Manage a FlexCache relationship

ONTAP 9

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Manage a FlexCache relationship

Synchronize properties of a FlexCache volume from an origin volume

Some of the volume properties of the FlexCache volume must always be synchronized with those of the origin volume. If the volume properties of a FlexCache volume fail to synchronize automatically after the properties are modified at the origin volume, you can manually synchronize the properties.

About this task

The following volume properties of a FlexCache volume must always be synchronized with those of the origin volume:

- Security style (`-security-style`)
- Volume name (`-volume-name`)
- Maximum directory size (`-maxdir-size`)
- Minimum read ahead (`-min-readahead`)

Step

1. From the FlexCache volume, synchronize the volume properties:

   ```
   volume flexcache sync-properties -vserver svm_name -volume flexcache_volume
   ```

   ```
   cluster1::> volume flexcache sync-properties -vserver vs1 -volume fc1
   ```

Update the configurations of a FlexCache relationship

After events such as volume move, aggregate relocation, or storage failover, the volume configuration information on the origin volume and FlexCache volume is updated automatically. In case the automatic updates fail, an EMS message is generated and then you must manually update the configuration for the FlexCache relationship.

If the origin volume and the FlexCache volume are in the disconnected mode, you might need to perform some additional operations to update a FlexCache relationship manually.

About this task

If you want to update the configurations of a FlexCache volume, you must run the command from the origin volume. If you want to update the configurations of an origin volume, you must run the command from the FlexCache volume.

Step

1. Update the configuration of the FlexCache relationship:

   ```
   volume flexcache config-refresh -peer-vserver peer_svm -peer-volume
   ```

```
peer_volume_to_update -peer-endpoint-type [origin | cache]
```

Enable file access time updates

Beginning with ONTAP 9.11.1, you can enable the `-atime-update` field on the FlexCache volume to permit file access time updates. You can also set an access time update period with the `-atime-update-period` attribute. The `-atime-update-period` attribute controls how often access time updates can take place and when they can propagate to the origin volume.

Overview

ONTAP provides a volume-level field called `-atime-update`, to manage access time updates on files and directories that are read using READ, READLINK, and READDIR. Atime is used for data lifecycle decisions for files and directories that are infrequently accessed. The infrequently accessed files are eventually migrated to archive storage and are often later moved to tape.

The atime-update field is disabled by default on existing and newly created FlexCache volumes. If you are using FlexCache volumes with ONTAP releases earlier than 9.11.1, you should leave the atime-update field disabled so caches aren't unnecessarily evicted when a read operation is performed on the origin volume. With large FlexCache caches, however, administrators use special tools to manage data and help to ensure that hot data remains in the cache and cold data is purged. This is not possible when atime-update is disabled. However, beginning with ONTAP 9.11.1, you can enable `-atime-update` and `-atime-update-period`, and use the tools required to manage the cached data.

Before you begin

All FlexCache volumes must be running ONTAP 9.11.1 or later.

About this task

Setting `-atime-update-period` to 86400 seconds allows no more than one access time update per 24-hour period, regardless of the number of read-like operations performed on a file.

Setting the `-atime-update-period` to 0 sends messages to the origin for each read access. The origin then informs each FlexCache volume that the atime is outdated, which impacts performance.

Steps

1. Enable file access time updates and set the update frequency:

   ```
   volume modify -volume vol_name -vserver SVM_name -atime-update true -atime
   -update-period seconds
   ```

   The following example enables `-atime-update` and sets `-atime-update-period` to 86400 seconds, or 24 hours:

   ```
   c1: volume modify -volume origin1 vs1_c1 -atime-update true -atime
   -update-period 86400
   ```

2. Verify that `-atime-update` is enabled:

   `volume show -volume vol_name -fields atime-update,atime-update-period`

```
c1::*> volume show -volume cache1_origin1 -fields atime-update,atime-
update-period
vserver volume         atime-update atime-update-period
------- -------------- ------------ -------------------
vs2_c1  cache1_origin1 true         86400
```

Enable global file locking

Beginning with ONTAP 9.10.1, global file locking can be applied to prevent reads across all related cached files.

About this task

By default, FlexCache volumes favor availability over consistency. Without global file locking, any modification to an origin will be distributed to FlexCache volumes, but they might not be updated simultaneously. Global file locking favors consistency across volumes over availability. With global file locking enabled, modifications to the origin will be suspended until all FlexCache volumes are online.

> You should only enable global file locking when you have control over the reliability of the connections between cache and origin due to suspension and possible timeouts of modifications when FlexCache volumes are offline.

Global file locking requires the clusters containing the origin and all associated caches to be running ONTAP 9.9.1 or later. Global file locking can be enabled on new or existing FlexCache volumes. The command can be run on one volume and will apply to all associated volumes.

