



# **Manage home directories**

ONTAP 9

NetApp  
April 06, 2024

# Table of Contents

- Manage home directories . . . . . 1
  - How ONTAP enables dynamic home directories . . . . . 1
  - Home directory shares . . . . . 2
  - Add a home directory search path . . . . . 4
  - Create a home directory configuration using the %w and %d variables . . . . . 5
  - Configure home directories using the %u variable . . . . . 8
  - Additional home directory configurations . . . . . 11
  - Commands for managing search paths . . . . . 11
  - Display information about an SMB user’s home directory path . . . . . 12
  - Manage accessibility to users' home directories . . . . . 12

# Manage home directories

## How ONTAP enables dynamic home directories

ONTAP home directories enable you to configure an SMB share that maps to different directories based on the user that connects to it and a set of variables. Instead of creating separate shares for each user, you can configure one share with a few home directory parameters to define a user's relationship between an entry point (the share) and the home directory (a directory on the SVM).

A user who is logged in as a guest user does not have a home directory and cannot access other users' home directories. There are four variables that determine how a user is mapped to a directory:

- **Share name**

This is the name of the share that you create to which the user connects. You must set the home directory property for this share.

The share name can use the following dynamic names:

- `%w` (the user's Windows user name)
- `%d` (the user's Windows domain name)
- `%u` (the user's mapped UNIX user name) To make the share name unique across all home directories, the share name must contain either the `%w` or the `%u` variable. The share name can contain both the `%d` and the `%w` variable (for example, `%d/%w`), or the share name can contain a static portion and a variable portion (for example, `home_%w`).

- **Share path**

This is the relative path, which is defined by the share and is therefore associated with one of the share names, that is appended to each search path to generate the user's entire home directory path from the root of the SVM. It can be static (for example, `home`), dynamic (for example, `%w`), or a combination of the two (for example, `eng/%w`).

- **Search paths**

This is the set of absolute paths from the root of the SVM that you specify that directs the ONTAP search for home directories. You can specify one or more search paths by using the `vserver cifs home-directory search-path add` command. If you specify multiple search paths, ONTAP tries them in the order specified until it finds a valid path.

- **Directory**

This is the user's home directory that you create for the user. The directory name is usually the user's name. You must create the home directory in one of the directories that are defined by the search paths.

As an example, consider the following setup:

- User: John Smith
- User domain: acme

- User name: jsmith
- SVM name: vs1
- Home directory share name #1: home\_%w - share path: %w
- Home directory share name #2: %w - share path: %d/%w
- Search path #1: /vol0home/home
- Search path #2: /vol1home/home
- Search path #3: /vol2home/home
- Home directory: /vol1home/home/jsmith

Scenario 1: The user connects to `\\vs1\home_jsmith`. This matches the first home directory share name and generates the relative path `jsmith`. ONTAP now searches for a directory named `jsmith` by checking each search path in order:

- `/vol0home/home/jsmith` does not exist; moving on to search path #2.
- `/vol1home/home/jsmith` does exist; therefore, search path #3 is not checked; the user is now connected to his home directory.

Scenario 2: The user connects to `\\vs1\jsmith`. This matches the second home directory share name and generates the relative path `acme/jsmith`. ONTAP now searches for a directory named `acme/jsmith` by checking each search path in order:

- `/vol0home/home/acme/jsmith` does not exist; moving on to search path #2.
- `/vol1home/home/acme/jsmith` does not exist; moving on to search path #3.
- `/vol2home/home/acme/jsmith` does not exist; the home directory does not exist; therefore, the connection fails.

## Home directory shares

### Add a home directory share

If you want to use the SMB home directory feature, you must add at least one share with the home directory property included in the share properties.

#### About this task

You can create a home directory share at the time you create the share by using the `vserver cifs share create` command, or you can change an existing share into a home directory share at any time by using the `vserver cifs share modify` command.

To create a home directory share, you must include the `homedirectory` value in the `-share-properties` option when you create or modify a share. You can specify the share name and share path using variables that are dynamically expanded when users connect to their home directories. Available variables that you can use in the path are `%w`, `%d`, and `%u`, corresponding to the Windows user name, domain, and mapped UNIX user name, respectively.

#### Steps

1. Add a home directory share:

```
vserver cifs share create -vserver vserver_name -share-name share_name -path
path -share-properties homedirectory[,...]
```

`-vserver vserver` specifies the CIFS-enabled storage virtual machine (SVM) on which to add the search path.

`-share-name share_name` specifies the home directory share name.

