

Dell EMC Boot Optimized Server Storage-S1

User's Guide

Notes, cautions, and warnings

 | **NOTE:** A NOTE indicates important information that helps you make better use of your product.

 | **CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

 | **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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Overview

BOSS-S1 is a simple RAID solution card designed specifically for booting a server's operating system. The card supports up to two 6 Gbps M.2 SATA drives. The BOSS-S1 adapter card has a x8 connector using PCIe gen 2.0 x2 lanes, available only in the low-profile and full-height form factors. The BOSS-S1 modular card has a dedicated slot in modular servers.

NOTE: There are no status LEDs on the BOSS-S1 card.

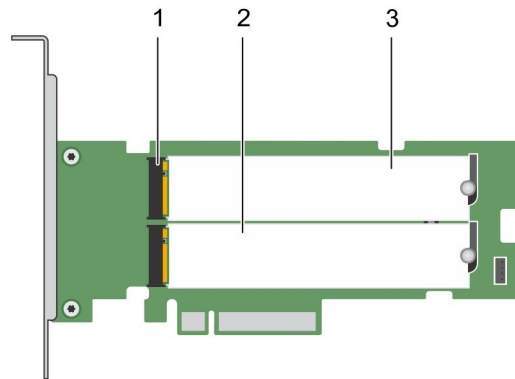


Figure 1. Features of adapter BOSS-S1 card

- | | | | |
|---|--------------------------|---|------------------------|
| 1 | SATA drive connector (2) | 2 | 80 mm M.2 SATA drive 1 |
| 3 | 80 mm M.2 SATA drive 2 | | |

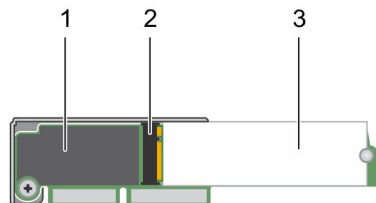


Figure 2. Features of BOSS-S1 modular card

- | | | | |
|---|----------------------|---|----------------------|
| 1 | Modular BOSS-S1 card | 2 | SATA drive connector |
| 3 | 80 mm M.2 SATA drive | | |

Topics:

- [Supported operating systems](#)
- [Supported PowerEdge systems](#)
- [BOSS-S1 card specifications](#)
- [Management applications for the BOSS-S1 controller](#)
- [Update the BOSS-S1 controller](#)
- [Update the BOSS-S1 firmware](#)
- [Firmware update using an operating system-specific DUP](#)
- [Firmware update using UEFI Shell](#)
- [Firmware update using BOSS-S1 CLI](#)
- [Firmware update using iDRAC](#)
- [Firmware update using Lifecycle Controller](#)
- [Related documentation](#)

Supported operating systems

The BOSS-S1 card supports the following operating systems:

- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2016
- Red Hat Enterprise Linux version 6.9
- Red Hat Enterprise Linux version 7.4
- SUSE Linux Enterprise Server version 12 SP3
- VMware ESXi 6.0 Update 3
- VMware ESXi 6.5 Update 1
- Ubuntu version 16.04

NOTE: For the latest list of supported operating systems and driver installation instructions, see the system documentation at [Dell.com/operatingsystemmanuals](https://www.dell.com/operatingsystemmanuals). For specific operating system service pack requirements, see the Drivers and Downloads section at [Dell.com/manuals](https://www.dell.com/manuals).

Supported PowerEdge systems

The following PowerEdge systems support the BOSS-S1 adapter card:

- PowerEdge C4140
- PowerEdge R440
- PowerEdge R540
- PowerEdge R540xd
- PowerEdge R640
- PowerEdge R740
- PowerEdge R740xd
- PowerEdge R940
- PowerEdge R6415
- PowerEdge R7415
- PowerEdge R7425
- PowerEdge T640
- PowerEdge T440

The following PowerEdge systems support the BOSS-S1 modular card:

- PowerEdge C6420

- PowerEdge FC640
- PowerEdge M640 (for M1000e)
- PowerEdge M640 (for VRTX)

BOSS-S1 card specifications

The following table lists the BOSS-S1 card feature specifications:

Table 1. BOSS-S1 card feature specifications

Feature	BOSS-S1 card
RAID levels	RAID 1
Stripe size	Supports default 64K stripe size only
Battery backup unit	No
Non-Volatile cache	No
Virtual disk cache function	Write through
Maximum number of virtual disks	1
Maximum number of drives supported	Two
Support for Non-RAID disks	Yes (supports up to two disks)
Drive types	6 Gbps M.2 SATA SSDs
PCIe support	Gen 2
Disk cache policy	Drive default
TRIM	Non-RAID disk mode

Management applications for the BOSS-S1 controller

Management applications enable you to manage and configure the RAID system, create and manage the disk group, and provide online maintenance. The management applications for BOSS-S1 card include:

- **Unified Extensible Firmware Interface (UEFI) RAID Configuration Utility** — This storage management application is integrated into the System BIOS (F2). See [UEFI/HII RAID configuration utility](#).
- **Dell OpenManage Storage Management** — This application enables you to perform controller and enclosure functions for all supported RAID controllers and enclosures from a single graphical or command-line interface. For more information, see the *Dell OpenManage Storage Management User's Guide* at Dell.com/openmanagemanuals.
- **BOSS-S1 Command Line Interface (CLI) Utility** — This application enables you to check controller, Physical Disk and Virtual Disk status while booted to an operating system. The application is also used to check SMART data from the physical disks or display controller events. Windows systems use the mvsetup utility while Linux systems use the mvcli utility. BOSS-S1 CLI Utility also supports ESXi. For more information about the CLI commands, see [BOSS-S1 CLI commands](#).
 - ① **NOTE:** To use the mvsetup Windows utility, the BOSS-S1 management driver must first be installed. Linux mvcli does not require a driver. You can download the latest Windows driver from Dell.com/support.
 - ① **NOTE:** To remove mvcli from operating systems, uninstall BOSS-S1 drivers from the operating systems or remove libraries and executables.
 - ① **NOTE:** Systems Management through iDRAC/LC is not enabled in the firmware version A00. It is available in A01 and later versions.
- **iDRAC and LC** — This application enables you to effectively monitor the RAID and network controllers installed on the system using iDRAC and LC without an OS installed on the system. For more information, see the *Integrated Dell Remote Access Controller 9 User's Guide* at Dell.com/idracmanuals.

