

Replacing a Failed Controller Canister in a Simplex Configuration

When you replace a failed controller canister in an E-Series E2600 or E2700 storage array that has only one controller canister, you must stop all host I/O operations and power down the storage array. You must also remove the battery and the host interface card (if installed) from the original controller canister, and install them in the replacement controller canister.

Before you begin

You have obtained the following items:

- Antistatic protection
- Replacement E2600 or E2700 controller canister with the same part number as the controller canister you are replacing
- Phillips screwdriver
- Labels to identify each cable that is connected to the controller canister

About this task

Use this procedure to replace a controller canister in the simplex configuration of the following controller-drive trays:

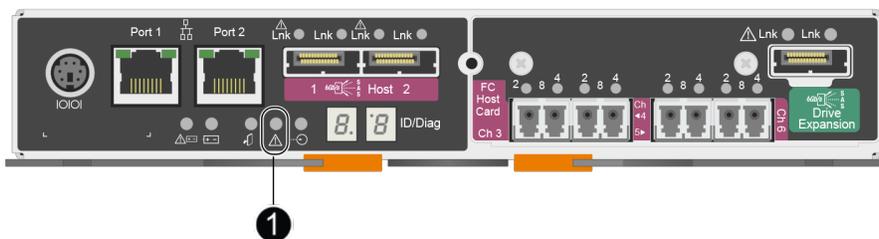
- E2612
- E2624
- E2712
- E2724

Attention: Data on the storage array will not be accessible until you replace the controller canister. You must stop host I/O operations and power down the storage array.

You can determine if you have a failed controller by checking the amber Service Action Required LED on the controller, shown in the following figures.

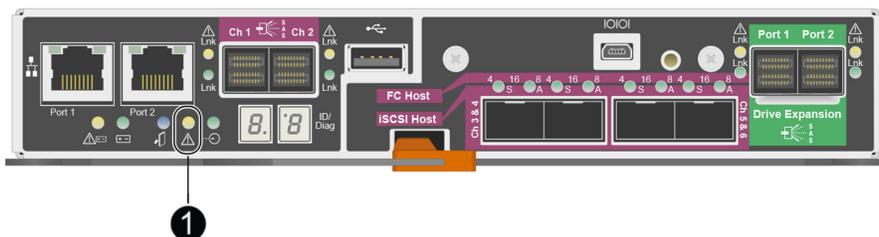
Note: The figures show example controller canisters. Your controller might have a different number and a different type of host ports.

Service Action Required LED for E2612 or E2624 controller



Item	Description
1	Controller Service Action Required LED (amber)

Service Action Required LED for E2712 or E2724 controller



Item	Description
1	Controller Service Action Required LED (amber)

For additional documentation and instructions for E-Series products, go to the [NetApp E-Series and EF-Series Systems Documentation Center](#).

Steps

1. [Preparing to replace the controller](#) on page 2
2. [Powering down the storage array](#) on page 3
3. [Removing a controller canister](#) on page 4
4. [Removing the battery](#) on page 4
5. [Removing the host interface card](#) on page 7
6. [Installing the battery](#) on page 7
7. [Installing the host interface card](#) on page 7
8. [Installing a controller canister](#) on page 8
9. [Applying power](#) on page 8
10. [After replacing a failed controller canister](#) on page 8

Preparing to replace the controller

Before removing a controller canister, you must perform a number of steps to prepare your system. These steps include saving a security key, saving a support bundle, and stopping host I/O operations.

Steps

1. If possible, make sure that the storage array is updated to the latest released operating system (controller firmware) version.
2. If the Drive Security feature is enabled and a security key exists on the storage array, save the key, if possible.

Attention: Possible loss of data access – If the controller that you are replacing manages any secure volumes, the new controller needs the correct security key to manage those volumes. Before replacing the controller be sure that such a file exists and that you know the pass phrase required to install the security key. After replacing the controller and restoring

power to the controller-drive tray, you can use SANtricity Storage Manager to load the key from the file in which it was saved.

