NexentaStor 5.0.1 and NexentaFusion 1.0.0

Release Notes

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Revision History

Date	Description
October, 2016	NexentaStor 5.0.1 and NexentaFusion 1.0 GA versions.

Product Overview

This document provides the release notes for the GA versions of NexentaStor 5.0.1 and NexentaFusion 1.0. NexentaStor 5.0 is a software-defined storage (SDS) platform that can be deployed as a full storage operating system on standard x 86 servers providing standard file (NFS and SMB) as well as block (FC and iSCSI) protocol services. NexentaStor 5.0 can be run in single-node configurations on internal devices, or in dual-node high-availability (HA) cluster configurations, with SAS-connected shared backend devices.

NexentaStor5.0 Feature Support

The following is a high-level list of supported features in NexentaStor 5.0:

Protocols	File: NFSv3, NFSv4, SMB 1.0, SMB 2.1, SMB 3.0
	Block: Fibre Channel, iSCSI
Configurations	Single node on bare metal or VMware virtual machine
	HA clustered nodes on bare metal or VMware virtual machines
Data Management	Striped mirrors; single, double and triple parity RAID and unprotected
	ZFS end-to-end data integrity
	Unlimited snapshots and clones
	Unlimited file system size
	Inline compression
	Inline deduplication
	Thin provisioning
	Scheduled replication
	Continuous replication
Management	Self-documenting REST API, CLI, NexentaFusion
Client OS Support	VMware, Microsoft, Linux, OpenStack, Docker
Ecosystem Integration	SMB 3 ODX for Microsoft Hyper-V
	VMware VAAI Block
	VMware Virtual Volume (VVOL) 2.0
	VMware vCenter Plugin
	OpenStack Cinder & Manila
	Docker Volume Plugin

NexentaStor 5.0 Reference Architectures

NexentaStor supports a wide selection of certified reference architectures (RAs), fully defined configurations that feature components from leading server vendors. A number of Nexenta server partners provide a seamless end-user experience by acting as a single point of contact for deployment and support of the end-to-end hardware and software solution.

NexentaStor 5.0 License Editions

NexentaStor 5.0 is available in an Enterprise Edition or Community Edition:

NexentaStor Enterprise Edition is sold as a perpetual software license based on raw capacity limits. Support and services are sold separately. Pricing is tiered on the amount of raw capacity required for a system, yielding a lower price per GB for larger configurations. The Enterprise Edition includes all core storage functionality such as snapshots, clones, inline data reduction, software RAID and scheduled replication. It also includes the right to use NexentaFusion as the Graphical User Interface (GUI) for the system running that license. Additional options are sold on a per node basis and include features such as High-Availability Cluster, continuous replication or Fibre Channel support.

NexentaStor Community Edition is a limited-functionality, limited-capacity, free version of the software that can be used for non-production, non-commercial deployments. The NexentaStor Community Edition has limited functionality, limited capacity, and outside of the online Nexenta Community forums, no support services are available. A NexentaFusion server can manage at most one NexentaStor Community Edition appliance. For more information, see the online Nexenta Community forums.

What's New in NexentaStor 5.0

NexentaStor 5.0 is a major update of NexentaStor. This section provides an overview of the architecture changes and feature enhancements.

Ease of Use Enhancements

NexentaStor 5.0 is simpler to deploy, manage, and operate at scale. NexentaStor 5.0 provides a complete set of DevOps-friendly REST APIs, a new storage-centric Command Line Interface (CLI), and integration with the new NexentaFusion user interface (UI) management solution.

NexentaFusion is deployed on a separate management server (or a separate virtual machine) to provide a single-pane-of-glass graphical user interface (UI), allowing you to intuitively manage any number of NexentaStor 5.0 appliances. It incorporates intuitive workflows for provisioning, as well as advanced analytics dashboards for detailed monitoring and troubleshooting, with up to two years of historical service data.

New Management Framework

The new Nexenta Management Framework is a high-performance, multi-threaded, fault-tolerant management plane that provides a streamlined and simplified, storage-centric management experience.