Update the BOSS-S1 controller

You can update controller firmware using Lifecycle Controller (LC), iDRAC, or UEFI shell. The controller firmware can be updated using BOSS-S1 Command Line Interface (CLI) utility and Dell Update Package (DUP) when booted to an operating system. You can download the latest DUP and BOSS-S1 CLI from Dell.com/support.

Update the BOSS-S1 firmware

The BOSS-S1 card firmware updates can be done using the following methods:

- Firmware update using operating system Dell Update Packages
- Firmware update using UEFI Shell
- Firmware update using BOSS-S1 CLI
- Firmware update using iDRAC
- Firmware update using Lifecycle Controller

Firmware update using an operating system-specific DUP

Download the latest operating system Dell Update Package (DUP) from **SAS-RAID_Firmware_XXXXX_XXXX_XXX.EXE** for Windows and **SAS-RAID_Firmware_XXXXX_XXXX_XXX.BIN** for Linux from Dell.com/support and install it for monolithic servers.

Download the latest modular operating system DUPs from **SAS-RAID_Firmware_XXXXX_XXXX_XXX.EXE** for Windows and **SAS-RAID_Firmware_XXXXX_XXXX_XXX.BIN** for Linux from Dell.com/support and install it.

Firmware update using Linux DUP

Perform the following steps to update using Linux:

- 1 Copy the downloaded Linux Dell Update Package (DUP) file in the Linux system.
- 2 Go to the path and provide the permissions to execute the DUP file.
- 3 Execute the .BIN file i.e. **./SAS-RAID_Firmware_XXXXX_XXXX_XXX.BIN**.
- 4 When prompted, press **Q** to continue the execution.
After the inventory collection and firmware validation processes are complete, the installed version and package version are displayed.
- 5 To continue press **Y + ENTER** or else **N + ENTER** to abort.
- 6 Press **Y + ENTER** when prompted.
- 7 Verify the installed firmware version in HII, iDRAC or BOSS-S1 CLI.

 **NOTE: Administrator privileges for Windows and Root/Sudo for Linux are recommended.**

Firmware update using Windows DUP

Perform the following steps to update using Windows:

- 1 Copy the downloaded Windows Dell Update Package (DUP) file to the Windows system.
- 2 Double-click the .EXE file and click **Install**.
After the inventory collection and firmware validation processes are complete, the installed version and package version are displayed.

 **NOTE: Installed version refers to the firmware version, while package version refers to the DUP version.**

- 3 Click **Yes** to continue.
- 4 Click **Yes**.
- 5 Verify the installed firmware version in HII or using BOSS-S1 CLI.

Firmware update using UEFI Shell

Perform the following steps to update your firmware using UEFI Shell:

- 1 Download the **SAS-RAID_Firmware_XXXX_UEFI_Axx.zip** from **Dell.com/support** and unzip the file.
- 2 Copy the files onto a UEFI bootable USB drive and map it to the system.
- 3 Reboot the system, boot from the USB drive, and go to UEFI.
- 4 Type the command **fs0:/fs1:** to enter the file system and locate the file.

NOTE: File system partitions may vary depending on your system configuration. Browse through the **fsx** to locate the USB disk.

- 5 Run the file **run.nsh** to flash the firmware.
- 6 On successful update of firmware type **Exit** to exit from the UEFI shell and reboot the system.
- 7 Verify the installed firmware version in HII, iDRAC or BOSS-S1 CLI.

Firmware update using BOSS-S1 CLI

Download appropriate CLI application file from **Dell.com/Support** for Windows and Linux operating system.

Firmware update using Linux

Perform the following steps to update your firmware using the Linux BOSS-S1 Command Line Interface(CLI):

- 1 Copy the downloaded files to the Linux system.
- 2 Open the folder into which you've downloaded the .CLI file, for example: **C:\Home\Desktop\ mvcli.xxxx_Axx\x64\cli**.
- 3 Copy the firmware image binary from the **SAS-RAID_Firmware_XXXX_UEFI_Axx.zip** (to be downloaded from **Dell.com/support**) folder to the directory where the CLI file is located. Overwrite any existing files.

NOTE: The BOSS-S1 supports multiple subdevice IDs. Locate the correct subdevice ID, available in iDRAC, BOSS-S1 HII, and BOSS-S1 operating system CLI (Info -o hba).

Table 2. Supported SubDevice ID

SubDevice ID	Firmware Binary Image
1FD6 (Monolithic)	ImageA1_1FD6
1FE2 (Monolithic)	ImageA1_1FE2
1FDF (Modular)	ImageA1_1FDF

- 4 Provide user permissions to that entire folder.
- 5 To install BOSS-S1 by run **./install.sh**, followed by **./mvcli**.
- 6 To flash the firmware, run the command **flash -a update -f ImageA1_XXXX.bin -t raw** in the CLI shell.
- 7 Exit and reboot the system, then and verify the firmware version.

NOTE: Administrator privileges for Windows and Root/Sudo for Linux are recommended.

Firmware update using Windows

To update the firmware using the Windows Command Line Interface (CLI), do the following: Make sure the sections that follow use this updated format.

- 1 Unzip and copy the downloaded file to the windows system.
- 2 Open the **vs2015/windows** folder. Example: **C:\Desktop\mvsetup.xxxxx_Axx\windows\x64\cli**
- 3 Copy the firmware image binary from the **SAS-RAID_Firmware_xxxxx_UEFI_Axx.zip** (to be downloaded from **Dell.com/support**) folder to the directory where .CLI file is located. Overwrite any existing files.

