



Tiering inactive data to low-cost object storage

Cloud Manager

Ben Cammett
November 04, 2020

This PDF was generated from https://docs.netapp.com/us-en/occm/task_tiering.html on November 10, 2020.
Always check docs.netapp.com for the latest.

Table of Contents

- Tiering inactive data to low-cost object storage 1
 - Configurations that support data tiering 2
 - Requirements 2
 - Ensuring that tiering is enabled on aggregates..... 4
 - Tiering data from read-write volumes 5
 - Tiering data from data protection volumes..... 6
 - Changing the storage class for tiered data 7

Tiering inactive data to low-cost object storage

You can reduce storage costs for Cloud Volumes ONTAP by combining an SSD or HDD performance tier for hot data with an object storage capacity tier for inactive data. For a high-level overview, see [Data tiering overview](#).

To set up data tiering, you need to do the following:

Choose a supported configuration

Most configurations are supported. If you have a Cloud Volumes ONTAP Standard, Premium, or BYOL system running the most recent version, then you should be good to go. [Learn more](#).

Ensure connectivity between Cloud Volumes ONTAP and object storage

- For AWS, you'll need a VPC Endpoint to S3. [Learn more](#).
- For Azure, you won't need to do anything as long as Cloud Manager has the required permissions. [Learn more](#).
- For GCP, you need to configure the subnet for Private Google Access and set up a service account. [Learn more](#).

Ensure that you have an aggregate with tiering enabled

Data tiering must be enabled on an aggregate in order to enable data tiering on a volume. You should be aware of the requirements for new volumes and for existing volumes. [Learn more](#).

Choose a tiering policy when creating, modifying, or replicating a volume

Cloud Manager prompts you to choose a tiering policy when you create, modify, or replicate a volume.

- [Tiering data on read-write volumes](#)
- [Tiering data on data protection volumes](#)

What's not required for data tiering?



- You don't need to install a feature license to enable data tiering.
- You don't need to create the capacity tier (an S3 bucket, Azure Blob container, or GCP bucket). Cloud Manager does that for you.
- You don't need to enable data tiering at the system level.

Cloud Manager creates an object store for cold data when the system is created, [as long as there are no connectivity or permissions issues](#). After that, you just need to enable data tiering on volumes (and in some cases, [on aggregates](#)).

Configurations that support data tiering

You can enable data tiering when using specific configurations and features:

- Data tiering is supported with Cloud Volumes ONTAP Standard, Premium, and BYOL, starting with the following versions:
 - Version 9.2 in AWS
 - Version 9.4 in Azure with single node systems
 - Version 9.6 in Azure with HA pairs
 - Version 9.6 in GCP



Data tiering is not supported in Azure with the DS3_v2 virtual machine type.

- In AWS, the performance tier can be General Purpose SSDs, Provisioned IOPS SSDs, or Throughput Optimized HDDs.
- In Azure, the performance tier can be Premium SSD managed disks, Standard SSD managed disks, or Standard HDD managed disks.
- In GCP, the performance tier can be either SSDs or HDDs (standard disks).
- Data tiering is supported with encryption technologies.
- Thin provisioning must be enabled on volumes.

Requirements

Depending on your cloud provider, certain connections and permissions must be set up so that Cloud Volumes ONTAP can tier cold data to object storage.

Requirements to tier cold data to AWS S3

Ensure that Cloud Volumes ONTAP 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 Cloud Volumes ONTAP instance. You must also modify the security group to add an outbound HTTPS rule that enables traffic to the S3 endpoint. Otherwise, Cloud Volumes ONTAP 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?](#).

Requirements to tier cold data to Azure Blob storage

You don't need to set up a connection between the performance tier and the capacity tier as long as Cloud Manager has the required permissions. Cloud Manager enables a VNet service endpoint for you if the Cloud Manager policy has these permissions:

```
"Microsoft.Network/virtualNetworks/subnets/write",  
"Microsoft.Network/routeTables/join/action",
```

The permissions are included in the latest [Cloud Manager policy](#).

Requirements to tier cold data to a Google Cloud Storage bucket

- The subnet in which Cloud Volumes ONTAP resides must be configured for Private Google Access. For instructions, refer to [Google Cloud Documentation: Configuring Private Google Access](#).
- You need a service account that has the predefined Storage Admin role. You'll need to select this service account when you create a Cloud Volumes ONTAP working environment.

[Set up this tiering service account as follows:](#)

- a. Assign the predefined *Storage Admin* role to the tiering service account.
- b. Add the Connector service account as a *Service Account User* to the tiering service account.

You can provide the user role [in step 3 of the wizard when you create the tiering service account](#), or [grant the role after the service account was created](#).

You'll need to select the tiering service account later when you create a Cloud Volumes ONTAP working environment.

