



# **Manage and monitor the BranchCache configuration**

**ONTAP 9**

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# Table of Contents

- Manage and monitor the BranchCache configuration ..... 1
  - Modify BranchCache configurations ..... 1
  - Display information about BranchCache configurations ..... 3
  - Change the BranchCache server key ..... 3
  - Pre-compute BranchCache hashes on specified paths ..... 4
  - Flush hashes from the SVM BranchCache hash store ..... 7
  - Display BranchCache statistics ..... 7
  - Support for BranchCache Group Policy Objects ..... 10
  - Display information about BranchCache Group Policy Objects ..... 11

# Manage and monitor the BranchCache configuration

## Modify BranchCache configurations

You can modify the configuration of the BranchCache service on SVMs, including changing the hash store directory path, the hash store maximum directory size, the operating mode, and which BranchCache versions are supported. You can also increase the size of the volume that contains the hash store.

### Steps

1. Perform the appropriate action:

| If you want to...  | Enter the following...   |
|--|--|
| Modify the hash store directory size                         | <pre>vserver cifs branchcache modify -vserver vserver_name -hash-store-max -size {integer[KB MB GB TB PB]}</pre>   |
| Increase the size of the volume that contains the hash store | <pre>volume size -vserver vserver_name -volume volume_name -new-size new_size[k m g t]</pre> <p>If the volume containing the hash store fills up, you might be able to increase the size of the volume. You can specify the new volume size as a number followed by a unit designation.</p> <p>Learn more about <a href="#">managing FlexVol volumes</a></p> |

| If you want to...                      | Enter the following...   |
|--|--|
| Modify the hash store directory path   | <pre>vserver cifs branchcache modify -vserver vserver_name -hash-store-path path -flush-hashes {true false}</pre> <p>If the SVM is an SVM disaster recovery source, the hash path cannot be on the root volume. This is because the root volume is not replicated to the disaster recovery destination.</p> <p>The BranchCache hash path can contain blanks and any valid file name characters.</p> <p>If you modify the hash path, <code>-flush-hashes</code> is a required parameter that specifies whether you want ONTAP to flush the hashes from the original hash store location. You can set the following values for the <code>-flush-hashes</code> parameter:</p> <ul style="list-style-type: none"> <li>• If you specify <code>true</code>, ONTAP deletes the hashes in the original location and creates new hashes in the new location as new requests are made by BranchCache-enabled clients.</li> <li>• If you specify <code>false</code>, the hashes are not flushed.</li> </ul> <p>In this case, you can choose to reuse the existing hashes later by changing the hash store path back to the original location.</p> |
| Change the operating mode              | <pre>vserver cifs branchcache modify -vserver vserver_name -operating-mode {per-share all-shares disable}</pre> <p>You should be aware of the following when modifying the operating mode:</p> <ul style="list-style-type: none"> <li>• ONTAP advertises BranchCache support for a share when the SMB session is set up.</li> <li>• Clients that already have established sessions when BranchCache is enabled need to disconnect and reconnect to use cached content for this share.</li> </ul>   |
| Change the BranchCache version support | <pre>vserver cifs branchcache modify -vserver vserver_name -versions {v1- enable v2-enable enable-all}</pre>   |

2. Verify the configuration changes by using the `vserver cifs branchcache show` command.

# Display information about BranchCache configurations

You can display information about BranchCache configurations on storage virtual machines (SVMs), which can be used when verifying a configuration or when determining current settings before modifying a configuration.

## Step

1. Perform one of the following actions:

| If you want to display...  | Enter this command...   |
|--|---|
| Summary information about BranchCache configurations on all SVMs | <code>vserver cifs branchcache show</code>                              |
| Detailed information about the configuration on a specific SVM   | <code>vserver cifs branchcache show -vserver <i>vserver_name</i></code> |

## Example

The following example displays information about the BranchCache configuration on SVM vs1:

```
cluster1::> vserver cifs branchcache show -vserver vs1

                                Vserver: vs1
        Supported BranchCache Versions: enable_all
                        Path to Hash Store: /hash_data
        Maximum Size of the Hash Store: 20GB
Encryption Key Used to Secure the Hashes: -
        CIFS BranchCache Operating Modes: per_share
```

# Change the BranchCache server key

You can change the BranchCache server key by modifying the BranchCache configuration on the storage virtual machine (SVM) and specifying a different server key.

## About this task

You can set the server key to a specific value so that if multiple servers are providing BranchCache data for the same files, clients can use hashes from any server using that same server key.

