END USER GUIDE

Solidigm™ Storage Driver

August 2022

SOLIDIGM™

Revision History

Document Revision	Description	Revision Date
001	• Initial Release	August 2022

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1 Introduction

This document supports customers to enable, configure, and evaluate Solidigm™ Storage Driver. This User guide consists of Supported features list, Solidigm package including (Storage Driver and Installer) Limitations (Hardware, Software, Configuration Limitation) and Power Management.

2 Supported Features

Here we will document overview and key features of the Solidigm™ Storage Driver.

2.1 Host Managed Cache (HMC)

Solidigm™ Storage Driver support 1.0 ver. HMC feature if used with HMC supported device.

This feature is unique to Solidigm™ Storage Driver only and require **Solidigm P41 Plus solid state drive**.

The purpose of Host Managed Cache feature is to assure performance consistency over lifetime of an SSD by keeping most important/used data in smaller fast part of the media (SLC) while the rest of the data resides in slower bulk storage (QLC). It significantly improves utilization of SLC cache within the drive and speeds up access to most frequently used data.

Current state of this feature is presented in Solidigm GUI and CLI.

HMC is enabled on supported drives by default, but it can be disabled using provided GUI or CLI (Solidigm Storage Tool).

If user disables HMC feature they will not get performance benefit via HMC.

2.1.1 Via Solidigm Storage Tool CLI

```
set [-help|-h] [-output|-o (text|nvmxml|json)] -ssd (Index|SerialNumber|PhysicalPath)
HMCEnabled = ('true'|'false')
```

HMCEnabled = (true|false) (Required) Specify whether to enable or disable
true: Enable HMC
false: Disable HMC

Limitations:
To successfully execute this command, the drive and system must support this feature. After sending HMC enable/disable reboot is necessary to perform operation successfully.

Currently HMC feature by default enabled. But it has the capability to show the statues if HMC is enable/disable

2.1.2 Via Solidigm Storage Tool GUI

User has the ability to enable/disable HMC by using Solidigm Storage Tool by clicking enable/disable button via GUI. It will become visible to user if the drive is supporting HMC.

