



## **Release notes**

### **Astra Trident**

NetApp  
March 27, 2023

This PDF was generated from <https://docs.netapp.com/us-en/trident/trident-rn.html> on March 27, 2023.  
Always check [docs.netapp.com](https://docs.netapp.com) for the latest.

# Table of Contents

- Release Notes ..... 1
  - What's new in 23.01.1 ..... 1
  - Changes in 23.01 ..... 1
  - Changes in 22.10 ..... 2
  - Changes in 22.07 ..... 3
  - Changes in 22.04 ..... 4
  - Changes in 22.01.1 ..... 4
  - Changes in 22.01.0 ..... 5
  - Changes in 21.10.1 ..... 5
  - Changes in 21.10.0 ..... 6
  - Known issues ..... 6
  - Find more information ..... 7

# Release Notes

Release Notes provide information about new features, enhancements, and bug fixes in the latest version of Astra Trident.



The `tridentctl` binary for Linux that is provided in the installer zip file is the tested and supported version. Be aware that the `macos` binary provided in the `/extras` part of the zip file is not tested or supported.

## What's new in 23.01.1

### Fixes

- Fixed Trident Operator to use IPv6 localhost for installation when specified in spec.
- Fixed Trident Operator cluster role permissions to be in sync with the bundle permissions [Issue #799](#).
- Added a fix to allow external processes to run to completion.
- Fixed issue with attaching raw block volume on multiple nodes in RWX mode.
- Fixed FlexGroup cloning support and volume import for SMB volumes.

## Changes in 23.01



Kubernetes 1.26 is now supported in Trident. Please upgrade Astra Trident prior to upgrading Kubernetes.

### Fixes

- Kubernetes: Added options to exclude Pod Security Policy creation to fix Trident installations via Helm ([Issues #783, #794](#)).

### Enhancements

#### Kubernetes

- Added support for Kubernetes 1.26.
- Improved overall Trident RBAC resource utilization ([Issue #757](#)).
- Added automation to detect and fix broken or stale iSCSI sessions on host nodes.
- Added support for expanding LUKS encrypted volumes.
- Kubernetes: Added credential rotation support for LUKS encrypted volumes.

#### Astra Trident

- Added support for SMB volumes with Amazon FSx for ONTAP to the `ontap-nas` storage driver.
- Added support for NTFS permissions when using SMB volumes.
- Added support for storage pools for GCP volumes with CVS service level.
- Added support for optional use of `flexgroupAggregateList` when creating FlexGroups with the `ontap-nas-flexgroup` storage driver.

- Improved performance for the ontap-nas-economy storage driver when managing multiple FlexVols.
- Enabled dataLIF updates for all ONTAP NAS storage drivers.
- Updated the Trident Deployment and DaemonSet naming convention to reflect the host node OS.

## Deprecations

- Kubernetes: Updated minimum supported Kubernetes to 1.21.
- Data LIFs should no longer be specified when configuring `ontap-san` or `ontap-san-economy` drivers.

## Changes in 22.10

You must read the following critical information before upgrading to Astra Trident 22.10.

### Critical information about Astra Trident 22.10



- Kubernetes 1.25 is now supported in Trident. You must upgrade Astra Trident to 22.10 prior to upgrading to Kubernetes 1.25.
- Astra Trident now strictly enforces the use of multipathing configuration in SAN environments, with a recommended value of `find_multipaths: no` in `multipath.conf` file.

Use of non-multipathing configuration or use of `find_multipaths: yes` or `find_multipaths: smart` value in `multipath.conf` file will result in mount failures. Trident has recommended the use of `find_multipaths: no` since the 21.07 release.