NOTE: BOSS-S1 Supports multiple sub device ID's. Please locate the correct sub device ID which is available in iDRAC, BOSS-S1 HII and BOSS-S1 OS CLI (Info -o hba).

Table 3. Supported SubDevice ID

SubDevice ID	Firmware Binary Link
1FD6 (Monolithic)	ImageA1_1FD6
1FE2 (Monolithic)	ImageA1_1FE2
1FDF (Modular)	ImageA1_1FDF

- 4 Run **mvsetup.exe**.
- 5 To flash the firmware, run the command `flash -a update -f ImageA1_xxxx.bin -t raw` in the CLI shell.
- 6 Exit and reboot the system, and verify the firmware version.

NOTE: Administrator privileges for Windows and Root/Sudo for Linux are recommended.

Firmware update using iDRAC

To update the firmware using the Windows command line interface (CLI), do the following: Make sure the sections that follow use this updated format.

- 1 Enter the iDRAC and click **Maintenance** tab.
- 2 Click **System Update**.
- 3 Choose the .EXE Dell Update Package (DUP) file which you have downloaded from **Dell.com/support**. An example of the filename is **SAS- RAID_Firmware_xxxxx_xxxx_xxx.EXE**.
- 4 Upload the file, and then click **Install** and **Reboot**.
- 5 Wait until the firmware update is finished and reboot.
- 6 Login and verify the installed firmware version in HII, iDRAC, or BOSS-S1 CLI.

Firmware update using Lifecycle Controller

To update the firmware using the Windows command line interface (CLI), do the following: Make sure the sections that follow use this updated format.

- 1 Open Virtual Console and boot into Lifecycle Controller by pressing F10 at boot time.
- 2 Select **Get the Latest firmware** on the dashboard window.
- 3 Select **Local Drive (CD/DVD/USB)**.
Enter the name of .EXE file and select **Update**.
- 4 After successful installation, reboot and verify the installed FW version in HII, iDRAC, or BOSS-S1 CLI.

① **NOTE:** BOSS-S1 firmware update through iDRAC/Lifecycle Controller is supported only on firmware version A01 and above. For more information see [Updating BOSS-S1 controller firmware using iDRAC or LC fails](#).

① **NOTE:** For Information on how to update via CLI refer [BOSS-S1 CLI commands](#).

Related documentation

① **NOTE:**

- For all Dell OpenManage documents, go to [Dell.com/openmanagemanuals](https://www.dell.com/openmanagemanuals).
- For all operating system documents, go to [Dell.com/operatingsystemmanuals](https://www.dell.com/operatingsystemmanuals).
- For all PowerEdge documentation, go to [Dell.com/poweredgemanuals](https://www.dell.com/poweredgemanuals).

Features

BOSS-S1 card supports the below mentioned features:

Topics:

- [Foreign import](#)
- [SMART info](#)
- [Auto-rebuild](#)
- [Non-RAID disks support](#)
- [TRIM](#)
- [Quick initialization](#)
- [Erase physical disk](#)

Foreign import

A virtual disk is considered foreign if it is not native to the adapter.

- A virtual disk is considered native to the adapter if:
 - The virtual disk was created or imported on the adapter.
- A physical disk is considered native to the adapter if:
 - There is no previous virtual disk metadata on the adapter and the physical disk are unconfigured.
 - All configured virtual disk on the physical disk are deleted

System needs to be rebooted after performing foreign import.

To check for previous virtual disk metadata, see [Controller Information](#). Only a virtual disk or physical disk native to adapter will be presented to the operating system.

Upon migrating two foreign drives to a controller, you must do either of the following:

- Clear the Controller Configuration if using unconfigured drives — [Clear Controller Configuration](#).
- Import the virtual disk if using configured drives — [Virtual Disk Import](#).

SMART info

SMART monitors certain physical aspects of all motors, heads, and physical disk electronics to help detect predictable physical disk failures. Data on SMART-compliant physical disks can be monitored to identify changes in values and determine whether the values are within threshold limits. Many mechanical and electrical failures display some degradation in performance before failure.

A SMART failure is also referred to as predicted failure. There are numerous factors that are predicted physical disk failures, such as a bearing failure, a broken read/write head, and changes in spin-up rate. In addition, there are factors related to read/write surface failure, such as seek error rate and excessive bad sectors.

ⓘ | NOTE: BOSS-S1 CLI displays error message with the status OK and NOT OK along with smart attributes.

Auto-rebuild

A virtual disk rebuild will begin on system boot automatically if the native virtual disk is degraded and a valid rebuild target is present. A valid rebuild target is any functional drive attached to the BOSS-S1 device which is not part of the native virtual disk and is of equal or greater storage capacity. An auto-rebuild occurs without prompting the user, and any data on the rebuild target is overwritten.

Non-RAID disks support

By default, all disks are in an unconfigured state.

NOTE:

- For BOSS-S1, unconfigured drives are automatically non-RAID drives. To convert RAID drives to non-RAID drives, delete the virtual disk.
- BOSS only supports one configured (RAID) and two unconfigured states. BOSS does not break `unconfigured` drives into RAID and non-RAID states.

TRIM

TRIM (Non-RAID physical disk) allows an operating system to delete a block of data that is no longer considered in use from SSDs. For supported operating systems, the TRIM command resolves the Write Amplification issue. When an operating system deletes a file, the file is marked for deletion in the file system, but the contents on the disk are not actually erased. As a result, the SSDs do not know the LBA (Logical Block Addressing) previously occupied can be erased. With the introduction of TRIM, when a file is deleted, the operating system sends a TRIM command along with the LBAs that do not contain valid data to the physical disk.

Quick initialization

Quick initialization is a feature that enables you erase the files and file systems from the virtual disk while keeping the virtual disk configuration intact.

Erase physical disk

Erase physical disk feature deletes metadata from the physical disk. This feature can be enabled only when the physical disk is not part of any virtual disk.