NexentaStor 5.0 has a new Command Line Interface (CLI) that provides full provisioning, operation, and management of all system, high-availability, storage, and data protection services.

NexentaStor 5.0 implements a simple licensing engine that seamlessly integrates with the new customer license portals. Managing a license and associated activation tokens can be done directly on the portal.

New Functionality

To improve storage availability and simplify maintenance operations, NexentaStor 5.0 adds support for smart compression.

NexentaStor 5.0 implements a new High-Performance Replication (HPR) facility that provides low RPO, scheduled replication, as well as a new continuous asynchronous replication functionality for close to zero RPO across any distance. The standard Enterprise license allows replication every 15 minutes and above. The optional continuous replication feature license allows tighter replication schedules, as well as true continuous replication services.

NexentaStor supports a wide variety of all-flash reference architectures, from tens of terabytes all-SSDbased solutions to petabyte-scale SanDisk Infiniflash-based configurations. NexentaStor 5.0 adds support for Non-Volatile Memory Express (NVMe) flash devices, for low latency, high-performance solutions.

NexentaStor 5.0 ships with SMB 2.1 as the default SMB protocol version and adds support for SMB 3.0 to provide a high-performance, file-based storage backend for Microsoft Hyper-V environments, including Offloaded Data Transfer (ODX) to accelerate Hyper-V copy operations over SMB 3.0.

NexentaStor 5.0 comes with a new VMware vCenter Plugin, VMware Virtual Volume (VVOL 2.0) VASA providers, OpenStack Cinder and Manila drivers, Docker volume drivers, and so on.

OpenZFS Performance Improvements

NexentaStor 5.0 incorporates the following OpenZFS performance improvements:

- It is now possible to configure pool and dataset record sizes greater than 128 KB, all the way to 1 MB. This can be useful for streaming-type workloads with large sequential I/Os.
- The read cache device in a pool (also known as the L2ARC) is now persistent, allowing the SSD-based read cache to be kept hot while a pool is failed over or moved from one NexentaStor node to another in a high-availability configuration.
- Inline compression and inline deduplication are both supported. Inline compression implements the high-performance LZ4 algorithm by default. Inline deduplication can be used for lower capacity appliances.
- NexentaStor 5.0 supports automated or scheduled TRIM / UNMAP on the backend SSDs of all-flash pools. For some SSDs, this can help maintain performance, lower I/O latency, and increase the useful life of the SSDs in the pool.

NexentaFusion 1.0

The NexentaFusion graphical user interface (GUI) enables you to intuitively manage NexentaStor appliances. You can create and configure pools, create and share file systems, as well as access appliance-level summaries of hardware, pools, NICs, file systems, shares, volumes, LUNs, and services. NexentaFusion uses drill-down menus, action cogs, and expand-contract arrows, to provide a full range of administrative functionality for provisioning, monitoring, and optimizing storage appliances. You access NexentaFusion online help through a Web browser.

NexentaFusion 1.0.0 supports the following Web browsers and versions: the latest version of Chrome, and Firefox v47 or later.

Installation and Upgrade Procedures

Follow the instructions in the *NexentaStor 5.0 and NexentaFusion 1.0 Installation QuickStart Guide.*
This document includes the instructions to install and upgrade NexentaStor and NexentaFusion.

Known Issues

Table 1 lists known issues as of NexentaStor 5.0.1. Table 2 lists known issues as of NexentaFusion 1.0.

