



NVMesh Release Notes

2.5.2 — Last update: 14 August 2022

Excelero, Ltd.

Table of Contents

1. Copyright and Trademark Information	1
2. Introducing NVMesh 2.5.2	2
2.1. Functionality Changes	2
2.2. Fixed Issues	2
2.3. Hotfix, version 2.5.2-21	3
2.4. Hotfix, management version 2.5.2-8	3
3. REST API Changes	4
4. Known Issues	5
4.1. General Issues	5
4.2. Management	5
4.3. Drives	6
4.4. Networking	6
4.5. Volumes	6
4.6. Ubuntu 20.04	7
5. Upgrade Instructions	8
5.1. Upgrade Prerequisites	8
5.2. Upgrade Instructions – Rolling Upgrade	8
5.3. Upgrade Mellanox OFED	10
5.4. Upgrade MongoDB and NodeJS	10
6. NVMesh Release Directory	12
7. NVMesh Upgrade Path	16

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2. Introducing NVMesh 2.5.2

Excelero NVMesh 2.5.2 is a minor update of Excelero’s elastic NVMe software-defined block storage solution for accelerating demanding workloads on cloud, public and private. It introduces minor bug fixes.

The follow sections denote the issues addressed.

2.1. Functionality Changes

The following section describes functionality changes in **NVMesh 2.5.2**.

Interoperability Additions

Support for kernel 4.18.0-348.20.1.el8_5.x86_64 for Red Hat Enterprise Linux 8.5 added.
 Support for kernel 3.10.0-1160.62.1.el7.x86_64 for Red Hat Enterprise Linux 7.9 added.

2.2. Fixed Issues

The following table lists previously known issues fixed in **NVMesh 2.5.2**:

Component	Issue No.	Description	Explanation/Resolution
TOMA	28	TOMA networking fails with an Infiniband network setup that has the same LID on two different NICs, on different subnets.	Fixed.
Client	8057	Enable hot upgrade of 512b attached volumes when Management is down. The problem was that on restart they were incorrectly attached with a 4k block size.	Fixed.
Client	26	TRIM operations fail on drives larger than 8 TB and leave the volume areas locked.	Root cause is a 32-bit value that should have been 64-bit. Fixed.
TOMA	8123	Rebuild fails incorrectly.	Fixed.
TOMA	8219	Bad handling of large topologies, which led to excessive networking retries.	Root cause is a fixed retry timeout. Fixed by making it dynamic. Parsing improvements also improve performance with large topologies.
Clients Targets	8108	MCS or nvmeshcm takes 10 minutes to recognize that a Management is down.	Root cause is an error in handling missing keep-alive messages from the Management . Fixed.
TOMA	7733 8141	Excessive logging when there are two or more distinct subnets in use by TOMA .	Reduced logging.

Clients Targets	7967	Statistics are collect at endpoints by nvmeshagent even when they are off in Management .	Fixed. This can also be tuned for specific endpoints using the new COLLECT_STATS configuration parameter.
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2.3. Hotfix, version 2.5.2-21

The following table lists issues fixed in a hot fix released enumerated 2.5.2-21 for **NVMesh 2.5.2**:

Component	Issue No.	Description	Explanation/Resolution
Clients Upgrade	117	The Client service fails to start sometimes after an upgrade requiring another restart.	Fixed.
TOMA	N/A	The TOMA sometimes uses 100% of a single core, as it runs in a tight loop.	Fixed.

2.4. Hotfix, management version 2.5.2-8

The following table lists issues fixed in a hot fix released enumerated 2.5.2-8 for **Management 2.5.2**:

Component	Issue No.	Description	Explanation/Resolution
Management	217	Management crash when printing log warning after stopping TOMA	Fixed
Management	N/A	Typo in management.js.conf stopped daily backups from being rotated	Fixed
Management	N/A	Management crash due to running on a null block_devices list when deleting a client	Fixed
Management	N/A	Management crash when extending volume with null value in selectedClientsForNvmf field	Fixed

3. REST API Changes

The **NVMesh** REST API was not updated in this version.

4. Known Issues

This section present the known issues with **NVMesh 2.5.2**

4.1. General Issues

The following table lists general known issues in **NVMesh 2.5.2**. The subsequent sub-sections note additional issues warranting larger descriptions beyond the scope of the table.

Component	Issue No.	Description	Explanation / Resolution
Networking	5788	NVMesh 2.5.2 does not support the AMD IOMMU.	Turning on the kernel amd_iommu option may lead to crashes and will generate memory access issues for RDMA. Set amd_iommu to off to resolve.

