



# Introduction

## ONTAP 9

NetApp  
May 13, 2021

# Table of Contents

- Introduction..... 1
  - Overview ..... 1
  - Key terminology ..... 2
  - Role of Mediator..... 3
  - Basic failover and recovery concepts..... 3
  - Additional information..... 3

# Introduction

## Overview

Beginning with ONTAP 9.8, you can use SnapMirror Business Continuity (SM-BC) to protect applications with LUNs, enabling applications to fail over transparently, ensuring business continuity in case of a disaster. SM-BC is supported on AFF clusters or All SAN Array (ASA) clusters, where the primary and secondary clusters can be either AFF or ASA. SM-BC protects applications with iSCSI or FCP LUNs.

### Benefits

SnapMirror Business Continuity provides the following benefits:

- Provides continuous availability for business-critical applications
- Ability to host critical applications alternately from primary and secondary site
- Simplified application management using consistency groups for dependent write-order consistency
- The ability to test failover for each application
- Instantaneous creation of mirror clones without impacting application availability

### Typical use cases

#### Application deployment for zero RTO or Transparent Application Failover

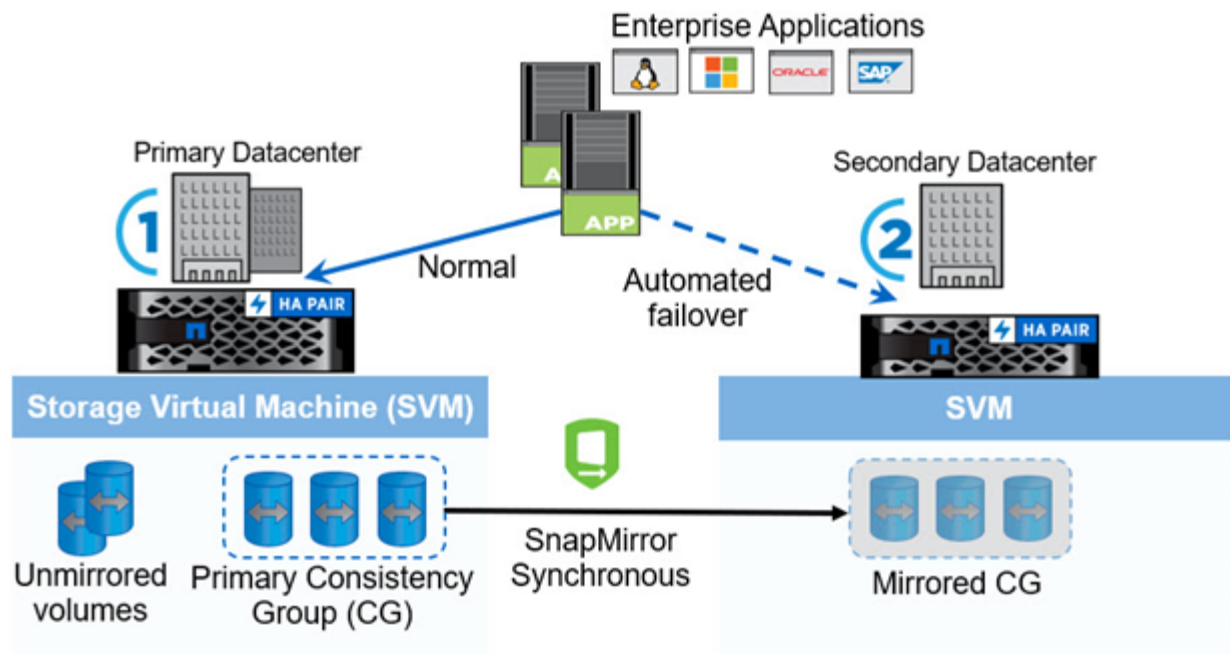
Transparent Application Failover is based on host multipath I/O (MPIO) software-based path failover to achieve non-disruptive access to the storage. Both LUN copies, for example, primary(L1P) and mirror copy(L1S), have the same identity (serial number) and are reported as read-writable to the host. However, reads and writes are serviced only by the primary volume. I/Os issued to the mirror copy are proxied to the primary copy. The host's preferred path to L1 is VS1:N1 based on Asymmetric Logical Unit Access (ALUA) access state Active Optimized (A/O). Mediator is recommended as part of the deployment, primarily to perform failover in case of a storage outage on the primary.

