



vserver locks commands

ONTAP 9.6 commands

NetApp
August 29, 2024

Table of Contents

- vserver locks commands 1
- vserver locks break 1
- vserver locks show 3

vserver locks commands

vserver locks break

Break file locks based on a set of criteria

Availability: This command is available to *cluster* and *Vserver* administrators at the *advanced* privilege level.

Description

The `vserver locks break` command breaks one or more locks.

Parameters

{ -vserver <vserver name> - Vserver (privilege: advanced)

This parameter specifies the Vserver containing the lock.

-volume <volume name> - Volume (privilege: advanced)

This parameter specifies the name of the volume containing the lock.

[-lif <lif-name>] - Logical Interface (privilege: advanced)

This parameter specifies the logical interface through which the lock was established.

[-lif-id <integer>] - Logical Interface ID (privilege: advanced)

This parameter specifies the logical interface id through which the lock was established.

-path <text> - Object Path (privilege: advanced)

This parameter specifies a path to the lock.

| -lockid <UUID> - Lock UUID (privilege: advanced) }

This parameter specifies the universally unique identifier (UUID) for the lock. Queries and wildcard characters are not supported.

-owner-id <text> - Owner ID (privilege: advanced)

This parameter specifies an owner ID for a lock. This parameter must be used with the query notation `{ }` exhibited in the second example.

-protocol <lock protocol> - Lock Protocol (privilege: advanced)

This parameter specifies the protocol that was used to establish a lock. This parameter must be used with the query notation `{ }` exhibited in the second example.

-client-address <IP Address> - Client Address (privilege: advanced)

This parameter specifies a client address associated with a lock. This parameter must be used with the query notation `{ }` exhibited in the second example.

-client-address-type {ipv4|ipv6|ipv6z} - Client Address Type (privilege: advanced)

This parameter specifies the type of ip address a client used to create its lock (ipv4, ipv6). This parameter must be used with the query notation `{ }` exhibited in the second example.

-flexcache-volume <text> - FlexCache Volume Name (privilege: advanced)

This parameter specifies the name of the FlexCache volume. This parameter must be used with the query notation { } exhibited in the third example.

-flexcache-vserver <text> - FlexCache Vserver Name (privilege: advanced)

This parameter specifies the name of the Vserver hosting the FlexCache volume. This parameter must be used with the query notation { } exhibited in the third example.

-flexcache-cluster <text> - FlexCache Cluster Name (privilege: advanced)

This parameter specifies the name of the cluster hosting the FlexCache volume. This parameter must be used with the query notation { } exhibited in the third example.

Examples

The following example breaks the locks on all objects on the Vserver named vs0 in the volume named vol0, regardless of the paths to the locked objects and the logical interface through which the locks were established.

```
cluster1::*> vserver locks break -vserver vs0 -volume vol0 -path * -lif *
WARNING: Breaking file locks can cause applications to become
unsynchronized
           and may lead to data corruption.
Do you want to continue? {y|n}: y
1 entry was acted on.
```

The vserver locks break command can also be issued using a query on the parameters available to the vserver locks show command. The following example breaks all NLM protocol lock objects locked by the client at address 12.34.56.78.

```
cluster1::*> vserver locks break { -protocol nlm -client-address
12.34.56.78 }
Warning: Breaking file locks can cause applications to become
unsynchronized
           and may lead to data corruption.
Do you want to continue? {y|n}: y
1 entry was acted on.
```

The following example breaks all FlexCache lock objects locked for FlexCache volume "fc1" in Vserver "vs12".

```
cluster1::*> vserver locks break { -flexcache-volume fc1 -flexcache
-vserver vs12 -flexcache-cluster cluster2 }
Warning: Breaking file locks can cause applications to become
unsynchronized
        and may lead to data corruption.
Do you want to continue? {y|n}: y
1 entry was acted on.
```

vserver locks show

Display current list of locks

Availability: This command is available to *cluster* and *Vserver* administrators at the *admin* privilege level.