When you change the server key, you must also flush the hash cache. After flushing the hashes, ONTAP creates new hashes as new requests are made by BranchCache-enabled clients.

## Steps

1. Change the server key by using the following command: `vserver cifs branchcache modify -vserver vserver_name -server-key text -flush-hashes true`

When configuring a new server key, you must also specify `-flush-hashes` and set the value to `true`.

2. Verify that the BranchCache configuration is correct by using the `vserver cifs branchcache show` command.

### Example

The following example sets a new server key that contains spaces and flushes the hash cache on SVM vs1:

```
cluster1::> vserver cifs branchcache modify -vserver vs1 -server-key "new
vserver secret" -flush-hashes true

cluster1::> vserver cifs branchcache show -vserver vs1

                Vserver: vs1
Supported BranchCache Versions: enable_all
                Path to Hash Store: /hash_data
Maximum Size of the Hash Store: 20GB
Encryption Key Used to Secure the Hashes: -
CIFS BranchCache Operating Modes: per_share
```

### Related information

[Reasons ONTAP invalidates BranchCache hashes](#)

## Pre-compute BranchCache hashes on specified paths

You can configure the BranchCache service to pre-compute hashes for a single file, for a directory, or for all files in a directory structure. This can be helpful if you want to compute hashes on data in a BranchCache-enabled share during off, non-peak hours.

### About this task

If you want to collect a data sample before you display hash statistics, you must use the `statistics start` and optional `statistics stop` commands.

- You must specify the storage virtual machine (SVM) and path on which you want to pre-compute hashes.
- You must also specify whether you want hashes computed recursively.
- If you want hashes computed recursively, the BranchCache service traverses the entire directory tree under the specified path, and computes hashes for each eligible object.

### Steps

1. Pre-compute hashes as desired:

| If you want to pre-compute hashes on... | Enter the command...  |
|---|---|
| A single file or directory              | <pre>vserver cifs branchcache hash-create -vserver vserver_name -path path -recurse false</pre> |

| If you want to pre-compute hashes on...           | Enter the command...  |
|---|---|
| Recursively on all files in a directory structure | <code>vserver cifs branchcache hash-create<br/>-vserver vserver_name -path<br/>absolute_path -recurse true</code> |

2. Verify that hashes are being computed by using the `statistics` command:

- a. Display statistics for the `hashd` object on the desired SVM instance: `statistics show -object hashd -instance vserver_name`
- b. Verify that the number of hashes created is increasing by repeating the command.

### Examples

The following example creates hashes on the path `/data` and on all contained files and subdirectories on SVM vs1:

```
cluster1::> vserver cifs branchcache hash-create -vserver vs1 -path /data
-recurse true
```

```
cluster1::> statistics show -object hashd -instance vs1
```

Object: hashd

Instance: vs1

Start-time: 9/6/2012 19:09:54

End-time: 9/6/2012 19:11:15

Cluster: cluster1

| Counter                         | Value                                |
|---------------------------------|--------------------------------------|
| branchcache_hash_created        | 85                                   |
| branchcache_hash_files_replaced | 0                                    |
| branchcache_hash_rejected       | 0                                    |
| branchcache_hash_store_bytes    | 0                                    |
| branchcache_hash_store_size     | 0                                    |
| instance_name                   | vs1                                  |
| node_name                       | node1                                |
| node_uuid                       | 11111111-1111-1111-1111-111111111111 |
| process_name                    | -                                    |

```
cluster1::> statistics show -object hashd -instance vs1
```

Object: hashd

Instance: vs1

Start-time: 9/6/2012 19:09:54

End-time: 9/6/2012 19:11:15

Cluster: cluster1

| Counter                         | Value                                |
|---------------------------------|--------------------------------------|
| branchcache_hash_created        | 92                                   |
| branchcache_hash_files_replaced | 0                                    |
| branchcache_hash_rejected       | 0                                    |
| branchcache_hash_store_bytes    | 0                                    |
| branchcache_hash_store_size     | 0                                    |
| instance_name                   | vs1                                  |
| node_name                       | node1                                |
| node_uuid                       | 11111111-1111-1111-1111-111111111111 |
| process_name                    | -                                    |

## Related information

[Performance monitoring setup](#)



# Flush hashes from the SVM BranchCache hash store

You can flush all cached hashes from the BranchCache hash store on the storage virtual machine (SVM). This can be useful if you have changed the branch office BranchCache configuration. For example, if you recently reconfigured the caching mode from distributed caching to hosted caching mode, you would want to flush the hash store.

