

SFA OS[™]

Mandatory Update to SFA Block Driver for Embedded File Systems

ALERT! *Upgrade to SFA block driver version 3.1.2.0-36501 is MANDATORY.* Please contact DDN Support for assistance at your earliest convenience.

Issue Summary

File system software running on SFA storage platforms with embedded processing support require an SFA block driver on each virtual machine (VM) in order to access local SFA storage. This block driver is not part of SFA OS, but is shipped with DDN file system solutions such as GRIDScaler and EXAScaler. Custom solutions engineered by DDN Professional Services for other file systems, such as XFS or EXT4, will also use the SFA block driver if the file system executes on the storage VMs.

DDN has discovered an off-by-one addressing error that occurs in the SFA block driver when the guest physical address of an individual scatter/gather buffer is at exactly 4 GiB. The SFA block driver translates this address for SFA OS incorrectly. SFA OS then accesses memory 1 GiB higher in the guest physical address space than it should. For a read, this will result in a read error that corrupts VM memory in an unexpected location. For a write, this will result in a 512 byte to 64 KiB corruption of data on disk.

When this issue is seen on EXAScaler systems, it will commonly cause OSTs to enter read-only mode due to **ldiskfs** corruption. GRIDScaler is vulnerable to a lesser extent, since it buffers block I/O differently than EXAScaler, but it is still affected on block I/Os. Non-DDN file systems such as XFS or EXT4 are also vulnerable.

Affected Products

This issue is seen in all versions of the SFA block driver prior to version 3.1.2.0-36501.

All SFA storage platforms with embedded processing support are affected by this issue, including the ES7K, ES14K, GS7K, GS14K, SFA7700E, SFA7700XE, SFA10KE, SFA10KXE, SFA12KE, SFA12KXE, SFA14KE, and SFA14KXE.

The latest releases of EXAScaler and GRIDScaler incorporate the new SFA block driver with the fix for this issue. However, all earlier releases are affected, as shown in Table 1.

Table 1. File System Versions Affected by SFA Block Driver Issue

	VERSIONS AFFECTED	VERSIONS WITH FIX
EXAScaler	2.4.1 and earlier 3.0.0, 3.0.1	2.4.2 3.1.0 and later
GRIDScaler	3.2.3 and earlier 4.0.0, 4.1.0	3.2.4 4.2.0 and later

Resolution

SFA block driver version 3.1.2.0-36501 resolves this issue. This block driver is compatible with SFA OS version 2.3.0 or higher. Consequently, EXAScaler and GRIDScaler installations running on SFA OS 2.3.0 or higher may be able to resolve this issue by upgrading the SFA block driver and not the entire file system. Candidates for SFA block driver-only upgrades are listed in Table 2.

Table 2. Candidates for SFA Block Driver-Only Upgrades

	VERSIONS COMPATIBLE WITH NEW BLOCK DRIVER
EXAScaler	2.2.0, 2.3.0, 2.3.1, 2.4.0, 2.4.1, 3.0.0, 3.0.1
GRIDScaler	3.1.0, 3.2.0, 3.2.1, 3.2.2, 3.2.3, 4.0.0, 4.1.0

If your file system is running on a version of SFA OS prior to 2.3.0, the resolution for this issue is to upgrade both SFA OS and your file system solution to the latest versions, as shown in Table 3.

Table 3. Candidates for Full File System and SFA OS Upgrades

	FULL UPGRADE REQUIRED IF RUNNING . . .	UPGRADE TO . . .
EXAScaler	SFA OS 2.2.x or earlier EXAScaler 2.1.x or earlier	SFA OS 3.1.2.x or later EXAScaler 2.4.2 or 3.1.0
GRIDScaler	SFA OS 2.2.x or earlier GRIDScaler 3.0.x or earlier	SFA OS 3.1.2.x or later GRIDScaler 3.2.4 or 4.2.0

ALERT! *Please contact DDN Support* for a check of specific installation dependencies that could affect upgrade planning at your site. Do **NOT** attempt an SFA block driver upgrade, or any other upgrade, without DDN Support assistance.

Determining Your SFA Block Driver Version

To determine which version of the SFA block driver is currently installed on the embedded VMs on your SFA storage array, do the following for each VM:

Step 1. Log in to the VM.

Step 2. Determine which version of the block driver is *installed* with the command:

```
# rpm -q kmod-ddn-sfablkdriver
```

Step 3. Determine which version of the block driver is currently *running* with the command:

```
# dmesg|grep -i sfa
```

Contacting DDN Technical Support

Please contact DDN Technical Support at any time if you have questions or require assistance. Support can be reached by phone, by email, or on the web as listed below.

Web

DDN Community Support Portal
Portal Assistance

<https://community.ddn.com/login>
webportal.support@ddn.com

Telephone

DDN Support Worldwide Directory

<http://www.ddn.com/support/contact-support>

Email

Support Email

support@ddn.com

Bulletins

Support Bulletins

End-of-Life Notices

Bulletin Subscription Requests

<http://www.ddn.com/support/technical-support-bulletins>

<http://www.ddn.com/support/end-of-life-notices>

support-tsb@ddn.com