Managing ONTAP Cloud

Cloud Manager 3.4

NetApp
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Tiering data in AWS

You can reduce storage costs in AWS by combining an EBS performance tier for "hot" data with an S3 capacity tier for "cold" data. For an overview of data tiering, see Data tiering in AWS.

Configurations supported with data tiering

Data tiering is supported with specific configurations and features:

- Data tiering is supported with ONTAP Cloud Standard, Premium, and BYOL.

  It is not supported with ONTAP Cloud Explore or with M3 and R3 instance types when using Standard and Premium.

- The EBS tier can be General Purpose SSDs or Throughput Optimized HDDs.
- Data tiering is supported with AWS-managed encryption.

  It is not supported with ONTAP Cloud-managed encryption.

- Thin provisioning must be enabled on volumes.
- ONTAP performance enhancements introduced in ONTAP Cloud 9.2 are not supported with data tiering.

Requirements for data tiering

You must ensure that ONTAP Cloud has a connection to S3. The best way to provide that connection is by creating a VPC Endpoint to the S3 service. For instructions, see AWS Documentation: Creating a Gateway Endpoint.

When you create the VPC Endpoint, be sure to select the region, VPC, and route table that corresponds to the ONTAP Cloud instance. You must also modify the security group to add an outbound HTTPS rule that enables traffic to the S3 endpoint. Otherwise, ONTAP Cloud cannot connect to the S3 service.

If you experience any issues, see AWS Support Knowledge Center: Why can't I connect to an S3 bucket using a gateway VPC endpoint?.

What's not required for data tiering

- You do not need to install a feature license to enable data tiering.
- You do not need to create the S3 bucket. Cloud Manager creates it for you.

Tiering data on read-write volumes

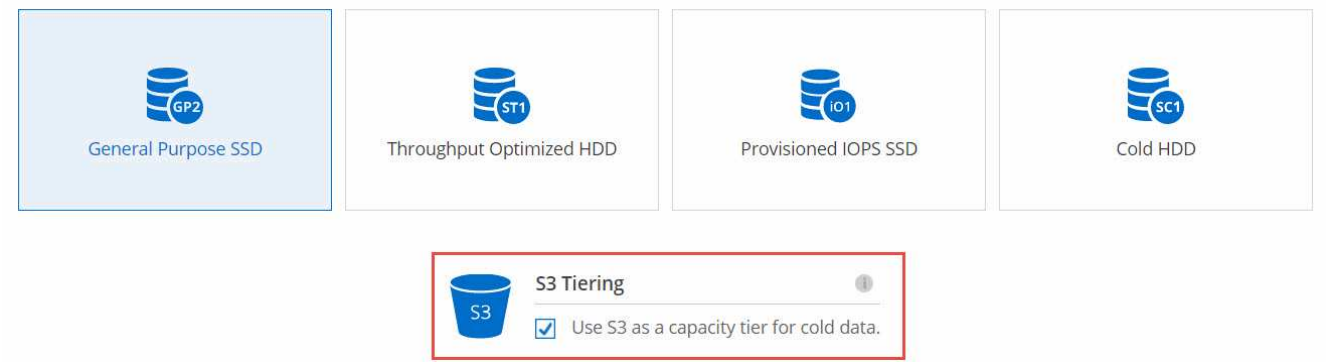
ONTAP Cloud can tier Snapshot copies of read-write volumes to cost-effective S3 storage, freeing up the EBS performance tier for "hot" data.

Steps

1. In the working environment, create a new volume or change the tier of an existing volume:

Task	Action
Create a new volume	Click **Add New Volume**.
Modify an existing volume	Select the volume and click **Change Tier**.

2. Enable S3 Tiering:



Cloud Manager creates a new aggregate if a data tiering-enabled aggregate does not already exist.

If you prefer to create aggregates yourself, you can enable data tiering when creating aggregates.

Tiering data on data protection volumes

ONTAP Cloud can tier data from a data protection volume to an S3 capacity tier. If you activate the destination volume, the data gradually moves to the EBS performance tier as it is read.

Steps

1. On the Working Environments page, select the working environment that contains the source volume, and then drag it to the working environment to which you want to replicate the volume.
2. Follow the prompts until you reach the tiering page and enable **S3 Tiering**.

   For help with replicating data, see Replicating data to and from the cloud.

Managing existing storage

Cloud Manager enables you to manage volumes, aggregates, and CIFS servers. It also prompts you to move volumes to avoid capacity issues.

Managing existing volumes

You can manage existing volumes as your storage needs change. You can view, edit, clone, restore, and delete volumes.

Steps

1. On the Working Environments page, double-click the ONTAP Cloud working environment on which you want to manage volumes.