#### Disaster scenario

The site hosting the primary cluster experiences a disaster. Host multipathing software marks all paths through the cluster as down and uses paths from the secondary cluster. The result is a non-disruptive failover to the mirror copy for LUN L1. L1S is converted from a mirror copy to an active copy of LUN L1. The failover happens automatically when an external Mediator is configured. The host's preferred path to L1 becomes VS2:N1.

### Architecture

The following figure illustrates the operation of the SnapMirror Business Continuity feature at a high level.



## Key terminology

As you begin to explore the ONTAP SnapMirror Business Continuity and plan a deployment, it is helpful to become familiar with the key terminology and concepts.

### SM-BC

Acronym for the SnapMirror Business Continuity (SM-BC) solution available with ONTAP 9.8 and later.

### Consistency group

A consistency group (CG) is a collection of FlexVol volumes that provide a write order consistency guarantee for the application workload which needs to be protected for business continuity. The purpose of a consistency group is to take simultaneous crash-consistent Snapshot copies of a collection of volumes at a point in time. In regular deployment, the group of volumes picked to be part of a CG are mapped to an application instance. SnapMirror relationships, also known as a CG relationship, is established between a source CG and a destination CG. The source and destination CGs must contain the same number and type of volumes.

### Constituent

The individual FlexVol volumes that are part of a consistency group.

### Mediator

External software installed in a standalone server or in a VM. It is a monolithic process that is required to complete a quorum for SM-BC deployment. Mediator is used for health checking and to establish a consensus across a 3-party quorum where the other two parties are the two clusters hosting the SM-BC primary CG and mirror CG copies. Both are used interchangeably.

### Out of Sync (OOS)

The application I/O is not replicating to the secondary storage system. The destination volume is not in sync with the source volume because SnapMirror replication is not occurring. If the mirror state is Snapmirrored, this indicates a transfer failure or failure due to an unsupported operation.

### Zero RPO

Zero recovery point objective. This is the acceptable amount of data loss from downtime.

### **Zero RTO**

Zero recovery time objective or Transparent Application Failover is achieved by using host multipath I/O (MPIO) software-based path failover to provide non-disruptive access to the storage.

## **Role of Mediator**

ONTAP Mediator provides an alternate health path to the peer cluster, with the intercluster LIFs providing the other health path. With the Mediator's health information, clusters can differentiate between intercluster LIF failure and site failure. When the site goes down, Mediator passes on the health information to the peer cluster on demand, facilitating the peer cluster to fail over. With the Mediator-provided information and the intercluster LIF health check information, ONTAP determines whether to perform an auto failover, if it is failover incapable, continue or stop.

Mediator is one of three parties in the SM-BC quorum, working with the primary cluster and the secondary cluster to reach a consensus. A consensus requires at least two parties in the quorum to agree to an operation.

## **Basic failover and recovery concepts**

It might be helpful to understand some of the basic SM-BC failover and recovery concepts.

### **Planned failover**

A manual operation to change the roles of copies in a SM-BC relationship. The primary becomes the secondary and the secondary becomes the primary. ALUA reporting also changes.

### **Automatic unplanned failover (AUFO)**

An automatic operation to perform a failover to the mirror copy. The operation requires assistance from Mediator to detect that the primary copy is unavailable.

## **Additional information**

For more information about data protection using SnapMirror Synchronous, see the following documentation:

[SnapMirror Synchronous disaster recovery basics](#)

## Copyright Information

Copyright © 2021 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.