Updating CPLD on MegaRAID SAS 9361-16i Controllers

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Application Note

After an Unexpected Power Loss, the RAID Adapter Might Hang

When power to a SuperCap-protected RAID adapter is interrupted unexpectedly, cache offload begins.

During internal validation, Broadcom observed that the MegaRAID® SAS 9361-16i controllers might occasionally hang before the cache is restored after a successful cache offload. However, the cached data remains in the flash, and, on subsequent cold boot, the cache is restored properly.

This issue is noted only on MegaRAID SAS 9361-16i controllers.

Identifying the MegaRAID Firmware and CPLD Versions Using StorCLI

The Storage Command Line Interface (StorCLI) is a software designed for the MegaRAID product line. To identify if your firmware requires a Complex Programmable Logical Device (CPLD) update, run the `storcli /cx show all` command to display the CPLD versions.

- If your firmware displays **CPLD Version = 04468-031**, your controller firmware is updated with the latest CPLD code and you do not need to update the firmware.

  The following StorCLI code snippet (output truncated) is an example of a 9361-16i controller and its CPLD version.

  ```
  Version:
  =======
  Firmware Package Build = 24.19.0-0047
  Firmware Version = 4.720.00-8218
  CPLD Version = 04468-031
  Bios Version = 6.34.01.0_4.19.08.00_0x06160200
  HII Version = 03.23.06.00
  Ctrl-R Version = 5.18-0403
  NVDATA Version = 4.2510.01-0051
  Boot Block Version = 3.10.01.00-0000
  Driver Name = megaraid_sas
  Driver Version = 07.702.03.00
  ```

- If your firmware displays **CPLD Version = 04468-021**, your firmware is not updated with the latest available CPLD code, and it requires an update.

  The following StorCLI code snippet (output truncated) is an example of an affected 9361-16i controller and its CPLD version.

  ```
  Version:
  =======
  Firmware Package Build = 24.19.0-0047
  Firmware Version = 4.720.00-8218
  CPLD Version = 04468-021
  Bios Version = 6.34.01.0_4.19.08.00_0x06160200
  ```

```
HII Version = 03.23.06.00
Ctrl-R Version = 5.18-0403
NVDATA Version = 4.2510.01-0051
Boot Block Version = 3.10.01.00-0000
Driver Name = megaraid_sas
Driver Version = 07.702.03.00
```

For comparison, see Table 1, CPLD Version Comparison.

Table 1 CPLD Version Comparison

Board	Channel MPN	Level 3 Number Sticker on Board	CPLD Code Requiring Update	Latest Available CPLD Code
9361-16i	05-25708-00	03-25708-27 Rev004	04468-021	04468-031
9361-16i	05-25708-00	03-25708-27 Rev005	Not applicable	04468-031

Updating MegaRAID Firmware and CPLD Versions Using StorCLI

To update the firmware, use StorCLI version *1.18.xx* or later, and perform the following steps:

1. List the RAID controllers in your system to ensure that you have the correct controller number for MegaRAID SAS 9361-16i by running the `storcli show` command.

2. Ensure that MegaRAID SAS 9361-16i controller is running on the MegaRAID 6.13 firmware package <*24.19.0-0047*> or later by running the `storcli /cx show` command.

   a. If you are not running the MegaRAID 6.13 firmware, you need to first upgrade your firmware. Run the `storcli /cx download file=<firmware package>` command.

   b. Perform one of the following actions:
      - If the Online Controller Reset (OCR) feature is turned to ON in your system, restart your controller by running the `storcli /cx restart` command.
      - If the Online Controller Reset (OCR) feature is not turned to ON in your system, you need to reboot the system.

   c. After the OCR or reboot is successful, verify that the new firmware has been updated by running the `storcli /cx show all` command.

3. If your MegaRAID SAS 9361-16i controller is running on the MR 6.13 firmware package and if this firmware package requires a CPLD update, see Table 1, CPLD Version Comparison, and use the applicable `CPLD.rom` file and update the firmware by running the `storcli /cx download file=<CPLD filename.rom>` command.

4. Perform a clean reboot of the system.

5. Ensure that the new CPLD code has been updated by running the `storcli /cx show all` command.

   The following StorCLI code snippet (output truncated) is an example of the updated CPLD version after a successful update.

```
Version:
=======
Firmware Package Build = 24.19.0-0047
Firmware Version = 4.720.00-8218
CPLD Version = 04468-031
Bios Version = 6.34.01.0_4.19.08.00_0x06160200
HII Version = 03.23.06.00
Ctrl-R Version = 5.18-0403
NVDATA Version = 4.2510.01-0051
Boot Block Version = 3.10.01.00-0000
Driver Name = megaraid_sas
Driver Version = 07.702.03.00
```

The following StorCLI code snippet (output truncated) is an example of the updated CPLD version after a successful update.

```
Version:
=======
Firmware Package Build = 24.19.0-0047
Firmware Version = 4.720.00-8218
CPLD Version = 04468-031
Bios Version = 6.34.01.0_4.19.08.00_0x06160200
HII Version = 03.23.06.00
Ctrl-R Version = 5.18-0403
NVDATA Version = 4.2510.01-0051
Boot Block Version = 3.10.01.00-0000
Driver Name = megaraid_sas
Driver Version = 07.702.03.00
```

Obtaining The Updated CPLD Package

The Complex Programmable Logic Device (CPLD) is programmed specifically for the 9361-16i. The updated CPLD package is factory-programmed and is available at https://www.broadcom.com/support/download-search for download.

- Any subsequent revisions will include the CPLD fix.
- Versions of the 9361-16i boards are already in the field. The sticker on the controller shows the Level 3 number. If the Level 3 number is *03-25708-27 Rev004*, the board might require an update to the CPLD.
- Broadcom recommends updating the CPLD on the next scheduled maintenance cycle.
- The updated CPLD file along with update instructions are provided with the MegaRAID 6.13 and later packages.
- You can also contact Broadcom support to obtain the updated CPLD package.

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