Description

The `vserver locks show` command displays information about locks. A lock is a synchronization mechanism for enforcing limits on concurrent access to files where many clients can be accessing the same file at the same time. The command output depends on the parameter or parameters specified with the command. If you do not specify any parameters, the command displays the following information about locks:

- Vserver name
- Volume name
- Object path
- Logical interface name
- Lock protocol
- Lock type
- Client



The `vserver locks show` command is also used to display FlexCache specific locks. FlexCache locks are not stored on the FlexCache volume. Instead all of the locks are stored on the origin of a FlexCache volume. To view the FlexCache locks use the `vserver locks show` command on the origin cluster.

Parameters

{ [-fields <fieldname>,...]

If you specify the `-fields <fieldname>, ...` parameter, the command output also includes the specified field or fields. You can use `'-fields ?'` to display the fields to specify.

| [-smb-attrs]

If you specify the `-smb-attrs` parameter, the command displays information related to SMB2 and higher.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

{ [-vserver <vserver name>] - Vserver

If you specify this parameter, the command displays information about locks on the specified Vserver.

[-volume <volume name>] - Volume

If you specify this parameter, the command displays information about locks on the specified volume.



For the FlexCache locks, this parameter displays the origin of a FlexCache volume name.

[-lif <lif-name>] - Logical Interface

If you specify this parameter, the command displays information about locks established through the specified logical interface name.



For the FlexCache locks, this parameter is unset if the FlexCache volume is not local to the cluster.

[-lif-id <integer>] - Logical Interface ID (privilege: advanced)

If you specify this parameter, the command displays information about locks established through the specified logical interface id.



For the FlexCache locks, this parameter displays the logical interface id of the FlexCache cluster.

[-path <text>] - Object Path

If you specify this parameter, the command displays information about locks at the specified path name.

[-lockid <UUID>] - Lock UUID }

If you specify this parameter, the command displays information about the lock with the specified universally unique identifier (UUID).

[-is-constituent {true|false}] - Is Constituent Volume

If you specify this parameter, the command displays information only about volumes that either are or are not constituents of a FlexGroup, depending on the value provided.

[-protocol <lock protocol>] - Lock Protocol

If you specify this parameter, the command displays information about locks established through the specified protocol. Some of the valid protocols are:

- *cifs*: SMB locks
- *nlm*: NFS3 locks
- *nfsv4*: NFS4.0 locks
- *nfsv4.1*: NFS4.1 locks
- *crposix*: CrPosix locks for CREATE and LINK
- *fcache*: Delegations for 7-mode destination FlexCache volumes

[-type {byte-range|share-level|op-lock|delegation}] - Lock Type

If you specify this parameter, the command displays information about locks of the specified lock type. The four types of locks are:

- Byte-range locks: Lock only a portion of a file.
- Share locks: Represent opened files.
- Opportunistic locks: Control client-side caching over SMB.
- Delegations: Control client-side caching over NFSv4.

[-node <nodename>] - Node Holding Lock State

If you specify this parameter, the command displays information about all locks on the specified node.

[-lock-state <lock_state>] - Lock State

If you specify this parameter, the command displays information about the state of the lock. Some of the valid states are:

- *granted*: The lock is established.
- *revoking*: The server is currently coordinating with the client to change the state of this lock.
- *revoked*: The lock is undergoing revocation to be downgraded or released.
- *adjusted*: The lock is undergoing revocation to be replaced by a lock equal to or weaker than the current lock.
- *subsumed*: The lock is one of a set of locks that will replace a lock that is being revoked.
- *waiting*: The lock is waiting to be granted, because it conflicts with another lock.
- *denied*: The lock has been denied.
- *timeout*: The lock was waiting and has now timed out.
- *gone*: The lock is about to be released.
- *unused*: The lock is allocated but has not been processed into any state.

[-bytelock-offset <integer>] - Bytelock Starting Offset

If you specify this parameter, the command displays information about bytelocks with the specified offset value. This is the index in the file (in bytes) where the lock begins.

[-bytelock-length <integer>] - Number of Bytes Locked

If you specify this parameter, the command displays information about bytelocks with the specified length. This is the number of bytes that are locked by this particular lock.

[-bytelock-mandatory {true|false}] - Bytelock is Mandatory

If you specify this parameter, the command displays information only about mandatory bytelocks. A mandatory bytelock enforces the requirement of byte range locking on clients before accessing the associated range.