## About this task

After flushing the hashes, ONTAP creates new hashes as new requests are made by BranchCache-enabled clients.

## Step

1. Flush the hashes from the BranchCache hash store: `vserver cifs branchcache hash-flush -vserver vserver_name`  
  
`vserver cifs branchcache hash-flush -vserver vs1`

# Display BranchCache statistics

You can display BranchCache statistics to, among other things, identify how well caching is performing, determine whether your configuration is providing cached content to clients, and determine whether hash files were deleted to make room for more recent hash data.

## About this task

The `hashd` statistic object contains counters that provide statistical information about BranchCache hashes. The `cifs` statistic object contains counters that provide statistical information about BranchCache-related activity. You can collect and display information about these objects at the advanced-privilege level.

## Steps

1. Set the privilege level to advanced: `set -privilege advanced`

```
cluster1::> set -privilege advanced
```

```
Warning: These advanced commands are potentially dangerous; use them  
only when directed to do so by support personnel.  
Do you want to continue? {y|n}: y
```

2. Display the BranchCache-related counters by using the `statistics catalog counter show` command.

For more information about statistics counters, see the man page for this command.

```
cluster1::*> statistics catalog counter show -object hashd  
  
Object: hashd
```

| Counter                         | Description  |
|---------------------------------|--|
| -----                           | -----  |
| branchcache_hash_created        | Number of times a request to generate BranchCache hash for a file succeeded.   |
| branchcache_hash_files_replaced | Number of times a BranchCache hash file was deleted to make room for more recent hash data. This happens if the hash store size is exceeded. |
| branchcache_hash_rejected       | Number of times a request to generate BranchCache hash data failed.  |
| branchcache_hash_store_bytes    | Total number of bytes used to store hash data.   |
| branchcache_hash_store_size     | Total space used to store BranchCache hash data for the Vserver.   |
| instance_name                   | Instance Name  |
| instance_uuid                   | Instance UUID  |
| node_name                       | System node name   |
| node_uuid                       | System node id   |

9 entries were displayed.

```
cluster1::*> statistics catalog counter show -object cifs
```

Object: cifs

| Counter                     | Description  |
|-----------------------------|--|
| -----                       | -----  |
| active_searches             | Number of active searches over SMB and SMB2  |
| auth_reject_too_many        | Authentication refused after too many requests were made in rapid succession       |
| avg_directory_depth         | Average number of directories crossed by SMB and SMB2 path-based commands          |
| avg_junction_depth          | Average number of junctions crossed by SMB and SMB2 path-based commands            |
| branchcache_hash_fetch_fail | Total number of times a request to fetch hash data failed. These are failures when |

```

It attempting to read existing hash data.
data does not include attempts to fetch hash
that has not yet been generated.
branchcache_hash_fetch_ok Total number of times a request to fetch
hash data succeeded.
branchcache_hash_sent_bytes Total number of bytes sent to clients
requesting hashes.
branchcache_missing_hash_bytes
Total number of bytes of data that had
to be read by the client because the hash for
that content was not available on the server.
....Output truncated....

```

3. Collect BranchCache-related statistics by using the `statistics start` and `statistics stop` commands.

```

cluster1:*> statistics start -object cifs -vserver vs1 -sample-id 11
Statistics collection is being started for Sample-id: 11

cluster1:*> statistics stop -sample-id 11
Statistics collection is being stopped for Sample-id: 11

```

4. Display the collected BranchCache statistics by using the `statistics show` command.

```
cluster1::*> statistics show -object cifs -counter  
branchcache_hash_sent_bytes -sample-id 11
```

```
Object: cifs  
Instance: vs1  
Start-time: 12/26/2012 19:50:24  
End-time: 12/26/2012 19:51:01  
Cluster: cluster1
```

| Counter                     | Value |
|-----------------------------|-------|
| branchcache_hash_sent_bytes | 0     |
| branchcache_hash_sent_bytes | 0     |
| branchcache_hash_sent_bytes | 0     |
| branchcache_hash_sent_bytes | 0     |

```
cluster1::*> statistics show -object cifs -counter  
branchcache_missing_hash_bytes -sample-id 11
```

```
Object: cifs  
Instance: vs1  
Start-time: 12/26/2012 19:50:24  
End-time: 12/26/2012 19:51:01  
Cluster: cluster1
```

| Counter                        | Value |
|--------------------------------|-------|
| branchcache_missing_hash_bytes | 0     |
| branchcache_missing_hash_bytes | 0     |
| branchcache_missing_hash_bytes | 0     |
| branchcache_missing_hash_bytes | 0     |

5. Return to the admin privilege level: `set -privilege admin`

```
cluster1::*> set -privilege admin
```

## Related information

[Displaying statistics](#)

[Performance monitoring setup](#)

# Support for BranchCache Group Policy Objects

ONTAP BranchCache provides support for BranchCache Group Policy Objects (GPOs),

which allow centralized management for certain BranchCache configuration parameters. There are two GPOs used for BranchCache, the Hash Publication for BranchCache GPO and the Hash Version Support for BranchCache GPO.

