



Manage Flash Pool caching policies

ONTAP 9

NetApp

March 14, 2023

Table of Contents

- Manage Flash Pool caching policies 1
 - Overview of managing Flash Pool caching policies 1
 - Determine whether to modify the caching policy of Flash Pool local tiers (aggregates) 1
 - Modify caching policies of Flash Pool local tiers (aggregates)..... 2
 - Set the cache-retention policy for Flash Pool local tiers (aggregates)..... 3

Manage Flash Pool caching policies

Overview of managing Flash Pool caching policies

Using the CLI, you can perform various procedures to manage Flash Pool caching policies in your system.

- **Preparation**
 - [Determine whether to modify the caching policy of Flash Pool local tiers \(aggregates\)](#)
- **Caching policies modification**
 - [Modify caching policies of Flash Pool local tiers \(aggregates\)](#)
 - [Set the cache-retention policy for Flash Pool local tiers \(aggregates\)](#)

Determine whether to modify the caching policy of Flash Pool local tiers (aggregates)

You can assign cache-retention policies to volumes in Flash Pool local tiers (aggregates) to determine how long the volume data remains in the Flash Pool cache. However, in some cases changing the cache-retention policy might not impact the amount of time the volume's data remains in the cache.

About this task

If your data meets any of the following conditions, changing your cache-retention policy might not have an impact:

- Your workload is sequential.
- Your workload does not reread the random blocks cached in the solid state drives (SSDs).
- The cache size of the volume is too small.

Steps

The following steps check for the conditions that must be met by the data. The task must be done using the CLI in advanced privilege mode.

1. Use the CLI to view the workload volume:

```
statistics start -object workload_volume
```

2. Determine the workload pattern of the volume:

```
statistics show -object workload_volume -instance volume-workload -counter sequential_reads
```

3. Determine the hit rate of the volume:

```
statistics show -object waf1_hya_vvol -instance volume -counter read_ops_replaced_ppercent|wc_write_blks_overwritten_percent
```

4. Determine the Cacheable Read and Project Cache Alloc of the volume:

```
system node run -node node_name wafl awa start aggr_name
```

5. Display the AWA summary:

```
system node run -node node_name wafl awa print aggr_name
```

6. Compare the volume's hit rate to the Cacheable Read.

If the hit rate of the volume is greater than the Cacheable Read, then your workload does not reread random blocks cached in the SSDs.

7. Compare the volume's current cache size to the Project Cache Alloc.

If the current cache size of the volume is greater than the Project Cache Alloc, then the size of your volume cache is too small.

Modify caching policies of Flash Pool local tiers (aggregates)

You should modify the caching policy of a volume only if a different caching policy is expected to provide better performance. You can modify the caching policy of a volume on a Flash Pool local tier (aggregate).

What you'll need

You must determine whether you want to modify your caching policy.

About this task

In most cases, the default caching policy of "auto" is the best caching policy that you can use. The caching policy should be changed only if a different policy provides better performance for your workload. Configuring the wrong caching policy can severely degrade volume performance; the performance degradation could increase gradually over time. You should use caution when modifying caching policies. If you experience performance issues with a volume for which the caching policy has been changed, you should return the caching policy to "auto".

Step

1. Use the CLI to modify the volume's caching policy:

```
volume modify -volume volume_name -caching-policy policy_name
```

Example

The following example modifies the caching policy of a volume named "vol2" to the policy "none":

```
volume modify -volume vol2 -caching-policy none
```

Set the cache-retention policy for Flash Pool local tiers (aggregates)

You can assign cache-retention policies to volumes in Flash Pool local tiers (aggregates). Data in volumes with a high cache-retention policy remains in cache longer and data in volumes with a low cache-retention policy is removed sooner. This increases performance of your critical workloads by making high priority information accessible at a faster rate for a longer period of time.

What you'll need

You should know whether your system has any conditions that might prevent the cache-retention policy from having an impact on how long your data remains in cache.

Steps

Use the CLI in advanced privilege mode to perform the following steps:

1. Change the privilege setting to advanced:

```
set -privilege advanced
```

2. Verify the volume's cache-retention policy:

By default the cache retention policy is "normal".

3. Set the cache-retention policy:

ONTAP Version	Command
ONTAP 9.0, 9.1	<pre>priority hybrid-cache set volume_name read-cache=read_cache_value write- cache=write_cache_value cache- retention- priority=cache_retention_policy</pre> <p>Set <code>cache_retention_policy</code> to high for data that you want to remain in cache longer. Set <code>cache_retention_policy</code> to low for data that you want to remove from cache sooner.</p>
ONTAP 9.2 or later	<pre>volume modify -volume volume_name -vserver vservers_name -caching-policy policy_name.</pre>

4. Verify that the volume's cache-retention policy is changed to the option you selected.
5. Return the privilege setting to admin:

```
set -privilege admin
```

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.