2. Manage your volumes:

Task	Action
View information about a volume	Select a volume, and then click **Info**.
Edit a volume (read-write volumes only)	a. Select a volume, and then click **Edit**. b. Modify the volume's Snapshot policy, NFS access control list, or share permissions, and then click **Update**.
Clone a volume	a. Select a volume, and then click **Clone**. b. Modify the clone name as needed, and then click **Clone**. This process creates a FlexClone volume. A FlexClone volume is a writable, point-in-time copy that is space-efficient because it uses a small amount of space for metadata, and then only consumes additional space as data is changed or added. To learn more about FlexClone volumes, see the ONTAP 9 Logical Storage Management Guide.
Restore data from a Snapshot copy to a new volume	a. Select a volume, and then click **Restore from Snapshot copy**. b. Select a Snapshot copy, enter a name for the new volume, and then click **Restore**.
Create a Snapshot copy on demand	a. Select a volume, and then click **Create a Snapshot copy**. b. Change the name, if needed, and then click **Create**.
Get the NFS mount command	a. Select a volume, and then click **Mount Command**. b. Click **Copy**.
Change the underlying disk type	a. Select a volume, and then click **Change Tier**. b. Select the disk type, and then click **Change**. Cloud Manager moves the volume to an existing aggregate that uses the selected disk type or it creates a new aggregate for the volume.
Enable or disable sync to S3 for a volume	Select a volume and then click **Sync to S3** or **Delete Sync Relationship**. The sync to S3 feature must be enabled before you can use these options. For instructions, see Syncing data to AWS S3
Delete a volume	a. Select a volume, and then click **Delete**. b. Click **Delete** again to confirm.

Managing existing aggregates

If you want to manage existing aggregates yourself, you can add disks to aggregates, view information about aggregates, and delete them.

Before you begin

If you want to delete an aggregate, you must have first deleted the volumes in the aggregate.

About this task

If an aggregate is running out of space, you can move volumes to another aggregate by using OnCommand System Manager.

Steps

1. On the Working Environments page, double-click the ONTAP Cloud working environment on which you want to manage aggregates.
2. Click the menu icon and then click **Advanced > Advanced allocation**.
3. Manage your aggregates:

Task	Action
View information about an aggregate	Select an aggregate and click **Info**.
Create a volume on a specific aggregate	Select an aggregate and click **Create volume**.
Add disks to an aggregate	a. Select an aggregate and click **Add AWS disks** or **Add Azure disks**. b. Select the number of disks that you want to add and click **Add**.
Delete an aggregate	a. Select an aggregate that does not contain any volumes and click **Delete**. b. Click **Delete** again to confirm.

Modifying the CIFS server

If you change your DNS servers or Active Directory domain, you need to modify the CIFS server in ONTAP Cloud so that it can continue to serve storage to clients.

Steps

1. From the working environment, click the menu icon and then click **Advanced > CIFS setup**.
2. Specify settings for the CIFS server:

Task	Action
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.

Task	Action
Active Directory Domain to join	The FQDN of the Active Directory (AD) domain that you want the CIFS server to join.
Credentials authorized to join the domain	The name and password of a Windows account with sufficient privileges to add computers to the specified Organizational Unit (OU) within the AD domain.
CIFS server NetBIOS name	A CIFS server name that is unique in the AD domain.
Organizational Unit	The organizational unit within the AD domain to associate with the CIFS server. The default is CN=Computers.
DNS Domain	The DNS domain for the ONTAP Cloud storage virtual machine (SVM). In most cases, the domain is the same as the AD domain.

3. Click **Save**.

Result

ONTAP Cloud updates the CIFS server with the changes.

Moving a volume to avoid capacity issues

Cloud Manager might display an Action Required message that says moving a volume is necessary to avoid capacity issues, but that it cannot provide recommendations to correct the issue. If this happens, you need to identify how to correct the issue and then move one or more volumes.

Steps

1. Identify how to correct the issue.
2. Based on your analysis, move volumes to avoid capacity issues:
   - Move volumes to another system.
   - Move volumes to another aggregate on the same system.

Identifying how to correct capacity issues

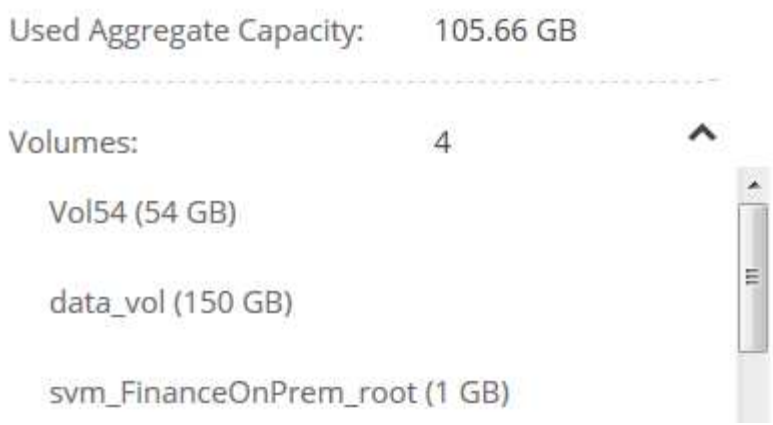
If Cloud Manager cannot provide recommendations for moving a volume to avoid capacity issues, you must identify the volumes that you need to move and whether you should move them to another aggregate on the same system or to another system.

Steps

1. View the advanced information in the Action Required message to identify the aggregate that has reached its capacity limit.

   For example, the advanced information should say something similar to the following: Aggregate aggr1 has reached its capacity limit.

2. Identify one or more volumes to move out of the aggregate:
   a. In the working environment, click the menu icon, and then click **Advanced > Advanced allocation**.
   b. Select the aggregate, and then click **Info**.
   c. Expand the list of volumes.



d. Review the size of each volume and choose one or more volumes to move out of the aggregate.

   You should choose volumes that are large enough to free space in the aggregate so that you avoid additional capacity issues in the future.

3. If the system has not reached the disk limit, you should move the volumes to an existing aggregate or a new aggregate on the same system.