- a. From SANtricity Storage Manager, go to the Array Management Window.
- b. From the Storage Array menu, select **Security > Drive Security > Save Key**.
- c. Save the security key to a location not on the storage array.

3. If possible, gather support data about your storage array:

Option	Description
SANtricity Storage Manager	<ol style="list-style-type: none">a. From the Array Management Window toolbar, select Monitor > Health > Collect Support Data Manually.b. Name and specify a location on your system where you want to store the support bundle.
Command line interface (CLI)	<pre>save storageArray supportData</pre>

Note: Gathering support data can temporarily impact performance on your storage array.

4. Ensure that no I/O operations are occurring between the storage array and all connected hosts. For example, you can perform these steps:

- Stop all processes that involve the LUNs mapped from the storage to the hosts.
- Ensure that no applications are writing data to any LUNs mapped from the storage to the hosts.
- Unmount all file systems associated with volumes on the array.

Note: The exact steps to stop host I/O operations depend on the host operating system and the configuration, which are beyond the scope of these instructions. If you are not sure how to stop host I/O operations in your environment, consider shutting down the host.

Attention: Possible data loss – If you continue this procedure while I/O operations are occurring, you might lose data.

5. Wait five minutes to allow any data in cache memory to be flushed to disk.
6. From the title bar of the **Array Management Window**, select **Monitor > Reports > Operations in Progress**.
7. Wait for all operations shown on the **Operations in Progress** window to complete before continuing with the next step.

Powering down the storage array

If you only have one controller canister, you must power down the storage array before you can replace the controller.

Before you begin

- If you have the Drive Security feature enabled, you have saved the security key, if possible.
- You have saved a support bundle.
- You have stopped host I/O operations.

Steps

1. Turn off both power switches on the controller-drive tray.

2. Wait for all LEDs on the controller-drive tray to go dark.
3. Turn off both power switches on any attached expansion drive trays.
4. Wait two minutes for drive activity to stop.

Removing a controller canister

When you remove a controller canister, you must disconnect all cables and remove any transceivers. Then, you can slide the controller canister out of the controller shelf.

Before you begin

You must have an ESD wristband or have taken other antistatic precautions.

Steps

1. Label each cable that is attached to the controller canister so that you can reconnect each cable correctly after the new controller canister is installed.
2. Disconnect all of the cables from the controller canister.
If fiber-optic cables are present, partially remove the controller canister with the two release levers. Opening the release levers makes it easier to press down on the release tabs for the cables.
Attention: Potential degraded performance – To prevent degraded performance, do not twist, fold, pinch, or step on the cables.
3. If the host ports in the failed controller canister contain transceivers, remove them and save them for reuse.
4. Remove the failed controller canister.
 - a. Unlock and pull out the release levers to release the controller canister.
 - b. Using the release levers and your hands, pull the controller canister out of the controller-drive tray.
 - c. Turn the controller canister over and set it on a flat, static-free surface, so you can access the top cover.