Table 1: NexentaStor 5.0.1 Known Issues

Component	Key	Description	Workaround
Kernel	NEX-928	When using ZEUS IOPS drives in a JBOD, an mptsas deadlock may occur due to a poor connection with the backplane.	Ensure that the required components are installed and properly configured when using ZEUS IOPS drives in a JBOD.
Kernel	NEX-1074 (NEX-5092)	In configurations with a NexentaStor cluster running NFSv4, it is possible to encounter hung I/O's after a failover.	If this issue is encountered, the client must be rebooted.
Kernel	NEX-1760	ZFS exhibits long kmem reap times in certain situations.	No known workaround
Installation	NEX-1881	Under certain circumstances, NexentaStor clusters can have mismatched controller numbers between the nodes.	Contact the system installer or support provider to manually reconcile the controller numbers.
Kernel	NEX-2940	Disk pools with a failed sTEC drive as a single ZIL can cause a system panic when users attempt to remove the failed ZIL.	Use redundantly configured (mirrored) ZILs.
Kernel	NEX-3043	Alternating I/Os to datasets of different record sizes can cause long zio_cache reaps.	No known workaround
HA	NEX-3191	An export failure can occur on failover in clusters with a large number of NFS mounts for replication jobs.	If an automatic failover times out, manually initiate the failover.
Installation	NEX-3488	Unable to boot NexentaStor from a drive with 4k native sector size.	Use 512 native or 512 emulated drives for NexentaStor installations.
Kernel	NEX-3585	An intermittent issue where the VM stack in non-ARC ZFS kmem caches can degrade ARC performance.	No known workaround
COMSTAR, Fiber Channel, HA	NEX-3648	Manual failovers can hang and cause a loss of communication with FC LUNs configured in an ESXi 6.0 cluster.	NexentaStor does not currently support manual failover using the ESXi version 6.0 for FC LUNs. ESXi 5.5 Server is recommended for clusters using FC LUNs.
Kernel	NEX-3734	ZFS allows a user to set a duplicate mount point path on two different ZFS filesystems, which can lead to broken volume services.	Check pools for duplicate mount points before a failover occurs, then perform a manual remediation.
Kernel	NEX-4393	In certain situations, the slow I/O diagnosis engine may identify disks experiencing high latency. Also, slow I/O may produce a message indicating that an attempt to retire a disk has been made.	Unless slow I/O disk retirement has been explicitly enabled, disregard this message. By default, slow I/O does not attempt to retire any devices.

Kernel	NEX-4523	Recovery from a failed ZFS Intent Log (ZIL) device without down time is currently not possible if the ZIL is not mirrored.	In all cases, it is recommended that a mirrored ZIL be configured.
HA	NEX-5092	In configurations with a NexentaStor cluster running NFSv4, it is possible to experience hung I/O's after a failover.	If this issue is encountered, the client must be rebooted.
SNMP	NEX-6285	Cannot create a snmpv3 account.	Stay with SNMP v2.
NEF-HPR	NEX-6393	If the user renames a dataset that is a child of a source of enabled continuous replication, the related replication service goes to a faulted state with the following error: Session write stream error (UNIX_ERRNO_ENOENT).	Rename destination dataset respectively and re-enable the replication service. For example: filesystem rename test/dst/sub1 test/dst/sub2 hpr clear test hpr enable test
NEF-HPR	NEX-6394	HPR services can fail after a common source snapshot has been cloned and promoted.	Destroy or rename the cloned dataset, then replace the original dataset with promoted clone. For example: filesystem rename test/src test/srcLegacy or filesystem destroy -r test/src filesystem rename test/clone test/src
NEF	NEX-6776	When attempting a domain join with a NexentaStor appliance that is not properly time synced with the AD server, the join will fail with an authentication error indicating a wrong password, instead of an error indicating the time delta. The log entry in /var/adm/messages properly indicates the time delta.	Use NTP to ensure that the NexentaStor appliance time is aligned with the AD server Time.
NEF	NEX-6811	Problems can occur when pools are created using a single disk.	Do not create pools using a single disk.
SMB	NEX-6949	SMB shares that do not allow root permission fail after restart. This occurs because the root user cannot access the path to the root of the share when it has dropped its special privileges.	Root user requires read + execute on the share root.
NEF	NEX-7228	If the name of an IPMP group ends with 10 or more numbers (e.g. IPMP_group_123456789012), naming will fail and the system will assign a random IPMP group name.	The name for an IPMP group must not end with 10 or more numbers.
Protocols	NEX-7273	If cross protocol locking is enabled (nbmand=on) on a filesystem shared out by NFSv4, NFS file operations may become restricted while the NFSv4 client has a file open.	If you are working with NFSv4 shares in a multi-protocol environment, please contact Nexenta Technical Support for assistance.