   For details, see Moving volumes to another aggregate to avoid capacity issues.

4. If the system has reached the disk limit, do any of the following:
   a. Delete any unused volumes.
   b. Rearrange volumes to free space on an aggregate.

      For details, see Moving volumes to another aggregate to avoid capacity issues.

   c. Move two or more volumes to another system that has space.

      For details, see Moving volumes to another system to avoid capacity issues.

Moving volumes to another system to avoid capacity issues

You can move one or more volumes to another ONTAP Cloud system to avoid capacity issues. You might need to do this if the system reached its disk limit.

About this task

You can follow the steps in this task to correct the following Action Required message:

```
Moving a volume is necessary to avoid capacity issues; however, Cloud Manager
cannot perform this action for you because the system has reached the disk limit.
```

Steps

1. Identify an ONTAP Cloud system that has available capacity, or deploy a new system.
2. Drag and drop the source working environment on the target working environment to perform a one-time data replication of the volume.

   For details, see Replicating data between systems.

3. Go to the Replication Status page, and then break the SnapMirror relationship to convert the replicated

volume from a data protection volume to a read/write volume.

For details, see Managing data replication schedules and relationships.

4. Configure the volume for data access.

   For information about configuring a destination volume for data access, see the ONTAP 9 Volume Disaster Recovery Express Guide.

5. Delete the original volume.

   For details, see Managing existing volumes.

Moving volumes to another aggregate to avoid capacity issues

You can move one or more volumes to another aggregate to avoid capacity issues.

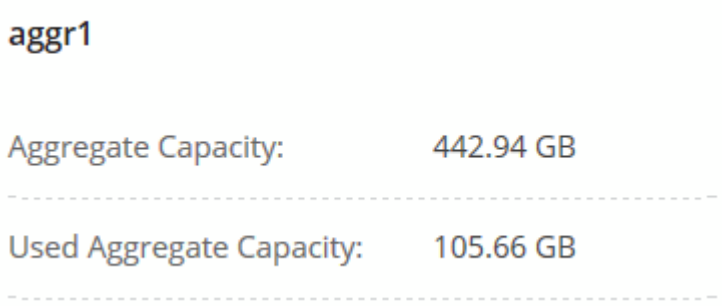
About this task

You can follow the steps in this task to correct the following Action Required message:

```
Moving two or more volumes is necessary to avoid capacity issues; however, Cloud Manager cannot perform this action for you.
```

Steps

1. Verify whether an existing aggregate has available capacity for the volumes that you need to move:
   a. In the working environment, click the menu icon, and then click **Advanced > Advanced allocation**.
   b. Select each aggregate, click **Info**, and then view the available capacity (aggregate capacity minus used aggregate capacity).



2. If needed, add disks to an existing aggregate:
   a. Select the aggregate, and then click **Add disks**.
   b. Select the number of disks to add, and then click **Add**.
3. If no aggregates have available capacity, create a new aggregate.

   For details, see Creating aggregates.

4. Use System Manager or the CLI to move the volumes to the aggregate.
5. In most situations, you can use System Manager to move volumes.

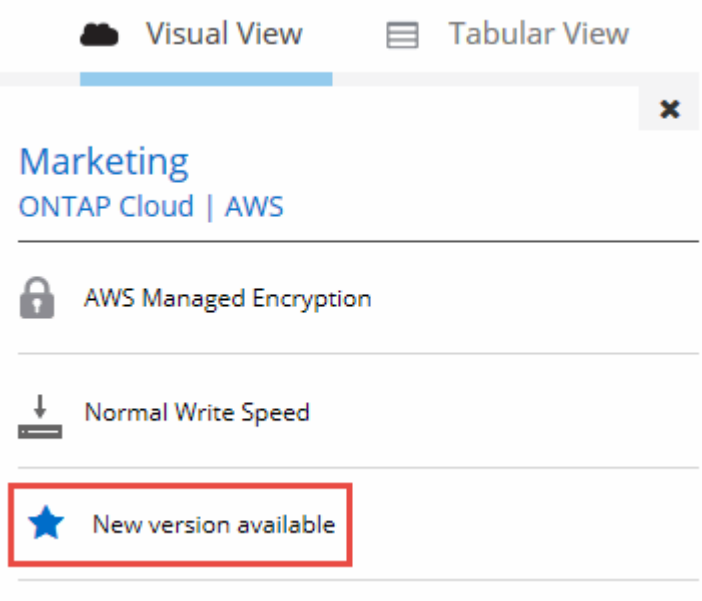
   For instructions, see the ONTAP 9 Volume Move Express Guide.

Updating ONTAP Cloud software

Cloud Manager includes several options that you can use to upgrade to the current ONTAP Cloud release or to downgrade ONTAP Cloud to an earlier release. You should prepare ONTAP Cloud systems before you upgrade or downgrade the software.

Overview

Cloud Manager displays a notification in ONTAP Cloud working environments when a new version of ONTAP Cloud is available:



You can start the upgrade process from this notification, which automates the process by obtaining the software image from an S3 bucket, installing the image, and then restarting the system.

Upgrades of HA pairs are nondisruptive—HA pairs continue to serve data during the upgrade process.
Cloud Manager might upgrade the HA mediator as part of this process.