[-bytelock-exclusive {true|false}] - Bytelock is Exclusive

If you specify this parameter, the command displays information only about exclusive bytelocks. When an exclusive bytelock is granted, no other bytelock may be granted whose range overlaps it.

[-bytelock-super {true|false}] - Bytelock is Superlock

If you specify this parameter, the command displays information only about super-bytelocks. When a super-bytelock is granted, all other locks on that file are released, and no other operations will be allowed on that file.

[-bytelock-soft {true|false}] - Bytelock is Soft

If you specify this parameter, the command displays information only about softened bytelocks. An NFSv4 bytelock might become softened if the connection to the client is interrupted. Soft locks might be reclaimed if the client reconnects. However if another client requests a lock that conflicts with a soft lock, then the soft lock will be released.

[-oplock-level {exclusive|level2|batch|null|read-batch}] - Oplock Level

If you specify this parameter, the command displays information about locks with the specified oplock level. The oplock level determines which operations the client may cache locally. Those operations include opening, reading, writing, closing, and creating and destroying bytelocks on a file. The five valid oplock levels are:

- *batch* : The client may cache all operations on the file.
- *exclusive* : The client may cache reads and writes on the file.
- *read-batch* : The client may cache reads and opens on the file.
- *level2* : The client may cache reads on the file.
- *null* : The client may not cache any operations on the file.

[-sharelock-mode <share lock mode>] - Shared Lock Access Mode

If you specify this parameter, the command displays information about locks with the specified sharelock mode. The parameter has two components separated by a hyphen: the access mode followed by the share mode. The access mode specifies which operations the client is allowed to perform on the file. The share mode specifies which operations other clients are disallowed to perform. The two modes are a combination of one or more of these permissions:

- *read*
- *write*
- *delete*
- *all*
- *none*

For example, the sharelock mode *read_write-deny_delete* allows the client to read and write the file, and disallows other clients to delete the file. A special mode is *delete-on-close*, which specifies that the server will delete the file as soon as it is closed.

[-sharelock-soft {true|false}] - Shared Lock is Soft

If you specify this parameter, the command displays information only about softened sharelocks. A NFSv4 sharelock can become softened when the connection to the client is interrupted. If the client reconnects, it might reclaim the sharelock. However, if another client creates a sharelock that conflicts with the softened sharelock, the softened sharelock will be released.

[-delegation-type {read|write}] - Delegation Type

If you specify this parameter, the command displays information only about locks with the specified delegation-type setting. The delegation type determines which operations the client may cache locally. The two valid delegation types are:

- *read* : The client may cache reads on the file.

- *write* : The client may cache reads and writes on the file.

[-owner-id <text>] - Owner ID

If you specify this parameter, the command displays information only about locks with the specified owner ID. The owner ID is an opaque byte string generated by the server for each file lock request.

[-client-address <IP Address>] - Client Address

If you specify this parameter, the command displays information only about locks from the specified client IP address.

[-client-address-type {ipv4|ipv6|ipv6z}] - Client Address Type

If you specify this parameter, the command displays information only about locks corresponding to a certain IP address type. Please note that locks created over the NFSv4 or NFSv4.1 protocol cannot have their address types resolved. Valid options are:

- *ipv4* : Clients operating over an IPv4 interface.
- *ipv6* : Clients operating over an IPv6 interface.

[-smb-open-type {none|durable|persistent}] - SMB Open Type

If you specify this parameter, the command displays information only about locks with the specified SMB open type. Valid open types are

- *durable* : Durability is a feature of SMB2. A durable lock might become "disconnected" if the connection between the client and server is disrupted. A disconnected durable lock might be reconnected if the connection is reestablished.
- *persistent* : Persistence is a feature of SMB3. Persistent locks can become disconnected and later reconnected, like durable locks. Persistent locks are used to facilitate continuously available shares.
- *none* : The lock is neither durable nor persistent.

[-smb-connect-state <Lock Connect State>] - SMB Connect State

If you specify this parameter, the command displays information only about locks with the specified SMB connection state. Some of the valid states are:

- *connected* : This is the normal state of a SMB lock when the server and client are connected.
- *disconnected* : If a lock is durable or persistent, it might become disconnected if the connection between the server and its client is interrupted. Disconnected locks may later be reconnected if the connection is reestablished.

