud Manager host every eight hours. If you want to send the backups to an alternate location, you can change the location to an FTP or HTTP server in your data center or in AWS. For example, you might already have a backup location for your FAS storage systems. You can change the backup location using the CLI. See the ONTAP 9 System Administration Reference.