NEF-HPR	NEX-7549	Recover/start with forceReceive cannot recover a replication if the re-created dataset has a clone on the destination.	Do the following: 1) Rename the destination cloned dataset. For example: filesystem rename data/dst/sub data/dst/subLegacy 2) Recover or clear and start the service with forceReceive flag. For example: hpr recover test Or, use the following commands: hpr clear <service_name> hpr start --properties=forceReceive=true <service_name>
Kernel	NEX-7551	If drives with differing physical block sizes are contained within a pool then this may result in a pool with inconsistent drive alignment. This may prevent the use of global spares.	When replacing drives, be certain not to mix drives with differing physical block sizes. If this is encountered, contact Nexenta technical support for assistance with a resolution.
Fibre Channel, NEF	NEX-7559	Attempts to create FC-initiator results in an "Invalid Request" error.	Currently, NS 5.0 release only supports FC Target mode operations.
NEF	NEX-7616	In situations where the date on two nodes differs by a matter of days or more, creating a cluster between the two can result in errors. Such as the license not validating, or one of the nodes not being recognized as being part of a cluster.	Confirm that the time/date are synchronized on the two nodes before creating a cluster. Use NTP to ensure that NexentaStor node times are aligned.
NEF-HPR	NEX-7664	Inconsistent results can appear in the NexentaFusion UI if a replication service is created with an invalid destination	Validate the destination prior to creating replication service
NEF-HPR	NEX-7707	A recursive replication service fails after re-creating a child dataset.	Do one of the following: 1) Destroy the destination dataset. For example: filesystem destroy test/dst/sub1 hpr clear test hpr enable test 2) Or, rename the destination dataset. For example: filesystem rename test/dst/sub1Legacy hpr clear test hpr enable test 3) Or, start the service with forceReceive to overwrite recreated dataset. For example: hpr clear test hpr start --properties=forceReceive=true test hpr enable test

			4) Or, recover the service (the same as start with forceReceive). For example: hpr recover test hpr enable test
NEF-HPR	NEX-7750	The HPR service may fail after cloning and then promoting a common destination snapshot.	If a snapshot clone is promoted, user should replace original dataset with promoted clone. Destroy or rename the cloned dataset, then replace the original dataset with the promoted clone. For example: filesystem rename test/dst test/dstLegacy or filesystem destroy -r test/dst filesystem rename test/clone test/dst
HA	NEX-7751	Performing a "haservice status" on a cluster while one node is rebooting, can cause a delayed response of up to a minute.	If a haservice status inquiry is performed during a node reboot, the user will have to wait for a delayed response.
NEF	NEX-7883	If a customer enables vScan and then wishes to disable it, vScan must be disabled twice to take effect.	Disable vScan twice in order to properly disable it.
NEF, Fusion	NEX-7928	HPR services cannot be destroyed unless they have been cleared prior to attempting to destroy the service.	Clear the HPR service before attempting to destroy it. For example: hpr clear <servicename> hpr destroy <servicename>
NEF	NEX-7959	When ALUA=true on both nodes of an HA cluster, FC target list does not include FC targets from both nodes.	Get the FC target list from each node and note them down for subsequent FC LUN creation steps.
HA	NEX-7970	Assigning an invalid IP on the secondary link of an HA cluster node can leave the cluster in a degraded state on the partner node.	Verify that the IP addresses being used for any links in a cluster are correct before executing the command to create it.
NEF-HPR	NEX-7995	Currently, a user is limited to replicating or creating snapshots of filesystems and volumes. There is no provision to replicate or create snapshots at the pool level.	No known workaround
NEF	NEX-8025	'hpr snapshots' output may display "no" in the 'SENT' column for snapshots that have actually been sent.	No known workaround
NEF	NEX-8037	Replication service may fail when the count of "kept" snapshots is reduced	To reduce the number of retained snapshots, run once: hpr clear rep1 hpr start rep1 Then: hpr enable rep1