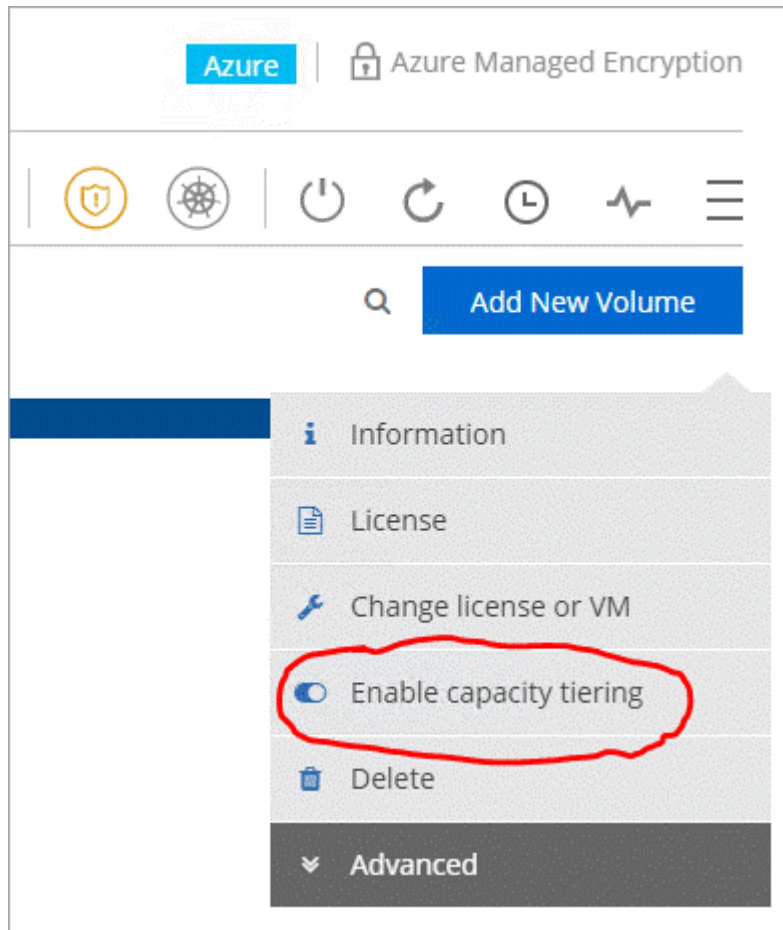
If you don't enable data tiering and select a service account when you create the Cloud Volumes ONTAP system, then you'll need to turn off the system and add the service account to Cloud Volumes ONTAP from the GCP console.

Enabling data tiering after implementing the requirements

Cloud Manager creates an object store for cold data when the system is created, as long as there are no connectivity or permissions issues. If you didn't implement the requirements listed above until after you created the system, then you'll need to manually enable tiering, which creates the object store.

Steps

1. [Ensure that you've met all requirements.](#)
2. On the Working Environments page, double-click the name of the Cloud Volumes ONTAP instance.
3. Click the menu icon and select **Enable capacity tiering**.



You'll only see this option if data tiering couldn't be enabled when Cloud Manager created the system.

Ensuring that tiering is enabled on aggregates

Data tiering must be enabled on an aggregate in order to enable data tiering on a volume. You should be aware of the requirements for new volumes and for existing volumes.

- **New volumes**

If you're enabling data tiering on a new volume, then you don't need to worry about enabling data tiering on an aggregate. Cloud Manager creates the volume on an existing aggregate that has tiering enabled, or it creates a new aggregate for the volume if a data tiering-enabled aggregate doesn't already exist.

- **Existing volumes**

If you want to enable data tiering on an existing volume, then you'll need to ensure that data tiering is enabled on the underlying aggregate. If data tiering isn't enabled on the existing aggregate, then you'll need to enable data tiering on a *new* aggregate and then move the volume to that aggregate. You can't enable data tiering on an existing aggregate.

Steps

1. On the Working Environments page, double-click the name of the Cloud Volumes ONTAP instance on which you want to manage aggregates.
2. Click the menu icon, and then click **Advanced > Advanced allocation**.
3. Click **Add Aggregate** and then specify details for the aggregate.
 - a. Enter a name.
 - b. Choose a disk type and keep tiering enabled.
 - c. Choose your disk size and number of disks.
 - d. Click **Go** and then click **Approve and Purchase**.
4. If needed, move existing volumes to the new aggregate by [following the ONTAP 9 Volume Move Express Guide](#).

What's next?

You can now enable data tiering on your volumes, as explained in the next section.

Tiering data from read-write volumes

Cloud Volumes ONTAP can tier inactive data on read-write volumes to cost-effective object storage, freeing up the 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 Disk Type & Tiering Policy .

2. Select a tiering policy.

For a description of these policies, see [Data tiering overview](#).

Example

 **Tiering data to object storage**


 **Volume Tiering Policy**

☒ **All** - Immediately tiers all data (not including metadata) to object storage.

☐ **Auto** - Tiers cold Snapshot copies and cold user data from the active file system to object storage.

☐ **Snapshot Only** - Tiers cold Snapshot copies to object storage

☐ **None** - Data tiering is disabled.

 Working Environment S3 Storage classes: Standard

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



Tiering data from data protection volumes

Cloud Volumes ONTAP can tier data from a data protection volume to a capacity tier. If you activate the destination volume, the data gradually moves to the 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 data tiering to object storage.

Example

 **S3 Tiering** What are storage tiers?

☒ **Enabled** ☐ **Disabled**

Note: If you enable S3 tiering, thin provisioning must be enabled on volumes created in this aggregate.

For help with replicating data, see [Replicating data to and from the cloud](#).

Changing the storage class for tiered data

After you deploy Cloud Volumes ONTAP, you can reduce your storage costs by changing the storage class for inactive data that hasn't been accessed for 30 days. The access costs are higher if you do access the data, so you must take that into consideration before you change the storage class.

The storage class for tiered data is system wide—it's not per volume.

For information about supported storage classes, see [Data tiering overview](#).

Steps

1. From the working environment, click the menu icon and then click **Storage Classes** or **Blob Storage Tiering**.
2. Choose a storage class and then click **Save**.

Copyright Information

Copyright © 2020 NetApp, Inc. All rights reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system-without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP “AS IS” AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

Trademark Information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.