



OnCommand® Cloud Manager 1.0

User Guide



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Part number: 215-09279_A0
November 2014

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Before you begin

This guide describes how to launch, set up, and use Cloud ONTAP instances and how to establish a network connection for NetApp Private Storage. Before you can perform these tasks, the Cloud Manager Admin should have prepared, installed, and set up Cloud Manager as described in the *OnCommand Cloud Manager Installation and Setup Guide*.

This guide assumes the following has been done:

- AWS networking requirements were met for Cloud Manager, Cloud ONTAP, the NetApp Support instance, and NetApp Private Storage
- IAM users have been granted the appropriate AWS permissions
- Each Cloud ONTAP product that users will launch was subscribed to from the AWS Marketplace
- Cloud Manager was installed
- If you have a NetApp Private Storage configuration, one or more configurations were added to Cloud Manager
- If necessary, Cloud Manager was configured to use a proxy server
- Tenants were defined
- At least one Tenant Admin was created

Related information

[*OnCommand Cloud Manager 1.0 Installation and Setup Guide*](#)

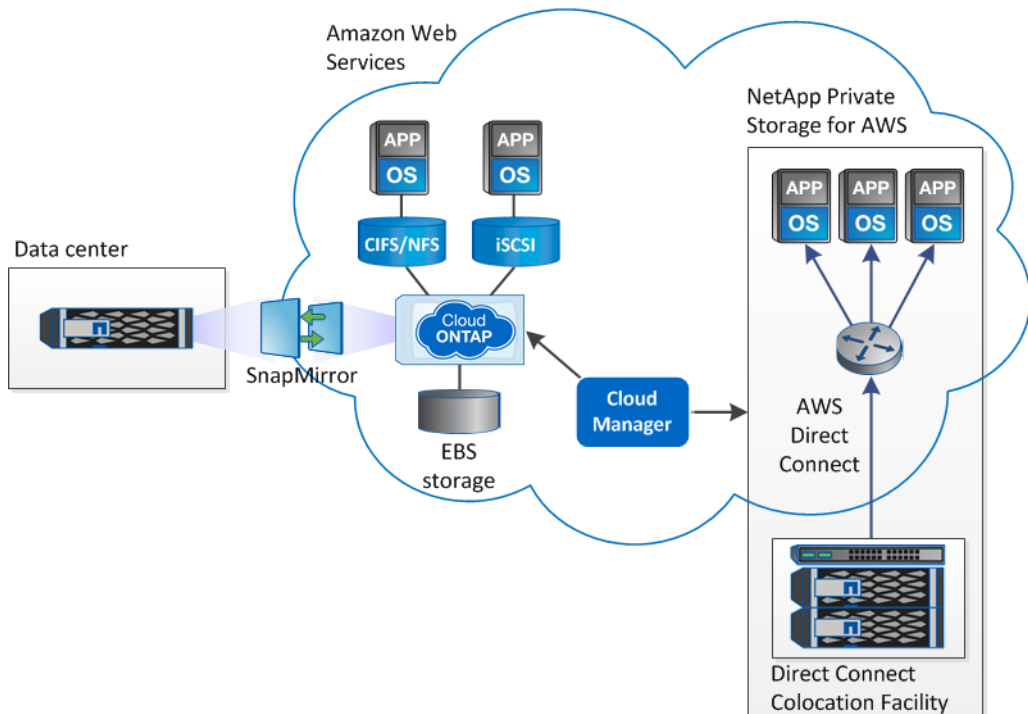
Product overview

OnCommand Cloud Manager helps you set up and manage hybrid cloud storage environments built on clustered Data ONTAP. You can use Cloud Manager to launch and manage Cloud ONTAP instances in Amazon Web Services (AWS) and to set up a network connection and Storage Virtual Machine (SVM) for NetApp Private Storage. Using clustered Data ONTAP in your data center and in the cloud gives you the enterprise standard for data management across your hybrid cloud.

Cloud Manager offers the following:

- Point-and-click deployments of Cloud ONTAP instances
- Simplified provisioning of cloud storage for Cloud ONTAP
- Cost monitoring of AWS storage and compute charges associated with Cloud ONTAP instances
- Network connection setup for NetApp Private Storage by connecting a FAS storage system in an AWS colocation facility to an AWS Direct Connect

You can run Cloud Manager in AWS or in your data center. The following graphic shows Cloud Manager running in AWS, managing a Cloud ONTAP instance and NetApp Private Storage:



Cloud ONTAP overview

Cloud ONTAP for Amazon Web Services (AWS) is a software-only storage appliance that runs the clustered Data ONTAP storage operating system in the cloud. Building your cloud environment on Cloud ONTAP provides enterprise-class features for your cloud storage and gives you a universal storage platform that allows you to easily replicate data between your data center and the cloud.

What Cloud ONTAP provides

Cloud ONTAP manages EBS General Purpose (SSD) storage with NetApp's clustered Data ONTAP storage operating system, which provides enterprise-class features on top of EBS storage:

- Multiprotocol support (NFS, CIFS, and iSCSI)
- Data protection (Snapshot copies, SnapMirror technology, and SnapVault technology)
- Storage efficiency (thin provisioning, data deduplication, and data compression)

Note: The licenses for these features are included with Cloud ONTAP.

How you deploy Cloud ONTAP

You need to use OnCommand Cloud Manager to launch Cloud ONTAP as an Elastic Cloud Compute (EC2) instance in AWS. Cloud Manager uses your AWS access and secret keys to launch the EC2 instance and to purchase the EBS volumes that Cloud ONTAP uses as back-end storage.

Cloud ONTAP product models

To best fit your application needs, Cloud ONTAP is available in three product models:

Product model	EC2 instance type options	Maximum raw EBS capacity	Payment method
Explore (Hourly)	m3.xlarge	2 TB	Pay by the hour
Standard (Hourly)	m3.xlarge or m3.2xlarge	10 TB	Pay by the hour
Standard (BYOL)	m3.xlarge or m3.2xlarge	50 TB	Bring your own license

How you can use Cloud ONTAP

You can use Cloud ONTAP in the following ways:

- To serve data for cloud applications using NFS, CIFS, and iSCSI
- As a SnapMirror source or destination for data replication and disaster recovery
- As a SnapVault source or destination for data archiving

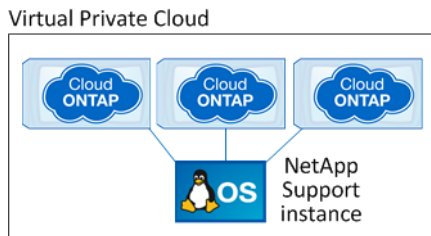
Related information

[*Amazon Web Services \(AWS\) Documentation: EBS Volume Types*](#)

What the NetApp Support instance is

When you launch your first Cloud ONTAP instance in a Virtual Private Cloud (VPC), Cloud Manager also launches the NetApp Support instance in the VPC. The NetApp Support instance, which is an EC2 Linux instance, is the backup location for cluster configuration files and it provides tools for instance changes and for troubleshooting and repairing Cloud ONTAP instances. If you prefer, you can run the tools in your data center.

One NetApp Support instance supports all Cloud ONTAP instances in a VPC:



Cloud ONTAP periodically takes cluster configuration backups and sends them to the NetApp Support instance, which includes an FTP server. If the root volume for a Cloud ONTAP instance fails or becomes inaccessible, NetApp technical support can use the backups to restore the configuration.

Note: The user name for the destination FTP server is supportftp. The password is the ID of the VPC in which the instance is running.

The NetApp Support instance also includes the following tools:

- A script that you can use to change the EC2 instance type for Cloud ONTAP
- Recovery scripts that NetApp technical support can use to troubleshoot and repair Cloud ONTAP

Note: The NetApp Support instance installs the tools from a package available in a NetApp-managed S3 bucket. When you run a script, it automatically checks for a newer version of the tools in the S3 bucket, and if one is available, the script prompts you to upgrade.

The NetApp Support instance is a t1.micro instance that requires 8 GB of magnetic (standard) EBS storage. NetApp strongly recommends that you keep the instance running so that Cloud ONTAP can save the cluster configuration backups to a remote location. However, if you have your own FTP or HTTP server that you want to use for the backups, you can configure Cloud ONTAP to use that location. You can then optionally stop the instance and start it when you or technical support need to use the tools.

As an alternative, you can run the tools on a Linux host in your data center. For instructions, see the [OnCommand Cloud Manager 1.0 Administration Guide](#).

Note: Stopping the instance is the best way to stop accruing compute charges. If you delete the NetApp Support instance, Cloud Manager will launch another instance when you launch a Cloud ONTAP instance in that VPC.

Related references

[Setting up Cloud ONTAP](#) on page 26

NetApp Private Storage for AWS overview

NetApp Private Storage for Amazon Web Services (AWS) combines compute resources from Amazon EC2 with NetApp storage hosted at an Amazon Direct Connect colocation facility. This configuration provides the elasticity and savings of AWS cloud compute with the performance and availability of dedicated enterprise storage.