Advanced options for software updates

Cloud Manager also provides the following advanced options for updating ONTAP Cloud software:

- Software updates using an image on an external URL

  This option is helpful if Cloud Manager cannot access the S3 bucket to upgrade the software, if you were provided with a patch, or if you want to downgrade the software to a specific version.

- Software updates using the alternate image on the system

  You can use this option to downgrade to the previous version by making the alternate software image the default image. This option is not available for HA pairs.

Transitioning ONTAP Cloud to an earlier release in the same release family (for example, 9.3 to 9.2) is referred to as a downgrade. You can downgrade without assistance when downgrading new or test clusters, but you

should contact technical support if you want to downgrade a production cluster.

Preparing to update ONTAP Cloud software

Before performing an upgrade or downgrade, you must verify that your systems are ready and make any required configuration changes.

Suspending SnapMirror transfers

If an ONTAP Cloud system has active SnapMirror relationships, it is best to suspend transfers before you update the ONTAP Cloud software. Suspending the transfers prevents SnapMirror failures. You must suspend the transfers from the destination system.

About this task

These steps describe how to use System Manager for ONTAP Cloud 9.3 and later.

Steps

1. Log in to System Manager from the destination system.
2. Click **Protection > Relationships**.
3. Select the relationship and click **Operations > Quiesce**.

Verifying that aggregates are online

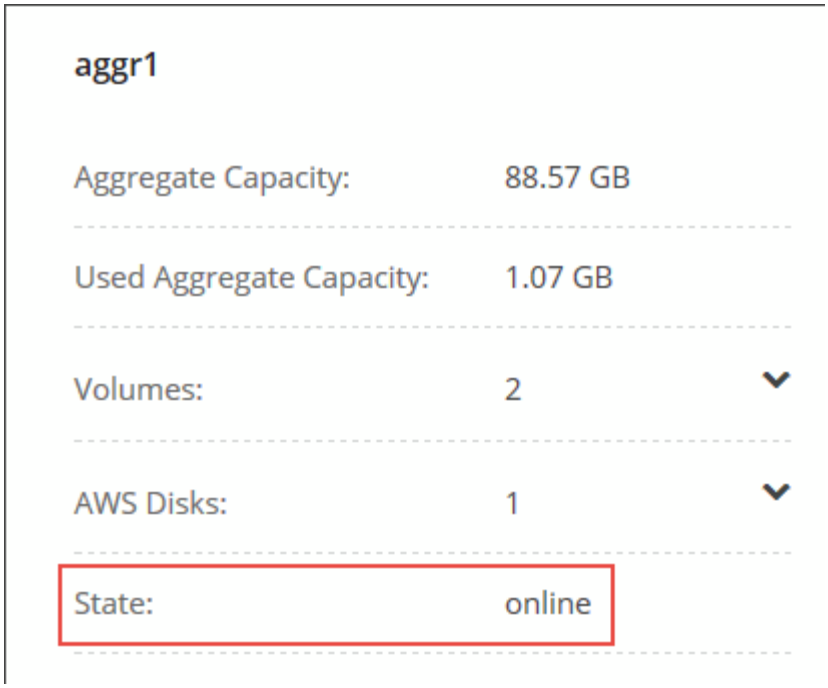
ONTAP Cloud aggregates must be online before you update the software. Aggregates should be online in most configurations, but if they are not, then you should bring them online.

About this task

These steps describe how to use System Manager for ONTAP Cloud 9.3 and later.

Steps

1. In the working environment, click the menu icon, and then click **Advanced > Advanced allocation**.
2. Select an aggregate, click **Info**, and then verify that the state is online.



3. If the aggregate is offline, use System Manager to bring the aggregate online:
   a. Log in to System Manager.
   b. Click **Storage > Aggregates & Disks > Aggregates**.
   c. Select the aggregate, and then click **More Actions > Status > Online**.

Upgrading ONTAP Cloud to the latest version

You can upgrade to the latest version of ONTAP Cloud directly from Cloud Manager. Cloud Manager notifies you when a new version is available.

Before you begin

Cloud Manager operations such as volume or aggregate creation must not be in progress for the ONTAP Cloud system.

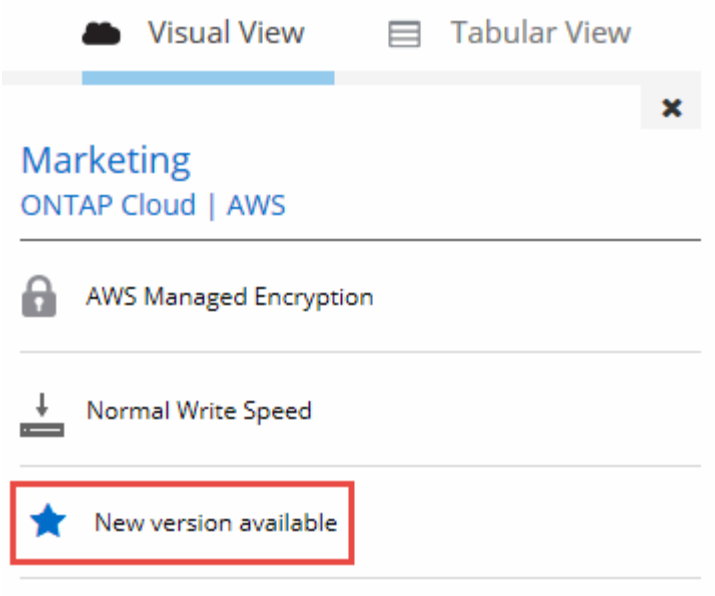
About this task

The upgrade process takes up to 25 minutes for a single ONTAP Cloud system and up to 90 minutes for an HA pair. Upgrades of HA pairs are nondisruptive. HA pairs continue to serve data during the upgrade process.