In addition to containing one of the required variables, if the share name contains one of the literal strings `%w`, `%u`, or `%d`, you must precede the literal string with a `%` (percent) character to prevent ONTAP from treating the literal string as a variable (for example, `%%w`).

- The share name must contain either the `%w` or the `%u` variable.
- The share name can additionally contain the `%d` variable (for example, `%d/%w`) or a static portion in the share name (for example, `home1_%%w`).
- If the share is used by administrators to connect to other users' home directories or to permit users to connect to other users' home directories, the dynamic share name pattern must be preceded by a tilde (`~`).

The `vserver cifs home-directory modify` is used to enable this access by setting the `-is-home-dirs-access-for-admin-enabled` option to `true`) or by setting the advanced option `-is-home-dirs-access-for-public-enabled` to `true`.

`-path path` specifies the relative path to the home directory.

`-share-properties homedirectory[,...]` specifies the share properties for that share. You must specify the `homedirectory` value. You can specify additional share properties using a comma delimited list.

1. Verify that you successfully added the home directory share by using the `vserver cifs share show` command.

## Example

The following command creates a home directory share named `%w`. The `oplocks`, `browsable`, and `changenotify` share properties are set in addition to setting the `homedirectory` share property.



This example does not display output for all of the shares on the SVM. Output is truncated.

```
cluster1::> vserver cifs share create -vserver vs1 -share-name %w -path %w
-share-properties oplocks,browsable,changenotify,homedirectory
```

```
vs1::> vserver cifs share show -vserver vs1
```

| Vserver | Share | Path | Properties    | Comment | ACL             |
|---------|-------|------|---------------|---------|-----------------|
| vs1     | %w    | %w   | oplocks       | -       | Everyone / Full |
| Control |       |      | browsable     |         |                 |
|         |       |      | changenotify  |         |                 |
|         |       |      | homedirectory |         |                 |

## Related information

[Adding a home directory search path](#)

[Requirements and guidelines for using automatic node referrals](#)

[Managing accessibility to users' home directories](#)

## Home directory shares require unique user names

Be careful to assign unique user names when creating home directory shares using the `%w` (Windows user name) or `%u` (UNIX user name) variables to generate shares dynamically. The share name is mapped to your user name.

Two problems can occur when a static share's name and a user's name are the same:

- When the user lists the shares on a cluster using the `net view` command, two shares with the same user name are displayed.
- When the user connects to that share name, the user is always connected to the static share and cannot access the home directory share with the same name.

For example, there is a share named “administrator” and you have an “administrator” Windows user name. If you create a home directory share and connect to that share, you get connected to the “administrator” static share, not to your “administrator” home directory share.

You can resolve the issue with duplicate share names by following any of these steps:

- Renaming the static share so that it no longer conflicts with the user's home directory share.
- Giving the user a new user name so that it no longer conflicts with the static share name.
- Creating a CIFS home directory share with a static name such as “home” instead of using the `%w` parameter to avoid conflicts with the share names.

## What happens to static home directory share names after upgrading

Home directory share names must contain either the `%w` or the `%u` dynamic variable. You should be aware of what happens to existing static home directory share names after upgrading to a version of ONTAP with the new requirement.

If your home directory configuration contains static share names and you upgrade to ONTAP, the static home directory share names are not changed and are still valid. However, you cannot create any new home directory shares that do not contain either the `%w` or `%u` variable.

Requiring that one of these variables is included in the user's home directory share name ensures that every share name is unique across the home directory configuration. If desired, you can change the static home directory share names to names that contain either the `%w` or `%u` variable.

## Add a home directory search path

If you want to use ONTAP SMB home directories, you must add at least one home directory search path.

## About this task

You can add a home directory search path by using the `vserver cifs home-directory search-path add` command.

The `vserver cifs home-directory search-path add` command checks the path specified in the `-path` option during command execution. If the specified path does not exist, the command generates a message prompting for whether you want to continue. You choose `y` or `n`. If you choose `y` to continue, ONTAP creates the search path. However, you must create the directory structure before you can use the search path in the home directory configuration. If you choose not to continue, the command fails; the search path is not created. You can then create the path directory structure and rerun the `vserver cifs home-directory search-path add` command.

## Steps

1. Add a home directory search path: `vserver cifs home-directory search-path add -vserver vs1 -path /home1`
2. Verify that you successfully added the search path using the `vserver cifs home-directory search-path show` command.