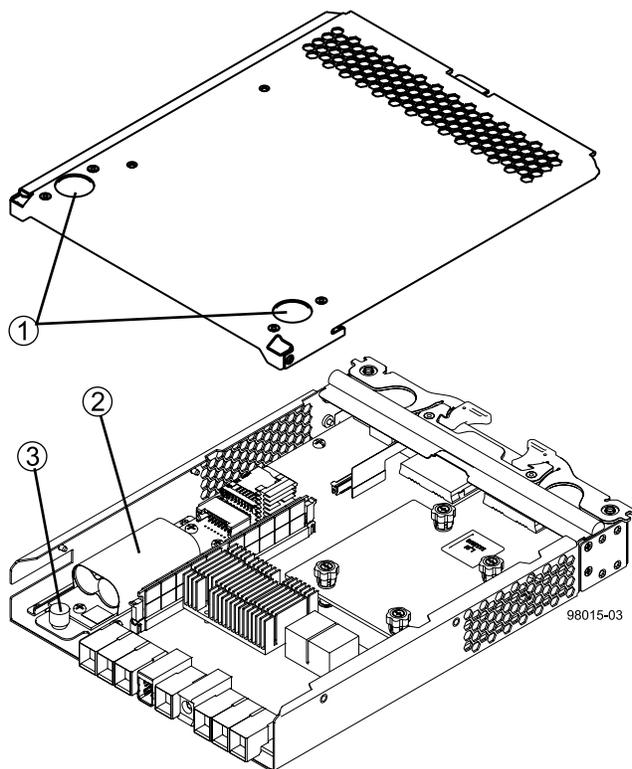
Removing the battery

You must remove the battery from the original controller canister, so you can install it in the replacement controller canister.

Steps

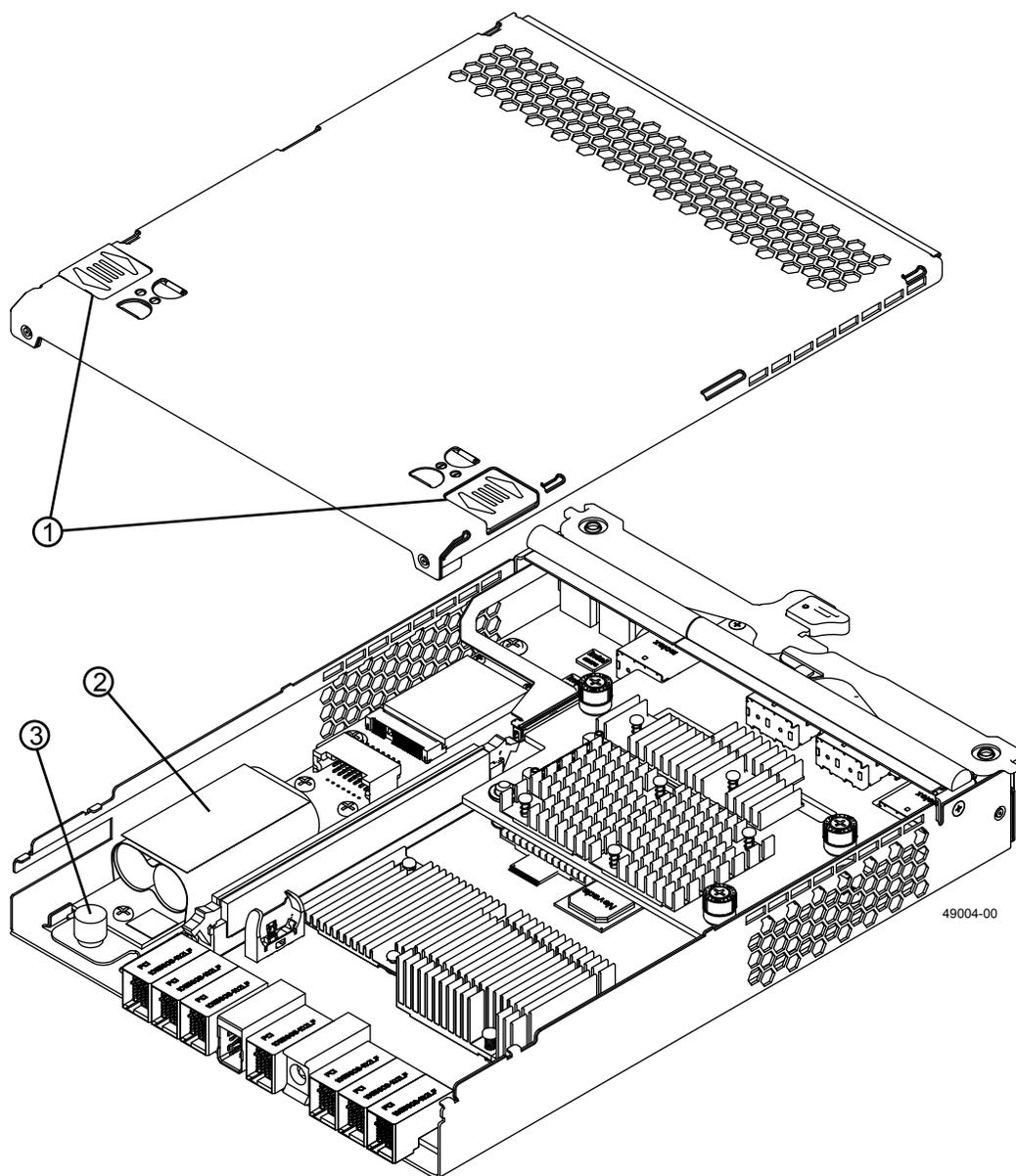
1. Remove the top cover from the controller canister by pressing down on both of the top cover latch buttons and sliding the top cover to the rear of the canister.
2. Unscrew the thumbscrew that secures the battery to the controller canister.