Steps

1. Click **Working Environments**.
2. Select a working environment.

   A notification appears in the right pane if a new version is available:



3. If a new version is available, click **Upgrade**.
4. In the Release Information page, click the link to read the ONTAP Cloud Release Notes for the specified version, and then select the **I have read…** check box.
5. In the End User License Agreement (EULA) page, read the EULA, and then select **I read and approve the EULA**.
6. In the Review and Approve page, read the important notes, select **I understand…**, and then click **Go**.

Result

Cloud Manager starts the software upgrade. You can perform actions on the working environment once the software update is complete.

After you finish

If you suspended SnapMirror transfers, use System Manager to resume the transfers.

Upgrading or downgrading ONTAP Cloud by using an HTTP or FTP server

You can place the ONTAP Cloud software image on an HTTP or FTP server and then initiate the software update from Cloud Manager. You might use this option if Cloud Manager cannot access the S3 bucket to upgrade the software or if you want to downgrade the software.

About this task

This upgrade or downgrade process takes up to 25 minutes for a single ONTAP Cloud system and up to 90 minutes for an HA pair. Upgrades and downgrades of HA pairs are nondisruptive. HA pairs continue to serve data during the process.

Steps

1. Set up an HTTP server or FTP server that can host the ONTAP Cloud software image.
2. If you have a VPN connection to the VPC, you can place the ONTAP Cloud software image on an HTTP server or FTP server in your own network. Otherwise, you must place the file on an HTTP server or FTP server in AWS.
3. If you use your own security group for ONTAP Cloud instances, ensure that the outbound rules allow HTTP or FTP connections so ONTAP Cloud can access the software image.

The predefined ONTAP Cloud security group allows outbound HTTP and FTP connections by default.

4. Obtain the software image from NetApp Downloads: Software.
5. Copy the software image to the directory on the HTTP or FTP server from which the file will be served.
6. From the working environment in Cloud Manager, click the menu icon, and then click **Advanced > Update ONTAP Cloud software**.
7. On the Update ONTAP Cloud software page, choose **Select an image available from a URL**, enter the URL, and then click **Change Image**.
8. Click **Proceed** to confirm.

Result

Cloud Manager starts the software update. You can perform actions on the working environment once the software update is complete.

After you finish

If you suspended SnapMirror transfers, use System Manager to resume the transfers.

Downgrading ONTAP Cloud by using a local image

Each ONTAP Cloud system can hold two software images: the current image that is running, and an alternate image that you can boot. Cloud Manager can change the alternate image to be the default image. You can use this option to downgrade to the previous version of ONTAP Cloud, if you are experiencing issues with the current image.

About this task

This downgrade process is available for single ONTAP Cloud systems only. It is not available for HA pairs. The process takes the ONTAP Cloud system offline for up to 25 minutes.

Steps

1. From the working environment, click the menu icon, and then click **Advanced > Update ONTAP Cloud software**.
2. On the Update ONTAP Cloud software page, select the alternate image, and then click **Change Image**.
3. Click **Proceed** to confirm.

Result

Cloud Manager starts the software update. You can perform actions on the working environment once the software update is complete.

After you finish

If you suspended SnapMirror transfers, use System Manager to resume the transfers.

Modifying ONTAP Cloud systems

You might need to change the configuration of ONTAP Cloud instances as your storage needs change. For example, you can change between pay-as-you-go configurations, change the instance or VM type, and move to an alternate subscription.

Installing license files on ONTAP Cloud BYOL systems

If Cloud Manager cannot obtain an ONTAP Cloud BYOL license file from NetApp, you can obtain the file yourself and then manually upload the file to Cloud Manager so it can install the license on the ONTAP Cloud system.

Steps

1. Go to the NetApp License File Generator and log in using your NetApp Support Site credentials.
2. Enter your password, choose your product (either **NetApp ONTAP Cloud BYOL for AWS**, **NetApp ONTAP Cloud BYOL for Azure**, or **NetApp ONTAP Cloud BYOL HA for AWS**), enter the serial number, confirm that you have read and accepted the privacy policy, and then click **Submit**.

   Example

3. Choose whether you want to receive the serialnumber.NLF JSON file through email or direct download.
4. In Cloud Manager, select the ONTAP Cloud BYOL working environment.
5. In the ONTAP Cloud Storage pane, click the menu icon, and then click **License**.
6. Click **Upload License File**.
7. Click **Upload** and then select the file.

Result

Cloud Manager installs the new license file on the ONTAP Cloud system.

Changing the instance or virtual machine type for ONTAP Cloud

You can choose from several instance or virtual machine types when you launch ONTAP Cloud in AWS or Azure. You can change the instance or virtual machine type at any time if you determine that it is undersized or oversized for your needs.

About this task

- The operation restarts ONTAP Cloud.

  For single node systems, I/O is interrupted.

  For HA pairs, the change is nondisruptive. HA pairs continue to serve data.

- Changing the instance or virtual machine type affects AWS or Azure service charges.