## Example

The following example adds the path `/home1` to the home directory configuration on SVM `vs1`.

```
cluster::> vserver cifs home-directory search-path add -vserver vs1 -path /home1

vs1::> vserver cifs home-directory search-path show
Vserver      Position Path
-----
vs1          1      /home1
```

The following example attempts to add the path `/home2` to the home directory configuration on SVM `vs1`. The path does not exist. The choice is made to not continue.

```
cluster::> vserver cifs home-directory search-path add -vserver vs1 -path /home2
Warning: The specified path "/home2" does not exist in the namespace
        belonging to Vserver "vs1".
Do you want to continue? {y|n}: n
```

## Related information

[Adding a home directory share](#)

# Create a home directory configuration using the %w and %d variables

You can create a home directory configuration using the `%w` and `%d` variables. Users can

then connect to their home share using dynamically created shares.

## Steps

1. Create a qtree to contain user's home directories: `volume qtree create -vserver vs1 -qtree-path /vol/vol1/users`
2. Verify that the qtree is using the correct security style: `volume qtree show`
3. If the qtree is not using the desired security style, change the security style using the `volume qtree security` command.
4. Add a home directory share: `vserver cifs share create -vserver vs1 -share-name %w -path %d/%w -share-properties homedirectory[,...]`

`-vserver vs1` specifies the CIFS-enabled storage virtual machine (SVM) on which to add the search path.

`-share-name %w` specifies the home directory share name. ONTAP dynamically creates the share name as each user connects to their home directory. The share name will be of the form *windows\_user\_name*.

`-path %d/%w` specifies the relative path to the home directory. The relative path is dynamically created as each user connects to their home directory and will be of the form *domain/windows\_user\_name*.

`-share-properties homedirectory[,...]` specifies the share properties for that share. You must specify the `homedirectory` value. You can specify additional share properties using a comma delimited list.

5. Verify that the share has the desired configuration using the `vserver cifs share show` command.
6. Add a home directory search path: `vserver cifs home-directory search-path add -vserver vs1 -path /vol/vol1/users`

`-vserver vs1` specifies the CIFS-enabled SVM on which to add the search path.

`-path /vol/vol1/users` specifies the absolute directory path to the search path.

7. Verify that you successfully added the search path using the `vserver cifs home-directory search-path show` command.
8. For users with a home directory, create a corresponding directory in the qtree or volume designated to contain home directories.

For example, if you created a qtree with the path of `/vol/vol1/users` and the user name whose directory you want to create is `mydomain\user1`, you would create a directory with the following path: `/vol/vol1/users/mydomain/user1`.

If you created a volume named "home1" mounted at `/home1`, you would create a directory with the following path: `/home1/mydomain/user1`.

9. Verify that a user can successfully connect to the home share either by mapping a drive or connecting using the UNC path.

For example, if user `mydomain\user1` wants to connect to the directory created in Step 8 that is located on SVM `vs1`, `user1` would connect using the UNC path `\\vs1\user1`.



## Example

The commands in the following example create a home directory configuration with the following settings:

- The share name is %w.
- The relative home directory path is %d/%w.
- The search path that is used to contain the home directories, /home1, is a volume configured with NTFS security style.
- The configuration is created on SVM vs1.

You can use this type of home directory configuration when users access their home directories from Windows hosts. You can also use this type of configuration when users access their home directories from Windows and UNIX hosts and the file system administrator uses Windows-based users and groups to control access to the file system.

```
cluster::> vsriver cifs share create -vsriver vs1 -share-name %w -path
%d/%w -share-properties oplocks,browsable,changenotify,homedirectory

cluster::> vsriver cifs share show -vsriver vs1 -share-name %w

                Vserver: vs1
                Share: %w
CIFS Server NetBIOS Name: VS1
                Path: %d/%w
        Share Properties: oplocks
                        browsable
                        changenotify
                        homedirectory
        Symlink Properties: enable
        File Mode Creation Mask: -
        Directory Mode Creation Mask: -
                Share Comment: -
                Share ACL: Everyone / Full Control
File Attribute Cache Lifetime: -
                Volume Name: -
                Offline Files: manual
Vscan File-Operations Profile: standard

cluster::> vsriver cifs home-directory search-path add -vsriver vs1 -path
/home1

cluster::> vsriver cifs home-directory search-path show
Vserver      Position Path
-----
vs1          1          /home1
```

## Related information

## Configure home directories using the %u variable

You can create a home directory configuration where you designate the share name using the %w variable but you use the %u variable to designate the relative path to the home directory share. Users can then connect to their home share using dynamically shares created using their Windows user name without being aware of the actual name or path of the home directory.