Deploying the BOSS card

This section provides a set of high-level installation and removal instructions for the BOSS-S1 card.

Topics:

- [Removing the BOSS-S1 card](#)
- [Installing the BOSS-S1 card](#)

Removing the BOSS-S1 card

CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.

- 1 Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet and peripherals.

NOTE: It is recommended that you always use a static mat and static strap while working on components in the interior of the system.

- 2 Open the system.
- 3 Locate the BOSS-S1 card on the system board.

CAUTION: To prevent damage to the card, you must hold the card by its edges only.

- 4 For the modular card, loosen the screw that secures the card to the system board.
- 5 After ensuring that the PCIe bracket is unobstructed, lift the card to remove it from the connector on the system board.

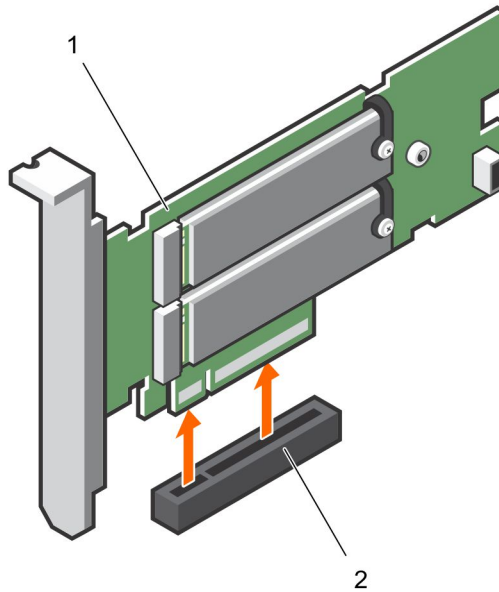


Figure 3. Removing the BOSS-S1 card

1 BOSS-S1 card

2 card connector on the system board

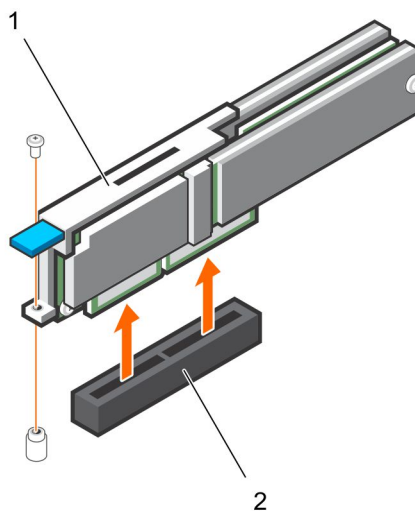


Figure 4. Removing the modular card

1 modular card

2 card connector on the system board

Removing the M.2 SSD module

CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.

- 1 Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet and peripherals.

NOTE: It is recommended that you always use a static mat and static strap while working on components in the interior of the system.

- 2 Open the system.
- 3 Remove the card. See [Removing the BOSS-S1 card](#).
- 4 Loosen and remove the screw that secures the M.2 SSD module on the card.
- 5 Lift the M.2 SSD module away from the card.

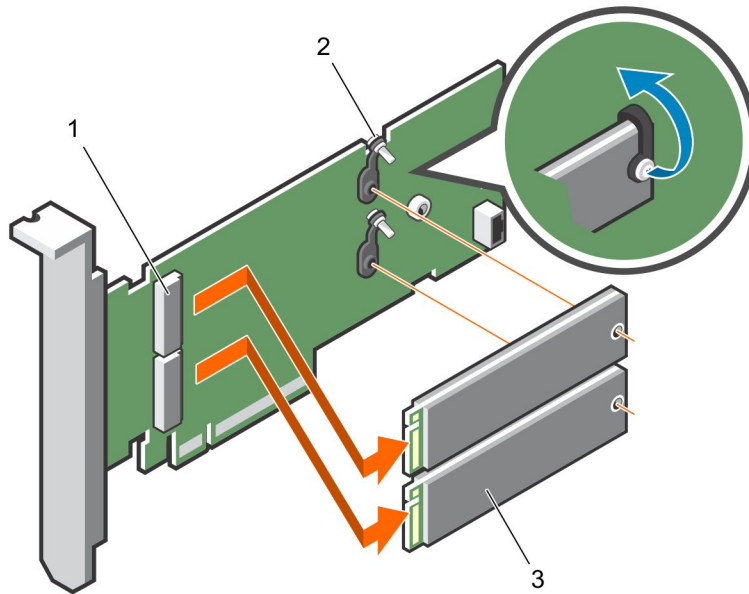


Figure 5. Removing the M.2 SSD module

1 module connector (2)

2 module (2)

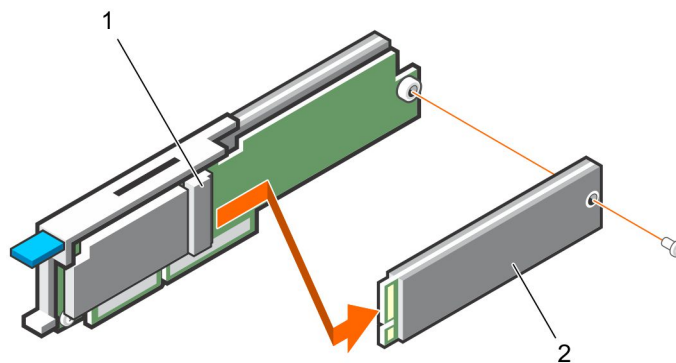


Figure 6. Removing the M.2 SSD module for modular card

1 module connector

2 module

Installing the M.2 SSD module

CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.

- 1 Align the M.2 SSD module connectors with the connectors on the card.
- 2 Tilt the M.2 SSD module downwards until the module is seated firmly on the card.
- 3 Tighten the screw that secures the M.2 SSD module on the card.