Steps

1. From the working environment, click the menu icon, and then click **Change license or instance for AWS** or click **Change license or VM for Azure**.
2. If you are using a pay-as-you-go configuration, you can optionally choose a different license.
3. Select an instance or virtual machine type, select the check box to confirm that you understand the implications of the change, and then click **OK**.

Result

ONTAP Cloud reboots with the new configuration.

Changing between pay-as-you-go configurations

After you launch pay-as-you-go ONTAP Cloud systems, you can change between the Explore, Standard, and Premium configurations at any time by modifying the license. Changing the license increases or decreases the raw capacity limit and enables you to choose from different EC2 instance types or Azure virtual machine types.

About this task

Note the following about changing between pay-as-you-go licenses:

- The operation restarts ONTAP Cloud.

  For single node systems, I/O is interrupted.

  For HA pairs, the change is nondisruptive. HA pairs continue to serve data.

- Changing the instance or virtual machine type affects AWS or Azure service charges.

Steps

1. From the working environment, click the menu icon, and then click **Change license or instance for AWS** or click **Change license or VM for Azure**.
2. Select a license type and an instance type or virtual machine type, select the check box to confirm that you understand the implications of the change, and then click **OK**.

Result

ONTAP Cloud reboots with the new license, instance type or virtual machine type, or both.

Moving to an alternate ONTAP Cloud configuration

If you want to move between a pay-as-you-go subscription and a BYOL subscription or between a single ONTAP Cloud system and an ONTAP Cloud HA pair, you can deploy a new system and then replicate data from the existing system to the new system.

Steps

1. Create a new ONTAP Cloud working environment.

   Launching ONTAP Cloud in AWS
   Launching ONTAP Cloud in Azure

2. If you chose an ONTAP Cloud pay-as-you-go license and the tenant does not have a NetApp Support Site account assigned to it, manually register the systems with NetApp.

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

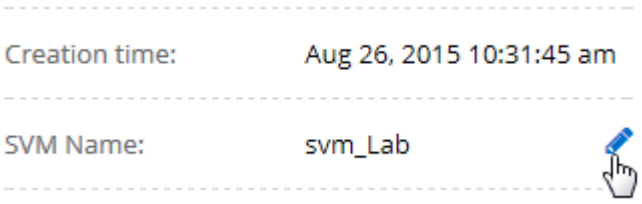
3. Set up one-time data replication between the systems for each volume that you must replicate.
4. Terminate the ONTAP Cloud system that you no longer need by deleting the original working environment.

Modifying the storage virtual machine name

Cloud Manager automatically names the storage virtual machine (SVM) for an ONTAP Cloud system. You can modify the name of the SVM if you have strict naming standards. For example, you might want it to match how you name the SVMs for your ONTAP clusters.

Steps

1. From the working environment, click the menu icon, and then click **Information**.
2. Click the edit icon to the right of the SVM name.



3. In the Modify SVM Name dialog box, modify the SVM name, and then click **Save**.

Changing the password for ONTAP Cloud

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

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 **Advanced > 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.

Changing the network MTU for c4.4xlarge and c4.8xlarge instances

By default, ONTAP Cloud is configured to use 9,000 MTU (also called jumbo frames) when you choose the c4.4xlarge instance or the c4.8xlarge instance in AWS. You can change the network MTU to 1,500 bytes if that is more appropriate for your network configuration.

About this task

A network maximum transmission unit (MTU) of 9,000 bytes can provide the highest maximum network throughput possible for specific configurations.

9,000 MTU is a good choice if clients in the same VPC communicate with the ONTAP Cloud system and some or all of those clients also support 9,000 MTU. If traffic leaves the VPC, packet fragmentation can occur, which degrades performance.

A network MTU of 1,500 bytes is a good choice if clients or systems outside of the VPC communicate with the ONTAP Cloud system.

Steps

1. From the working environment, click the menu icon and then click **Advanced > Network Utilization**.
2. Select **Standard** or **Jumbo Frames**.
3. Click **Change**.

Changing route tables associated with ONTAP Cloud HA pairs

You can modify the route tables that include routes to the floating IP addresses for an HA pair. You might do this if new NFS or CIFS clients need to access the HA pair.

Steps

1. From the working environment, click the menu icon and then click **Information**.
2. Click **Route Tables**.
3. Modify the list of selected route tables and then click **Save**.

Result

Cloud Manager sends an AWS request to modify the route tables.

Connecting to ONTAP Cloud systems

If you need to perform advanced management of ONTAP Cloud systems, you can do so using OnCommand System Manager or the command line interface.

Connecting to OnCommand System Manager

You might need to perform some ONTAP Cloud tasks from OnCommand System Manager, which is a browser-based management tool that runs on the ONTAP Cloud system. For example, you need to use System Manager if you want to create LUNs.

Before you begin

The computer from which you are accessing Cloud Manager must have a network connection to ONTAP Cloud. For example, you might need to log in to Cloud Manager from a jump host in AWS or Azure.

When deployed in multiple AWS Availability Zones, ONTAP Cloud HA configurations use a floating IP address for the cluster management interface, which means external routing is not available. You must connect from a host that is part of the same routing domain.

Steps

1. From the Working Environments page, double-click the ONTAP Cloud system that you want to manage with System Manager.
2. 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 ONTAP Cloud.

Connecting to the ONTAP Cloud CLI

The ONTAP Cloud CLI enables you to execute all administrative commands and is a good choice for advanced tasks or if you are more comfortable using the CLI. You can connect to the CLI using Secure Shell (SSH).