Amazon Direct Connect provides a dedicated network connection from AWS to a colocation facility that is physically near Amazon data centers. Within the colocation facility, you provide a Layer 3 network switch or router and a NetApp storage system. You can then use OnCommand Cloud Manager to easily configure a connection from the AWS Direct Connect to a Storage Virtual Machine (SVM) on the storage system.

After the configuration is set up, you can connect virtual machines within Amazon EC2 to NetApp storage. This gives you a configuration that leverages cloud computing services and enables you to retain full control and mobility of your enterprise data.

Logging in to Cloud Manager

You can log in to Cloud Manager from any web browser that has a connection to the Cloud Manager host.

Steps

1. Open a web browser and enter one of the following URLs:

If you are on...	Enter...
The Cloud Manager host	<code>https://localhost:port</code>
A host that has a connection to the Cloud Manager host	<code>https://ipaddress:port</code>

ipaddress can be either a private IP address or a public IP address, depending on the configuration of the Cloud Manager host. For example, if Cloud Manager is installed in AWS and the instance does not have a public IP address, you need to enter a private IP address from a host in AWS that has a connection to the Cloud Manager host.

port is necessary only if the default HTTP (80) or HTTPS (443) ports were changed. For example, if the HTTPS port was changed to 8443, you need to enter **`https://localhost:8443`**

After you enter the URL, the Cloud Manager log in screen appears:



Welcome to OnCommand Cloud Manager

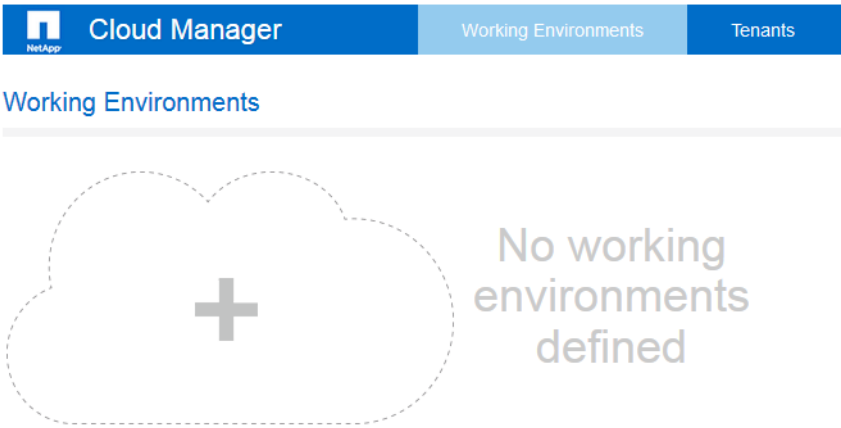
Email

Password

Log in

2. Enter your email address and password, and then click **Log in**.

The Working Environments page appears.

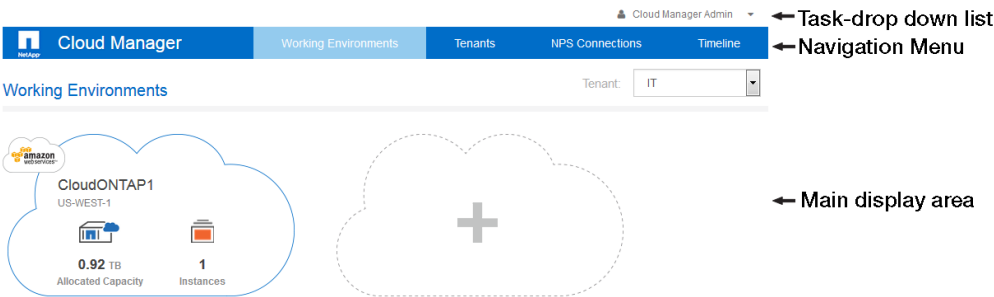


Overview of the Cloud Manager console

The Cloud Manager console is a web-based interface that gives users the ability to provision and manage storage in isolated groups called tenants.

Major components of the console

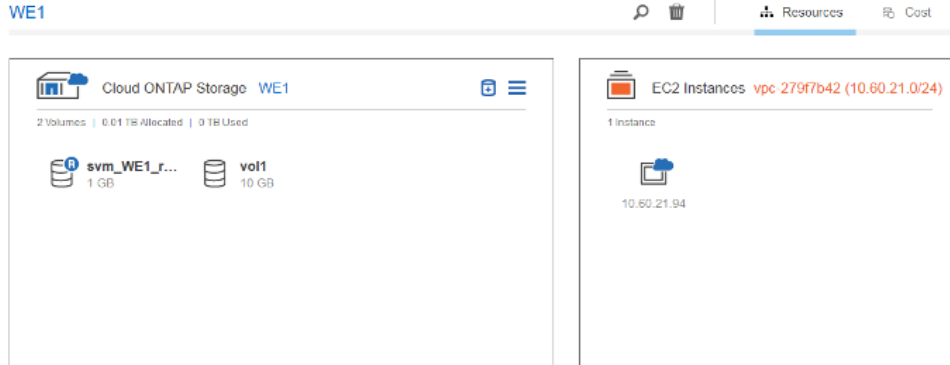
The console consists of a task drop-down list, a navigation menu, and a main display area:



Working environments and tenants

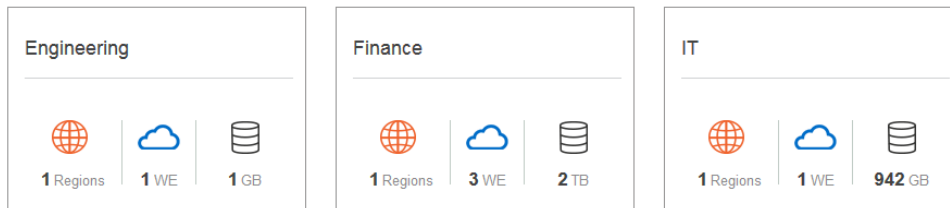
The console organizes storage by working environments and tenants.

A *working environment* includes a Cloud ONTAP instance or a NetApp Private Storage configuration and the AWS EC2 compute instances in the VPC. The following image shows a Cloud ONTAP working environment:



A *tenant* represents a group in your organization. You create one or more working environments within a tenant. The following image shows three tenants defined in Cloud Manager:

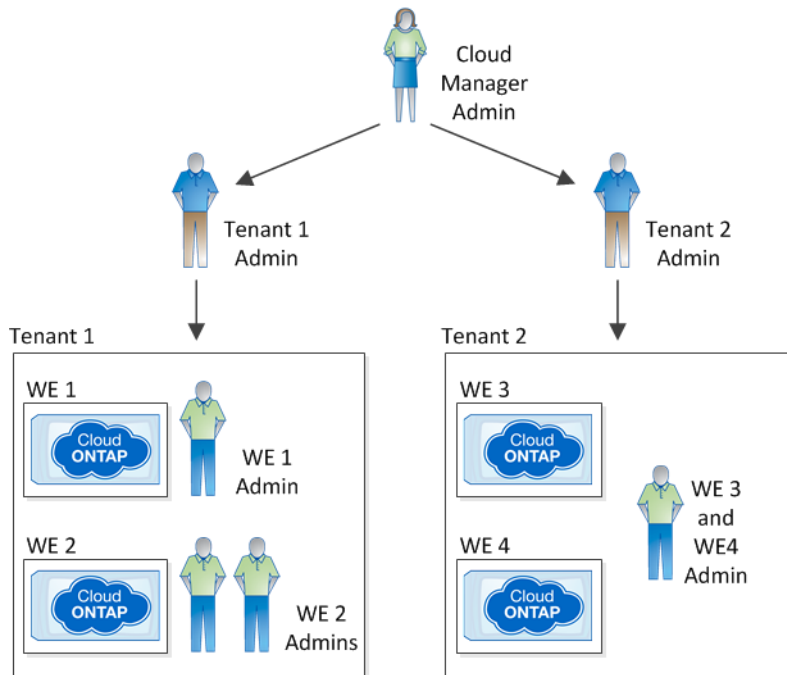
Tenants



How Cloud Manager users relate to tenants and working environments

The tasks that you can perform in the console depend on your user role. The three distinct user roles are: Cloud Manager Admin (who administers the product), Tenant Admin (who administers a specific tenant), and Working Environment Admin (who administers one or more working environments).

The following image shows the relationship between Cloud Manager user roles, tenants, and working environments:

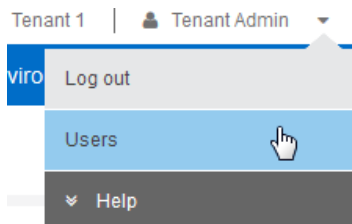


Changing your password

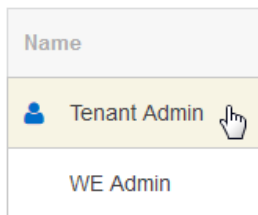
You might need to change your password after you log in to Cloud Manager for the first time.