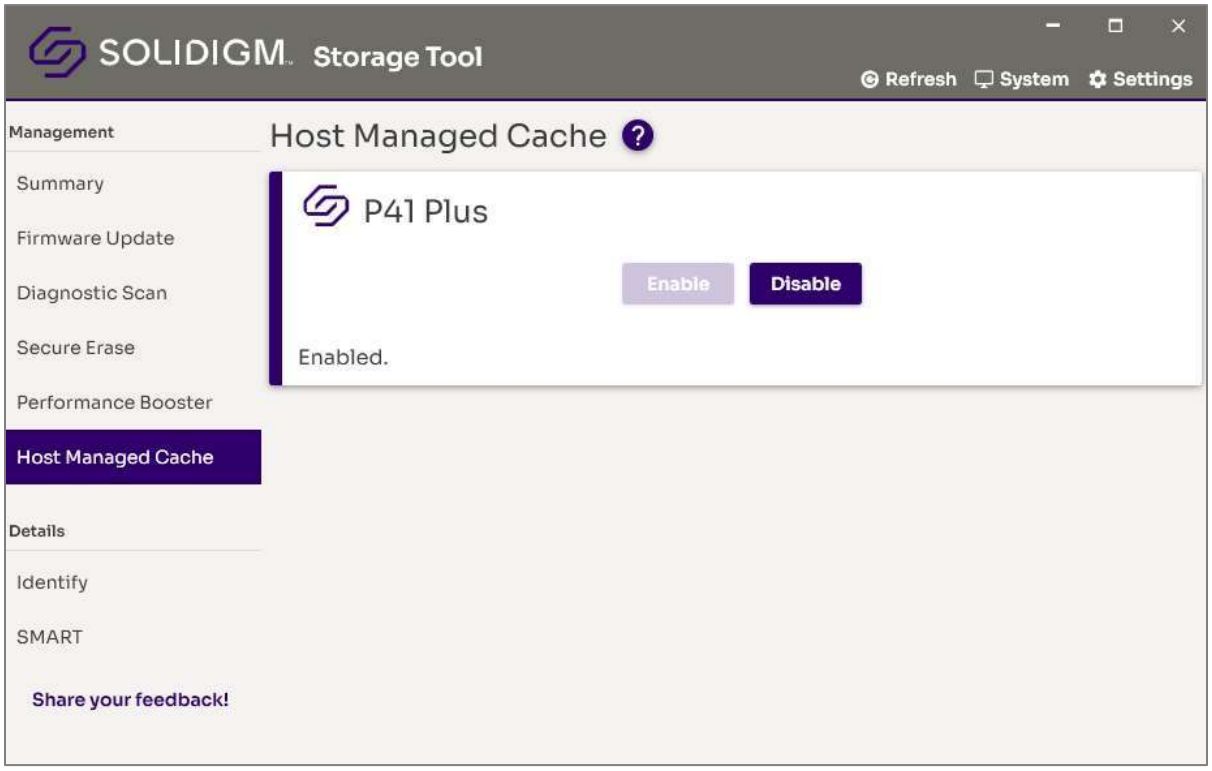


Figure 1 Solidigm Storage Tool indicates HMC option to be enable or disable

2.2 Additional Solidigm™ Storage Driver Supported Features

Driver supports the following features:

- HMB
- 512B and 4KB LBA support
- RTD3 support

3 Solidigm Package

Solidigm™ Storage Driver Package consists of following components: Solidigm™ Storage Driver and Installer.

3.1 Storage Driver

Solidigm™ Storage Driver is a platform independent, NVMe exclusive, 64-bit, storage driver supported on Windows operating systems. System file name: *solidnvm.sys.*

