Launching Cloud Volumes ONTAP in AWS

Cloud Manager

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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 a Connector that is associated with your workspace.

You must be an Account Admin to create a Connector. When you create your first Cloud Volumes ONTAP working environment, Cloud Manager prompts you to create a Connector if you don't have one yet.

- You should be prepared to leave the Connector running at all times.
- 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.

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 Canvas page, click **Add Working Environment** and follow the prompts.
2. **Choose a Location**: Select **Amazon Web Services** and **Cloud Volumes ONTAP Single Node**.
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:

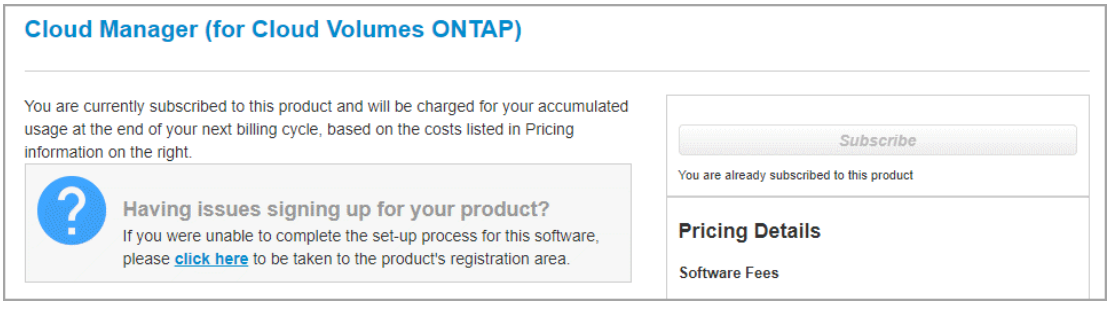
Field	Description
Working Environment Name	Cloud Manager uses the working environment name to name both the Cloud Volumes ONTAP system and the Amazon EC2 instance. It also uses the name as the prefix for the predefined security group, if you select that option.

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.



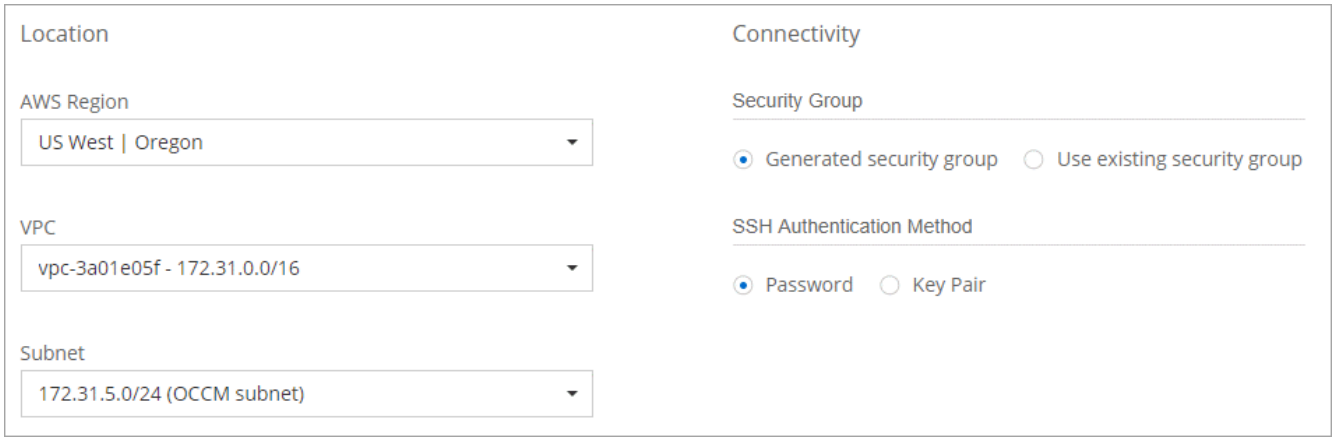
4. **Services**: Keep the services enabled or disable the individual services that you don't want to use with Cloud Volumes ONTAP.

- Learn more about Cloud Compliance.
- Learn more about Cloud Backup.
- Learn more about Monitoring.

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

   If you have an AWS Outpost, you can deploy a single node Cloud Volumes ONTAP system in that Outpost by selecting the Outpost VPC. The experience is the same as any other VPC that resides in AWS.

   The following image shows the page filled out:



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.

    WORM can't be enabled if data tiering was enabled.

    Learn more about WORM storage.