[-smb-expiration-time <integer>] - SMB Expiration Time (Secs)

If you specify this parameter, the command displays information only about locks with the specified SMB lock expiration time. When a lock is disconnected, `-smb-expiration-time` shows the time remaining until the lock expires. The server releases the lock after it expires.

[-smb-open-group-id <text>] - SMB Open Group ID

If you specify this parameter, the command displays information only about locks with the specified SMB open group identifier. This is an opaque byte string provided by the client as the SMB lease key when the lock is first established.

[-is-flexcache-lock {true|false}] - Is FlexCache Lock

If you specify this parameter, the command displays information only about locks with the specified value.

[-flexcache-volume <text>] - FlexCache Volume Name

If you specify this parameter, the command displays information only about locks with the specified FlexCache volume.

[-flexcache-vserver <text>] - FlexCache Vserver Name

If you specify this parameter, the command displays information only about locks with the specified Vserver hosting a FlexCache volume.

[-flexcache-vserver-uuid <UUID>] - FlexCache Vserver UUID

If you specify this parameter, the command displays information only about locks with the specified UUID of a Vserver hosting a FlexCache volume.

[-flexcache-volume-msid <integer>] - FlexCache Volume MSID

If you specify this parameter, the command displays information only about locks with the specified FlexCache volume MSID

[-flexcache-cluster <text>] - FlexCache Cluster Name

If you specify this parameter, the command displays information only about locks with the specified cluster hosting a FlexCache volume.

Examples

The following example displays default information about all locks:

```

cluster1::> vserver locks show

Vserver: vs0
Volume   Object Path          LIF          Protocol  Lock Type
Client
-----
-----
voll     /voll/notes.txt      node1_data1
                               cifs      share-level
192.168.1.5
          Sharelock Mode: read_write-deny_delete
                               op-lock
192.168.1.5
          Oplock Level: read-batch
          /voll/notes1.txt    node1_data1
                               cifs      share-level
192.168.1.5
          Sharelock Mode: read_write-deny_delete
                               op-lock
192.168.1.5
          Oplock Level: batch
          /voll              node1_data2
                               cifs      share-level
192.168.1.5
          Sharelock Mode: read-deny_delete
          /voll/notes.txt    node1_data2
                               cifs      share-level
192.168.1.5
          Sharelock Mode: read_write-deny_delete
                               op-lock
192.168.1.5
          Oplock Level: read-batch
7 entries were displayed.

```

The following example displays the SMB related information about all locks:

```

cluster1::> vserver locks show -smb-attrs

Vserver: vs0
Volume   Object Path          LIF          Protocol  Lock Type
Client
-----
-----
voll     /voll/notes.txt      node1_data1
                               cifs      share-level

```

```

192.168.1.5
  Sharelock Mode: read_write-deny_delete
  Open Type: durable      Connect State: connected      Expiration Time
  (Secs): -
  Open Group ID:
625e2ff46ee5df1194ba0050569d37047058909c00000000873d210700000000
op-lock      192.168.1.5
  Oplock Level: read-batch
  Open Type: -            Connect State: connected      Expiration Time
  (Secs): -
  Open Group ID:
625e2ff46ee5df1194ba0050569d37047058909c00000000873d210700000000
/voll1/notes1.txt      node1_data1
                                                                cifs      share-level

192.168.1.5
  Sharelock Mode: read_write-deny_delete
  Open Type: durable      Connect State: connected      Expiration Time
  (Secs): -
  Open Group ID:
625e2ff46ee5df1194ba0050569d370440fc8891000000005a3f210700000000
op-lock      192.168.1.5
  Oplock Level: batch
  Open Type: -            Connect State: connected      Expiration Time
  (Secs): -
  Open Group ID:
625e2ff46ee5df1194ba0050569d370440fc8891000000005a3f210700000000
/voll1      node1_data2
                                                                cifs      share-level

192.168.1.5
  Sharelock Mode: read-deny_delete
  Open Type: none         Connect State: connected      Expiration Time
  (Secs): -
  Open Group ID: -
/voll1/notes.txt      node1_data2
                                                                cifs      share-level

192.168.1.5
  Sharelock Mode: read_write-deny_delete
  Open Type: durable      Connect State: connected      Expiration Time
  (Secs): -
  Open Group ID:
625e2ff46ee5df1194ba0050569d370408e08d9c00000000da40210700000000
op-lock      192.168.1.5
  Oplock Level: read-batch
  Open Type: -            Connect State: connected      Expiration Time
  (Secs): -
  Open Group ID:

```

```
625e2ff46ee5df1194ba0050569d370408e08d9c0000000da40210700000000
```

7 entries were displayed.