Before you begin

The host from which you use SSH to connect to ONTAP Cloud must have a network connection to ONTAP Cloud. For example, you might need to use SSH from a jump host in AWS or Azure.

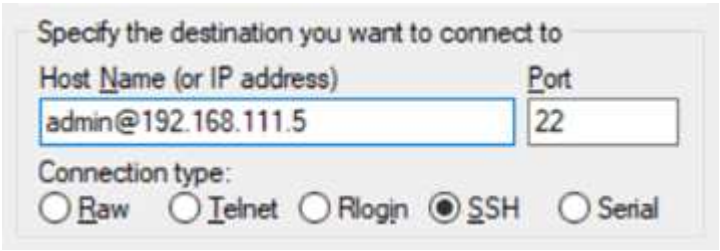
When deployed in multiple AZs, ONTAP Cloud HA configurations use a floating IP address for the cluster management interface, which means external routing is not available. You must connect from a host that is part of the same routing domain.

Steps

1. In Cloud Manager, identify the IP address of the cluster management interface:
   a. On the Working Environments page, select the ONTAP Cloud system.
   b. Copy the cluster management IP address that appears in the right pane.
2. Use SSH to connect to the cluster management interface IP address using the admin account.

   Example

   The following image shows an example using PuTTY:



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

   Example

```
Password: ********
COT2::>
```

Managing the state of ONTAP Cloud systems

You can stop and start ONTAP Cloud systems from Cloud Manager to manage your cloud compute costs.

Scheduling automatic shutdowns of ONTAP Cloud instances

You might want to shut down ONTAP Cloud instances during specific time intervals to lower your compute costs. Rather than do this manually, you can configure Cloud Manager to automatically shut down and then restart instances at specific times.

About this task

This task schedules automatic shutdowns of both nodes in an HA pair.

Steps

1. From the working environment, click the clock icon:

2. Specify the shutdown schedule:
   a. Choose whether you want to shut down the instance every weekday, every weekend, or both.
   b. Specify when you want to turn off the instance and for how long you want it turned off.

      Example

      The following image shows a schedule that instructs Cloud Manager to shut down the instance every Saturday at 12:00 a.m. for 48 hours. Cloud Manager restarts the instance every Monday at 12:00 a.m.

3. Click **Save**.

Result

Cloud Manager saves the schedule. The clock icon changes to indicate that a schedule is set: 

Stopping ONTAP Cloud instances

Stopping ONTAP Cloud saves you from accruing compute costs and creates snapshots of the root and boot disks, which can be helpful for troubleshooting.

About this task

When you stop an ONTAP Cloud HA pair, Cloud Manager shuts down both nodes.

Steps

1. From the working environment, click the **Turn off** icon.

2. Keep the option to create snapshots enabled because the snapshots can enable system recovery.
3. Click **Turn Off**.

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

Monitoring AWS storage and compute costs

You can view the cost associated with running ONTAP Cloud in AWS. The monthly cost consists of the compute purchased from AWS to run ONTAP Cloud and the disks purchased from AWS for ONTAP Cloud 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 instructions, see Setting up AWS billing and cost management for Cloud Manager.

About this task

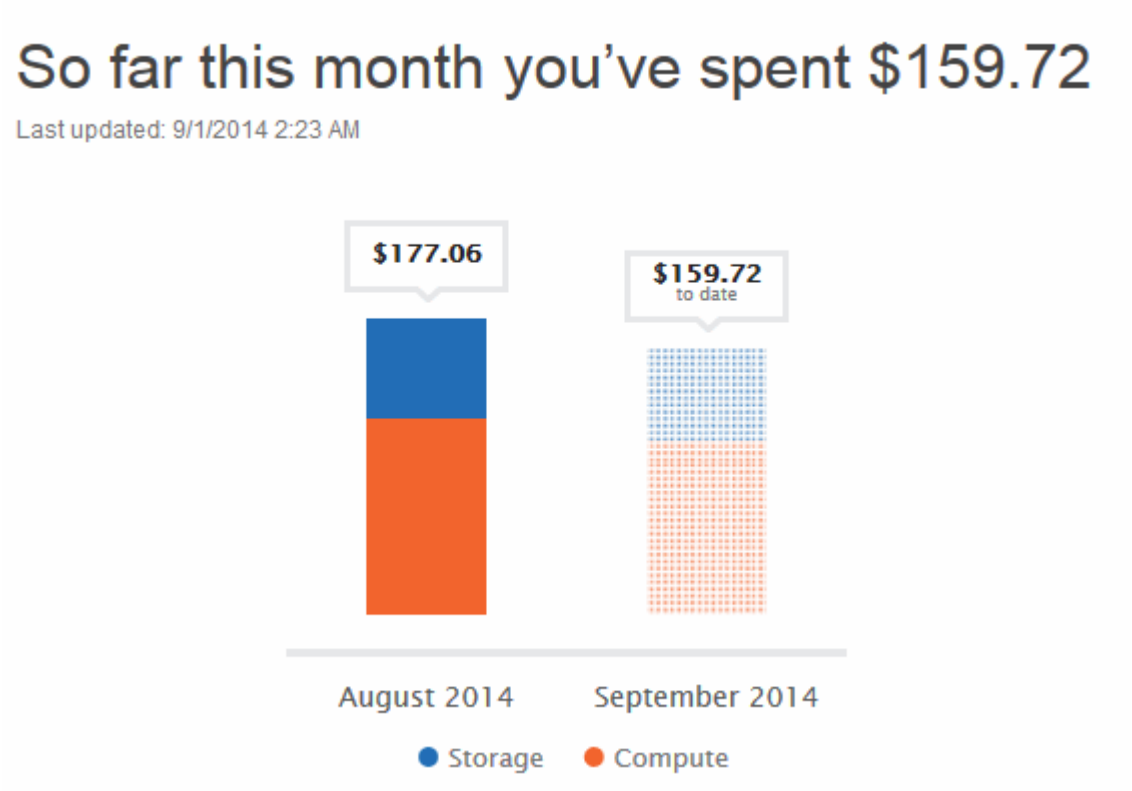
Cloud Manager updates the storage and compute costs every 12 hours. You should refer to AWS for final cost details.