4.2. Management

The following table lists the known management issues in **NVMesh 2.5.2**:

Component	Issue No.	Description	Explanation / Resolution
Management		If MongoDB fails and all instances are inaccessible, the management times out and exits with log messages. Upon restoration of MongoDB service, it is necessary to restart the management instances.	
Management		If an NVMesh client or target were up, but went down while the management service was also down, it may take up to 10 minutes for the status to get updated. Until it is updated, the service status may incorrectly present the client or target as up.	
Management	1339	Management HA may not work in IPv6 configuration with some MongoDB versions.	The root cause is a MongoDB limitation.
Management		Concatenated segments status in Targets screen is	Ignore the segment status in this case. The concatenated volume and its segments are

		“online” even if a volume is offline. Volume status is reflected correctly and will be “unavailable” in this case.	unavailable.
Management	1040	GUI screens may flicker.	This was observed in the graphical screens such as Statistics when using Chrome on Linux. The Issue is with Chrome Browser when using HTML canvas and Hardware acceleration option is ‘On’. To workaround, turn off Hardware acceleration: Browse to Chrome Settings, search for ‘hardware’, turn ‘Use hardware acceleration when available’ Off and click the ‘Relaunch’ button.

4.3. Drives

The following table lists the known drive related issues in **NVMesh 2.5.2**:

Component	Issue No.	Description	Explanation / Resolution
Drives	5834	The <code>nvme list</code> command for the version of this tool provided by the standard operating system’s <code>nvmeshcli</code> package may not work for NVMesh managed NVMe devices for newer versions of the tool.	A version of the tool that works properly will be provided by future versions of NVMesh .

4.4. Networking

The following table lists the known networking issues and limitations in **NVMesh 2.5.2**:

Component	Issue No.	Description	Explanation / Resolution
Networking		Multi-pathing is not supported with IPv6 .	This will be added in a future version.

4.5. Volumes

The following table lists the known *Volumes* issues in **NVMesh 2.5.2**:

Component	Issue No.	Description	Explanation / Resolution
Volumes	395	Volume goes into a suspended state and stops furnishing any IO upon failure of internal consistency checks. This includes, but is not limited to,	To avoid corruption for local file systems, under some circumstances it is better to stop IO operations than to fail some of them. Contact Excelero

		multiple permanent failures of P+1 drives for an N+P erasure coded volume.	Technical Support in such a case.
<i>Volumes</i>	4571	Rapid connection and disconnection from a remote drive, for instance due to a network issue, may lead to a warning in the system log and excessive latency on IO operations and high CPU load.	This is a rare occurrence.

4.6. Ubuntu 20.04

The following table lists known issues in *NVMesh 2.5.2* specific to Ubuntu 20.04:

Component	Issue No.	Description	Explanation / Resolution
NVME		Python 3.6 is required.	The default python version is 3.8 for Ubuntu 20.04. NVME requires python 3.6. Contact Excelero Technical Support if assistance is needed in installing python 3.6.

5. Upgrade Instructions

5.1. Upgrade Prerequisites

- It is the customer's responsibility to ensure that all data on the **NVMesh 2.5.2** system is regularly backed up using a schedule compliant with the organization's policies and requirements.
- It is recommended to perform a backup before any storage maintenance activities including upgrades.

5.2. Upgrade Instructions – Rolling Upgrade

Most **NVMesh** upgrades can be performed one node at a time. To upgrade an existing cluster using the rolling upgrade procedure, perform steps described in this section.

Important Notes

! From version **2.4**, the **TOMAs** cannot communicate with those of versions earlier than **2.4**. Therefore, it is recommended to restart all targets with the new version in a short timeframe to avoid service disruption. To perform this, first, install the new version on all **Targets**. Then, restart all at once or stop all and then start all. **2.2 Clients** work with **2.4 Targets**, which means that **Clients** can be hot-upgraded. There is no need to detach volumes.

! Upgrading from any version prior to and including 2.0.3 should be done first to 2.2. **Management** should then be started at least once to ensure the management database is upgraded. Then, it is possible to update to version 2.4.

Upgrade Management

! Do not upgrade all **Management Servers** concurrently! It is critical to upgrade a single **Management** first, and only after it is up, upgrade the others.