NEF	NEX-8053	iscsitarget set command does not allow user to specify multiple IP addresses	Use the 'iscsitarget create' command when setting up an iSCSI target with multiple IP's.
NEF-HPR	NEX-8081	When creating a replication service, do not use alias names for properties.	Use the full name of property, such as quotaSize.
HA	NEX-8083	When adding a VIP from the CLI you cannot use cider notation (e.g. /24).	When adding a VIP from the CLI you must not use cider notation (e.g. /24) you must fully specify the netmask (e.g. /255.255.255.240).
NEF	NEX-8122	If the update repository is not reachable due to networking issues, the general message will be "updates not available".	Attempt an update again after network issues have been resolved.
NEF	NEX-8190	When the replication agent on the secondary node is unreachable, you are unable to execute 'hpr snaplist-find' at the manager node.	Ensure that the replication agent on the secondary node is reachable.
NEF-HPR	NEX-8458	The user has to unmount the source filesystem before flipping the replication direction. This can lead to the inability to unshare the filesystem after the replication direction has been flipped.	Unmount source filesystem and its child with –force. For example: filesystem unmount -f data/src_sc/fs1/fs1_1 filesystem unmount -f data/src_sc/fs1/fs2_2 filesystem unmount -f data/src_sc/fs1 filesystem unmount -f data/src_sc/fs2 filesystem unmount -f data/src_sc
NEF-HPR	NEX-8471	Currently, if a source or destination pool is destroyed or removed, even if the pool is recreated with the same name the replication service will not recover nor resume the service.	Destroy service with --force and create another one using the same options.
Installation	NEX-8520, NEX-8523	Changing the choice of Time Zone DURING an installation of NexentaStor may lead to an incorrect time being reported on the system or installation failure.	Avoid changing the choice of Time Zone during an installation. Manually update to the current time of the recently selected time zone after the installation has completed.
NEF	NEX-8527	If a pool is imported with a new name, protection services are not imported.	Export and import the pool with the old name, or recreate the protection service.
NEF	NEX-8534	Replication cannot be started and recovered if source dataset has been renamed.	Rename dataset to the original name (test/src), or destroy and recreate service.
NEF	NEX-8535	HPR is unable to resume replication if the source sub dataset was renamed and a snapshot of this dataset has not been completely received at the destination.	Do the following: 1) Rename the source dataset to original name. For example: filesystem rename test/src/sub1 test/src/sub2 2) Or, rename the destination dataset and recover service. However, in this case the snapshot will be replicated from the beginning. For example: filesystem rename test/dst/sub1 test/dst/sub2 hpr recover test

Table 2: NexentaFusion 1.0 Known Issues

Component	Key	Description	Workaround
Fusion UI	NEX-6934	After confirming the dialog to destroy a LUN, the LUN may still be shown on the LUNs view.	Wait a few seconds, then click Refresh, and the LUN should no longer be visible on the view.
Fusion UI	NEX-7139	Fusion does not support reconfiguration from DHCP to static after the Fusion server is running.	Configure the network addresses as static using the console wizard at installation.
Fusion UI	NEX-7434	NexentaFusion continues to display the appliance as a cluster even after the cluster has been destroyed.	Unregister the cluster, and then re-register the individual nodes as separate appliances.
Fusion UI	NEX-7731	The NexentaFusion UI incorrectly allows the use of special characters when creating a network name, when the CLI does not.	Do not use special characters when creating a network name or address using the NexentaFusion UI.
Fusion UI	NEX-7734	The Fusion UI does not allow volumes to be created or destroyed if the volume group name contains less than 3 characters, whereas the CLI allows it.	Either use volume group names with 3 or more characters, or use the NexentaStor CLI to create or destroy volumes in those volume groups.
Fusion UI	NEX-7904	After clicking SAVE to create or remove a target and/or target group, the results may not be visible on the Targets view.	Wait a few seconds, then click Refresh to view the updated results.
Fusion Installer	NEX-7942	Re-configuring a Nexenta Management IP from a DHCP-assigned address to a static address on a different subnet (e.g. 1.1.1.1 -> 2.2.2.2) will not succeed and can leave the user unable to log in to NexentaFusion.	If this condition is encountered, restart the fusion process or reboot the node.
Fusion UI	NEX-8014	The NexentaFusion UI requires the entry of a CHAP user/secret when the user selects CHAP authentication when creating a target, when the use of a CHAP secret should be optional.	Create the target with the NexentaStor CLI. The target displays in the UI and can be assigned UI to a target group with the UI. However, you are unable to edit the target with the UI, such as assigning it to a different portal. Such changes to the target have to be done with the CLI.
Fusion UI	NEX-8088	If the DHCP lease has expired for Fusion VM, when it gets an IP again from DHCP, the user will not be able to log in and the ESDB will be unavailable.	IT is highly recommended to use static IP addresses. Contact Nexenta Support if this issue is encountered.
Fusion UI	NEX-8205	If a cluster node is down, it can delay NexentaFusion UI response time for queries. This may also result in display of timeout messages.	No workaround at this time. If a cluster node is down, the user will have to wait for delayed responses for some NexentaFusion UI queries.
Fusion UI	Nex-8417	When starting up NexentaFusion using the Firefox browser, there may be some error messages the first time Fusion is started after install. This issue only occurs with self-signed certificate.	Acknowledge the errors and continue. Refresh the webpage if additional issues are encountered.
Fusion UI	NEX-8418	Filesystem mount/unmount commands are not available via the Fusion UI.	Use the mount / unmount filesystems commands in the NexentaStor 5.0 CLI.

