



# High-availability pairs

## Cloud Volumes ONTAP

NetApp  
September 26, 2023

# Table of Contents

- High-availability pairs ..... 1
  - High-availability pairs in Azure ..... 1
  - Actions unavailable during takeover ..... 7

# High-availability pairs

## High-availability pairs in Azure

A Cloud Volumes ONTAP high availability (HA) pair provides enterprise reliability and continuous operations in case of failures in your cloud environment. In Azure, storage is shared between the two nodes.

### HA components

#### HA single availability zone configuration with page blobs

A Cloud Volumes ONTAP HA page blob configuration in Azure includes the following components:



Note the following about the Azure components that BlueXP deploys for you:

#### Azure Standard Load Balancer

The load balancer manages incoming traffic to the Cloud Volumes ONTAP HA pair.

#### Availability Set

The Azure Availability Set is a logical grouping of the Cloud Volumes ONTAP nodes. The Availability Set ensures that the nodes are in different fault and update domains to provide redundancy and availability.

[Learn more about Availability Sets in the Azure docs.](#)

## Disks

Customer data resides on Premium Storage page blobs. Each node has access to the other node's storage. Additional storage is also required for [boot, root, and core data](#).

## Storage accounts

- One storage account is required for managed disks.
- One or more storage accounts are required for the Premium Storage page blobs, as the disk capacity limit per storage account is reached.

[Azure documentation: Azure Storage scalability and performance targets for storage accounts](#).

- One storage account is required for data tiering to Azure Blob storage.
- Starting with Cloud Volumes ONTAP 9.7, the storage accounts that BlueXP creates for HA pairs are general-purpose v2 storage accounts.
- You can enable an HTTPS connection from a Cloud Volumes ONTAP 9.7 HA pair to Azure storage accounts when creating a working environment. Note that enabling this option can impact write performance. You can't change the setting after you create the working environment.

## HA single availability zone configuration with shared managed disks

A Cloud Volumes ONTAP HA single availability zone configuration running on top of shared managed disk includes the following components:



Note the following about the Azure components that BlueXP deploys for you:

#### Azure Standard Load Balancer

The load balancer manages incoming traffic to the Cloud Volumes ONTAP HA pair.

#### Availability Set

The Azure Availability Set is a logical grouping of the Cloud Volumes ONTAP nodes. The Availability Set ensures that the nodes are in different fault and update domains to provide redundancy and availability.

[Learn more about Availability Sets in the Azure docs.](#)

## **Disks**

Customer data resides on locally redundant storage (LRS) managed disks. Each node has access to the other node's storage. Additional storage is also required for [boot](#), [root](#), [partner root](#), [core](#), and [NVRAM data](#).

## **Storage accounts**

Storage accounts are used for managed disk based deployments to handle diagnostic logs and tiering to blob storage.

## **HA multiple availability zone configuration**

A Cloud Volumes ONTAP HA multiple availability zone configuration in Azure includes the following components:



Note the following about the Azure components that BlueXP deploys for you:

#### Azure Standard Load Balancer

The load balancer manages incoming traffic to the Cloud Volumes ONTAP HA pair.

#### Availability Zones

Two Cloud Volumes ONTAP nodes are deployed in to different availability zones. Availability zones ensure that the nodes are in different fault domains. [Learn more about Azure zone-redundant storage for managed disks in the Azure docs.](#)



## Disks

Customer data resides on zone-redundant storage (ZRS) managed disks. Each node has access to the other node's storage. Additional storage is also required for [boot](#), [root](#), [partner root](#), and [core data](#).

## Storage accounts

Storage accounts are used for managed disk based deployments to handle diagnostic logs and tiering to blob storage.

## RPO and RTO

An HA configuration maintains high availability of your data as follows:

- The recovery point objective (RPO) is 0 seconds.  
Your data is transactionally consistent with no data loss.
- The recovery time objective (RTO) is 120 seconds.  
In the event of an outage, data should be available in 120 seconds or less.

## Storage takeover and giveback

Similar to a physical ONTAP cluster, storage in an Azure HA pair is shared between nodes. Connections to the partner's storage allows each node to access the other's storage in the event of a *takeover*. Network path failover mechanisms ensure that clients and hosts continue to communicate with the surviving node. The partner *gives back* storage when the node is brought back on line.

For NAS configurations, data IP addresses automatically migrate between HA nodes if failures occur.

For iSCSI, Cloud Volumes ONTAP uses multipath I/O (MPIO) and Asymmetric Logical Unit Access (ALUA) to manage path failover between the active-optimized and non-optimized paths.



For information about which specific host configurations support ALUA, see the [NetApp Interoperability Matrix Tool](#) and the Host Utilities Installation and Setup Guide for your host operating system.

Storage takeover, resync, and giveback are all automatic by default. No user action is required.

## Storage configurations

You can use an HA pair as an active-active configuration, in which both nodes serve data to clients, or as an active-passive configuration, in which the passive node responds to data requests only if it has taken over storage for the active node.

## Actions unavailable during takeover

When a node in an HA pair isn't available, the other node serves data for its partner to provide continued data service. This is called *storage takeover*. Several actions are unavailable until in storage giveback is complete.



When a node in an HA pair is unavailable, the state of the working environment in BlueXP is *Degraded*.

The following actions are unavailable from BlueXP storage takeover:

- Support registration
- License changes
- Instance or VM type changes
- Write speed changes
- CIFS setup
- Changing the location of configuration backups
- Setting the cluster password
- Managing disks and aggregates (advanced allocation)

These actions are available again after storage giveback completes and the state of the working environment changes back to normal.

## 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.