The following example displays default information about all locks in list form:

```
cluster1::> vserver locks show -instance
Vserver: vs0
          Volume: vol1
Logical Interface: node1_data1
          Object Path: /vol1/notes.txt
          Lock UUID: 447db184-f801-11df-8bb5-00a098000e34
          Lock Protocol: cifs
          Lock Type: share-level
Node Holding Lock State: node1
          Lock State: granted
Bytelock Starting Offset: -
Number of Bytes Locked: -
Bytelock is Mandatory: -
Bytelock is Exclusive: -
Bytelock is Superlock: -
          Bytelock is Soft: -
          Oplock Level: -
Shared Lock Access Mode: read_write-deny_delete
Shared Lock is Soft: false
          Delegation Type: -
          Client Address: 192.168.1.5
Client Address Type: ipv4
          SMB Open Type: durable
          SMB Connect State: connected
SMB Expiration Time (Secs): -
          SMB Open Group ID:
625e2ff46ee5df1194ba0050569d37047058909c00000000873d2107000000004
Vserver: vs0
          Volume: vol1
Logical Interface: node1_data1
          Object Path: /vol1/notes.txt
          Lock UUID: 447db185-f801-11df-8bb5-00a098000e34
          Lock Protocol: cifs
          Lock Type: op-lock
Node Holding Lock State: node1
          Lock State: granted
Bytelock Starting Offset: -
Number of Bytes Locked: -
Bytelock is Mandatory: -
```

```

Bytelock is Exclusive: -
Bytelock is Superlock: -
    Bytelock is Soft: -
        Oplock Level: read-batch
Shared Lock Access Mode: -
    Shared Lock is Soft: -
        Delegation Type: -
            Client Address: 192.168.1.5
    Client Address Type: ipv4
        SMB Open Type: -
            SMB Connect State: connected
SMB Expiration Time (Secs): -
    SMB Open Group ID:
625e2ff46ee5df1194ba0050569d37047058909c00000000873d210700000000
Vserver: vs0
    Volume: vol1
    Logical Interface: node1_data1
        Object Path: /vol1/notes1.txt
            Lock UUID: 48cee334-f801-11df-8bb5-00a098000e34
        Lock Protocol: cifs
            Lock Type: share-level
Node Holding Lock State: node1
    Lock State: granted
Bytelock Starting Offset: -
Number of Bytes Locked: -
    Bytelock is Mandatory: -
    Bytelock is Exclusive: -
    Bytelock is Superlock: -
        Bytelock is Soft: -
            Oplock Level: -
Shared Lock Access Mode: read_write-deny_delete
    Shared Lock is Soft: false
        Delegation Type: -
            Client Address: 192.168.1.5
    Client Address Type: ipv4
        SMB Open Type: durable
            SMB Connect State: connected
SMB Expiration Time (Secs): -
    SMB Open Group ID:
625e2ff46ee5df1194ba0050569d370440fc8891000000005a3f210700000000
3 entries were displayed.

```

The following example displays the FlexCache locks:

```

cluster1::> vserver locks show

Vserver: vs34
Volume   Object Path                LIF           Protocol   Lock Type
Client
-----
origin   /origin/file1              data1         nlm        byte-range
10.235.224.139
          Bytelock Offset (Length): 0 (18446744073709551615)
          /origin/file3          data1         nlm        byte-range
10.234.133.121
          Bytelock Offset (Length): 0 (18446744073709551615)
          FlexCache Lock: true
          /origin/file2        -             nlm        byte-range
10.234.189.144
          Bytelock Offset (Length): 0 (18446744073709551615)
          FlexCache Lock: true

3 entries were displayed.
cluster1::> vserver locks show -fields flexcache-vserver, flexcache-
volume, flexcache-cluster

```

```

vserver volume lif  path                flexcache-volume flexcache-vserver
flexcache-cluster
-----
vs34   origin data1 /origin/file1 -             -
vs34   origin data1 /origin/file3 local_fc      vs34
cluster2
vs34   origin -      /origin/file2 fc1             vs12
cluster1
3 entries were displayed.