1. Stop the **Management** service on all **Management** cluster nodes. This can be performed concurrently.

To stop a single **Management** service using the Linux CLI:

```
systemctl stop nvmeshmgr
```

2. Upgrade the management service in a single management cluster member.

To upgrade a single management service in RHEL/CentOS:

```
yum install nvmesh-management-<PACKAGE DETAILS>.rpm nvmesh-utils-<PACKAG
```

```
E_DETAILS>.rpm
```

To upgrade a single management service in Ubuntu:

```
dpkg [ --force-confold ] -i nvmesh-management-<PACKAGE_DETAILS>.deb nvmesh-
utils-<PACKAGE_DETAILS>.deb
```

3. Update the **Clients** and **Targets**, see below. Then resume here.
4. Start the **Management** service in a single **Management** cluster member. Do not start the other **Management Servers**.

To start a single **Management** service using the Linux CLI:

```
systemctl start nvmeshmgr
```

5. Start the **Management** service in all the other **Management** cluster members. This can be performed concurrently.

To start a single **Management** service using the Linux CLI:

```
systemctl start nvmeshmgr
```

Upgrade NVMesh Clients and Targets

- * **Clients** and **Targets** of the previous and the new release can coexist. The services installed on each node can be upgraded and then restarted one node at a time. For caveats on specific upgrades, see the important notes above.

- * It is recommended if possible to turn off all **Management Servers** as a safeguard during the upgrade.

1. Unmount file systems on one of the nodes.
2. Stop the **Target** and **Client** service on the single node.

To stop a single **Client** service using the Linux CLI:

```
systemctl stop nvmeshclient
```
3. Stop the **Target** service on the same node.

To stop a single **Target** service using the Linux CLI:

```
systemctl stop nvmeshtarget
```
4. Upgrade the **Client** and **Target** packages on that same node.

To upgrade the **Client** and **Target** packages:

In RHEL/CentOS:

```
yum install nvmesh-core-<PACKAGE_DETAILS>.rpm nvmesh-utils-<PACKAGE_DETAILS>.rpm
```

In Ubuntu:

```
dpkg -i nvmesh-core-<PACKAGE_DETAILS>.deb nvmesh-utils-<PACKAGE_DETAILS>.deb --force-confold
```
5. Restart the **Client** and **Target** services on that same node.

To restart the **Client** and **Target** services:

```
systemctl start nvmeshclient
systemctl start nvmeshtarget
```
6. Validate that IO has resumed across the cluster.

As the **Management** must be down during the process, validation can be done either via observing volume state in `/proc/nvmeibc/volumes/<VOLNAME>/status` or performing IO operations to the volumes.

7. Now repeat steps 1-6 on the next node.

Note: When updating from a previous version, a hot upgrade may be possible, see the hot-upgrade section at this [link](#).

5.3. Upgrade Mellanox OFED

Mellanox OFED can be performed independently from **NVMesh 2.5.2**. To upgrade OFED on a server that has an installation of **NVMesh 2.5.2 Client** or **Target**, perform the following steps.

Stop NVMesh 2.5.2 Services

1. Stop the **Client** service on the server.
To stop a single **Client** service using the Linux CLI:

```
systemctl stop nvmeshclient
```
2. Stop the **Target** service on the server.
To stop a single **Target** using the Linux CLI:

```
systemctl stop nvmeshtarget
```

Upgrade OFED

Upgrade OFED according to the relevant Mellanox instructions.

Update NVMesh 2.5.2 Installation

After an OFED upgrade, it is important to update the kernel modules installation. To perform this update using the Linux CLI:

```
nvmesh_update
```

Reboot Server

Now that the OFED upgrade is completed, the server may need to be rebooted or services restarted.

5.4. Upgrade MongoDB and NodeJS

To upgrade MongoDB or NodeJS that are used as the back end data store and web services platform respectively for **NVMesh 2.5.2 Management Servers** perform the following steps:

Stop the Management Services

1. Stop the management service in all management cluster members. This can be performed

concurrently.

To stop a single **Management** service using the Linux CLI:

```
systemctl stop nvmeshmgr
```

Upgrade MongoDB or NodeJS

Perform the necessary steps to upgrade the MongoDB database on all **NVMesh 2.5.2 Management Servers**, see [NVMesh Upgrade](#).

Start the *Management* Services

1. Start the **Management** service in all **Management** cluster members. This can be performed concurrently.

To start a single **Management** service using the Linux CLI:

```
systemctl start nvmeshmgr
```

6. NVMesh Release Directory

The following associates package numbers and releases.