Steps

1. In the upper right corner of the Cloud Manager console, click the task-drop down list, and then select **Users**.



2. In the **Users** table, select your account, which is identified by a user icon.



3. Click **Change Password**, enter your current password and new password, and then click **Save**.

Result

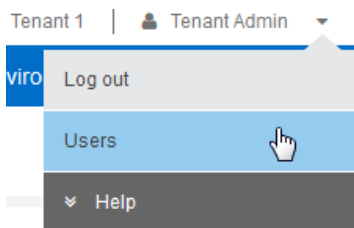
Cloud Manager saves your password. You can log out of the console and then log back in with your new password.

Creating Working Environment Admins

A tenant typically includes one or more Working Environment Admins who create and manage the working environments in that tenant. A Tenant Admin can create those Working Environment Admins, if the Cloud Manager Admin did not do so already.

Steps

1. In the upper right corner of the Cloud Manager console, click the task-drop down list, and then select **Users**.



2. In the **Users** page, click **New User**.
3. In the **New User** page, specify details for the new user account.

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

Field	Description
Email Address	Enter the email address that the user will use to log in to Cloud Manager. Cloud Manager does not send emails to this address.

Field	Description
Role	Assign the user to a tenant and, optionally, a working environment. If the selected tenant does not have a working environment, you can modify the assigned working environments at a later time. Note: Working Environment Admins automatically have privileges to the working environments that they create themselves.
AWS Access Key and Secret Key	Enter the access key and secret key assigned to the user in AWS. Cloud Manager uses the keys to make requests to AWS. If the user is an IAM user, the account must have specific AWS permissions. You can use NetApp-provided IAM policies that include the required permissions. <i>NetApp Cloud ONTAP: AWS IAM User Policies for Cloud Manager</i> Note: Cloud Manager validates the keys when the user creates and manages working environments.
AWS Cost S3 Bucket	Enter the S3 bucket that contains detailed billing reports if you specified keys for an AWS account under which the bucket was created. Giving Cloud Manager access to detailed billings reports enables it to display AWS storage and compute costs associated with Cloud ONTAP instances. If you are using AWS consolidated billing, you do not need to specify the bucket each time you create a Cloud Manager user account. You just need to specify the bucket for one Cloud Manager user account that corresponds to an IAM user created under the AWS payer account or the payer account itself. If you have not set up an S3 bucket and enabled billing reports, see the <i>OnCommand Cloud Manager Installation and Setup Guide</i> for details.

4. Click **Save**.

Result

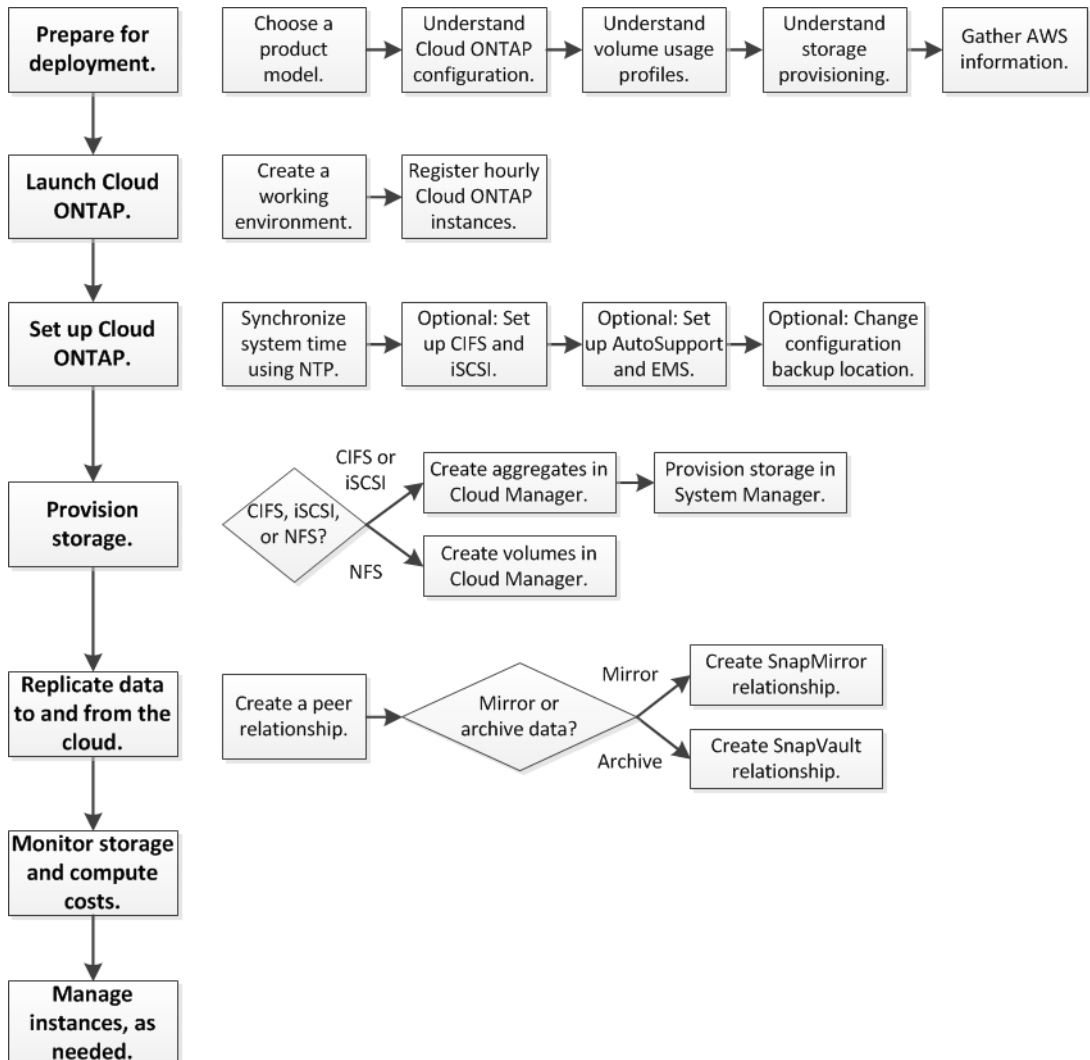
Cloud Manager creates the user account. The user can now log in to Cloud Manager.

Related information

[OnCommand Cloud Manager 1.0 Installation and Setup Guide](#)

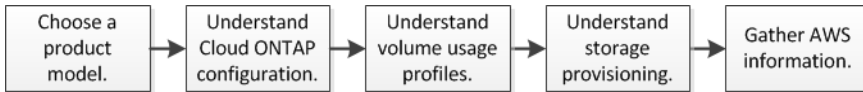
Launching, setting up, and using Cloud ONTAP instances

Getting Cloud ONTAP instances up and running involves preparing for deployment, launching the instances, setting them up, and then provisioning storage. You can then use the instances to serve data and to replicate data to and from the cloud. After that, you can monitor AWS costs and manage the instances as needed.



Preparing to launch Cloud ONTAP instances

Before you launch a Cloud ONTAP instance, you should decide which product model you want to use, understand how Cloud ONTAP uses storage, understand volume usage profiles, and then gather the information that you need to launch the instance.



Choosing a Cloud ONTAP product model

Because application needs are different, Cloud ONTAP is available in three product models that provide different options for EC2 instance types, maximum raw EBS capacity, and payment method. You need to choose a model when you launch an instance.

The following table shows the differences between the three models:

Product model	EC2 instance type options	Maximum raw EBS capacity	Payment method
Explore (Hourly)	m3.xlarge	2 TB	Pay by the hour
Standard (Hourly)	m3.xlarge or m3.2xlarge	10 TB	Pay by the hour
Standard (BYOL)	m3.xlarge or m3.2xlarge	50 TB	Bring your own license

You can view pricing details from the AWS Marketplace pages.

Related information

[AWS Marketplace: Cloud ONTAP for AWS: Explore \(Hourly\)](#)

[AWS Marketplace: Cloud ONTAP for AWS: Standard \(Hourly\)](#)

[AWS Marketplace: Cloud ONTAP for AWS: Standard \(BYOL\)](#)

Understanding how Cloud ONTAP is configured

If you are familiar with clustered Data ONTAP, you should understand how Cloud ONTAP is configured because there are some differences that impact how you use Cloud ONTAP.

- Cloud ONTAP is a single-node cluster. You cannot join other nodes to the cluster.
- Cloud ONTAP supports a single Storage Virtual Machine (SVM). Cloud Manager creates this SVM when it launches an instance.

Note: While you can create another SVM from System Manager or the CLI, using multiple SVMs is not supported.

- Several network interfaces are created by default:
 - A cluster management LIF
 - An intercluster LIF
 - A node management LIF
 - An iSCSI data LIF
 - A CIFS and NFS data LIF
- Cloud Manager sets up Cloud ONTAP for NFS access. iSCSI and CIFS require further configuration.