You must be in the advanced privilege level to enable global file locking.

The process to enable global file locking depends on whether the origin has existing caches.

- Enable global file locking on new FlexCache volumes
- Enable global file locking on existing FlexCache volumes

Enable global file locking on new FlexCache volumes

Steps

1. Create the FlexCache volume with `-is-global-file-locking` set to true:

   `volume flexcache create volume volume_name -is-global-file-locking-enabled true`

   The default value of `-is-global-file-locking` is “false”. When any subsequent `volume flexcache create` commands are run on a volume, they must be passed with `-is-global-file-locking enabled` set to “true”.

Enable global file locking on existing FlexCache volumes

Steps

1. Global file locking must be set from the origin volume.
2. The origin cannot have any other existing relationships (for example, SnapMirror). Any existing relationships must be dissociated. All caches and volumes must be connected at the time of running the command. To check the connection status, run:

   ```
   volume flexcache connection-status show
   ```

   The status for all the listed volumes should display as "`connected.`" For more information, see View the status of a FlexCache relationship or Synchronize properties of a FlexCache volume from an origin.

3. Enable global file locking on the caches:

   ```
   volume flexcache origin config show/modify -volume volume_name -is-global-file
   -locking-enabled true
   ```

If reverting to a version of ONTAP earlier than 9.9.1, global file lock must first be disabled on the origin and associated caches. This can be managed by running:

```
volume flexcache prepare-to-downgrade -disable-feature-set 9.10.0
```

Prepopulate a FlexCache volume

You can prepopulate a FlexCache volume to reduce the time it takes to access cached data.

What you'll need

- You must be a cluster administrator at the advanced privilege level
- The paths you pass for prepopulation must exist or the prepopulate operation fails.

About this task

- Prepopulate reads files only and crawls through directories
- The `-isRecursion` flag applies to the entire list of directories passed to prepopulate

Steps

1. Prepopulate a FlexCache volume:

   ```
   volume flexcache prepopulate -cache-vserver vserver_name -cache-volume -path
   -list path_list -isRecursion true|false
   ```

   - The `-path-list` parameter indicates the relative directory path you want to prepopulate starting from the origin root directory. For example, if the origin root directory is named /origin and it contains directories /origin/dir1 and /origin/dir2, you can specify the path list as follows: `-path-list dir1, dir2` or `-path-list /dir1, /dir2`.
   - The default value of the `-isRecursion` parameter is True.

     This example prepopulates a single directory path:

```
cluster1::*> flexcache prepopulate start -cache-vserver vs2 -cache
-volume fg_cachevol_1 -path-list /dir1
  (volume flexcache prepopulate start)
[JobId 207]: FlexCache prepopulate job queued.
```

This example prepopulates files from several directories:

```
cluster1::*> flexcache prepopulate start -cache-vserver vs2 -cache
-volume fg_cachevol_1 -path-list /dir1,/dir2,/dir3,/dir4
  (volume flexcache prepopulate start)
[JobId 208]: FlexCache prepopulate job queued.
```

This example prepopulates a single file:

```
cluster1::*> flexcache prepopulate start -cache-vserver vs2 -cache
-volume fg_cachevol_1 -path-list /dir1/file1.txt
  (volume flexcache prepopulate start)
[JobId 209]: FlexCache prepopulate job queued.
```

This example prepopulates all files from the origin:

```
cluster1::*> flexcache prepopulate start -cache-vserver vs2 -cache
-volume fg_cachevol_1 -path-list / -isRecursion true
  (volume flexcache prepopulate start)
[JobId 210]: FlexCache prepopulate job queued.
```

This example includes an invalid path for prepopulation:

```
cluster1::*> flexcache prepopulate start -cache-volume
vol_cache2_vs3_c2_vol_origin1_vs1_c1 -cache-vserver vs3_c2 -path-list
/dir1, dir5, dir6
  (volume flexcache prepopulate start)

Error: command failed: Path(s) "dir5, dir6" does not exist in origin
volume
       "vol_origin1_vs1_c1" in Vserver "vs1_c1".
```

2. Display the number of files read:

```
job show -id job_ID -ins
```

Delete a FlexCache relationship

You can delete a FlexCache relationship and the FlexCache volume if you no longer require the FlexCache volume.

Steps

1. From the cluster that has the FlexCache volume, take the FlexCache volume offline:

   ```
   volume offline -vserver svm_name -volume volume_name
   ```

2. Delete the FlexCache volume:

   ```
   volume flexcache delete -vserver svm_name -volume volume_name
   ```

   The FlexCache relationship details are removed from the origin volume and the FlexCache volume.

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