Release	nvmesh-core	nvmesh-management	nvmesh-utils	nvmesh-nvmft	nvmesh-nhc	Release Date*
2.5.2	2.5.2-14 2.5.2-21 (81)	2.5.2-4 2.5.2-8 (82)	2.5.2-4 2.5.2-8	20.01-26	TBD	2022-06-02 2022-05-23 2022-08-07
2.5.1	2.5.1-4 2.5.1-5 (71)	2.5.1-1	2.5.1-1	20.01-26	TBD	2022-04-11 2022-04-14
2.5	2.5.0-407	2.5.0-38	2.5.0-38	20.01-26	2.5.0-38	2022-02-22
2.4.1	2.4.1-53	2.4.1-17	2.4.1-17	20.01-26	2.4.1-17	
2.4	2.4.0-105	2.4.0-14	2.4.0-14	20.01-26	2.2.0-33	
2.2	2.2.0-363 2.2.0-364 (61) 2.2.0-375 (62)	2.2.0-33	2.2.0-33	20.01-26	2.2.0-33	
2.0.5	2.0.5-56 2.0.5-56.1 (51) 2.0.5-58 (52) 2.0.5-60 (53) 2.0.5-65 (54)	2.0.5-6	2.0.5-6	20.01-26	2.0.5-6	
2.0.4	2.0.4-68 2.0.4-68.1 (41) 2.0.4-71.1 (42)	2.0.4-21	2.0.4-21	20.01-26		
2.0.3	2.0.3-2 2.0.3-3 (31) 2.0.3-3.1 (32) 2.0.3-6 (33) 2.0.3-7 (34) 2.0.3-7.1 (35)	2.0.3-4	2.0.3-4	20.01-26		
2.0.2	2.0.2-70 2.0.2-70.1 (21)	2.0.2-123	2.0.2-123	20.01-26		
2.0.1	2.0.1-78 2.0.1-81 (11)	2.0.1-5	2.0.1-5			

	2.0.1-81.1 (12) 2.0.1-81.2 (13) 2.0.1-81.3 (14)				
2.0.0	2.0.0-256	2.0.0-26	2.0.0-26		
1.3.2p6	1.3.2-135 1.3.2-135.1 (8) 1.3.2-135.2 (9) 1.3.2-135.3 (9a) 1.3.2-135.4 (9b) 1.3.2-135.5 (9c) 1.3.2-135.6 (9d) 1.3.2-135.7 (9e)	1.3.2-35	1.3.2-35		
1.3.2p5	1.3.2-130 1.3.2-133 (1) 1.3.2-134.1 (3) 1.3.2-134.2 (4) 1.3.2-134.3 (5) 1.3.2-134.4 (6) 1.3.2-134.5 (7)	1.3.2-28 1.3.2-29 (2)	1.3.2-28		
1.3.2p4	1.3.2-115	1.3.2-23	1.3.2-23		
1.3.2p3	1.3.2-113	1.3.2-21	1.3.2-21		
1.3.2p1	1.3.2-76	1.3.2-18	1.3.2-18		
1.3.2	1.3.2-47	1.3.2-12	1.3.2-12		
1.3.1p2	1.3.1-426	1.3.1-1			
1.3.1p1	1.3.1-393	1.3.1-1			
1.3.1	1.3.1-390	1.3.1-1			

