



# **Mirrored and unmirrored aggregates**

## **ONTAP 9**

NetApp  
March 26, 2022

# Table of Contents

- Mirrored and unmirrored aggregates . . . . . 1
  - Mirrored and unmirrored aggregates . . . . . 1
  - How unmirrored aggregates work . . . . . 1
  - How mirrored aggregates work . . . . . 2

# Mirrored and unmirrored aggregates

## Mirrored and unmirrored aggregates

You can use an optional feature called *SyncMirror* to synchronously mirror aggregate data in copies, or *plexes*, stored in different RAID groups. Plexes ensure against data loss if more disks fail than the RAID type protects against, or if there is a loss of connectivity to RAID group disks.

## How unmirrored aggregates work

Unless you are using *SyncMirror*, all of your aggregates are unmirrored. Unmirrored aggregates have only one *plex* (copy of their data), which contains all of the RAID groups belonging to that aggregate.

The following diagram shows an unmirrored aggregate composed of disks, with its one plex. The aggregate has four RAID groups: rg0, rg1, rg2, and rg3. Each RAID group has 6 data disks, one parity disk, and one dparity (double parity) disk. All disks used by the aggregate come from the same pool, pool0.



The following diagram shows an unmirrored aggregate with array LUNs, with its one plex. It has two RAID groups, rg0 and rg1. All array LUNs used by the aggregate come from the same pool, pool0.



## How mirrored aggregates work

Mirrored aggregates have two *plexes* (copies of their data), which use the SyncMirror functionality to duplicate the data to provide redundancy.

When a mirrored aggregate is created (or when a second plex is added to an existing unmirrored aggregate), ONTAP copies the data in the original plex (plex0) to the new plex (plex1). The plexes are physically separated (each plex has its own RAID groups and its own pool), and the plexes are updated simultaneously. This provides added protection against data loss if more disks fail than the RAID level of the aggregate protects against or there is a loss of connectivity, because the unaffected plex continues to serve data while you fix the cause of the failure. After the plex that had a problem is fixed, the two plexes resynchronize and reestablish the mirror relationship.

The disks and array LUNs on the system are divided into two pools: pool0 and pool1. Plex0 gets its storage from pool0 and plex1 gets its storage from pool1.

The following diagram shows an aggregate composed of disks with the SyncMirror functionality enabled and implemented. A second plex has been created for the aggregate, plex1. The data in plex1 is a copy of the data in plex0, and the RAID groups are also identical. The 32 spare disks are allocated to pool0 or pool1, 16 disks for each pool.



The following diagram shows an aggregate composed of array LUNs with the SyncMirror functionality enabled and implemented. A second plex has been created for the aggregate, plex1. Plex1 is a copy of plex0, and the RAID groups are also identical.



## Copyright Information

Copyright © 2022 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, 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.