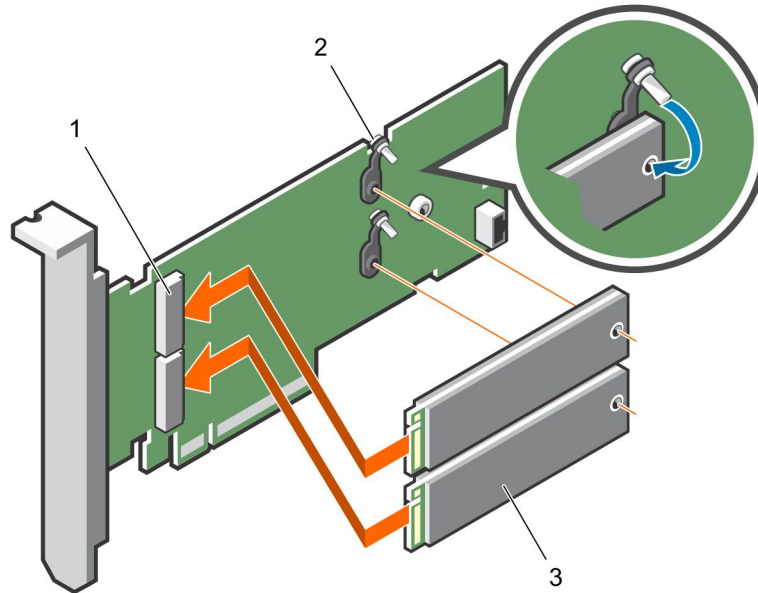


Figure 7. Installing the M.2 SSD module

1 module connector (2)

2 modules (2)

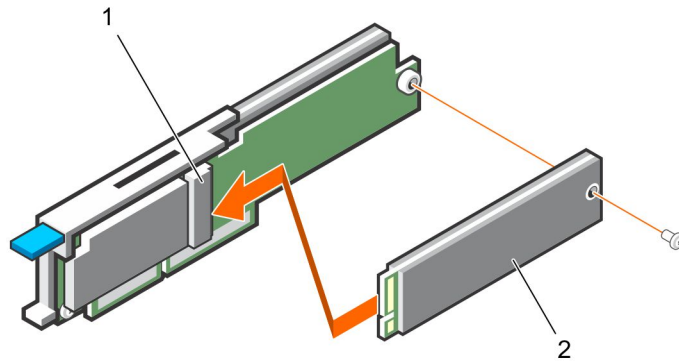


Figure 8. Installing the M.2 SSD module for modular card

1 module connector

2 modules

Installing the BOSS-S1 card

CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.

1 Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet and peripherals.

NOTE: It is recommended that you always use a static mat and static strap while working on components in the interior of the system.

2 Open the system.

3 Hold the card by its edges and align the card connector with the connector on the system board.

CAUTION: To prevent damage to the card, you must hold the card by its edges only.

4 Press the card-edge down until the card is fully seated.

5 For modular card, tighten the screw that secures the card to the system board.

6 Close the system.

7 Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

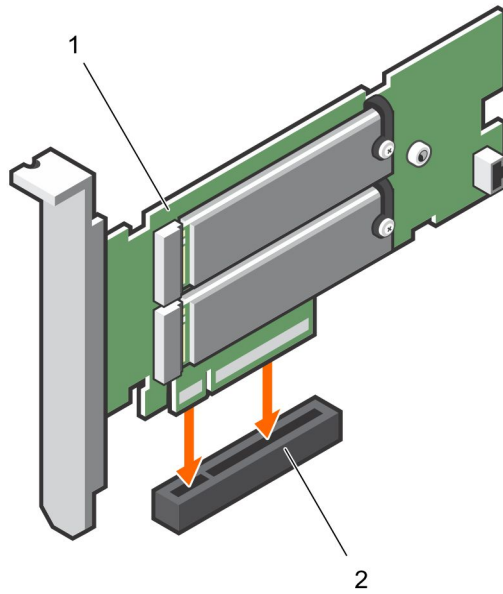


Figure 9. Installing the BOSS-S1 card

1 BOSS-S1 card

2 card connector on the system board

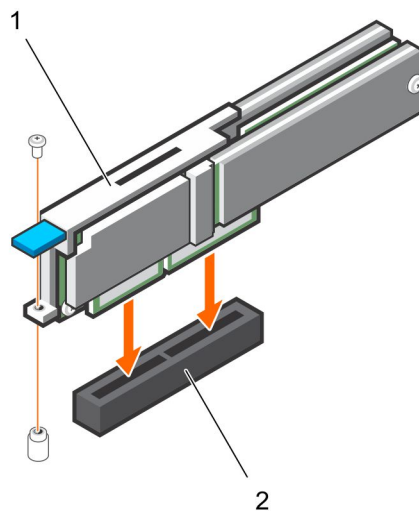


Figure 10. Installing the modular card

1 modular card

2 card connector on the system board

Driver installation

The BOSS-S1 card uses the native AHCI driver of the supported operating systems.

Windows driver installation — The Driver Update Package (DUP) updates drivers on the systems running Windows Server 2012 R2 and later operating system. DUP is an executable application that updates drivers for specific devices. DUP supports command line interface and silent execution. For more information, see Dell.com/support.

Linux driver installation — The Driver Update Disk (DUD) images are created only for those operating system releases in which the native (in-box) driver is insufficient for installation.

ESXi driver installation — By default, native AHCI driver is the inbox for installation.

UEFI or HII RAID configuration utility

The Unified Extensible Firmware Interface (UEFI) RAID configuration utility is a storage management application integrated into the System BIOS <F2>. It is used to configure and manage RAID disk groups, virtual disks, and physical disks. This utility is independent of the operating system.

The following sections provide information about using the UEFI RAID configuration utility. For more information, see the online help option in the UEFI RAID configuration utility.

NOTE: Use the UEFI RAID configuration utility for initial setup and disaster recovery. Certain advanced features are also offered in the utility.