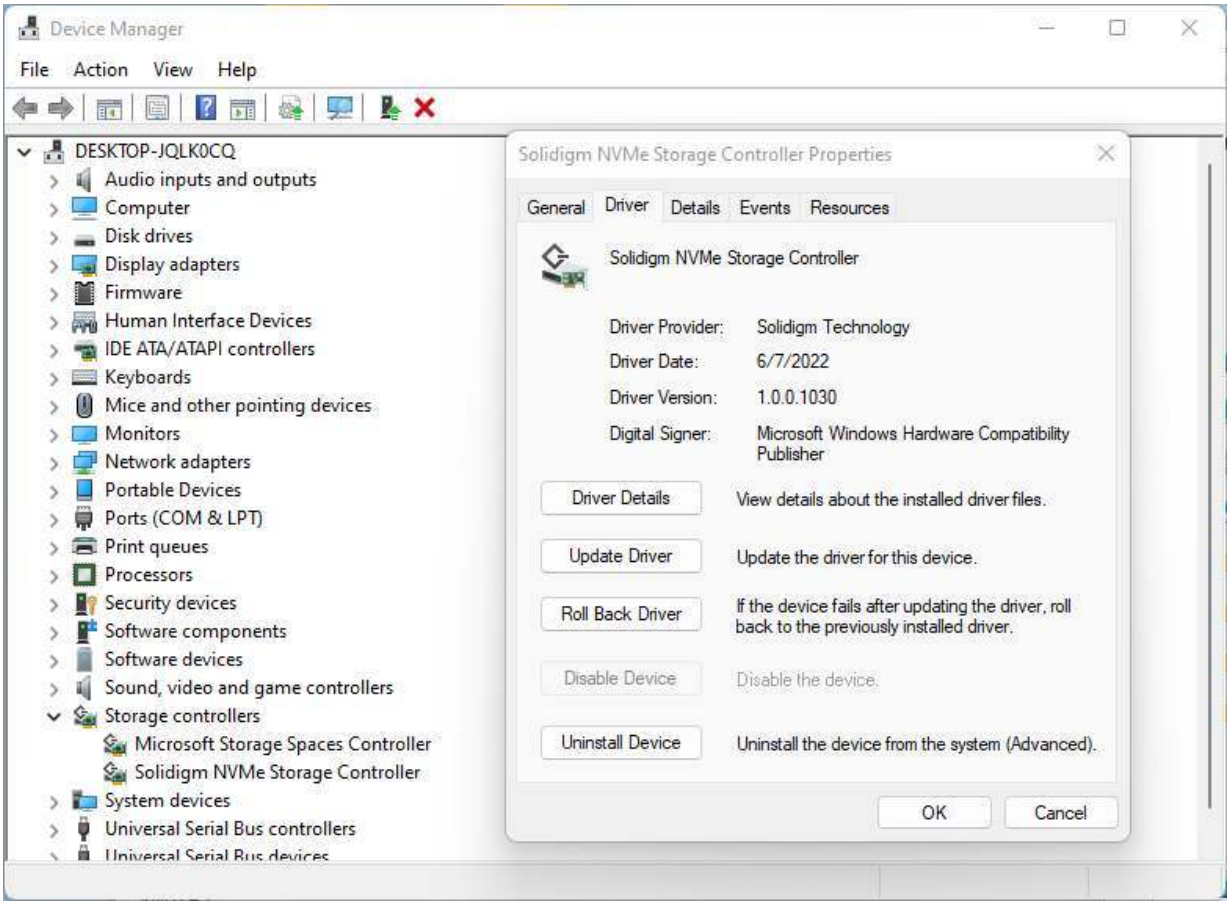


Figure 1 Screen from Device Manager when Solidigm™ Storage Driver successfully loaded

3.2 Installer

Solidigm Installer is a software component used for installation and maintenance on Windows operating systems. Executable file name: *SetupSolidigm.exe.* Following command line parameters are available.

Parameters	Description
[-help][-?]	Display help for command-line options
[-silent][-s]	The installer does not display any setup dialogs (silent install). The -accepteula flag must be provided with the silent flag (-s).
[-report]<directory>	Path to directory where logs files will be saved
[-reportfile]<filename>	Path and log filename where installer information will be written to.
[-accepteula]	You must accept the End User License Agreement (EULA) and provide this flag when installing in silent mode.

4 Limitations

Solidigm™ Storage Driver Package comes with following limitations:

4.1 Hardware Limitations

The following NVMe drives are validated by Solidigm™ Storage Driver:

- Intel® SSD 665p Series
- Intel® SSD 670p Series
- Solidigm P41 Plus Solid-State drive

4.2 Software Limitations

The following Windows version are validated by Solidigm™ Storage Driver:

- Windows 11 ver. 21H2
- Windows PE

4.3 Configuration Limitations

Solidigm™ Storage Driver does not support:

- Volume Management Device (VMD) enabled ports
- RAID configurations

5 Power Management Support

This chapter describes platform power management features provided by the Solidigm™ Storage Driver.

5.1 Modern Standby Support

To meet constantly increasing number of systems capable of S0 low power idle, Solidigm™ Storage Driver shall allow NVMe drives to enter DRIPS phase during Modern Standby. To achieve high percentage value of Hardware DRIPS during Modern Standby Solidigm™ Driver takes advantage of RTD3 feature. On Modern Standby session entry aggressive RTD3 policy is set to enable drive to achieve low power states easily. Based on platform configuration, NVMe drives will reach D3Cold or D3Hot power state. Aggressive RTD3 policy is revoked on Modern Standby session exit.

5.2 Directed PoFx* (DFx*) Support

Directed PoFx* (DFx*) is an optional directed power model provided by the Windows* run-time power management framework starting from version 3. With DFx*, the operating system directs device stacks to enter their appropriate low-power idle states when the system transitions to idle and thereby enables the system to enter low power more reliably. The objective is to make systems more power-efficient and to reduce energy consumption for Windows* devices across form factors. DFx* currently

5.3 Dynamic APST Feature

Autonomous Power State Transition (APST) is a mechanism for the Solidigm™ Storage Driver to configure the NVMe* controller to automatically transition between power states on certain conditions without software intervention. Additionally, as the driver has the capability to detect if the system is operating on the battery (DC) or plugged in (AC), based on the status of AC versus DC, driver sets the APST ITPT setting to performance or power mode. Anytime, if there is a change in status of AC versus DC, driver will issue Set Feature APST to change the settings to the drive. Driver disables APST when the system is in Performance mode. Foreach power state, both operational and non-operational, ITPS is set to last non-operational state.