

Single-Controller Write Back Cache Should Be Disabled



ALERT! The single-controller write-back cache setting on declustered RAID versions of SFA OS should be **disabled**. Enabling this option may put data at risk if a controller loss event occurs.

Issue Summary

In normal operation, SFA OS switches from write-back caching and mirroring to write-through operation whenever a controller loss occurs within a controller couplet. A controller loss occurs when a controller shuts down for any reason, such as a controller crash, normal shutdown, hardware failure, or a hot-plug event. There is no way to mirror cache when a second controller is not present.

Controller restart or replacement and SFA OS firmware upgrades routinely trigger such controller loss events.

Declustered RAID versions of SFA OS (versions 10.x and higher) permit this behavior to be overridden by changing the Single Controller Write Back subsystem setting to Enable. This option enables write-back caching on a single controller for certain limited purposes.

ALERT! **Write-back cache is not protected by mirroring** when the Single Controller Write Back option is enabled and the system is running on one controller. Cache will be at risk in the event of abrupt controller removal or catastrophic failure of the existing controller.

The Single Controller Write Back option is disabled by default and should normally remain disabled.

Write-back caching behavior interacts with virtual disk (VD) ownership by controller. DDN Engineering has discovered an issue in SFA OS where single-controller write-back cache data may not get copied to a VD when the VDs formerly owned by a missing controller are moved back to that controller as it re-joins the couplet. This can occur after an SFA OS update or a controller reboot if host I/O is being served.

ALERT! If this issue is encountered, lost cache data **cannot be recovered**.

Affected Products

SFA OS versions 12.2 and earlier in the declustered RAID series are affected by this issue.

Resolution

A future version of SFA OS will resolve this issue.

Workaround

Leaving the Single Controller Write Back subsystem setting set to Disabled (the default value) will prevent this issue. If this setting has been changed to Enabled, it should be set back to Disabled until an SFA OS version with a fix is available.

FINDING THE SINGLE-CONTROLLER WRITE-BACK CACHE SETTING

To find the current setting of the Single Controller Write Back option on your SFA storage system, run the following command at the SFA OS command line:

```
show subsystem all
```

In the resulting report, look for the setting labeled “Single Controller WB.” This should read “Disabled,” as shown in the example below.

```
RAID[1]$ sho sub all
```

```
*****  
* Subsystem *  
*****
```

```
RP Subsystem Name:  
Platform: SFA18KXE  
UID: 60001ff0c01100000000000030000000  
Subsystem Time: 2022-12-21 10:06:25  
Time Zone: America/Denver (POSIX)  
Locate Dwell Time: 20 seconds  
Read Retry Timeout: 8000 ms  
Periodic Cache Flush: 1440 minutes  
Enabled Licenses: NONE  
Fast Timeout: OFF  
Verify Policy: ENABLED  
Configuration Created: 2022-12-20 02:35:17  
Disk Enclosure Config: 1-SS18K head+5 SS9012 with 0 missing enclosures  
(AUTOMATIC Selection)  
NTP Mode: ON  
(10.32.101.24)  
Drive Error Tolerance: LOW  
Single Controller WB: DISABLED  
Encryption: DISABLED  
4K Drive Format Policy: NO_POLICY  
Default Pool Type: HPC  
Default End to End Data Integrity: DISABLED  
Slow Drive Detection: EVENT_ONLY  
Max Latency (Rotating): 5 seconds  
Max Latency (SSD): 5 seconds  
State: RUNNING
```

DISABLING SINGLE-CONTROLLER WRITE-BACK CACHE

If single-controller write-back caching is enabled on your SFA system, disable it by running the following command at the SFA OS command line:

```
set subsystem single_controller_wb disable
```

Contacting DDN Support

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

Web

DDN Community Support Portal <https://community.ddn.com/login>
Portal Assistance webportal.support@ddn.com

Email

Support Email support@ddn.com

Telephone

DDN Support Worldwide Directory <https://www.ddn.com/support/global-services-overview/>

Bulletins & Notices

Support Bulletins <http://www.ddn.com/support/technical-support-bulletins>
End-of-Life Notices <http://www.ddn.com/support/end-of-life-notices>
Release Notes <https://community.ddn.com/login>
Subscription Requests support-tsb@ddn.com