- **Hash Publication for BranchCache GPO**

The Hash Publication for BranchCache GPO corresponds to the `-operating-mode` parameter. When GPO updates occur, this value is applied to storage virtual machine (SVM) objects contained within the organizational unit (OU) to which the group policy applies.

- **Hash Version Support for BranchCache GPO**

The Hash Version Support for BranchCache GPO corresponds to the `-versions` parameter. When GPO updates occur, this value is applied to SVM objects contained within the organizational unit to which the group policy applies.

## Related information

[Applying Group Policy Objects to CIFS servers](#)

# Display information about BranchCache Group Policy Objects

You can display information about the CIFS server's Group Policy Object (GPO) configuration to determine whether BranchCache GPOs are defined for the domain to which the CIFS server belongs and, if so, what the allowed settings are. You can also determine whether BranchCache GPO settings are applied to the CIFS server.

## About this task

Even though a GPO setting is defined within the domain to which the CIFS server belongs, it is not necessarily applied to the organizational unit (OU) containing the CIFS-enabled storage virtual machine (SVM). Applied GPO settings are the subset of all defined GPOs that are applied to the CIFS-enabled SVM. BranchCache settings applied through GPOs override settings applied through the CLI.

## Steps

1. Display the defined BranchCache GPO setting for the Active Directory domain by using the `vserver cifs group-policy show-defined` command.



This example does not display all of the available output fields for the command. Output is truncated.

```
cluster1::> vserver cifs group-policy show-defined -vserver vs1
```

```
Vserver: vs1
```

```
-----
```

```
    GPO Name: Default Domain Policy
```

```
    Level: Domain
```

```
    Status: enabled
```

```
Advanced Audit Settings:
```

```
    Object Access:
```

```
        Central Access Policy Staging: failure
```

```
Registry Settings:
```

```
    Refresh Time Interval: 22
```

```
    Refresh Random Offset: 8
```

```
    Hash Publication Mode for BranchCache: per-share
```

```
    Hash Version Support for BranchCache: version1
```

```
[...]
```

```
    GPO Name: Resultant Set of Policy
```

```
    Status: enabled
```

```
Advanced Audit Settings:
```

```
    Object Access:
```

```
        Central Access Policy Staging: failure
```

```
Registry Settings:
```

```
    Refresh Time Interval: 22
```

```
    Refresh Random Offset: 8
```

```
    Hash Publication for Mode BranchCache: per-share
```

```
    Hash Version Support for BranchCache: version1
```

```
[...]
```

2. Display the BranchCache GPO setting applied to the CIFS server by using the `vserver cifs group-policy show-applied` command. ``



This example does not display all of the available output fields for the command. Output is truncated.

```
cluster1::> vserver cifs group-policy show-applied -vserver vs1
```

```
Vserver: vs1
```

```
-----
```

```
    GPO Name: Default Domain Policy
```

```
        Level: Domain
```

```
        Status: enabled
```

```
Advanced Audit Settings:
```

```
    Object Access:
```

```
        Central Access Policy Staging: failure
```

```
Registry Settings:
```

```
    Refresh Time Interval: 22
```

```
    Refresh Random Offset: 8
```

```
    Hash Publication Mode for BranchCache: per-share
```

```
    Hash Version Support for BranchCache: version1
```

```
[...]
```

```
    GPO Name: Resultant Set of Policy
```

```
        Level: RSOP
```

```
Advanced Audit Settings:
```

```
    Object Access:
```

```
        Central Access Policy Staging: failure
```

```
Registry Settings:
```

```
    Refresh Time Interval: 22
```

```
    Refresh Random Offset: 8
```

```
    Hash Publication Mode for BranchCache: per-share
```

```
    Hash Version Support for BranchCache: version1
```

```
[...]
```

## Related information

[Enabling or disabling GPO support on a CIFS server](#)

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