Step

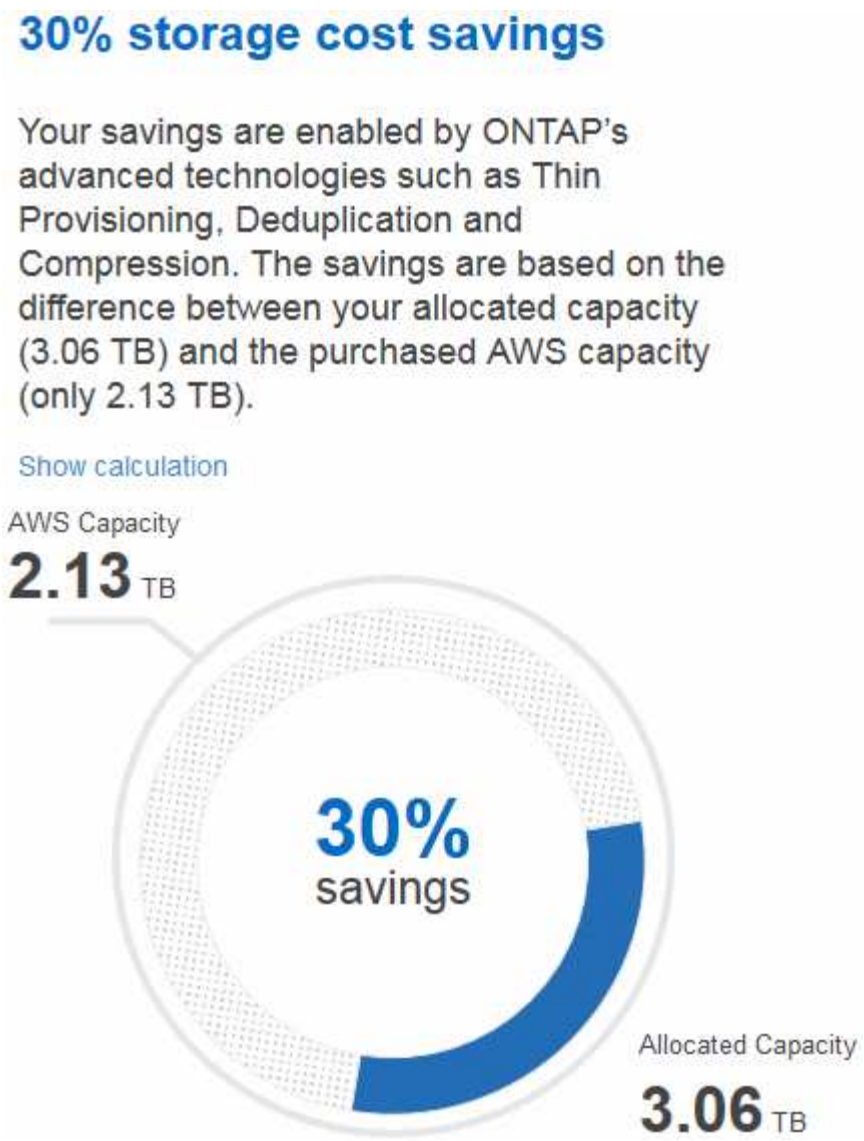
1. On the Working Environments page, select an ONTAP Cloud working environment and then click **Cost**.

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

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



   The following image shows an example of storage cost savings:



Adding existing ONTAP Cloud systems to Cloud Manager

You can discover and add existing ONTAP Cloud instances to Cloud Manager. You might do this if your Cloud Manager instance became unusable and you launched a new instance, but you could not restore all ONTAP Cloud instances from a recent Cloud Manager backup.

Before you begin

You must know the password for the ONTAP Cloud admin user account.

Steps

1. On the Working Environments page, click **Add environment**.
2. Under Discover, select **ONTAP Cloud**.

3. On the Region page, choose the region where the instances are running, and then select the instances.
4. On the Credentials page, enter the password for the ONTAP Cloud admin user, and then click **Go**.

Result

Cloud Manager adds the ONTAP Cloud instances to the tenant.

Deleting an ONTAP Cloud working environment

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

About this task

When you delete a working environment, Cloud Manager terminates instances, deletes disks, and snapshots.

ONTAP Cloud instances have termination protection enabled to help prevent accidental termination from AWS. However, if you do terminate an ONTAP Cloud 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 menu icon and then click **Delete**.
2. Type the name of the working environment and then click **Delete**.

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