Battery and thumbscrew for an E2612 or E2624 controller canister



1	Top cover latch buttons
2	Battery
3	Battery thumbscrew

Battery and thumbscrew for an E2712 or E2724 controller canister



1	Top cover latch buttons
2	Battery
3	Battery thumbscrew

3. Remove the battery by sliding it towards the back of the controller canister.

Removing the host interface card

If the failed controller canister includes a host interface card (HIC), you must remove the HIC so that you can install it in the new controller canister.

Steps

1. Using a Phillips screwdriver, remove the screws that hold the subplate to the controller canister.
The screws are located on the top, front, and side of the canister.
2. Remove the subplate from the controller canister, carefully working it from side-to-side until you can slide it off and gain access to the HIC.
3. Loosen the HIC thumbscrews that secure the HIC to the controller card.
If the thumbscrews are hard to turn, use a Phillips screwdriver to loosen them.
4. Disengage the HIC from the controller card, and remove the HIC by lifting it up and gently sliding it back, being careful not to scratch or bump any of the components on the bottom of the HIC or the top of the controller card.
The HIC connector is located on the right edge of the HIC next to the thumbscrews.
5. Place the HIC on a static-free surface.

Installing the battery

You must install a battery into the replacement controller canister. You can install the battery that you removed from the old controller canister or a new battery that you ordered.

Steps

1. Unpack the new controller canister.
Save the packing materials so that you can ship the failed controller canister.
2. Turn the controller canister over and set it on a flat, static-free surface, so you can access the top cover.
3. Press down on both of the top cover latch buttons, and slide the top cover to the rear of the canister.
4. Insert the battery into the controller canister and slide it toward the front.
5. Confirm that the battery is seated correctly.
You might need to back the battery out of the connector and realign it with the thumbscrew.
6. Tighten the thumbscrew to secure the battery to the controller canister.

Installing the host interface card

If you removed a host interface card (HIC) from the failed controller canister, you must install that HIC into the new controller canister.

Steps

1. Align the three thumbscrews on the HIC with the corresponding holes on the controller, and align the connector on the bottom of the HIC with the HIC connector on the controller.

Be careful to not scratch or bump any of the components on the bottom of the HIC or the top of the controller card.

2. Carefully lower the HIC into place, and seat the HIC connector by pressing gently on the HIC.
3. Hand-tighten the HIC thumbscrews.

Do not use a screwdriver, or you might overtighten the screws.

4. Reattach the subplate to the controller canister and tighten the screws with a Phillips screwdriver.

Installing a controller canister

After installing the HIC and the battery, you can install the new controller canister into the controller-drive tray.

Steps

1. Reinstall the cover on the controller canister by sliding the cover from back to front.
2. Turn the controller over and insert it into the controller-drive tray.
3. Slide the controller canister all the way into the controller-drive tray
4. Rotate the release levers towards the center to lock the controller canister in place.
5. If you removed transceivers from the original controller canister, install them in the new controller canister.
6. Reconnect all of the cables you disconnected.

Applying power

After replacing the controller canister and reconnecting the cables, you can reapply power.