Note Id	Note Description
Release Dates	Format is YYYY-MM-DD
82	nvmesh-management-2.5.2-8 adds some hot fixes, see Management 2.5.2-8 hotfix details
81	nvmesh-core-2.5.2-21 adds some hot fixes, see NVMesh 2.5.2-21 hotfix details
71	nvmesh-core-2.5.1-5 adds support for Ubuntu18/20.04 with kernel 5.4.0-100 and OFED 5.4-1.0.3.0
62	This is a hotfix, see NVMesh 2.2.0-375 hotfix details
61	nvmesh-core-2.2.0-364 adds support for multiple options on Ubuntu 18/20.04 and support for OFED 5.1-2.3.7.1 with RHEL 7.9
54	nvmesh-core-2.0.5-65 adds support for Ubuntu 18.04 with kernels 4.15.0-129 and 4.15.0-130
53	nvmesh-core-2.0.5-60 adds support for Ubuntu 18/20.04 with kernel 5.4.0-58 and Ubuntu 18.0.4 with kernel 4.15.0-128
52	nvmesh-core-2.0.5-58 adds support for Ubuntu 18.04 with kernel 4.15.0-126
51	nvmesh-core-2.0.5-56.1 adds support for Ubuntu 18/20.04 with kernel 5.4.0-56
42	nvmesh-core-2.0.4-71.1 adds support for Ubuntu 18.04 with OFEDs 4.9-0.1.7.0 and 5.1-0.6.6.0 and kernels 4.15.0-123 and 4.15.0-124. It also adds support for OFED 5.0-2.1.8.0 and kernels 5.4.0-53 and 5.4.0-54
41	nvmesh-core-2.0.4-68.1 adds support for Ubuntu 18.04 with OFED 4.9-0.1.7.0
35	nvmesh-core-2.0.3-7.1 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernel 4.15.0-121.
34	nvmesh-core-2.0.3-7 has a patch for an issue with the tracer and large core counts (128 and above).
33	nvmesh-core-2.0.3-6 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernel 4.15.0-118. It also has a patch for arbiter drives.
32	nvmesh-core-2.0.3-3.1 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernel 4.15.0-117.
31	nvmesh-core-2.0.3-3 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernel 4.15.0-115. It also has a minor patch for shutdowns.
21	nvmesh-core-2.0.2-70.1 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernels 4.15.0-111 and 4.15.0-112.
14	nvmesh-core-2.0.1-81.3 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernel 4.15.0-109.
13	nvmesh-core-2.0.1-81.2 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernels 4.15.0-106 and 4.15.0-108.
12	nvmesh-core-2.0.1-81.1 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernel

	4.15.0-101.
11	nvme-core-2.0.1-81 is for Redhat/CentOS 7.6 and 8.1.
9e	nvme-core-1.3.2-135.7 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0, 4.9-0.1.7.0 and kernel 4.15.0-128.
9d	nvme-core-1.3.2-135.6 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0, 4.9-0.1.7.0 and kernel 4.15.0-126.
9c	nvme-core-1.3.2-135.5 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernels 4.15.0-123 and 4.15.0-124.
9b	nvme-core-1.3.2-135.4 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernel 4.15.0-121.
9a	nvme-core-1.3.2-135.3 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernel 4.15.0-118.
9	nvme-core-1.3.2-135.2 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernel 4.15.0-117.
8	nvme-core-1.3.2-135.1 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernel 4.15.0-115.
7	nvme-core-1.3.2-134.4 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernel 4.15.0-109.
6	nvme-core-1.3.2-134.3 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernel 4.15.0-108.
5	nvme-core-1.3.2-134.3 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernel 4.15.0-106.
4	nvme-core-1.3.2-134.2 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernel 4.15.0-101.
3	nvme-core-1.3.2-134.1 adds support for Ubuntu 18.04 with OFED 4.7-3.2.9.0 and kernel 4.15.0-99.
2	nvme-management-1.3.2-29 adds Cipher configuration options.
1	nvme-core-1.3.2-133 adds support for additional OFED versions.


7. NVMesh Upgrade Path

The following diagrams summarize the paths for upgrading **NVMesh**.


For upgrading from version 1.2.10 or prior, consult with [Excelero Technical Support](#).

See [Upgrade NVMesh](#) for more comprehensive upgrade instructions.

From \ To	1.3.2	2.0	2.0.1	2.0.2	2.0.3	2.0.4	2.0.5	2.2	2.4	2.4.1	2.5	2.5.1 / 2.5.2
1.2.10	Cold											
1.3.2		Cold	Cold	Warm	Warm	Warm	Warm					
2.0			Cold	Cold	Cold	Cold	Cold					
2.0.1				Cold	Hot	Hot	Hot					
2.0.2					Cold	Cold	Cold					
2.0.3						Hot	Hot	Hot				
2.0.4							Hot	Hot				
2.0.5								Hot				
2.2									Cold	Cold	Cold	Cold
2.4										Hot	Hot	Hot
2.4.1											Hot	Hot
2.5 / 2.5.1												Hot

 Upgrade from 2.2 or older to 2.4/2.4.1 is only with Cold upgrade. **Targets** of pre-2.4 release and 2.4.X and later are incompatible. After the new version is installed, **Targets** should be restarted or stopped and started together. **2.2 Clients** work with **2.4.X**, but not with **2.5.X Targets** (updated 2022-04-19).

Under rare circumstances, the **Client** may not restart properly after an upgrade. In this case, try again to start it after starting a **Management** instance.

 Upgrading from any version prior to and including 2.0.3 should be done first to 2.2. **Management** should then be started at least once to ensure the management database is upgraded. Then, it is possible to update to version 2.4.X or later.