### Steps

1. Create a qtree to contain user's home directories: `volume qtree create -vserver vservers_name -qtree-path qtree_path`
2. Verify that the qtree is using the correct security style: `volume qtree show`
3. If the qtree is not using the desired security style, change the security style using the `volume qtree security` command.
4. Add a home directory share: `vserver cifs share create -vserver vservers_name -share-name %w -path %u -share-properties homedirectory ,...]`

`-vserver vservers_name` specifies the CIFS-enabled storage virtual machine (SVM) on which to add the search path.

`-share-name %w` specifies the home directory share name. The share name is dynamically created as each user connects to their home directory and is of the form *windows\_user\_name*.



You can also use the %u variable for the `-share-name` option. This creates a relative share path that uses the mapped UNIX user name.

`-path %u` specifies the relative path to the home directory. The relative path is created dynamically as each user connects to their home directory and is of the form *mapped\_UNIX\_user\_name*.



The value for this option can contain static elements as well. For example, `eng/%u`.

`-share-properties homedirectory\[ ,... \]` specifies the share properties for that share. You must specify the `homedirectory` value. You can specify additional share properties using a comma delimited list.

5. Verify that the share has the desired configuration using the `vserver cifs share show` command.
6. Add a home directory search path: `vserver cifs home-directory search-path add -vserver vservers_name -path path`

`-vserver vservers_name` specifies the CIFS-enabled SVM on which to add the search path.

`-path path` specifies the absolute directory path to the search path.

7. Verify that you successfully added the search path using the `vserver cifs home-directory search-path show` command.
8. If the UNIX user does not exist, create the UNIX user using the `vserver services unix-user create` command.



The UNIX user name to which you map the Windows user name must exist before mapping the user.

9. Create a name mapping for the Windows user to the UNIX user using the following command: `vserver name-mapping create -vserver vserver_name -direction win-unix -priority integer -pattern windows_user_name -replacement unix_user_name`



If name mappings already exist that map Windows users to UNIX users, you do not have to perform the mapping step.

The Windows user name is mapped to the corresponding UNIX user name. When the Windows user connects to their home directory share, they connect to a dynamically created home directory with a share name that corresponds to their Windows user name without being aware that the directory name corresponds to the UNIX user name.

10. For users with a home directory, create a corresponding directory in the qtree or volume designated to contain home directories.

For example, if you created a qtree with the path of `/vol/vol1/users` and the mapped UNIX user name of the user whose directory you want to create is “unixuser1”, you would create a directory with the following path: `/vol/vol1/users/unixuser1`.

If you created a volume named “home1” mounted at `/home1`, you would create a directory with the following path: `/home1/unixuser1`.

11. Verify that a user can successfully connect to the home share either by mapping a drive or connecting using the UNC path.

For example, if user `mydomain\user1` maps to UNIX user `unixuser1` and wants to connect to the directory created in Step 10 that is located on SVM `vs1`, user1 would connect using the UNC path `\\vs1\user1`.

## Example

The commands in the following example create a home directory configuration with the following settings:

- The share name is `%w`.
- The relative home directory path is `%u`.
- The search path that is used to contain the home directories, `/home1`, is a volume configured with UNIX security style.
- The configuration is created on SVM `vs1`.

You can use this type of home directory configuration when users access their home directories from both Windows hosts or Windows and UNIX hosts and the file system administrator uses UNIX-based users and groups to control access to the file system.

```
cluster::> vservice cifs share create -vservice vs1 -share-name %w -path %u
-share-properties oplocks,browsable,changenotify,homedirectory
```

```
cluster::> vservice cifs share show -vservice vs1 -share-name %u
```

```

                Vservice: vs1
                Share: %w
CIFS Server NetBIOS Name: VS1
                Path: %u
        Share Properties: oplocks
                        browsable
                        changenotify
                        homedirectory
        Symlink Properties: enable
        File Mode Creation Mask: -
        Directory Mode Creation Mask: -
                Share Comment: -
                Share ACL: Everyone / Full Control
File Attribute Cache Lifetime: -
                Volume Name: -
                Offline Files: manual
Vscan File-Operations Profile: standard
```

```
cluster::> vservice cifs home-directory search-path add -vservice vs1 -path
/home1
```

```
cluster::> vservice cifs home-directory search-path show -vservice vs1
```

```
Vservice      Position Path
-----
vs1           1         /home1
```

```
cluster::> vservice name-mapping create -vservice vs1 -direction win-unix
-position 5 -pattern user1 -replacement unixuser1
```

```
cluster::> vservice name-mapping show -pattern user1
```

```
Vservice      Direction Position
-----
vs1           win-unix  5         Pattern: user1
                                Replacement: unixuser1
```

## Related information

[Creating a home directory configuration using the %w and %d variables](#)

[Additional home directory configurations](#)

[Displaying information about an SMB user's home directory path](#)

## Additional home directory configurations

You can create additional home directory configurations using the %w, %d, and %u variables, which enables you to customize the home directory configuration to meet your needs.