Steps

1. If you have expansion drive trays, turn on the two power switches at the back of each tray.
2. Wait two minutes.
3. Turn on the two power switches at the back of the controller-drive tray.
 - Do not turn off the power switches during the power-on process.
 - The fans in each tray are very loud when they first start up. The loud noise during start-up is normal.
4. Wait 10 minutes for the power-on process to complete.

After replacing a failed controller canister

After replacing a controller canister, you might need to import a saved security key. Then, you can confirm that the new controller is working correctly, gather support data, and resume operations.

Steps

1. If you saved the security key, perform the following steps on the controller to import that key.
 - a. If there is a mix of secured and unsecured drives in the storage array, create a new security key.
 - *Unsecured drives* are unassigned drives, GHS drives, or drives that are part of a volume group or a disk pool that is not secured by Drive Security.

- *Secured drives* are assigned drives that are a part of a secured volume group or disk pool using Drive Security.
- Import the security key that you saved. (From the **Storage Array** menu, select **Security > Drive Security > Import Key**.)
 - If there were only secured drives (no unsecured drives) in the storage array, the controller automatically reboots to complete the import operation. Wait for the controller to boot up.

When a controller finishes booting, its icon appears in the Enterprise Management Window.

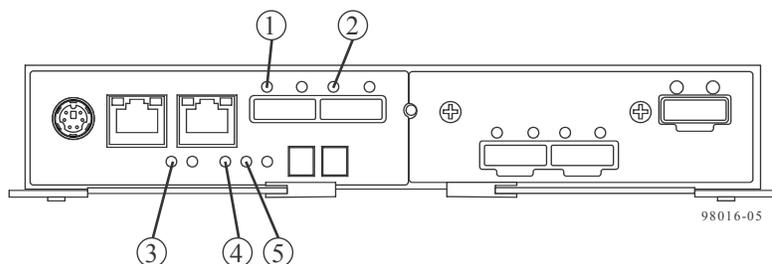
- If the Drive Security feature is enabled, and the storage array has a mix of secured and unsecured drives, follow these steps:
 - Run the `set allDrives nativeState SMcli` command.
 - Reset the controller using SANtricity Storage Manager.
 - Wait for the controller to boot up.

When a controller finishes booting, its icon appears in the Enterprise Management Window.

- Look at the LEDs on the controller to make sure that it is booting correctly.
 - The Host Link Service Action Required LEDs turn green during the reboot.
 - The seven-segment display shows the sequence `OS+ Sd+ blank-` to indicate that the controller is performing Start-of-day (SOD) processing. After the controller successfully completes rebooting, the seven-segment display shows the tray ID. You can now discover the new controller by using the storage management software.

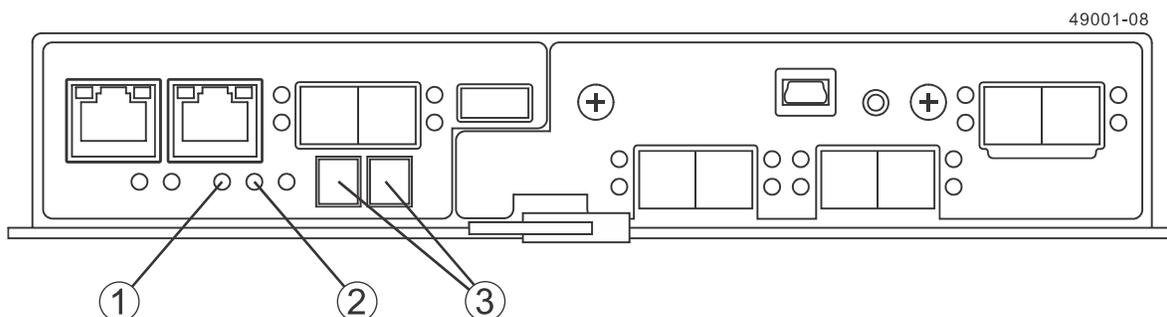
Note: The figures show example controller canisters. Your controller might have a different number and a different type of host ports.

