



NetApp Storage Integrations Overview

NetApp Solutions

NetApp
August 13, 2023

This PDF was generated from https://docs.netapp.com/us-en/netapp-solutions/containers/anthos-with-netapp/a-w-n_overview_trident.html on August 13, 2023. Always check docs.netapp.com for the latest.

Table of Contents

- NetApp Storage Integration Overview 1
 - Anthos Ready storage partner program. 1
 - NetApp storage integrations. 2
 - Astra Trident Overview 2

NetApp Storage Integration Overview

Anthos Ready storage partner program.

Google Cloud periodically requests updated validation of partner storage integrations with new releases of Anthos through their Anthos Ready storage partner program. A list of currently validated storage solutions, CSI drivers, available features, and the versions of Anthos supported can be found [here](#).

NetApp has maintained regular compliance on a quarterly basis with requests to validate our Astra Trident CSI-compliant storage orchestrator and our ONTAP storage system with versions of Anthos.

The following table contains the Anthos versions tested by NetApp and NetApp partner engineers for validation of NetApp Astra Trident CSI drivers and feature sets as a part of the Anthos Ready storage partner program:

Deployment Type	Version	Storage System	Astra Trident Version	Protocol	Features
VMware	1.15	ONTAP 9.12.1	23.04	NAS	Multiwriter, Volume Expansion, SnapShots, PVCDataSource
VMware	1.15	ONTAP 9.12.1	23.04	SAN	Raw Block, Volume Expansion, SnapShots, PVCDataSource
VMware	1.14	ONTAP 9.12.1	23.01	NAS	Multiwriter, Volume Expansion, SnapShots, PVCDataSource
VMware	1.14	ONTAP 9.12.1	23.01	SAN	Raw Block, Volume Expansion, SnapShots, PVCDataSource
VMware	1.13	ONTAP 9.12.1	22.10	NAS	Multiwriter, Volume Expansion, SnapShots, PVCDataSource
VMware	1.13	ONTAP 9.12.1	22.10	SAN	Raw Block, Volume Expansion, SnapShots, PVCDataSource

VMware	1.11	ONTAP 9.9.1	22.04	NAS	Multiwriter, Volume Expansion, SnapShots
VMware	1.11	ONTAP 9.9.1	22.04	SAN	Raw Block, Volume Expansion, SnapShots
VMware	1.11	Element 12.3	22.04	SAN	Raw Block, Volume Expansion, SnapShots
bare metal	1.10	ONTAP 9.8	22.01	NAS	Multiwriter, Volume Expansion, SnapShots
bare metal	1.10	ONTAP 9.8	22.01	SAN	Raw Block, Volume Expansion, SnapShots

NetApp storage integrations

NetApp provides a number of products to help you with orchestrating and managing persistent data in container-based environments such as Anthos.

NetApp Astra Trident is an open-source, fully-supported storage orchestrator for containers and Kubernetes distributions, including Anthos. For more information, visit the Astra Trident website [here](#).

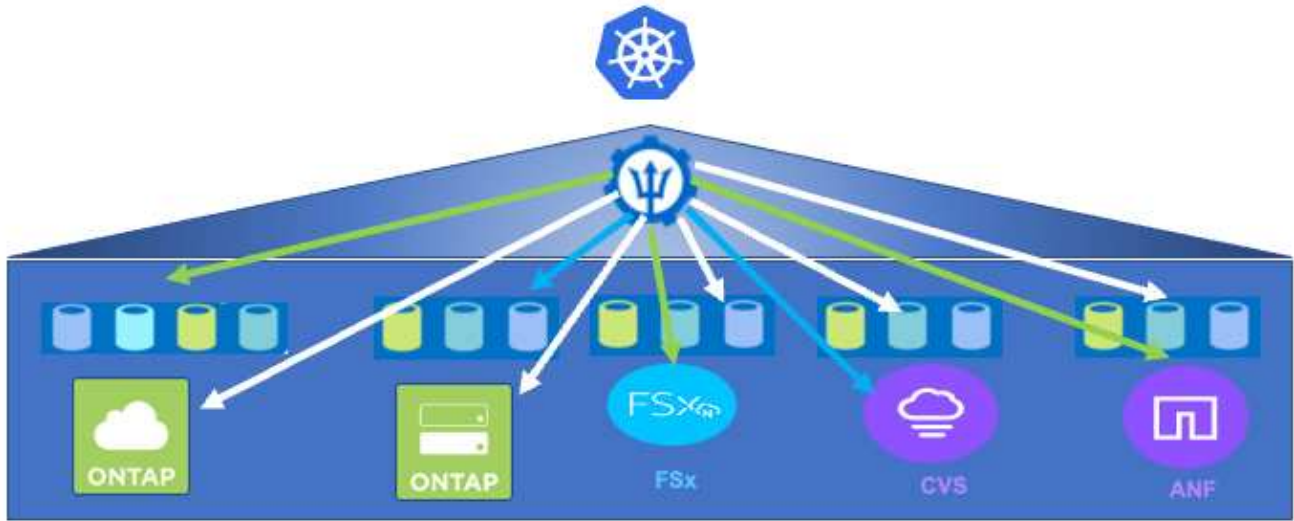
The following pages have additional information about the NetApp products that have been validated for application and persistent-storage management in the Anthos with NetApp solution.

Next: [NetApp Astra Trident Overview](#).

Astra Trident Overview

Astra Trident is a fully supported, open-source storage orchestrator for containers and Kubernetes distributions, including Anthos. Trident works with the entire NetApp storage portfolio, including NetApp ONTAP, and it also supports NFS and iSCSI connections. Trident accelerates the DevOps workflow by allowing end users to provision and manage storage from their NetApp storage systems without requiring intervention from a storage administrator.

An administrator can configure a number of storage backends based on project needs and storage system models that enable advanced storage features, including compression, specific disk types, and QoS levels that guarantee a certain level of performance. After they are defined, these backends can be used by developers in their projects to create persistent volume claims (PVCs) and to attach persistent storage to their containers on demand.



Astra Trident has a rapid development cycle and, like Kubernetes, is released four times a year.

The documentation for the latest version of Astra Trident can be found [here](#). A support matrix for what version of Trident has been tested with which Kubernetes distribution can be found [here](#).

Starting with the 20.04 release, Trident setup is performed by the Trident operator. The operator makes large scale deployments easier and provides additional support including self healing for pods that are deployed as a part of the Trident install.

With the 22.04 release, a Helm chart was made available to ease the installation of the Trident Operator.

For Astra Trident installation details, please see [here](#).

Create a storage-system backend

After completing the Astra Trident Operator install, you must configure the backend for the specific NetApp storage platform you are using. Follow the link below in order to continue the setup and configuration of Astra Trident.

[Create a backend.](#)

Create a storage class

After creating the backend, you must create a storage class that Kubernetes users will specify when they want a volume. Kubernetes users provision volumes by using persistent volume claims (PVCs) that specify a storage class by name.

Follow the link below to create a storage class.

[Create a storage class](#)

Dynamically provision a volume

You must create a Kubernetes persistent volume claim (PVC) object using the storage class to dynamically provision a volume. Follow the link below to create a PVC object.

[Create a PVC](#)

Use the volume

The volume provisioned in the above step can be used by an application by mounting the volume in the pod. The link below shows an example.

[Mount the volume in a pod](#)

[Next: Advanced Configuration Options for Anthos.](#)

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.