Related tasks

[Setting up Cloud ONTAP for iSCSI](#) on page 32

[Setting up Cloud ONTAP for CIFS/SMB](#) on page 30

Understanding volume usage profiles

Cloud 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 from usage profiles that enable or disable thin provisioning, deduplication, and compression. You should learn more about these profiles to help you decide which to use.

Cloud Manager provides three usage profiles:

Usage profile	Description	Efficiency features
Highest performance	Recommended for applications that require low latency.	None.
Performance with efficiency	Provides good performance with NetApp storage efficiency.	Thin provisioning and deduplication.
Most efficient	Best for storing a large amount of data.	Thin provisioning, deduplication, and compression.

NetApp efficiency features provide the following benefits:

Thin provisioning

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

Deduplication

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

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

Related information

[NetApp Storage Efficiency: Overview](#)

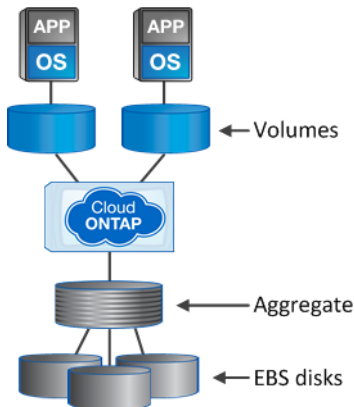
Understanding how Cloud Manager provisions storage

Cloud Manager makes storage provisioning easy by purchasing the EBS disks that you need to provision volumes for Cloud ONTAP. However, you might want to understand how Cloud Manager provisions storage, in case you want to perform advanced provisioning tasks.

How Cloud ONTAP uses AWS storage

Cloud ONTAP uses EBS General Purpose (SSD) volumes as back-end storage. Cloud ONTAP sees these AWS volumes as disks, which are grouped into one or more aggregates. Aggregates provide storage to one or more Cloud ONTAP volumes.

The following graphic shows the relationship between EBS disks and Cloud ONTAP storage:



How Cloud Manager provisions storage when you launch a Cloud ONTAP instance

When you launch a Cloud ONTAP instance, Cloud Manager purchases the following AWS storage:

- One EBS Provisioned IOPS (SSD) disk for Cloud ONTAP boot data, which is approximately 42 GB and 1250 PIOPS

- One EBS General Purpose (SSD) disk for Cloud ONTAP root data, which is approximately 140 GB
- Two EBS snapshots for the Cloud ONTAP boot disk and root disk
- One to four 500 GB EBS General Purpose (SSD) disks for Cloud ONTAP user data
The number of 500 GB disks that Cloud Manager purchases depends on the size of the Cloud ONTAP volume that you create when you launch an instance. If you do not create a volume when you launch an instance, Cloud Manager purchases one 500 GB EBS disk.

Note: The total amount of storage from an EBS disk is the *raw* capacity. The *usable* capacity is less because approximately 12-14 percent is overhead that is reserved for Cloud ONTAP use. For example, if Cloud Manager creates a 500 GB aggregate, the usable capacity is 442.94 GB.

Cloud Manager lays out the storage from the EBS disks as follows:

- Boot data resides on an EBS disk attached to the instance under `/dev/sda1`. This disk, which contains the boot image, is not available to Cloud ONTAP.
- Root data, which contains the system configuration and logs, resides in `aggr0`.
- The Storage Virtual Machine (SVM) root volume resides in `aggr1`.
- Data volumes also reside in `aggr1`.

How Cloud Manager provisions storage using the simple provisioning method

Cloud Manager creates aggregates for you when you launch an instance, and when you provision additional volumes for that instance by clicking the new volume icon .

When you create a volume, Cloud Manager does one of three things:

- It places the volume on an existing aggregate that has sufficient free space.
- It places the volume on an existing aggregate by purchasing more AWS disks for that aggregate (up to a total of four disks).
- It purchases up to four 500 GB EBS disks for a new aggregate and places the volume on that aggregate.

Note: Cloud Manager always purchases 500 GB disks when it creates a new aggregate.

Cloud Manager determines where to place a new volume by looking at several factors: an aggregate's maximum size, whether thin provisioning is enabled, an aggregate's free space threshold (10 percent by default), and an aggregate's overcommitment threshold (500 percent by default).

Note: The Cloud Manager Admin can modify these thresholds. For details, see the [OnCommand Cloud Manager 1.0 Administration Guide](#).

The size of the volume that you can create largely depends on whether you enable thin provisioning. For example, if you create a volume using the Highest Performance usage profile, which does not

enable thin provisioning, the maximum size for the volume is approximately 1.51 TB. This is because 12-14 percent of the aggregate's usable capacity is reserved for overhead and 10% is reserved for free space. If you want to create a larger volume, you either need to choose a profile that enables thin provisioning, or you need to create an aggregate yourself, which enables you to add up to 6 AWS disks in an aggregate and use larger 1 TB disks.

How you can provision storage using the advanced allocation option

Rather than let Cloud Manager manage aggregates for you, you can do it yourself. From the Advanced allocation screen, you can create new aggregates that contain up to 6 disks, add EBS disks to an existing aggregate, and create volumes on specific aggregates.

The benefit in managing aggregates yourself is that you can choose the underlying EBS disk size, which lets you size your aggregate for the performance that you need. You can choose from the following disk sizes:

100 GB

Provides a small amount of storage with lower performance. You might choose this size to start out with something small or if you have low performance requirements.

500 GB

Provides the best price to performance ratio, which is why it is the default disk size that Cloud Manager selects when it creates an aggregate.

1 TB

Provides the best sustained performance. Another advantage is that larger aggregates can enhance the value of NetApp's storage efficiency features (deduplication and compression), which work at the aggregate level.

Note the following about creating aggregates:

- An aggregate can contain up to six EBS disks.
- All EBS disks in an aggregate must be the same size (100 GB, 500 GB, or 1 TB).
- An aggregate's raw capacity can be no bigger than 6 TB.

While you pay for the *amount* of storage that you buy, you should be aware of the *performance* differences between these disks. To understand the relationship between size and IOPS, see [AWS Documentation: EBS Volume Types](#).

You should take the following into consideration when looking at the performance of these AWS disks:

- In a FAS storage system, more spindles is better. However, that is not always the case with EBS disks. You can get better sustained performance from larger disks and you can get a higher maximum burst duration and less time to refill an empty credit balance.
- Even if you do choose larger disks (for example, six 1 TB disks), you might not get all of the IOPS because the Cloud ONTAP instance type (either m3.xlarge or m3.2xlarge) can reach its bandwidth limit.

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

Related tasks

[Provisioning storage](#) on page 32

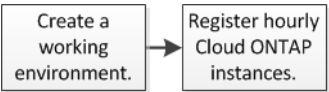
Gathering AWS information to launch Cloud ONTAP instances

When you launch a Cloud ONTAP instance, you need to specify the AWS region, VPC, subnet, and security group for the instance. You can use a worksheet to collect the information from your administrator.

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

Launching Cloud ONTAP instances

You launch a Cloud ONTAP instance by creating a working environment in Cloud Manager. After you launch an instance using the Explore (Hourly) license or the Standard (Hourly) license, you should register it with NetApp.



Creating a Cloud ONTAP working environment

To launch a Cloud ONTAP instance in AWS, you need to create a Cloud ONTAP working environment in Cloud Manager.

Before you begin

- You should have obtained AWS networking information from your administrator. See [Gathering information to launch Cloud ONTAP instances](#) on page 22.
- If this is the first Cloud ONTAP instance in the VPC, you must have created an EC2 key pair in the AWS region. You need a key pair to launch a NetApp Support instance in the VPC.

Important: If you lose the key pair, you cannot connect to the NetApp Support instance.

- If you want to launch a Cloud ONTAP Standard (BYOL) instance, you must have the license key. If you do not have it, go to [NetApp Software License Search](#) and follow the instructions to obtain your license key.

Steps

1. On the **Working Environments** page, click the + icon.
2. On the **Details** page, enter a name and description for the working environment, select **Cloud ONTAP**, and then click **Next**.

Cloud Manager uses the working environment name to name the Cloud ONTAP cluster, the Amazon EC2 instance, and uses it as the prefix for the predefined security group, if selected.

Note: If AWS keys were not specified for your Cloud Manager account, you are prompted to enter them after you click **Next**. You need to enter them before you can proceed.

3. On the **VPC** page, enter the network information that you recorded in the AWS worksheet and then click **Next**.

If Cloud Manager is running in AWS, the Cloud Manager VPC and subnet are selected by default. If you choose another subnet, it must have a connection to the Cloud Manager subnet.

