



# Path failover

## ONTAP 9

NetApp  
April 25, 2023

# Table of Contents

- Path failover ..... 1
  - Path failover overview ..... 1
  - NAS path failover ..... 1
  - SAN path failover ..... 2

# Path failover

## Path failover overview

There are important differences in how ONTAP manages path failover in NAS and SAN topologies. A NAS LIF automatically migrates to a different network port after a link failure. A SAN LIF does not migrate (unless you move it manually after the failure). Instead, multipathing technology on the host diverts traffic to a different LIF—on the same SVM, but accessing a different network port.

## NAS path failover

A NAS LIF automatically migrates to a surviving network port after a link failure on its current port. The port to which the LIF migrates must be a member of the *failover group* for the LIF. The *failover group policy* narrows the failover targets for a data LIF to ports on the node that owns the data and its HA partner.

For administrative convenience, ONTAP creates a failover group for each *broadcast domain* in the network architecture. Broadcast domains group ports that belong to the same layer 2 network. If you are using VLANs, for example, to segregate traffic by department (Engineering, Marketing, Finance, and so on), each VLAN defines a separate broadcast domain. The failover group associated with the broadcast domain is automatically updated each time you add or remove a broadcast domain port.

It is almost always a good idea to use a broadcast domain to define a failover group to ensure that the failover group remains current. Occasionally, however, you may want to define a failover group that is not associated with a broadcast domain. For example, you may want LIFs to fail over only to ports in a subset of the ports defined in the broadcast domain.



*A NAS LIF automatically migrates to a surviving network port after a link failure on its current port.*

## Subnets

A *subnet* reserves a block of IP addresses in a broadcast domain. These addresses belong to the same layer 3 network and are allocated to ports in the broadcast domain when you create a LIF. It is usually easier and less error-prone to specify a subnet name when you define a LIF address than it is to specify an IP address and network mask.

## SAN path failover

A SAN host uses ALUA (Asymmetric Logical Unit Access) and MPIO (multipath I/O) to reroute traffic to a surviving LIF after a link failure. Predefined paths determine the possible routes to the LUN served by the SVM.

In a SAN environment, hosts are regarded as *initiators* of requests to LUN *targets*. MPIO enables multiple paths from initiators to targets. ALUA identifies the most direct paths, called *optimized paths*.

You typically configure multiple optimized paths to LIFs on the LUN's owning node, and multiple non-optimized paths to LIFs on its HA partner. If one port fails on the owning node, the host routes traffic to the surviving ports. If all the ports fail, the host routes traffic over the non-optimized paths.

ONTAP Selective LUN Map (SLM) limits the number of paths from the host to a LUN by default. A newly created LUN is accessible only through paths to the node that owns the LUN or its HA partner. You can also limit access to a LUN by configuring LIFs in a *port set* for the initiator.



*A SAN host uses multipathing technology to reroute traffic to a surviving LIF after a link failure.*

### ***Moving volumes in SAN environments***

By default, ONTAP *Selective LUN Map (SLM)* limits the number of paths to a LUN from a SAN host. A newly created LUN is accessible only through paths to the node that owns the LUN or its HA partner, the *reporting nodes* for the LUN.

This means that when you move a volume to a node on another HA pair, you need to add reporting nodes for the destination HA pair to the LUN mapping. You can then specify the new paths in your MPIO setup. After the volume move is complete, you can delete the reporting nodes for the source HA pair from the mapping.

## Copyright information

Copyright © 2023 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.