## Fixes

- Fixed issue specific to ONTAP backend created using `credentials` field failing to come online during 22.07.0 upgrade ([Issue #759](#)).
- **Docker:** Fixed an issue causing the Docker volume plugin to fail to start in some environments ([Issue #548](#) and [Issue #760](#)).
- Fixed SLM issue specific to ONTAP SAN backends to ensure only subset of data LIFs belonging to reporting nodes are published.
- Fixed performance issue where unnecessary scans for iSCSI LUNs happened when attaching a volume.
- Removed granular retries within the Astra Trident iSCSI workflow to fail fast and reduce external retry intervals.
- Fixed issue where an error was returned when flushing an iSCSI device when the corresponding multipath device was already flushed.

## Enhancements

- Kubernetes:
  - Added support for Kubernetes 1.25. You must upgrade Astra Trident to 22.10 prior to upgrading to Kubernetes 1.25.
  - Added a separate ServiceAccount, ClusterRole, and ClusterRoleBinding for the Trident Deployment and DaemonSet to allow future permissions enhancements.
  - Added support for [cross-namespace volume sharing](#).

- All Trident `ontap-*` storage drivers now work with the ONTAP REST API.
- Added new operator yaml (`bundle_post_1_25.yaml`) without a `PodSecurityPolicy` to support Kubernetes 1.25.
- Added [support for LUKS-encrypted volumes](#) for `ontap-san` and `ontap-san-economy` storage drivers.
- Added support for Windows Server 2019 nodes.
- Added [support for SMB volumes on Windows nodes](#) through the `azure-netapp-files` storage driver.
- Automatic MetroCluster switchover detection for ONTAP drivers is now generally available.

## Deprecations

- **Kubernetes:** Updated minimum supported Kubernetes to 1.20.
- Removed Astra Data Store (ADS) driver.
- Removed support for `yes` and `smart` options for `find_multipaths` when configuring worker node multipathing for iSCSI.

## Changes in 22.07

### Fixes

#### Kubernetes

- Fixed issue to handle boolean and number values for node selector when configuring Trident with Helm or the Trident Operator. ([GitHub issue #700](#))
- Fixed issue in handling errors from non-CHAP path, so that kubelet will retry if it fails. ([GitHub issue #736](#))

### Enhancements

- Transition from `k8s.gcr.io` to `registry.k8s.io` as default registry for CSI images
- ONTAP-SAN volumes will now use per-node igroups and only map LUNs to igroups while actively published to those nodes to improve our security posture. Existing volumes will be opportunistically switched to the new igroup scheme when Trident determines it is safe to do so without impacting active workloads.
- Included a `ResourceQuota` with Trident installations to ensure Trident `DaemonSet` is scheduled when `PriorityClass` consumption is limited by default.
- Added support for Network Features to ANF driver. ([GitHub issue #717](#))
- Added tech preview automatic MetroCluster switchover detection to ONTAP drivers. ([GitHub issue #228](#))

## Deprecations

- **Kubernetes:** Updated minimum supported Kubernetes to 1.19.
- Backend config no longer allows multiple authentication types in single config.

## Removals

- AWS CVS driver (deprecated since 22.04) has been removed.

- Kubernetes
  - Removed unnecessary SYS\_ADMIN capability from node pods.
  - Reduces nodeprep down to simple host info and active service discovery to do a best-effort confirmation that NFS/iSCSI services are available on worker nodes.

## Documentation

A new [Pod Security Standards](#) (PSS) section has been added detailing permissions enabled by Astra Trident on installation.

## Changes in 22.04

NetApp is continually improving and enhancing its products and services. Here are some of the latest features in Astra Trident. For previous releases, see [Earlier versions of documentation](#).



If you are upgrading from any previous Trident release and use Azure NetApp Files, the `location` config parameter is now a mandatory, singleton field.

## Fixes

- Improved parsing of iSCSI initiator names. ([GitHub issue #681](#))
- Fixed issue where CSI storage class parameters weren't allowed. ([GitHub issue #598](#))
- Fixed duplicate key declaration in Trident CRD. ([GitHub issue #671](#))
- Fixed inaccurate CSI Snapshot logs. ([GitHub issue #629](#))
- Fixed issue with unpublishing volumes on deleted nodes. ([GitHub issue #691](#))
- Added handling of filesystem inconsistencies on block devices. ([GitHub issue #656](#))
- Fixed issue pulling auto-support images when setting the `imageRegistry` flag during installation. ([GitHub issue #715](#))
- Fixed issue where ANF driver failed to clone a volume with multiple export rules.