The following image shows the VPC page filled out:

AWS Region

us-east-1



vpc-21bd1d44
 10.0.0.0/16 | [View Tags](#)

10.0.1.0/24

Use generated Security Group

Name : VPC1

4. On the **Cloud ONTAP** page, configure the Cloud ONTAP instance.

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

Field	More information
Cloud ONTAP Licensing	If your needs change after you launch the instance, you can modify the instance type at a later time. See Managing your Cloud ONTAP instances on page 40 for details.
Cloud ONTAP Credentials	These are the credentials for the cluster admin account. You can use these credentials to connect to Cloud ONTAP through OnCommand System Manager or its CLI.
NetApp Support Instance	One NetApp Support instance supports all Cloud ONTAP instances in a VPC. For more information about the NetApp Support instance, see What the NetApp Support instance is on page 8.
Encryption	This field enables the AWS encryption feature on the EBS disks that Cloud Manager purchases for Cloud ONTAP (except for the boot disk). For more information, see AWS Documentation: EBS Encryption .

5. On the **Volume** page, enter details for the new volume and click **Next** or click **Skip**.

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

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

Field	More information
Size	The maximum size that you can enter largely depends on whether you enable thin provisioning, which allows you to create a volume that is bigger than the physical storage currently available to it. For more details about storage provisioning, see Understanding how Cloud Manager provisions storage on page 19.
Usage Profile	Usage profiles define the NetApp storage efficiency features that are enabled for a volume. For more information, see Understanding volume usage profiles on page 18.
Snapshot Policy	A Snapshot copy policy specifies the frequency and number of automatically created Snapshot copies. A 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.

The following image shows the Volume page filled out:

Details

Volume Name:

Protocol: NFS Size: GB

Access control:

Usage Profile

☐ **Highest Performance**
Recommended for applications requiring lowest latency.

☒ **Performance with Efficiency**
Good performance with ONTAP storage efficiency™.

☐ **Most Efficient**
Best for storing the most data.

Protection

Snapshot Policy:

default

- Every **hour**, keep the last **6** copies
- Once a **day**, keep the last **2** copies
- Once a **week**, keep the last **2** copies

6. On the **Review** page, review and confirm your selections:

- Review details about the configuration.
- Click **More information** to review the AWS resources that Cloud Manager will purchase.
- Click **I understand...**
- Click **Finish**.

Result

Cloud Manager launches the Cloud ONTAP instance. The working environment should be ready in approximately 25 minutes. You can track the progress in the timeline.

If you experience any issues launching the Cloud ONTAP instance, verify that your AWS environment meets the requirements. For details, see the [OnCommand Cloud Manager 1.0 Installation and Setup Guide](#).

After you finish

- If you launched a Cloud ONTAP hourly instance, register it with NetApp. Support from NetApp is included with your Cloud ONTAP instance. To activate support, you must first register the instance with NetApp. [Registering Cloud ONTAP instances](#) on page 26
- If this is the first Cloud ONTAP instance launched in AWS, remind your administrator to finish setting up AWS billing and cost requirements by enabling the **WorkingEnvironmentId** tag. This tag is not available in AWS until after you create your first Cloud ONTAP working environment under the AWS payer account. For details, see the [OnCommand Cloud Manager 1.0 Installation and Setup Guide](#).

Registering Cloud ONTAP hourly instances

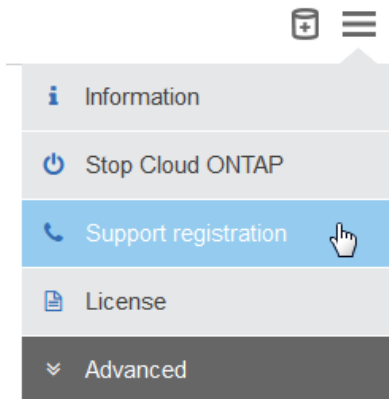
Support from NetApp is included with Cloud ONTAP Explore (Hourly) and Standard (Hourly) instances, but you must first activate that support by registering the instances with NetApp.

Before you begin

The host from which you are logged in to Cloud Manager must have Internet access. If it does not, you must have registered from another location by going to [NetApp Cloud ONTAP Registration](#).

Steps

1. From the **Working Environments** page, click the name of the instance that you want to register.
2. In the **Cloud ONTAP Storage** pane, click the menu icon and click **Support registration**:



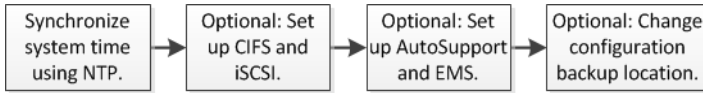
The information that you need to register an instance displays:

- Instance ID
 - Serial number
 - Account ID
3. Under **Support Registration**, click **Register Now**.
Following this link automatically completes the instance ID, serial number, and account ID in the registration form.
 4. Follow the instructions to register your Cloud ONTAP instance.

Setting up Cloud ONTAP

After you launch Cloud ONTAP, you can set it up by synchronizing the system time using NTP, and then optionally setting up additional protocols, configuring AutoSupport and EMS, and changing the

backup location of cluster configuration files to an existing FTP or HTTP server. You must perform these tasks from either System Manager or the CLI.



Task	Description
Synchronize the system time using NTP	Cloud ONTAP needs a Network Time Protocol (NTP) server to synchronize the time with clients and peered clusters. Problems can occur when the time is inaccurate. You can configure the NTP server using System Manager or the CLI. For instructions, see the System Manager Help or the Clustered Data ONTAP 8.3 System Administration Guide for Cluster Administrators.
Optional: Set up Cloud ONTAP for CIFS/SMB	If you want to use CIFS/SMB with Cloud ONTAP, you must set up Cloud ONTAP by adding CIFS access to the Storage Virtual Machine (SVM) from System Manager. Setting up Cloud ONTAP for CIFS/SMB on page 30
Optional: Set up Cloud ONTAP for iSCSI	If you want to use iSCSI with Cloud ONTAP, you must start the iSCSI server from System Manager. Setting up Cloud ONTAP for iSCSI on page 32
Optional: Configure AutoSupport	AutoSupport proactively monitors the health of your system and automatically sends messages to NetApp technical support by default. If you want messages sent to your internal support organization, you must set the correct options and have a valid mail host. If the Cloud Manager Admin added a proxy server to Cloud Manager before you launched your instance, Cloud ONTAP is configured to use that proxy server for AutoSupport messages. You can configure AutoSupport using System Manager or the CLI. For instructions, see the System Manager Help or the Clustered Data ONTAP 8.3 System Administration Guide for Cluster Administrators.
Optional: Configure EMS	The Event Management System (EMS) collects and displays information about events that occur on a Cloud ONTAP instance. To receive notifications of events, you can set the event destinations (email addresses, SNMP trap hosts, or syslog servers) and the event routes for a particular event severity. You can configure EMS using the CLI. For instructions, see the Clustered Data ONTAP 8.3 System Administration Guide for Cluster Administrators.

Task	Description
Optional: Change the backup location of cluster configuration files	Cloud ONTAP automatically creates cluster configuration backup files that contain information about the configurable options that it needs to operate properly. It is a best practice to back up the files at a remote location. By default, Cloud ONTAP backs up the files to the NetApp Support instance 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. For instructions, see the Clustered Data ONTAP 8.3 System Administration Guide for Cluster Administrators.

Related tasks

[Connecting to OnCommand System Manager](#) on page 28

[Connecting to the Cloud ONTAP CLI](#) on page 29

Related information

[NetApp Documentation: OnCommand System Manager \(current releases\)](#)

Connecting to OnCommand System Manager

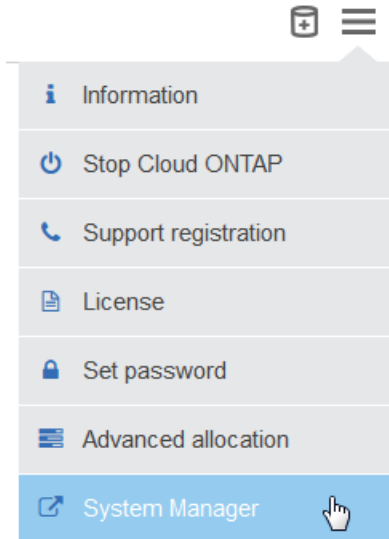
You need to perform some Cloud ONTAP tasks from OnCommand System Manager, which is a browser-based management tool that runs on the Cloud ONTAP instance. For example, you need to use System Manager to configure the CIFS and iSCSI protocols, and to use SnapMirror and SnapVault technologies.

Before you begin

You must have a network connection from the host on which you are accessing Cloud Manager to the Cloud ONTAP instance. For example, you might need to log in to Cloud Manager from the Cloud Manager instance or from a jump host in AWS.

Steps

1. From the **Working Environments** page, click the name of the instance that you want to manage with System Manager.
2. In the **Cloud ONTAP Storage** pane, click the menu icon and then click **Advanced > System Manager**.



3. Click **Launch**.

System Manager loads in a new browser tab.

4. At the login screen, enter **admin** in the **User Name** field, enter the password that you specified when you created the working environment, and then click **Sign In**.

Result

The System Manager console loads. You can now use it to manage Cloud ONTAP.