Topics:

- [Entering the UEFI configuration utility](#)
- [Exiting the UEFI configuration utility](#)
- [Navigating to BOSS-S1 configuration utility](#)
- [Physical or virtual disk information](#)
- [Creating virtual disks](#)
- [Deleting virtual disks](#)
- [RAID rebuild](#)
- [Erase physical disk](#)
- [Controller information](#)

Entering the UEFI configuration utility

Perform the following steps to boot to the UEFI configuration utility:

- 1 Turn on the system.
- 2 While the system is booting, press <F2> to enter **System Setup**.
- 3 Click **Device Settings**.

Device Settings lists all the RAID controllers in the system.

To access the management menu for the controller, use the arrow keys or the mouse.

NOTE: For more information in all the options, click Help that is available on the top right-hand corner of the browser screen. Help information for individual option menus can also be viewed by scrolling down on each option.

NOTE: Some of the options within the UEFI RAID configuration utility are not present if the controller does not support the corresponding feature. Options may also be grayed out if the feature is not supported in the existing configuration.

Exiting the UEFI configuration utility

To exit the UEFI configuration utility, perform the following steps:

- 1 Click **Finish** at the bottom-right corner on the **System Setup Main Menu** screen.

Displays a warning message to confirm your choice.

- 2 Click **Yes** to exit the configuration utility.

NOTE: Depending on the device configuration changes, exiting the UEFI configuration utility may prompt for a system reboot.

Navigating to BOSS-S1 configuration utility

- 1 Enter the UEFI configuration utility. See [Entering the UEFI RAID configuration utility](#)
The **Device Settings** screen displays a list of NIC ports and the BOSS-S1 configuration utility.
- 2 To enter BOSS-S1 configuration utility, click **BOSS-S1 Configuration Utility**.

Displays the list of **Configuration Options**:

- **Physical/Virtual Disk Information** — allows you to view the properties of physical disks and virtual disks
- **Create RAID Configuration** — allows you to configure a virtual disk
- **Delete RAID Configuration** — allows you to delete a virtual disk
- **RAID Rebuild** — allows you to rebuild a degraded RAID volume, if a suitable peer drive is available
- **Erase Physical Disk** — allows you to clear RAID setting on a physical disk
- **Controller Information** — allows you to view BOSS-S1 adapter information

Physical or virtual disk information

The **Physical/virtual disk information** menu allows the user to view physical disk properties and virtual disk properties.

Physical disk information

To view physical disk information:

- 1 Enter the **BOSS-S1 Configuration utility**. See [Navigating to BOSS-S1 Configuration Utility](#).
- 2 Click **Physical/Virtual disk information**.
- 3 By default, **Physical disk info** radio button is selected.
- 4 All available physical disks are displayed.
- 5 Select a physical disk to view its information.

Virtual Disk Information

To view virtual disk information:

- 1 Enter the **BOSS-S1 Configuration utility**. See [Navigating to BOSS-S1 Configuration Utility](#).
- 2 Click **Physical/Virtual disk information**.
- 3 Select the **Virtual disk info** radio button.
- 4 All available virtual disks are displayed.
- 5 Select a virtual disk to view its information.
- 6 Quick initialization will be observed in the virtual disk information.

Virtual disk import

The Import operation sets a foreign virtual disk as native to the configuration.

- 1 Click **Virtual disk information**.
- 2 Select **Import**.
- 3 Press **Enter**.

Creating virtual disks

- 1 Enter the **BOSS-S1 configuration utility**. See [Navigating to BOSS-S1 Configuration Utility](#).
- 2 Click **create RAID configuration**.
- 3 Select the devices by selecting the radio button next to the available physical disks.
- 4 Click **Next**.
- 5 Specify the name for the virtual disk in the **Name** field.

 **NOTE: Usage of special characters is allowed but HII will display a warning message.**

- 6 Select Quick initialization option as either **Yes** or **No** when displayed.
- 7 Virtual disks are created with Quick initialization by default.

Deleting virtual disks

- 1 Enter the **BOSS-S1 configuration utility**. See [Navigating to BOSS-S1 Configuration Utility](#).
- 2 Click **Delete RAID configuration**.
- 3 Select the virtual disk by selecting the check box next to the available RAID configuration.
- 4 Select **Yes** by selecting the radio button next to the message `Are you sure you want to delete the selected Virtual Disk?`.
- 5 Click **Next** to delete the selected virtual disk.

RAID rebuild

You can manually rebuild a degraded virtual disk. RAID rebuild is available only when a degraded RAID volume is present and there is an available target device. If a foreign virtual disk has rebuild state, rebuild starts automatically when the virtual disk is imported. Clear configuration operation does not affect any BGA like rebuild.

Erase physical disk

- 1 Enter the **BOSS-S1 Configuration Utility**. See [Navigating to BOSS-S1 Configuration Utility](#).
- 2 Click **Erase Physical Disk**.
- 3 Select the devices by selecting the check box next to the available Physical Disk configuration.
- 4 Select the radio button **Yes** next to the message `:Would you like to erase this Physical Disk?`
- 5 Click **Next**.

After the Physical Disk is successfully erased, the Physical Disk Information tab shows the Physical Disk status as **unconfigured**.

 **NOTE: Erase physical disk is not supported when physical disk is part of Virtual disk.**

Controller information

The Controller information menu allows the user to view the properties of the RAID Controller.

- 1 Enter the **BOSS-S1 configuration utility**. See [Navigating to BOSS-S1 Configuration Utility](#).
- 2 Click **Controller information**.
The RAID adapter information is displayed.

Clear controller configuration

The Clear config operation is used to clear RAID metadata from the adapter.

 **NOTE: The Clear config operation does not delete any data on the virtual disk.**

- 1 Click **Controller information**.
- 2 Select **Clear config**.
- 3 Press **Enter**.

BOSS-S1 CLI commands

This section provides information about the methods to use the BOSS-S1 Command Line Interface (CLI) for performing a variety of controller and enclosure specific operations.