## Enhancements

- Inbound connections to Trident's secure endpoints now require a minimum of TLS 1.3. ([GitHub issue #698](#))
- Trident now adds HSTS headers to responses from its secure endpoints.
- Trident now attempts to enable the Azure NetApp Files unix permissions feature automatically.
- **Kubernetes:** Trident daemonset now runs at system-node-critical priority class. ([GitHub issue #694](#))

## Removals

E-Series driver (disabled since 20.07) has been removed.

## Changes in 22.01.1

## Fixes

- Fixed issue with unpublishing volumes on deleted nodes. ([GitHub issue #691](#))
- Fixed panic when accessing nil fields for aggregate space in ONTAP API responses.

## Changes in 22.01.0

### Fixes

- **Kubernetes:** Increase node registration backoff retry time for large clusters.
- Fixed issue where azure-netapp-files driver could be confused by multiple resources with the same name.
- ONTAP SAN IPv6 Data LIFs now work if specified with brackets.
- Fixed issue where attempting to import an already imported volume returns EOF leaving PVC in pending state. ([GitHub issue #489](#))
- Fixed issue when Astra Trident performance slows down when > 32 snapshots are created on a SolidFire volume.
- Replaced SHA-1 with SHA-256 in SSL certificate creation.
- Fixed ANF driver to allow duplicate resource names and limit operations to a single location.
- Fixed ANF driver to allow duplicate resource names and limit operations to a single location.

### Enhancements

- Kubernetes enhancements:
  - Added support for Kubernetes 1.23.
  - Add scheduling options for Trident pods when installed via Trident Operator or Helm. ([GitHub issue #651](#))
- Allow cross-region volumes in GCP driver. ([GitHub issue #633](#))
- Added support for 'unixPermissions' option to ANF volumes. ([GitHub issue #666](#))

### Deprecations

Trident REST interface can listen and serve only at 127.0.0.1 or [::1] addresses

## Changes in 21.10.1



The v21.10.0 release has an issue that can put the Trident controller into a CrashLoopBackOff state when a node is removed and then added back to the Kubernetes cluster. This issue is fixed in v21.10.1 ([GitHub issue 669](#)).

### Fixes

- Fixed potential race condition when importing a volume on a GCP CVS backend resulting in failure to import.
- Fixed an issue that can put the Trident controller into a CrashLoopBackOff state when a node is removed and then added back to the Kubernetes cluster ([GitHub issue 669](#)).

- Fixed issue where SVMs were no longer discovered if no SVM name was specified (GitHub issue 612).

## Changes in 21.10.0

### Fixes

- Fixed issue where clones of XFS volumes could not be mounted on the same node as the source volume (GitHub issue 514).
- Fixed issue where Astra Trident logged a fatal error on shutdown (GitHub issue 597).
- Kubernetes-related fixes:
  - Return a volume's used space as the minimum `restoreSize` when creating snapshots with `ontap-nas` and `ontap-nas-flexgroup` drivers (GitHub issue 645).
  - Fixed issue where `Failed to expand filesystem` error was logged after volume resize (GitHub issue 560).
  - Fixed issue where a pod could get stuck in `Terminating` state (GitHub issue 572).
  - Fixed the case where an `ontap-san-economy FlexVol` might be full of snapshot LUNs (GitHub issue 533).
  - Fixed custom YAML installer issue with different image (GitHub issue 613).
  - Fixed snapshot size calculation (GitHub issue 611).
  - Fixed issue where all Astra Trident installers could identify plain Kubernetes as OpenShift (GitHub issue 639).
  - Fixed the Trident operator to stop reconciliation if the Kubernetes API server is unreachable (GitHub issue 599).