Connecting to the Cloud ONTAP CLI

If you would rather manage your Cloud ONTAP instance using the CLI, you can use SSH to access the virtual storage appliance.

Before you begin

You must have a network connection from your host to the Cloud ONTAP instance. For example, you might need to log in to Cloud Manager from the Cloud Manager instance or from a jump host in AWS.

Steps

1. In Cloud Manager, identify the cluster management interface IP address:
 - a. From the **Working Environments** page, click the name of the instance to which you want to connect.
 - b. In the **Cloud ONTAP Storage** pane, click the menu icon and then click **Information**.

- c. Copy the cluster management IP address:

Information

Cluster Management :	192.168.111.5
----------------------	---------------

Intercluster :	192.168.111.217
----------------	-----------------

Node Management :	192.168.111.50
-------------------	----------------

Data (iscsi) :	192.168.111.219
----------------	-----------------

2. From an SSH client, connect to the cluster management interface IP address using the admin account.

Example

```
ssh admin@192.168.111.5
```

3. At the login prompt, enter the password for the admin account.

Example

```
Password: *****
cot1::>
```

Setting up Cloud ONTAP for CIFS/SMB

If you want to provision CIFS/SMB shares for Cloud ONTAP, you need to first set up Cloud ONTAP by adding CIFS access to the Storage Virtual Machine (SVM) from System Manager. You then need to map the CIFS server in the DNS server.

Before you begin

You must have set up DNS and Active Directory. For more details about this requirement, see the [OnCommand Cloud Manager 1.0 Installation and Setup Guide](#).

Note: If DNS was not set up in the DHCP options for the VPC before you launched the Cloud ONTAP instance, you will need to add a DNS server using System Manager.

About this task

You do not need to create a CIFS data LIF because Cloud Manager created one by default when you launched the Cloud ONTAP instance.

Steps

1. Log in to System Manager.
[Connecting to OnCommand System Manager](#) on page 28
2. If DNS was not set up prior to launching the instance, add a DNS server through System Manager:
 - a. Select the Storage Virtual Machine and click **Configuration > Services > DNS**.
 - b. Click **Edit** and check **Enable DNS service**.
 - c. In the **DNS Domains** and **Name Servers** areas, add the DNS domain names and the IP addresses.
 - d. Click **OK**.
3. In System Manager, add CIFS access to the SVM:
 - a. Select the Storage Virtual Machine and click **Configuration > Protocols > CIFS**.
 - b. Click **Setup**.
 - c. In the **CIFS Server Setup** dialog box, specify the NetBIOS name and the Active Directory domain details.
 - d. Click **Setup**.
4. Create forward (A - Address record) and reverse (PTR - Pointer record) lookup entries to map the CIFS server name and the IP address of the data LIF.
 The DNS server must have an entry pointing the CIFS server name to the IP address of the data LIF so that Windows users can map a drive to the CIFS server name.

Related information

[NetApp Documentation: OnCommand System Manager \(current releases\)](#)

Setting up Cloud ONTAP for iSCSI

If you want to provision iSCSI LUNs for Cloud ONTAP, you need to start the iSCSI server from System Manager.

About this task

You do not need to create an iSCSI data LIF because Cloud Manager created one by default when you launched the Cloud ONTAP instance.

Steps

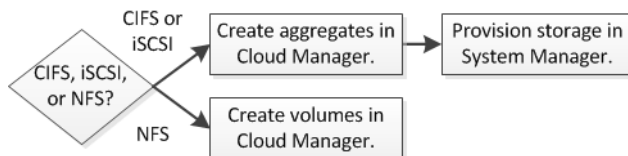
1. Log in to System Manager.
Connecting to OnCommand System Manager on page 28
2. Select the Storage Virtual Machine and click **Configuration > Protocols > iSCSI**.
3. Click **Start**.

Related information

NetApp Documentation: OnCommand System Manager (current releases)

Provisioning storage

You can provision additional storage for your Cloud ONTAP instances from Cloud Manager by managing volumes and aggregates. If you need to create iSCSI or CIFS storage, you should do so from System Manager.



Managing NFS volumes

If you need more storage, you can provision new NFS volumes, clone volumes, and delete volumes.

About this task

Cloud Manager gives you two ways to provision a new NFS volume:

- You can create a volume and let Cloud Manager choose the containing aggregate
- You can create a volume on a specific aggregate

Choosing the aggregate yourself is helpful because aggregates can have different performance levels.

See [Understanding how Cloud Manager provisions storage](#) on page 19.

Steps

1. From the **Working Environments** page, click the name of the Cloud ONTAP instance on which you want to manage volumes.
2. Manage your volumes:

To...	Do this...
Create a new volume	a. Click the create new volume icon.  b. Enter a volume name and size, define access control to the volume, select a usage profile, and then select a Snapshot copy policy. c. Click Create. d. Click Approve.
Create a new volume on a specific aggregate	a. Click the menu icon and then click Advanced > Advanced allocation. b. Select an aggregate. c. Click Create volume. d. Enter a volume name and size, define access control to the volume, select a usage profile, and then select a Snapshot copy policy. e. Click Create. f. Click Approve.
View information about a volume	Click the volume and then click Info .
Clone a volume	a. Click the volume and then click Clone. b. Modify the clone name as needed. c. Click Clone.
Delete a volume	Click the volume and then click Delete . Click Delete again to confirm.

Related concepts

[Understanding volume usage profiles](#) on page 18

Managing aggregates

You can manage aggregates yourself or let Cloud Manager do it for you when it creates volumes. The benefit in managing aggregates yourself is that you can choose the underlying EBS disk size, which lets you size your aggregate for the performance that you need.

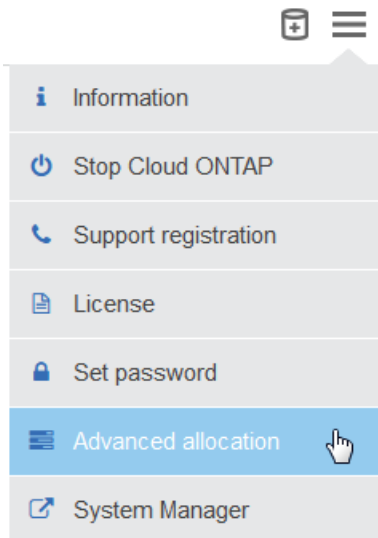
About this task

You create aggregates when you do not have enough disk space for another volume or when you want to create an aggregate that has a specific performance level.

See [Understanding how Cloud Manager provisions storage](#) on page 19.

Steps

1. From the **Working Environments** page, click the name of the Cloud ONTAP instance on which you want to manage aggregates.
2. In the **Cloud ONTAP Storage** pane, click the menu icon and then click **Advanced > Advanced allocation**.



3. Manage your aggregates:

To...	Do this...
Create a new aggregate	- Click the + icon. - Enter an aggregate name, select the number of EBS disks, and then select the underlying EBS disk type. - Click Create. - Click Approve and Purchase.
View information about an aggregate	Click the aggregate and then click Info .
Add EBS volumes to an aggregate	- Click the aggregate. - Click Add AWS disks. - Specify the number of disks that you want to add. - Click Add.
Delete an aggregate	Click the aggregate and then click Delete . Click Delete again to confirm.

Provisioning CIFS/SMB shares

If you want to create CIFS/SMB shares for Cloud ONTAP, you need to do so from System Manager.

Before you begin

Before you create volumes in System Manager for the CIFS/SMB shares, you must ensure that you have an aggregate with sufficient space. You need to create aggregates in Cloud Manager.

Steps

- Log in to System Manager.
Connecting to OnCommand System Manager on page 28
- In System Manager, create a volume:
 - Select the Storage Virtual Machine and click **Storage > Volumes**.
 - Click **Create**.
 - Specify details for the volume and click **Create**.
- In System Manager, create a share:
 - Click **Storage > Shares**.
 - Click **Create Share**.

- c. Specify details for the share and click **Create**.
4. On a Windows client, use an administrator role to give the users or groups permissions to the files and folders.
5. In System Manager, modify the share ACL to give Windows users or groups access to the share:
 - a. Click **Storage > Shares**.
 - b. Select the share and click **Edit**.
 - c. Select the **Permissions** tab, and give the users or groups access to the share.
6. On a Windows client, log in as one of the users who now has access to the share and files, and verify that you can access the share and create a file.

Related information

[NetApp Documentation: OnCommand System Manager \(current releases\)](#)

Provisioning iSCSI LUNs

If you want to create iSCSI LUNs, you need to do so from System Manager.

Before you begin

- The Host Utilities must be installed and set up on the hosts that will connect to the LUN.
- You must have recorded the iSCSI initiator name from the host. You need to supply this name when you create an igroup for the LUN.
- Before you create volumes in System Manager, you must ensure that you have an aggregate with sufficient space. You need to create aggregates in Cloud Manager.