BOSS-S1 CLI utility is supported on the following operating systems:

- Windows
- Linux
- ESXi

Topics:

- [Using CLI commands from Windows](#)
- [Using CLI commands from Linux](#)
- [Using CLI commands from ESXi](#)
- [Supported BOSS-S1 CLI commands](#)

Using CLI commands from Windows

Follow these procedures to run the Command Line Interface (CLI) commands using the Windows operating system:

- 1 Download the latest **MVSETUP BOSS-S1 utility for Windows** from Dell.com/support.
- 2 Extract the content of the **mvsetup_xxxx_Axx.zip** file on the system.
- 3 Navigate to the directory where you have extracted the content of the **mvsetup_xxxx_Axx.zip** file and run the **mvsetup.exe** file. The CLI window, within which you can run BOSS-S1 CLI commands, is displayed. where you can run the BOSS-S1 CLI commands.

Using CLI commands from Linux

Follow these procedures to run the Command Line Interface (CLI) commands using the Linux operating system:

- 1 Download the latest **MVCLI BOSS-S1 utility for Linux** from Dell.com/support.
- 2 Extract the content of the **mvcli.xxxx_Axx.zip** file on the system.
- 3 Navigate to the directory where you have extracted the content of the **mvcli.xxxx_Axx.zip** file and run **./install** and **./mvcli** files. The CLI window, within which you can run BOSS-S1 CLI commands, is displayed. where you can run the BOSS-S1 CLI commands.

Using CLI commands from ESXi

Follow these procedures to run the Command Line Interface (CLI) commands using the ESXi operating system:

- 1 Install ESXi on a host machine.
- 2 Use **Winscp** or **Scp** and copy the attached files into the **/tmp/** directory.
- 3 Login to an **ESXi shell** using putty.
- 4 Change the directory to **cd /tmp**.
- 5 Run the command, - **esxcli software vib and install -d /tmp/SAS-RAID_BOSS-S1_CLI_Axx.zip** to install offline bundle. Successful commands are reported at the command line.

6 Enter the directory `cd /opt/Marvell` and run the command at the CLI normally.

NOTE: ESXi 6.5 U1 or ESXi 6.0 U3 P06 is the minimum requirement to install the BOSS-S1 CLI utility.

Supported BOSS-S1 CLI commands

The following table lists supported BOSS-S1 Command Line Interface (CLI) commands. For more information about the commands, type `> help`.

Table 4. Supported CLI commands

CLI commands	Description	Windows Usage	Linux / Vmware Usage
<code>info -o hba</code>	Display BOSS-S1 controller information.	<code>mvsetup info -o hba</code>	<code>./mvcli info -o hba</code>
<code>info -o vd</code>	Display virtual drive information.	<code>mvsetup info -o vd</code>	<code>./mvcli info -o vd</code>
<code>info -o pd</code>	Display physical drive information.	<code>mvsetup info -o pd</code>	<code>./mvcli info -o pd</code>
<code>smart -p <PD_ID></code>	Display SMART information of physical drive.	<code>mvsetup smart -p 0</code>	<code>./mvcli smart -p 0</code>
	NOTE: SMART will report the health status of the M.2 disks. Refer to the SMART status return once the command is executed.		
<code>event</code>	Display controller events.	<code>mvsetup event</code>	<code>./mvcli event</code>
<code>flash</code>	Enables you to perform controller firmware upgrade.	<code>mvsetup flash -a update -f <image binary file> -t raw</code>	<code>./mvcli flash -a update -f <image binary file> -t raw</code>
<code>help</code>	Details help for all commands or for only one command.	<code>mvsetup help info</code>	<code>./mvcli help info</code>

Troubleshooting

To get help with your Dell BOSS-S1 card, you can contact your Dell Technical Service representative or see Dell.com/support.

Topics:

- [BOSS-S1 CLI displays No Adapter Found error in Linux](#)
- [LC log displays fan unavailability error](#)
- [Updating BOSS-S1 controller firmware using iDRAC or LC fails](#)
- [Physical disk size as zero in iDRAC](#)
- [Back Ground Activity task progress in HII does not report current status](#)
- [Virtual disk state will be generated twice](#)
- [Character limitation while naming a virtual disk](#)
- [VMFS datastore is disabled on the 14th generation of PowerEdge systems that are shipped with VMware ESXi installed on BOSS-S1](#)
- [Physical disk not visible to operating system](#)
- [Virtual disk not visible to operating system](#)
- [Drive replacement](#)
- [Controller replacement](#)
- [Controller failure](#)
- [Unable to boot to M.2 drive installed in slot 1](#)
- [CLI reports unsupported features](#)
- [Failure to install ESXi on RAID 1](#)

BOSS-S1 CLI displays No Adapter Found error in Linux

- Issue:** BOSS-S1 CLI displays `No Adapter Found` error message in the Linux operating system.
- Probable Cause:** Using BOSS-S1 CLI, when you run the CLI commands using non-administrative user privileges, the error No Adapter found is displayed.
- Corrective Action:** Use root/sudo administrator privilege while you run the CLI commands.

LC log displays fan unavailability error

- Issue:** LC log displays `The BOSS-S1 device does not have a fan installed in it` error message.
- Probable Cause:** Currently there is no fan requirement for BOSS-S1, which might be required in future based on M.2 thermal requirement.
- Corrective Action:** No action required. This error message can be ignored.

Updating BOSS-S1 controller firmware using iDRAC or LC fails

- Issue:** Updating firmware on a BOSS-S1 controller from versions A00 to A01 using iDRAC/LC fails.
- Probable Cause:** The systems management is not enabled in the firmware version A00. iDRAC/LC update is supported only on the firmware version A01 and later
- Corrective Action:** Use UEFI, OS DUP, or BOSS -S1 CLI to update firmware.

Physical disk size as zero in iDRAC

- Issue:** When enquired for physical disk size, it will display zero in iDRAC.
- Probable Cause:** Collect System Inventory on Reboot (CSIOR) may be disabled causing no CSIOR data. BOSS-S1 cannot be supported if CSIOR is disabled.
- Corrective Action:** You must perform a CSIOR operation before the inventory of devices associated with an AHCI controller could be accurate.