### Enhancements

- Added support for `unixPermissions` option to GCP-CVS Performance volumes.
- Added support for scale-optimized CVS volumes in GCP in the range 600 GiB to 1 TiB.
- Kubernetes-related enhancements:
  - Added support for Kubernetes 1.22.
  - Enabled the Trident operator and Helm chart to work with Kubernetes 1.22 (GitHub issue 628).
  - Added operator image to `tridentctl images` command (GitHub issue 570).

### Experimental enhancements

- Added support for volume replication in the `ontap-san` driver.
- Added **tech preview** REST support for the `ontap-nas-flexgroup`, `ontap-san`, and `ontap-nas-economy` drivers.

## Known issues

Known issues identify problems that might prevent you from using the product successfully.



- When upgrading a Kubernetes cluster from 1.24 to 1.25 or later that has Astra Trident installed, you must update `values.yaml` to set `excludePodSecurityPolicy` to `true` or add `--set excludePodSecurityPolicy=true` to the `helm upgrade` command before you can upgrade the cluster.
- Astra Trident now enforces a blank `fsType` (`fsType=""`) for volumes that do not have the `fsType` specified in their `StorageClass`. When working with Kubernetes 1.17 or later, Trident supports providing a blank `fsType` for NFS volumes. For iSCSI volumes, you are required to set the `fsType` on your `StorageClass` when enforcing an `fsGroup` using a `Security Context`.
- When using a backend across multiple Astra Trident instances, each backend configuration file should have a different `storagePrefix` value for ONTAP backends or use a different `TenantName` for SolidFire backends. Astra Trident cannot detect volumes that other instances of Astra Trident have created. Attempting to create an existing volume on either ONTAP or SolidFire backends succeeds, because Astra Trident treats volume creation as an idempotent operation. If `storagePrefix` or `TenantName` do not differ, there might be name collisions for volumes created on the same backend.
- When installing Astra Trident (using `tridentctl` or the Trident Operator) and using `tridentctl` to manage Astra Trident, you should ensure the `KUBECONFIG` environment variable is set. This is necessary to indicate the Kubernetes cluster that `tridentctl` should work against. When working with multiple Kubernetes environments, you should ensure that the `KUBECONFIG` file is sourced accurately.
- To perform online space reclamation for iSCSI PVs, the underlying OS on the worker node might require mount options to be passed to the volume. This is true for RHEL/RedHat CoreOS instances, which require the `discard` [mount option](#); ensure that the `discard` `mountOption` is included in your `StorageClass` to support online block discard.
- If you have more than one instance of Astra Trident per Kubernetes cluster, Astra Trident cannot communicate with other instances and cannot discover other volumes that they have created, which leads to unexpected and incorrect behavior if more than one instance runs within a cluster. There should be only one instance of Astra Trident per Kubernetes cluster.
- If Astra Trident-based `StorageClass` objects are deleted from Kubernetes while Astra Trident is offline, Astra Trident does not remove the corresponding storage classes from its database when it comes back online. You should delete these storage classes using `tridentctl` or the REST API.
- If a user deletes a PV provisioned by Astra Trident before deleting the corresponding PVC, Astra Trident does not automatically delete the backing volume. You should remove the volume via `tridentctl` or the REST API.
- ONTAP cannot concurrently provision more than one `FlexGroup` at a time unless the set of aggregates are unique to each provisioning request.
- When using Astra Trident over IPv6, you should specify `managementLIF` and `dataLIF` in the backend definition within square brackets. For example, `[fd20:8b1e:b258:2000:f816:3eff:feec:0]`.



You cannot specify `dataLIF` on an ONTAP SAN backend. Astra Trident discovers all available iSCSI LIFs and uses them to establish the multipath session.

- If using the `solidfire-san` driver with OpenShift 4.5, ensure that the underlying worker nodes use MD5 as the CHAP authentication algorithm. Secure FIPS-compliant CHAP algorithms SHA1, SHA-256, and SHA3-256 are available with Element 12.7.

## Find more information

- [Astra Trident GitHub](#)

- [Astra Trident blogs](#)

## 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.