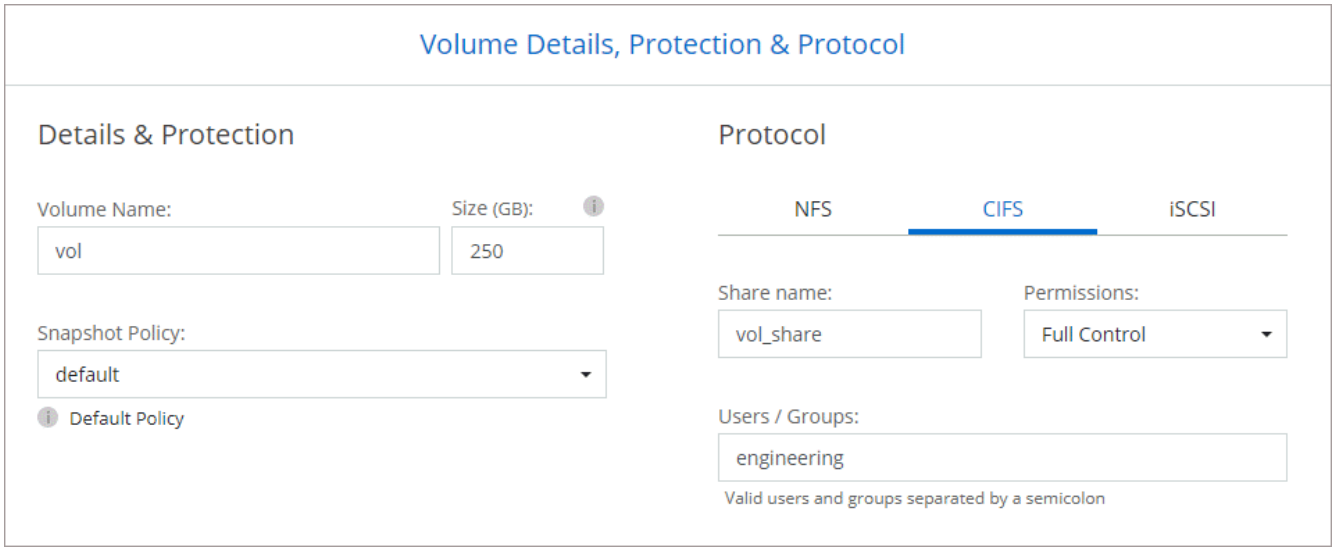
13. **Create Volume**: Enter details for the new volume or click **Skip**.

    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.
Initiator group and IQN (for iSCSI only)	iSCSI storage targets are called LUNs (logical units) and are presented to hosts as standard block devices. Initiator groups are tables of iSCSI host node names and control which initiators have access to which LUNs. iSCSI targets connect to the network through standard Ethernet network adapters (NICs), TCP offload engine (TOE) cards with software initiators, converged network adapters (CNAs) or dedicated host bust adapters (HBAs) and are identified by iSCSI qualified names (IQNs). When you create an iSCSI volume, Cloud Manager automatically creates a LUN for you. We've made it simple by creating just one LUN per volume, so there's no management involved. After you create the volume, use the IQN to connect to the LUN from your hosts.

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.
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 a Connector that is associated with your workspace.

You must be an Account Admin to create a Connector. When you create your first Cloud Volumes ONTAP working environment, Cloud Manager prompts you to create a Connector if you don't have one yet.

- You should be prepared to leave the Connector running at all times.
- 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.

Limitation

At this time, HA pairs are not supported with AWS Outposts.

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 Canvas page, click **Add Working Environment** and follow the prompts.
2. **Choose a Location**: Select **Amazon Web Services** and **Cloud Volumes ONTAP Single Node**.
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)*

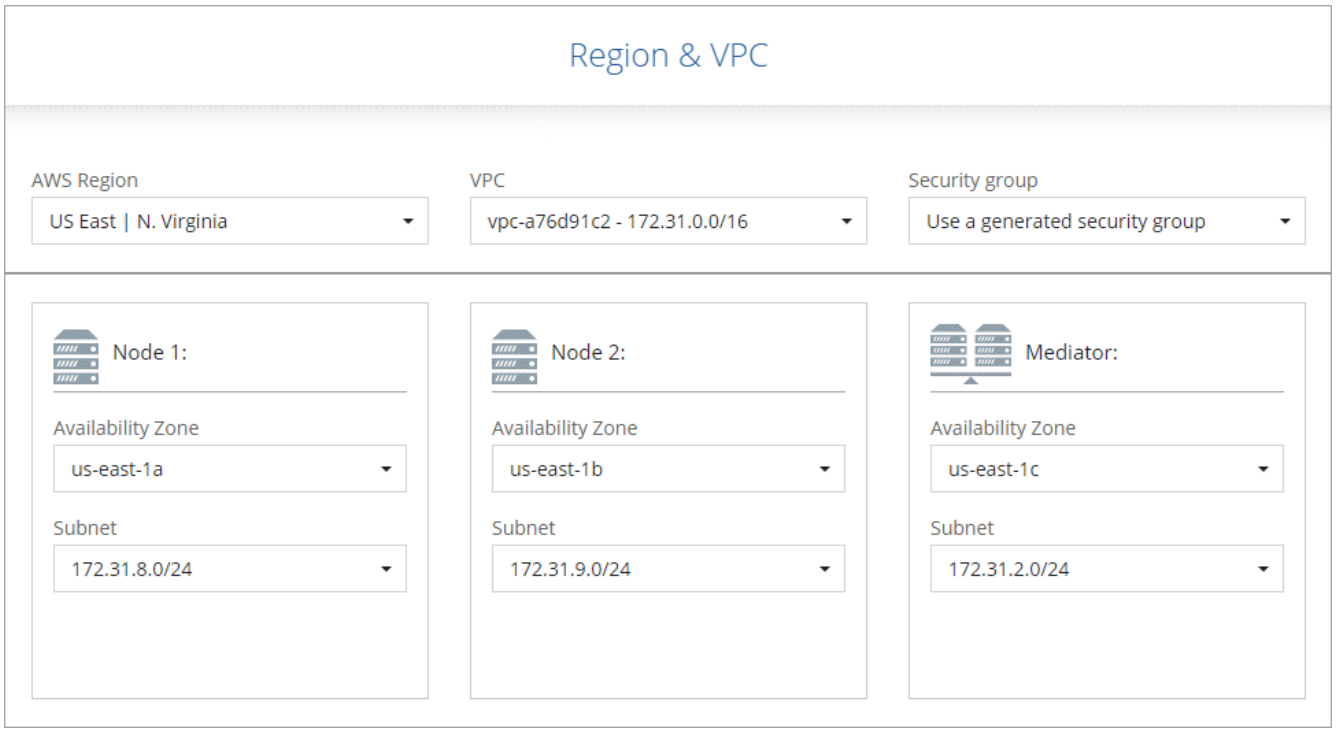
If multiple IAM users work in the same AWS account, then each user needs to subscribe. After the first user subscribes, the AWS Marketplace informs subsequent users that they're already subscribed, as shown in the image below. While a subscription is in place for the AWS *account*, each IAM user needs 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 Cloud Compliance.
   - Learn more about Cloud Backup.
   - 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. **Write Speed & WORM**: Choose **Normal** or **High** write speed, and activate write once, read many (WORM) storage, if desired.

