



# **Manage the Snapshot copy reserve**

## **ONTAP 9**

NetApp  
August 10, 2023

# Table of Contents

- Manage the Snapshot copy reserve . . . . . 1
  - Manage the Snapshot copy reserve overview . . . . . 1
  - When to increase the Snapshot copy reserve . . . . . 1
  - How deleting protected files can lead to less file space than expected . . . . . 2
  - Monitor Snapshot copy disk consumption . . . . . 3
  - Check available Snapshot copy reserve on a volume . . . . . 3
  - Modify the Snapshot copy reserve . . . . . 4
  - Autodelete Snapshot copies . . . . . 4

# Manage the Snapshot copy reserve

## Manage the Snapshot copy reserve overview

The *Snapshot copy reserve* sets aside a percentage of disk space for Snapshot copies, five percent by default. Because Snapshot copies use space in the active file system when the Snapshot copy reserve is exhausted, you might want to increase the Snapshot copy reserve as needed. Alternatively, you can autodelete Snapshot copies when the reserve is full.

## When to increase the Snapshot copy reserve

In deciding whether to increase the Snapshot reserve, it's important to remember that a Snapshot copy records only changes to files since the last Snapshot copy was made. It consumes disk space only when blocks in the active file system are modified or deleted.

This means that the rate of change of the file system is the key factor in determining the amount of disk space used by Snapshot copies. No matter how many Snapshot copies you create, they will not consume disk space if the active file system has not changed.

A FlexVol volume containing database transaction logs, for example, might have a Snapshot copy reserve as large as 20% to account for its greater rate of change. Not only will you want to create more Snapshot copies to capture the more frequent updates to the database, you will also want to have a larger Snapshot copy reserve to handle the additional disk space the Snapshot copies consume.



A Snapshot copy consists of pointers to blocks rather than copies of blocks. You can think of a pointer as a “claim” on a block: ONTAP “holds” the block until the Snapshot copy is deleted.



*A Snapshot copy consumes disk space only when blocks in the active file system are modified or deleted.*

## How deleting protected files can lead to less file space than expected

A Snapshot copy points to a block even after you delete the file that used the block. This explains why an exhausted Snapshot copy reserve might lead to the counter-intuitive result in which deleting an entire file system results in less space being available than the file system occupied.

Consider the following example. Before deleting any files, the `df` command output is as follows:

```

Filesystem      kbytes  used  avail  capacity
/vol/vol0/      3000000 3000000 0       100%
/vol/vol0/.snapshot 1000000 500000 500000  50%
```

After deleting the entire file system and making a Snapshot copy of the volume, the `df` command generates the following output:

```
Filesystem      kbytes  used   avail  capacity
/vol/vol0/      3000000 2500000 500000   83%
/vol/vol0/.snapshot 1000000 3500000 0         350%
```

As the output shows, the entire 3 GB formerly used by the active file system is now being used by Snapshot copies, in addition to the 0.5 GB used before the deletion.

Because the disk space used by the Snapshot copies now exceeds the Snapshot copy reserve, the overflow of 2.5 GB “spills” into the space reserved for active files, leaving you with 0.5 GB free space for files where you might reasonably have expected 3 GB.

## Monitor Snapshot copy disk consumption

You can monitor Snapshot copy disk consumption using the `df` command. The command displays the amount of free space in the active file system and the Snapshot copy reserve.

### Step

1. Display Snapshot copy disk consumption: `df`

The following example shows Snapshot copy disk consumption:

```
cluster1::> df
Filesystem      kbytes  used   avail  capacity
/vol/vol0/      3000000 3000000 0         100%
/vol/vol0/.snapshot 1000000 500000 500000   50%
```

## Check available Snapshot copy reserve on a volume

You might want to check how much Snapshot copy reserve is available on a volume by using the `snapshot-reserve-available` parameter with the `volume show` command.

### Step

1. Check the Snapshot copy reserve available on a volume:

```
vol show -vserver SVM -volume volume -fields snapshot-reserve-available
```

For complete command syntax, see the man page.

The following example displays the available Snapshot copy reserve for `vol11`:

```
cluster1::> vol show -vserver vs0 -volume vol1 -fields snapshot-reserve-
available

vserver volume snapshot-reserve-available
-----
vs0      vol1      4.84GB
```

## Modify the Snapshot copy reserve

You might want to configure a larger Snapshot copy reserve to prevent Snapshot copies from using space reserved for the active file system. You can decrease the Snapshot copy reserve when you no longer need as much space for Snapshot copies.

### Step

1. Modify the Snapshot copy reserve:

```
volume modify -vserver SVM -volume volume -percent-snapshot-space snap_reserve
```

For complete command syntax, see the man page.

The following example sets the Snapshot copy reserve for `vol1` to 10 percent:

```
cluster1::> volume modify -vserver vs0 -volume vol1 -percent-snapshot
-space 10
```

## Autodelete Snapshot copies

You can use the `volume snapshot autodelete modify` command to trigger automatic deletion of Snapshot copies when the Snapshot reserve is exceeded. By default, the oldest Snapshot copies are deleted first.

### About this task

LUN and file clones are deleted when there are no more Snapshot copies to be deleted.

### Step

1. Autodelete Snapshot copies:

```
volume snapshot autodelete modify -vserver SVM -volume volume -enabled
true|false -trigger volume|snap_reserve
```

For complete command syntax, see the man page.

The following example autodeletes Snapshot copies for `vol1` when the Snapshot copy reserve is exhausted:

```
cluster1::> volume snapshot autodelete modify -vserver vs0 -volume vol1  
-enabled true -trigger snap_reserve
```

## Copyright information

Copyright © 2023 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.

LIMITED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (b)(3) of the Rights in Technical Data -Noncommercial Items at DFARS 252.227-7013 (FEB 2014) and FAR 52.227-19 (DEC 2007).

Data contained herein pertains to a commercial product and/or commercial service (as defined in FAR 2.101) and is proprietary to NetApp, Inc. All NetApp technical data and computer software provided under this Agreement is commercial in nature and developed solely at private expense. The U.S. Government has a non-exclusive, non-transferrable, nonsublicensable, worldwide, limited irrevocable license to use the Data only in connection with and in support of the U.S. Government contract under which the Data was delivered. Except as provided herein, the Data may not be used, disclosed, reproduced, modified, performed, or displayed without the prior written approval of NetApp, Inc. United States Government license rights for the Department of Defense are limited to those rights identified in DFARS clause 252.227-7015(b) (FEB 2014).

## 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.