You can create a number of home directory configurations using a combination of variables and static strings in the share names and search paths. The following table provides some examples illustrating how to create different home directory configurations:

| Paths created when /vol1/user contains home directories...  | Share command...   |
|---|--|
| To create a share path \\vs1\~win_username that directs the user to /vol1/user/win_username       | <code>vserver cifs share create -share-name ~%w -path %w -share-properties oplocks,browsable,changenotify,homedirectory</code>   |
| To create a share path \\vs1\win_username that directs the user to /vol1/user/domain/win_username | <code>vserver cifs share create -share-name %w -path %d/%w -share-properties oplocks,browsable,changenotify,homedirectory</code> |
| To create a share path \\vs1\win_username that directs the user to /vol1/user/unix_username       | <code>vserver cifs share create -share-name %w -path %u -share-properties oplocks,browsable,changenotify,homedirectory</code>    |
| To create a share path \\vs1\unix_username that directs the user to /vol1/user/unix_username      | <code>vserver cifs share create -share-name %u -path %u -share-properties oplocks,browsable,changenotify,homedirectory</code>    |

## Commands for managing search paths

There are specific ONTAP commands for managing search paths for SMB home directory configurations. For example, there are commands for adding, removing, and displaying information about search paths. There is also a command for changing the search path order.

| If you want to...    | Use this command...                                       |
|----------------------|---|
| Add a search path    | <code>vserver cifs home-directory search-path add</code>  |
| Display search paths | <code>vserver cifs home-directory search-path show</code> |

| If you want to...            | Use this command...  |
|------------------------------|--|
| Change the search path order | <code>vserver cifs home-directory search-path reorder</code> |
| Remove a search path         | <code>vserver cifs home-directory search-path remove</code>  |

See the man page for each command for more information.

## Display information about an SMB user's home directory path

You can display an SMB user's home directory path on the storage virtual machine (SVM), which can be used if you have multiple CIFS home directory paths configured and you want to see which path holds the user's home directory.

### Step

1. Display the home directory path by using the `vserver cifs home-directory show-user` command.

```
vserver cifs home-directory show-user -vserver vs1 -username user1
```

| Vserver | User  | Home Dir Path |
|---------|-------|---------------|
| -----   | ----- | -----         |
| vs1     | user1 | /home/user1   |

### Related information

[Managing accessibility to users' home directories](#)

## Manage accessibility to users' home directories

By default, a user's home directory can be accessed only by that user. For shares where the dynamic name of the share is preceded with a tilde (~), you can enable or disable access to users' home directories by Windows administrators or by any other user (public access).

### Before you begin

Home directory shares on the storage virtual machine (SVM) must be configured with dynamic share names that are preceded with a tilde (~). The following cases illustrate share naming requirements:

| Home directory share name | Example of command to connect to the share                        |
|---------------------------|---|
| ~%d~%w                    | <code>net use *<br/>\\IPAddress\~domain~user/u:credentials</code> |

| Home directory share name | Example of command to connect to the share      |
|---------------------------|---|
| ~%W                       | net use *<br>\\IPAddress\~user/u:credentials    |
| ~abc~%W                   | net use *<br>\\IPAddress\abc~user/u:credentials |

## Step

1. Perform the appropriate action:

| If you want to enable or disable access to users' home directories to... | Enter the following...  |
|--|---|
| Windows administrators   | vserver cifs home-directory modify<br>-vserver vserver_name -is-home-dirs<br>-access-for-admin-enabled {true false}<br>The default is true.   |
| Any user (public access)   | <p>a. Set the privilege level to advanced:<br/>set -privilege advanced</p> <p>b. Enable or disable access: vserver cifs<br/>home-directory modify -vserver<br/>vserver_name -is-home-dirs-access<br/>-for-public-enabled {true false}<br/>The default is false.</p> <p>c. Return to the admin privilege level:<br/>set -privilege admin</p> |

The following example enables public access to users' home directories:

```
set -privilege advanced
vserver cifs home-directory modify -vserver vs1 -is-home-dirs-access-for-public
-enabled true
set -privilege admin
```

## Related information

[Displaying information about an SMB user's home directory path](#)

## 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.