Back Ground Activity task progress in HII does not report current status

- Issue:** Back Ground Activity (BGA) task progress in HII does not report the current status of running tasks.
- Probable Cause:** This is an expected firmware behavior.
- Corrective Action:** There is no functionality loss and it is recommended that you check iDRAC for status.

NOTE: BOSS-S1 Command Line Interface (CLI) and Dell Open Manage Storage Services will report events for these tasks when completed.

Virtual disk state will be generated twice

- Issue:** Events related to virtual disk state will be generated twice in BOSS-S1 CLI and Open Manage Storage Services (OMSS).
- Probable Cause:** This occurs when DellEMC PowerEdge Servers perform a cold Reboot.
- Corrective Action:** These events can be safely ignored as there is no functionality loss.

Character limitation while naming a virtual disk

- Issue:** Limitation in the number of characters while creating a virtual disk name
- Corrective Action:** It is recommended to use maximum of 10 characters while naming the virtual disk.

VMFS datastore is disabled on the 14th generation of PowerEdge systems that are shipped with VMware ESXi installed on BOSS-S1

Issue: Installation of ESXi on a BOSS-S1 device do not have VMFS datastore enabled by default and disables VMFS if you use custom image for installation. This issue occurs when using ESXi version 6.5.x and later on the BOSS-S1 card.

Corrective Action: When you have VMware ESXi installed on BOSS-S1, it is recommended that you use the BOSS-S1 device only as a boot device and disable VMFS if you are installing a custom image. For more information, see <https://kb.vmware.com/s/article/2004582> and <https://kb.vmware.com/s/article/2145210>.

Physical disk not visible to operating system

Issue: One or both physical disks are not appearing for use by an operating system.

Probable Cause: A physical disk will not be presented to the operating system in the following scenarios:

- There is RAID metadata on the physical disk and no RAID metadata on the controller.
- The BOSS-S1 controller has RAID metadata on it and the physical disk do not have the RAID metadata on it.

Corrective Action: If the RAID metadata is on the controller, follow the steps listed in [Clear Controller Configuration](#).
If the RAID metadata is on the physical disk, follow the steps specified in [Erase physical disk](#).

Alternatively, if you wish to keep the RAID drive, refer to [Virtual Disk Not visible to Operating System](#)

Virtual disk not visible to operating system

Issue: In RAID mode a virtual disk is not appearing for use by an operating system.

Probable Cause: Virtual disks will not be presented to the system if they are not native to the controller.

Corrective Action: Import the virtual disk via HLL as specified in section [Virtual Disk Import](#).

Drive replacement

Issue: An installed drive is not listed in the BOSS-S1 configuration utility
OpenManage reports **Physical disk offline** state

Probable Cause: Drive is either in failure state or has corrupted firmware.

Corrective Action: Reseat drive to ensure drive is inserted correctly. If error persists, attempt to update drive firmware using DUP. If error is still present, replace erroneous drive.

Controller replacement

Issue: Controller's UEFI configuration utility menu entry not appearing.

Probable Cause: Either a firmware or a hardware fault

Corrective Action:

- Flash the latest firmware on the BOSS adapter.
- If the problem persists, shutdown the server and unplug the BOSS-S1 adapter.
- Plug the BOSS-S1 adapter into the PCIe slot.
- Boot the system and check the UEFI configuration utility menu again.

If the problem still persists, see [Controller Failure](#)

NOTE: Ensure that the system is completely disconnected from all power sources before making any hardware changes.

Controller failure

- Issue:** BOSS-S1 device is not presented to system.
- Probable Cause:** Hardware fault on the card.
- Corrective Action:** Replace the BOSS-S1 adapter with a new one.

Unable to boot to M.2 drive installed in slot 1

- Issue:** When two unconfigured bootable M.2 drives are inserted into the BOSS-S1 device, only the slot 0 drive may be booted to.
- Probable Cause:** Working as designed, BIOS only allows booting from the first listed boot device (in this case, slot 0) per peripheral controller. This only occurs in legacy BIOS boot mode.
- Corrective Action:** Swap the drive in slot 1 to slot 0.

CLI reports unsupported features

- Issue:** Several commands, options, or other features listed by the CLI state that they are unsupported when run.
- Probable Cause:** CLI shows the same information on all Marvell products, but only implements the functions which are pertinent to that platform or system.
- Corrective Action:** Use supported features.

Failure to install ESXi on RAID 1

- Issue:** Attempting to install ESXi on a RAID 1 results in an invalid partition table error.
- Probable Cause:** If an unconfigured physical disk containing an ESXi partition is used in a virtual disk, any attempts to install a partition of ESXi on this virtual disk will raise an error due to failure to clear out the previous partition.
- Corrective Action:** Delete the existing RAID 1, run `erase physical disk` on both drives, re-create the RAID 1 with Quick initialization ON, then attempt to reinstall ESXi on the virtual disk.

Getting help

You can get help with your Dell product by contacting Dell, or send feedback on product documentation.

Contacting Dell EMC

Dell EMC provides several online and telephone based support and service options. If you do not have an active internet connection, you can find contact information about your purchase invoice, packing slip, bill, or Dell EMC product catalog. Availability varies by country and product, and some services may not be available in your area. To contact Dell EMC for sales, technical assistance, or customer service issues:

- 1 Go to Dell.com/support/home.
- 2 Select your country from the drop-down menu on the lower right corner of the page.
- 3 For customized support:
 - a Enter your system Service Tag in the **Enter your Service Tag** field.
 - b Click **Submit**.The support page that lists the various support categories is displayed.
- 4 For general support:
 - a Select your product category.
 - b Select your product segment.
 - c Select your product.The support page that lists the various support categories is displayed.
- 5 For contact details of Dell EMC Global Technical Support:
 - a Click [Global Technical Support](#).
 - b The **Contact Technical Support** page is displayed with details to call, chat, or e-mail the Dell EMC Global Technical Support team.

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