Fusion UI	Nex-8426	The Fusion UI does not allow a filesystem containing snapshots and clones to be destroyed. The error is: Failed to destroy snapshot: pool/filesystem@snapshot. Status code: EEXIST	Use the NexentaStor 5.0 CLI to destroy filesystem. For example: filesystem destroy -R pool/filesystem
Fusion UI	NEX-8575	In situations where an appliance is heavily loaded, or the user is "fast clicking" between screens it is possible to see timeout errors displayed on the FUSION UI.	Wait a few seconds, then click Refresh.

Where to Find More Information

NexentaStor Product Guide
This document includes an overview of NexentaStor and its core components, describes key features, and provides relevant CLI commands. This manual is intended as a guide to NexentaStor concepts and not as a configuration guide.

NexentaStor 5.0 and NexentaFusion 1.0 Installation QuickStart Guide
This document includes the instructions to install and upgrade NexentaStor and NexentaFusion.

NexentaFusion 1.0 User Guide and Online Help
This documentation provides easy to follow step-by-step instructions for common configuration and monitoring tasks.

NexentaStor 5.0 CLI Configuration Guide
This guide demonstrates the basic steps and commands to configure and manage NexentaStor 5.0 appliances. Use this document in conjunction with the *NexentaStor 5.0 CLI Reference Guide,* and the *NexentaStor 5.0 HA CLI Admin Guide.*

NexentaStor 5.0 Command Line Interface Reference Guide
This reference guide provides a summary of the CLI commands. Use it in conjunction with the companion document*: NexentaStor 5.0 CLI Configuration Guide*.

NexentaStor 5.0 HA CLI Admin Guide
This guide demonstrates the basic steps and commands to configure and manage the NexentaStor 5.0 High Availability (HA) cluster using the NexentaStor 5.0 Command Line Interface (CLI).

NexentaStor 5.0 vCenter Plugin Admin Guide
This guide includes instructions to install NexentaStor 5.0 vCenter Web Client Plugin (vCenter Plugin), which enables VMware customers to configure and manage storage and virtualization through a single interface. You can use this plugin to access summary and detailed analytics and real time status monitoring of single and clustered NexentaStor appliances.

NexentaStor 5.0 VVOL Admin Guide
This guide describes the NexentaStor Virtual Volume (VVOL) solution. It provides instructions on how to deploy VVOL, integrate it with VMware vSphere, and enumerates storage operations it supports.

Hardware Compatibility List for NexentaStor 5.0

This document provides a list of certified hardware for NexentaStor 5.0 and is intended for Nexenta Partners and Nexenta customer-facing organizations. The latest version of Nexenta Hardware Certification List (HCL) is posted on Partner Portal.

For information on the NexentaStor Openstack Cinder drivers (NFS/ iSCSI), see docs.openstack.org and search for 'NexentaStor 5.x'.