[Managing aggregates](#) on page 34

Steps

1. Log in to System Manager.
[Connecting to OnCommand System Manager](#) on page 28
2. Select the Storage Virtual Machine and click **Storage > LUNs > Create**.
3. Follow the prompts in the **Create LUN** wizard to create the LUN.
4. Connect to the LUN from the host.
For instructions, see the Host Utilities documentation for your operating system.

Related information

[NetApp Documentation: OnCommand System Manager \(current releases\)](#)

Replicating data to and from the cloud

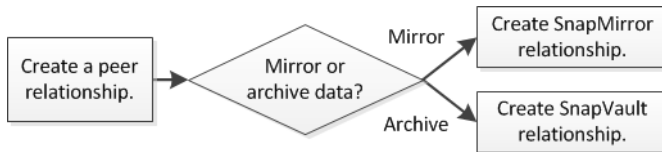
You can replicate data between Cloud ONTAP instances and between Cloud ONTAP and FAS storage systems, which brings your hybrid cloud together. You would typically replicate data between clusters to use the data on the other cluster, to provide disaster recovery, or to archive data. Data replication is possible by using SnapMirror technology and SnapVault technology.

About this task

Before you can replicate data between volumes in different clusters, you need to first create authenticated cluster peer relationships between the clusters. You create a peer relationship between two clusters by entering a passphrase and the IP addresses of the other cluster's intercluster LIFs. You must perform this procedure on each cluster.

Note: In addition to a cluster peer relationship, an SVM peer relationship is required to replicate data between clusters. However, System Manager can create the SVM peer relationship when you configure the SnapMirror or SnapVault relationship, as described in the Express Guides listed in step 4.

The following graphic shows the required steps to replicate data:



Steps

1. In Cloud Manager, record the IP address of the intercluster LIF for the Cloud ONTAP instance:
 - a. From the Cloud ONTAP working environment, click the menu icon and then click **Information**.
 - b. Record the intercluster IP address.
 - c. Repeat the steps for any other Cloud ONTAP instances for which you want to create a peer relationship.
2. If you are peering Cloud ONTAP with clustered Data ONTAP, create the relationship on the clustered Data ONTAP cluster by following the instructions in the [Clustered Data ONTAP 8.3 Cluster Peering Express Guide](#).
3. Create the relationship on the Cloud ONTAP instance:

Note: If you followed the Express Guide to create a peer relationship for clustered Data ONTAP, note that setting up the relationship on Cloud ONTAP is simpler. Cloud ONTAP does not require a subnet and an intercluster LIF was created by default when you launched the instance. You simply need to create the peer relationship.

- a. Log in to System Manager.

[Connecting to OnCommand System Manager](#) on page 28

- b. Under the cluster, click **Configuration** > **Peers**.

- c. Click **Create**.

- d. Specify the passphrase that both peers will use to ensure an authenticated cluster peer relationship.

- e. Enter the IP addresses of the other cluster's intercluster LIFs, separated by commas.

Important: A Cloud ONTAP instance, which is a single-node cluster, has one intercluster LIF. A clustered Data ONTAP cluster, which is typically comprised of several nodes, has several intercluster LIFs.

- f. Click **Create**.

- g. If you are peering two Cloud ONTAP instances, repeat these steps for the other instance.

The clusters should now be in a peer relationship.

4. Configure and initialize a data protection relationship as follows:

If you want to...	Do this...
Replicate data to use it on another cluster or to provide disaster recovery	Configure and initialize a SnapMirror relationship between the source and destination volumes. For detailed instructions, see the Clustered Data ONTAP 8.3 Volume Disaster Recovery Preparation Express Guide. If Cloud ONTAP is the destination, note that NAS LIFs and SAN LIFs are created by default when you launch a Cloud ONTAP instance. You do not need to create them.
Archive data	Configure and initialize a SnapVault relationship between the source and destination volumes. For detailed instructions, see the Clustered Data ONTAP 8.3 Volume Backup Using SnapVault Express Guide.

Monitoring AWS storage and compute costs

You can view the cost associated with running a Cloud ONTAP instance in AWS. The monthly cost consists of the compute purchased from AWS to run Cloud ONTAP and the disks purchased from AWS for Cloud ONTAP use.

Before you begin

The AWS payer account must meet specific billing and cost requirements and your Cloud Manager account must be associated with the AWS cost S3 bucket. For details, see the [OnCommand Cloud Manager 1.0 Installation and Setup Guide](#).

About this task

Cloud Manager updates the storage and compute costs every 12 hours.

You should refer to AWS for final cost details.

Step

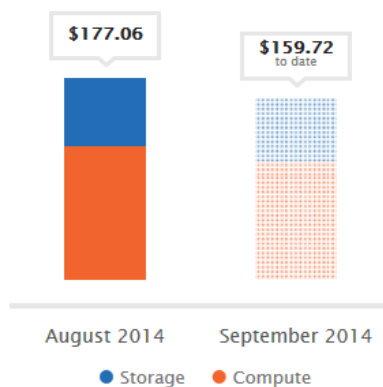
1. On the **Working Environments** page, hover over the name of the Cloud ONTAP instance and click **Cost**.

The Cost page displays costs for the current and previous months and shows your storage costs savings, if you used NetApp's efficiency features. If the cost information is not available, verify that the Cloud Manager Admin met the prerequisites listed above.

The following image shows an example of the AWS costs per month:

So far this month you've spent \$159.72

Last updated: 9/1/2014 2:23 AM

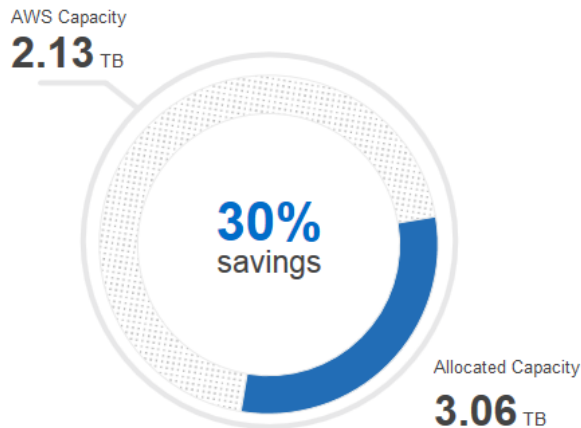


The following image shows an example of storage cost savings:

30% storage cost savings

Your savings are enabled by ONTAP's advanced technologies such as Thin Provisioning, Deduplication and Compression. The savings are based on the difference between your allocated capacity (3.06 TB) and the purchased AWS capacity (only 2.13 TB).

[Show calculation](#)



Managing your Cloud ONTAP instances

As you use your Cloud ONTAP instances, you might need to perform several management and maintenance tasks, which includes changing instance types, moving to a higher capacity instance, viewing configuration and licensing information, changing the admin password, stopping an instance, and deleting an instance.

Changing a Cloud ONTAP instance type

When you launch a Cloud ONTAP Standard instance, you can choose from an m3.xlarge or m3.2xlarge instance. After you launch the instance, you can change the instance type at any time if you determine that it is undersized or oversized for your needs. You need to use the NetApp Support instance to change the instance type.

Before you begin

You must have the private key file (*keypair*.pem) that was used to launch the NetApp Support instance. You need the file to connect to the instance.

About this task

The change instance type script will stop the Cloud ONTAP instance during the process.

Steps

1. From the EC2 console, select the NetApp Support instance, click **Connect**, and follow the instructions to connect to the instance using an SSH client.

Tip: You can find the IP address of the NetApp Support instance from Cloud Manager by selecting a working environment in the VPC and looking in the EC2 Instances pane.

Tip: If you are connecting from Windows using PuTTY, you need to first convert your private key using PuTTYgen. To do this, follow the AWS instructions.

Example

```
ssh -i mykeypair.pem ubuntu@10.60.20.26
```

2. Take an EBS snapshot of the boot volume before you change the instance type by running the following script:

```
./rec_snap_volume -w working_environment -t boot --norestart
```

Note: If you prefer, you can take an EBS snapshot using the EC2 console or API.

3. To change the instance type, run the following script:

```
./rec_chg_instance_type.pl -w working_environment -t instance_type
```

Example

```
./rec_chg_instance_type.pl -w we1 -t m3.2xlarge
```

Note: To get help with this script, enter `./rec_chg_instance_type.pl -h`

4. Take an EBS snapshot of the boot volume after you change the instance type:

```
./rec_snap_volume -w working_environment -t boot
```

Moving to an alternate Cloud ONTAP subscription

If you need to move to a different Cloud ONTAP subscription, you can launch a new Cloud ONTAP instance based on that subscription and then replicate any applicable data from the original instance

to the destination instance. For example, you might want to move from the Cloud ONTAP Standard (Hourly) subscription to the Standard (BYOL) subscription.

About this task

After you replicate the data to the new Cloud ONTAP instance, you can then delete the original Cloud ONTAP working environment to release the AWS resources.

Steps

1. Launch a new Cloud ONTAP instance by creating a working environment.

You do not need to create a new volume when you launch the instance because you will create the destination data protection volumes from System Manager.