```

The following example displays default information about FlexCache and origin of FlexCache locks in list form:

```

cluster1::> vserver locks show -instance
Vserver: vs34
          Volume: origin
          Logical Interface: data1
          Object Path: /origin/file1
          Lock UUID: 173d10d6-f64c-4983-a2c2-9db0bc4f5c05
          Is Constituent Volume: false
          Lock Protocol: nlm
          Lock Type: byte-range
          Node Holding Lock State: node1

```

```
Lock State: granted
Bytelock Starting Offset: 0
Number of Bytes Locked: 18446744073709551615
Bytelock is Mandatory: false
Bytelock is Exclusive: false
Bytelock is Superlock: false
    Bytelock is Soft: false
    Oplock Level: -
Shared Lock Access Mode: -
    Shared Lock is Soft: -
    Delegation Type: -
        Owner ID: 31-
113439407363737072303435323636363030312e67646c2e656e676c61622e6e65746170
    Client Address: 10.235.224.139
    Client Address Type: ipv4
        SMB Open Type: -
        SMB Connect State: -
SMB Expiration Time (Secs): -
    SMB Open Group ID: -
    Is FlexCache Lock: -
    FlexCache Volume Name: -
    FlexCache Vserver Name: -
    FlexCache Vserver UUID: -
    FlexCache Volume MSID: -
    FlexCache Cluster Name: -
Vserver: vs34
    Volume: origin
    Logical Interface: data1
    Object Path: /origin/file3
    Lock UUID: e3bf0c78-7371-41b6-9eff-4fa81d64ca08
    Is Constituent Volume: false
    Lock Protocol: nlm
    Lock Type: byte-range
Node Holding Lock State: nodel
    Lock State: granted
Bytelock Starting Offset: 0
Number of Bytes Locked: 18446744073709551615
Bytelock is Mandatory: false
Bytelock is Exclusive: false
Bytelock is Superlock: false
    Bytelock is Soft: false
    Oplock Level: -
Shared Lock Access Mode: -
    Shared Lock is Soft: -
    Delegation Type: -
        Owner ID: 25-11333740736373707230343934343331303031
```



```
Client Address: 10.234.133.121
Client Address Type: ipv4
SMB Open Type: -
SMB Connect State: -
SMB Expiration Time (Secs): -
SMB Open Group ID: -
Is FlexCache Lock: true
FlexCache Volume Name: local_fc
FlexCache Vserver Name: vs34
FlexCache Vserver UUID: 388e3004-7520-11e8-8789-005056b47572
FlexCache Volume MSID: 2160150696
FlexCache Cluster Name: cluster2
Vserver: vs34
Volume: origin
Logical Interface: -
Object Path: /origin/file2
Lock UUID: c420b002-d78c-4157-94d5-55c186ef4df3
Is Constituent Volume: false
Lock Protocol: nlm
Lock Type: byte-range
Node Holding Lock State: node1
Lock State: granted
Bytelock Starting Offset: 0
Number of Bytes Locked: 18446744073709551615
Bytelock is Mandatory: false
Bytelock is Exclusive: false
Bytelock is Superlock: false
Bytelock is Soft: false
Oplock Level: -
Shared Lock Access Mode: -
Shared Lock is Soft: -
Delegation Type: -
Owner ID: 32-11353040736373707230343532363634303031
Client Address: 10.234.189.144
Client Address Type: ipv4
SMB Open Type: -
SMB Connect State: -
SMB Expiration Time (Secs): -
SMB Open Group ID: -
Is FlexCache Lock: true
FlexCache Volume Name: fc1
FlexCache Vserver Name: vs12
FlexCache Vserver UUID: 5a943dd9-7520-11e8-b5e7-005056b47786
FlexCache Volume MSID: 2150871844
FlexCache Cluster Name: cluster1
3 entries were displayed.
```

Copyright information

Copyright © 2024 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.