E2612 or E2624 controller LEDs



1	Host Link 1 Service Action Required (amber)
2	Host Link 2 Service Action Required (amber)
3	Battery Service Action Required (amber)
4	Controller Service Action Allowed (blue)
5	Controller Service Action Required (amber)

E2712 or E2724 controller LEDs and seven-segment display



1	Controller Service Action Allowed LED (blue)
2	Controller Service Action Required LED (amber)
3	Seven-segment display

4. Determine if the controller canister is installed correctly:

Option	Description
If all Service Action Required LEDs are off, and the Array Management Window indicates an Optimal status	The new controller is installed correctly.
If any of the controller-drive tray's Service Action Required LEDs are on, or if the controller's Service Action Required LED is on	There might be an issue with the new controller canister. Check that the controller canister has been installed correctly and that all cables are correctly seated. Reinstall the controller canister, if necessary. Note: If you cannot resolve the problem, contact technical support.

5. Using the LEDs and the storage management software, check the status of all of the trays in the storage array.

6. If any component in the storage array has a Needs Attention status, click the Recovery Guru toolbar button in the Array Management Window, and complete the recovery procedure.

Note: If you cannot resolve the problem, contact technical support.

7. Remove the antistatic protection.

8. Make sure that the latest version of controller firmware is running on the new controller. If necessary, install the latest firmware version.

9. Gather support data about your storage array:

Option	Description
SANtricity Storage Manager	<ol style="list-style-type: none"> From the Array Management Window toolbar, select Monitor > Health > Collect Support Data Manually. Name and specify a location on your system where you want to store the support bundle.
Command line interface (CLI)	<code>save storageArray supportData</code>

Note: Gathering support data can temporarily impact performance on your storage array.

Copyright information

Copyright © 1994–2016 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.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

Trademark information

NetApp, the NetApp logo, Go Further, Faster, AltaVault, ASUP, AutoSupport, Campaign Express, Cloud ONTAP, Clustered Data ONTAP, Customer Fitness, Data ONTAP, DataMotion, Fitness, Flash Accel, Flash Cache, Flash Pool, FlashRay, FlexArray, FlexCache, FlexClone, FlexPod, FlexScale, FlexShare, FlexVol, FPolicy, GetSuccessful, LockVault, Manage ONTAP, Mars, MetroCluster, MultiStore, NetApp Insight, OnCommand, ONTAP, ONTAPI, RAID DP, RAID-TEC, SANtricity, SecureShare, Simplicity, Simulate ONTAP, Snap Creator, SnapCenter, SnapCopy, SnapDrive, SnapIntegrator, SnapLock, SnapManager, SnapMirror, SnapMover, SnapProtect, SnapRestore, Snapshot, SnapValidator, SnapVault, StorageGRID, Tech OnTap, Unbound Cloud, and WAFL and other names are trademarks or registered trademarks of NetApp, Inc., in the United States, and/or other countries. All other brands or products are trademarks or registered trademarks of their respective holders and should be treated as such. A current list of NetApp trademarks is available on the web.

<http://www.netapp.com/us/legal/netapptmlist.aspx>

How to send comments about documentation and receive update notifications

You can help us to improve the quality of our documentation by sending us your feedback. You can receive automatic notification when production-level (GA/FCS) documentation is initially released or important changes are made to existing production-level documents.

If you have suggestions for improving this document, send us your comments by email.

doccomments@netapp.com

To help us direct your comments to the correct division, include in the subject line the product name, version, and operating system.

If you want to be notified automatically when production-level documentation is released or important changes are made to existing production-level documents, follow Twitter account @NetAppDoc.

You can also contact us in the following ways:

- NetApp, Inc., 495 East Java Drive, Sunnyvale, CA 94089 U.S.
- Telephone: +1 (408) 822-6000
- Fax: +1 (408) 822-4501
- Support telephone: +1 (888) 463-8277