[Creating a Cloud ONTAP working environment](#) on page 22

2. If you launched a Cloud ONTAP hourly instance, register it with NetApp.

Support from NetApp is included with your Cloud ONTAP instance. To activate support, you must first register the instance with NetApp.

[Registering Cloud ONTAP instances](#) on page 26

3. Provision aggregates for the new instance.

The aggregates must be big enough to hold the data that you want to replicate. You can add additional disks to aggr1 and you can create additional aggregates, if necessary.

[Managing aggregates](#) on page 34

4. Using System Manager, replicate the data between the source and destination volumes:

- a. Create a cluster peer relationship between the Cloud ONTAP instances.
- b. Create and initialize a SnapMirror relationship between the source and destination volumes.

[Replicating data to and from the cloud](#) on page 37

5. From the new Cloud ONTAP instance, use System Manager to break the SnapMirror relationship for each volume:

- a. Select the Storage Virtual Machine and click **Protection**.
- b. Select the mirror relationship that you want to break.
- c. Click **Operations > Break**.
- d. Select the confirmation check box and click **Break**.

Breaking the relationship converts a volume from a data protection volume to a read/write volume.

6. Configure the destination volumes for data access:

Storage protocol	Steps
CIFS or NFS	- Mount the NAS volumes to the namespace using the same junction path that the source volume was mounted to in the source SVM. - Apply the appropriate ACLs to the CIFS shares at the destination volume. - Assign the NFS export policies to the destination volume. - Apply the quota rules to the destination volume. - Redirect clients to the destination volume by performing the necessary steps such as changing the DNS name resolution. - Remount the NFS and CIFS shares on the clients.
iSCSI	- Map the LUNs to the appropriate initiator group to make the LUNs in the volume available to the SAN clients. - Create iSCSI sessions from the SAN host initiators to the SAN LIFs. - On the SAN client, perform a storage re-scan to detect the connected LUNs.

7. Terminate the Cloud ONTAP instance that you no longer need by deleting the original working environment.

[Deleting a Cloud ONTAP working environment](#) on page 45

Viewing Cloud ONTAP configuration details

You might need view to the configuration of a Cloud ONTAP instance. For example, you will need to know the cluster management IP address to SSH to Cloud ONTAP. You might also want to see the version of Cloud ONTAP that you are running. Or you might need to find your Cloud ONTAP serial number or account ID.

Steps

1. From the working environment, click the menu icon and then click **Information**.

The IP addresses of the various interfaces appear. If you want to understand more about these interfaces, see the [Clustered Data ONTAP 8.3 Network Management Guide](#).

2. To view more information about the instance, click **Advanced Information**.

The advanced information appears and displays information such as the instance ID, serial number, and account ID.

Viewing Cloud ONTAP license information

You can view licensing information about a Cloud ONTAP instance, which includes the license type, instance type, capacity limit, and current attached and allocated capacities.

Step

1. From the working environment, click the menu icon and then click **License**.

Changing the password for a Cloud ONTAP instance

Cloud ONTAP includes a cluster admin account. You can change the password for this account from Cloud Manager, if needed.

About this task

Important: You should not change the password for the admin account through System Manager or the CLI. The password will not be reflected in Cloud Manager. As a result, Cloud Manager cannot monitor the instance properly.

Steps

1. From the working environment, click the menu icon and then click **Set password**.
2. Enter the new password twice and then click **Save**.

The new password must be different than one of the last six passwords that you used.

Stopping a Cloud ONTAP instance

Stopping a Cloud ONTAP instance stops you from accruing AWS compute costs and it also creates EBS snapshots of the root and boot disks, which can be helpful for troubleshooting.

Steps

1. From the working environment, click the menu icon and then click **Stop Cloud ONTAP**.
2. Keep the option to create EBS snapshots enabled because the snapshots can enable system recovery.
3. Click **Stop**.

It can take up to a few minutes to stop the instance. You can restart it at a later time from the working environment page.

Deleting a Cloud ONTAP working environment

It is best to terminate a Cloud ONTAP instance from Cloud Manager, rather than from AWS. For example, if you terminate a licensed Cloud ONTAP instance from AWS, you cannot use the license key for another instance. You must delete the Cloud ONTAP working environment from Cloud Manager to release the license.

About this task

When you delete a working environment, Cloud Manager terminates the instance, deletes EBS disks, and EBS snapshots.

Important: Cloud ONTAP instances have termination protection enabled to help prevent accidental termination from AWS. However, if you do terminate a Cloud ONTAP instance from AWS, you must go to the AWS CloudFormation console and delete the instance's stack. The stack name is the name of the working environment.

Steps

1. From the working environment, click the **Delete** icon.
2. Select **I understand...** and then click **Delete**.

It can take up to 5 minutes to delete the working environment.

What to do next

After you set up Cloud ONTAP and start replicating data to and from the cloud, you might want to manage and protect your data with other NetApp storage software, and you might want to modify your configuration or get help with Cloud ONTAP.

You can perform the following tasks and use the following resources for help:

If you want to...	Open these resources...
Identify the NetApp storage software supported with Cloud ONTAP	NetApp Interoperability Matrix Tool
Activate and configure a destination SnapMirror volume for data access	Clustered Data ONTAP 8.3 Volume Disaster Recovery Express Guide
Restore a volume from a SnapVault backup	Clustered Data ONTAP 8.3 Volume Restore Using SnapVault Express Guide
Run the NetApp Support instance's recovery tools on a Linux host in your data center, rather than in AWS	OnCommand Cloud Manager 1.0 Administration Guide

If you want to...	Open these resources...
Review release-specific information (known issues, limitations, and so on) for Cloud Manager and Cloud ONTAP	<i>OnCommand Cloud Manager 1.0 Release Notes</i> <i>Find the Release Notes for your version of Cloud ONTAP</i>
View more documentation and videos for Cloud ONTAP and Cloud Manager	<i>NetApp Cloud ONTAP Resources</i>
Get help	<i>NetApp Cloud ONTAP Support</i> <i>NetApp Community: Hybrid Cloud</i>

Establishing a network connection for NetApp Private Storage

You can use Cloud Manager to establish a network connection between a FAS storage system in an AWS colocation facility and an AWS Direct Connect. You do this by creating a Data ONTAP working environment.

When you create the working environment, Cloud Manager does the following:

- Configures a VLAN on the switch
- Creates a Storage Virtual Machine (SVM) and two LIFs on the storage system (one management LIF and one data LIF)
- Connects the LIFs to the VLAN
- Creates a virtual interface in AWS and attaches it to a virtual gateway
- Configures a BGP connection from the VLAN to the subnet in AWS
- Creates a security group that includes the required rules to access NetApp Private Storage from EC2 instances

Note the following:

- Cloud Manager cannot use existing AWS virtual interfaces. It must use the virtual interfaces that it creates.
- Cloud Manager cannot create redundant Direct Connect links for the same configuration. Creating two working environments creates two separate SVMs.

Gathering AWS information for NetApp Private Storage

You need to enter information about your NetApp Private Storage configuration when you create a working environment. You can use a worksheet to collect the information that you need to provide.

AWS information	Your value
NPS connection name defined in Cloud Manager	
VPC	
Subnet	

Creating a NetApp Private Storage working environment

You can create a working environment for NetApp Private Storage which provisions and connects a Storage Virtual Machine (SVM) to an AWS Direct Connect.

Before you begin

The Cloud Manager Admin must have added details about the NetApp Private Storage connection to Cloud Manager (an “NPS Connection”). For details, see the [OnCommand Cloud Manager 1.0 Installation and Setup Guide](#).

Steps

1. From the **Working Environments** page, click the + icon.
2. In the **Details** page, enter a name and description for the working environment, select **Data ONTAP**, and then click **Next**.

The working environment name is the name of the SVM that Cloud Manager will create.

3. In the **VPC** page, choose your NetApp Private Storage connection, a VPC and subnet, and then click **Next**.

The following image shows the VPC page filled out:

NPS Connection

NPS1 | us-west-1 ▼



vpc-279f7b42
 10.60.21.0/24 | View Tags

10.60.21.0/25 ▼

Name : VPC2Master

4. In the **SVM** page, specify credentials for the administrator account on the SVM.
5. In the **Review** page, review and confirm your selections:
 - a. Review details about the configuration.
 - b. Click **More information** to review the AWS resources that Cloud Manager will allocate.

- c. Click **I understand...**
- d. Click **Finish**.

Result

Cloud Manager starts creating the working environment. The process should take approximately 5 minutes.

What to do next

After you set up your NetApp Private Storage connection in Cloud Manager, you can use NetApp storage with AWS compute. For information about using your storage system, see the clustered Data ONTAP and OnCommand System Manager documentation.

Related information

[NetApp Documentation: Data ONTAP 8 \(current releases\)](#)

[NetApp Documentation: OnCommand System Manager \(current releases\)](#)

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