    Learn more about write speed.

    WORM can’t be enabled if data tiering was enabled.

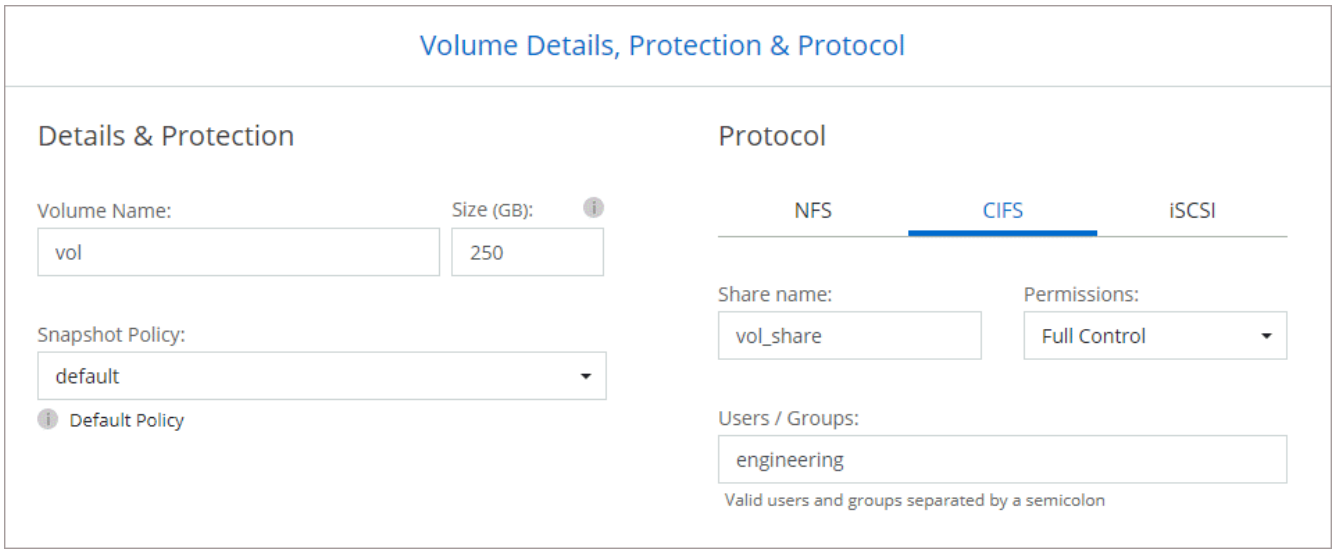
    Learn more about WORM storage.

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

    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.
Initiator group and IQN (for iSCSI only)	iSCSI storage targets are called LUNs (logical units) and are presented to hosts as standard block devices. Initiator groups are tables of iSCSI host node names and control which initiators have access to which LUNs. iSCSI targets connect to the network through standard Ethernet network adapters (NICs), TCP offload engine (TOE) cards with software initiators, converged network adapters (CNAs) or dedicated host bust adapters (HBAs) and are identified by iSCSI qualified names (IQNs). When you create an iSCSI volume, Cloud Manager automatically creates a LUN for you. We've made it simple by creating just one LUN per volume, so there's no management involved. After you create the volume, use the IQN to connect to the LUN from your hosts.

    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.