



Concepts

SANtricity 11.5

NetApp
February 12, 2024

Table of Contents

- Concepts 1
 - Controller software and firmware upgrades 1
 - Workflow for controller software and firmware upgrade 2
 - Drive firmware upgrades 3

Concepts

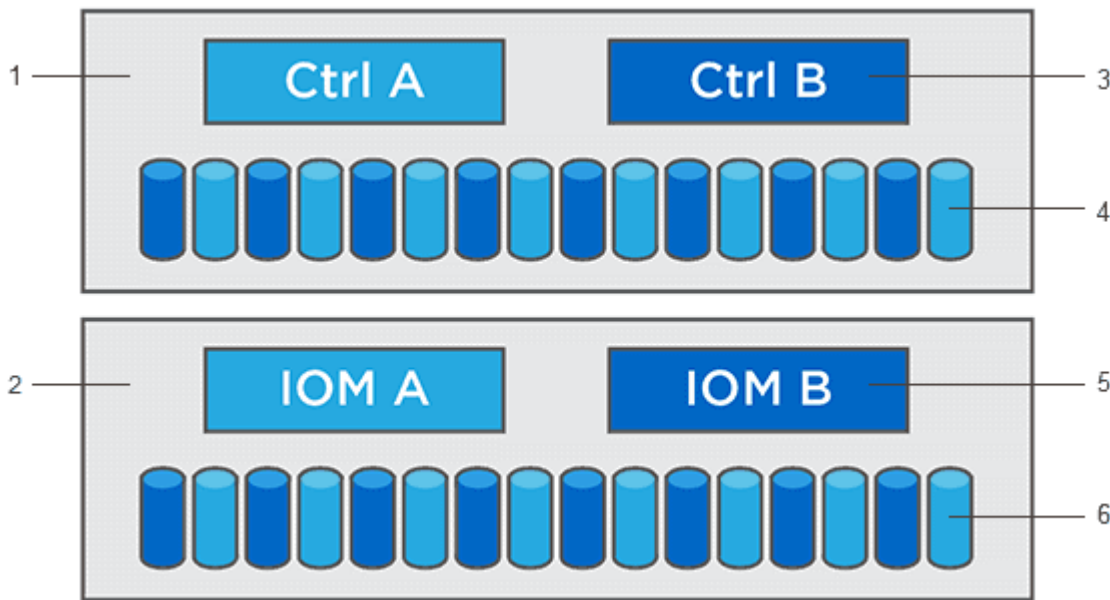
Controller software and firmware upgrades

You can upgrade your storage array's software and firmware for all the latest features and bug fixes.

Components included in the SANtricity OS controller software upgrade

Several storage array components contain software or hardware that you might want to upgrade occasionally.

- **Management software** — System Manager is the software that manages the storage array.
- **Controller firmware** — Controller firmware manages the I/O between hosts and volumes.
- **Controller NVSRAM** — Controller NVSRAM is a controller file that specifies the default settings for the controllers.
- **IOM firmware** — The I/O module (IOM) firmware manages the connection between a controller and a drive shelf. It also monitors the status of the components.
- **Supervisor software** — Supervisor software is the virtual machine on a controller in which the software runs.



¹ Controller shelf; ² Drive shelf; ³ Software, controller firmware, controller NVSRAM, supervisor software; ⁴ Drive firmware; ⁵ IOM firmware; ⁶ Drive firmware

You can view your current software and firmware versions in the Software and Firmware Inventory dialog box. Go to **Support > Upgrade Center**, and then click the link for **Software and Firmware Inventory**.

As part of the upgrade process, the host's multipath/failover driver and/or HBA driver might also need to be upgraded so the host can interact with the controllers correctly. To determine if this is the case, see the [Netapp Interoperability Matrix Tool](#).

When to stop I/O

If your storage array contains two controllers and you have a multipath driver installed, the storage array can remain processing I/O while the upgrade occurs. During the upgrade, controller A fails over all of its LUNs to controller B, upgrades, takes back its LUNs and all of controller B's LUNs, and then upgrades controller B. After the upgrade completes, you might need to manually redistribute volumes between the controllers to ensure volumes return to the correct owning controller.

Pre-upgrade health check

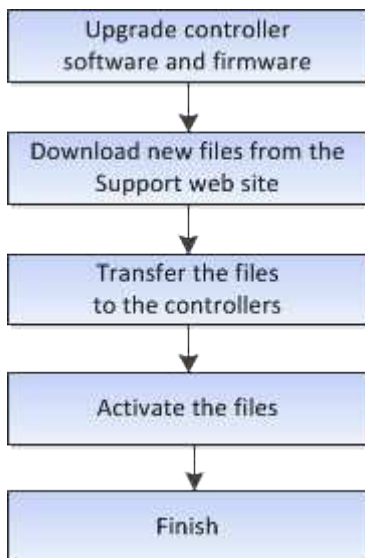
A pre-upgrade health check runs as part of the upgrade process. The pre-upgrade health check assesses all storage array components to make sure the upgrade can proceed. The following conditions might prevent the upgrade:

- Failed assigned drives
- Hot spares in use
- Incomplete volume groups
- Exclusive operations running
- Missing volumes
- Controller in Non-optimal status
- Excess number of event log events
- Configuration database validation failure
- Drives with old versions of DACstore

You also can run the pre-upgrade health check separately without doing an upgrade.

Workflow for controller software and firmware upgrade

In SANtricity System Manager, you can upgrade the controller software and firmware by following these steps.



Drive firmware upgrades

Drive firmware controls the low-level operating characteristics of a drive. Periodically, the drive manufacturers release updates to drive firmware to add new features, improve performance, and fix defects.

Online and offline drive firmware upgrades

There are two types of drive firmware upgrade methods: online and offline.

Online

During an online upgrade, drives are upgraded sequentially, one at a time. The storage array continues processing I/O while the upgrade occurs. You do not have to stop I/O. If a drive can do an online upgrade, the online method is used automatically.

Drives that can do an online upgrade include the following:

- Drives in an Optimal pool
- Drives in an Optimal redundant volume group (RAID 1, RAID 5, and RAID 6)
- Unassigned drives
- Standby hot spare drives

Doing an online drive firmware upgrade can take several hours exposing the storage array to potential volume failures. Volume failure could occur in these cases:

- In a RAID 1 or RAID 5 volume group, one drive fails while a different drive in the volume group is being upgraded.
- In a RAID 6 pool or volume group, two drives fail while a different drive in the pool or volume group is being upgraded.

Offline (parallel)

During an offline upgrade, all drives of the same drive type are upgraded at the same time. This method requires stopping I/O activity to the volumes associated with the selected drives. Because multiple drives can be upgraded concurrently (in parallel), the overall downtime is significantly reduced. If a drive can do only an offline upgrade, the offline method is used automatically.

The following drives **MUST** use the offline method:

- Drives in a non-redundant volume group (RAID 0)
- Drives in a non-optimal pool or volume group
- Drives in SSD cache

Compatibility

Each drive firmware file contains information about the drive type on which the firmware runs. You can download the specified firmware file only to a compatible drive. System Manager automatically checks compatibility during the upgrade process.

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.