User's Guide

LSI Logic MegaRAID SCSI
WebBIOS Configuration Utility
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Preface

This book is the primary reference and user’s guide for the MegaRAID WebBIOS™ Configuration Utility (CU), which enables configuration and management of RAID systems using the MegaRAID controllers.

Audience

This document assumes that you have familiarity with storage systems, and are knowledgeable about PCI, SCSI, and Serial ATA interfaces. It also assumes that you are familiar with computer systems and know how to use the keyboard, mouse, clipboard functions, toolbars, and drop down menus.

The people who benefit from this book are:

- Users who want to configure, monitor, or manage RAID systems that use MegaRAID controllers
- Engineers and managers who are evaluating MegaRAID controllers for use in a system
- Engineers who are designing MegaRAID controllers into a system

Organization

This document has the following chapter:

- Chapter 1, WebBIOS Configuration Utility, describes the WebBIOS CU.
MegaRAID System Installation Sequences and Document Organization

The following table outlines the installation, configuration, and management sequences for a MegaRAID SCSI system. Each sequence consists of a series of steps and operations that the reference manual explains. LSI Logic recommends performing the sequences in the order listed when you install and configure your SCSI system.

<table>
<thead>
<tr>
<th>Sequence</th>
<th>Task</th>
<th>Reference Manual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Understand RAID system theory and operation.</td>
<td>LSI Logic RAID Primer</td>
</tr>
<tr>
<td>2</td>
<td>Install the MegaRAID Serial ATA storage adapter and the related hardware.</td>
<td>MegaRAID 320 Storage Adapters User’s Guide</td>
</tr>
<tr>
<td>3</td>
<td>Configure the physical arrays and logical devices using either the MegaRAID Configuration Utility (CU) or the WebBIOS CU.</td>
<td>MegaRAID Configuration Software User’s Guide</td>
</tr>
<tr>
<td>4</td>
<td>Install the MegaRAID device drivers.</td>
<td>MegaRAID Device Driver Installation User’s Guide</td>
</tr>
<tr>
<td>5</td>
<td>Manage, monitor, and re-configure the RAID array using either the MegaRAID Manager tool or the Power Console Plus tool. Each tool runs under an operating system and can manage the RAID array while the system is operating.</td>
<td>MegaRAID Configuration Software User’s Guide</td>
</tr>
</tbody>
</table>

LSI Logic RAID Primer

Document Number: DB09-000123-00

This document explains RAID. Refer to this guide for definitions involving RAID and an explanation of RAID implementations.

SATA150-6 Quick Installation Guide

Document Number: DB11-000017-00

This document provides top-level installation instructions, jumper definitions, and connector locations. Use this document as a guide if you are already familiar with MegaRAID RAID Storage Adapter (RSA) installation and feel confident that you can installation a MegaRAID RSA in a PCI system.
MegaRAID SATA150 Storage Adapters User’s Guide

Document Number: DB15-000272-02

This document explains how to install your MegaRAID SATA150 storage adapter in the host system. It also provides the electrical and physical specifications, jumper definitions, and connector locations for the storage adapter.

MegaRAID 320 Storage Adapters User’s Guide

Document Number: DB15-000260-04

This document explains how to install your MegaRAID SCSI storage adapter in the host system. It also provides the electrical and physical specifications, jumper definitions, and connector locations for the storage adapter.

MegaRAID Device Driver Installation User’s Guide

Document Number: DB11-000018-01

This document explains how to install the MegaRAID device driver for your operating system. The information in this document is independent of the back-end bus and applies to both MegaRAID SCSI storage adapters and Serial ATA storage adapters.

MegaRAID Configuration Software User’s Guide

Document Number: DB15-000269-01

This document explains the various RAID system configuration, monitoring, and management tools that MegaRAID provides. This document provides step-by-step instructions for using the MegaRAID CU and WebBIOS CU BIOS-based utilities, as well as the MegaRAID Manager and Power Console Plus operating system-based tools. The information in this document is independent of the back-end bus and applies to both MegaRAID SCSI storage adapters and Serial ATA storage adapters.
## Conventions

<table>
<thead>
<tr>
<th>Convention</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bold</strong></td>
<td>Buttons and tabs within GUIs are listed in bold.</td>
<td><em>Next, Have Disk...</em></td>
</tr>
<tr>
<td>→</td>
<td>Used to indicate a series of selections in a GUI.</td>
<td><em>Start → Programs</em></td>
</tr>
<tr>
<td>&lt; &gt;</td>
<td>Key presses are enclosed in angle brackets.</td>
<td><em>&lt;F6&gt;, &lt;N&gt;, &lt;Enter&gt;</em></td>
</tr>
<tr>
<td><strong>Courier</strong></td>
<td>Screen text, filenames, directory paths, and user-entered commands are listed in courier.</td>
<td><em>A:\Windows, Setup could ...</em></td>
</tr>
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## Revision History

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<tr>
<th>Date</th>
<th>Version</th>
<th>Description</th>
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<tr>
<td>November 2003</td>
<td>1.0</td>
<td>Initial release of document</td>
</tr>
</tbody>
</table>
Contents

Chapter 1
WebBIOS Configuration Utility

1.1 General Description 1-1
1.2 Quick Configuration Steps 1-2
1.3 Starting the WebBIOS Utility on the Host Computer 1-2
1.4 Screen and Option Descriptions 1-3
  1.4.1 Toolbar Options 1-3
  1.4.2 Main Screen 1-5
  1.4.3 Adapter Properties Screen 1-6
  1.4.4 Scan Devices Option 1-8
  1.4.5 Logical Drive Screen 1-8
  1.4.6 Physical Drive Screen 1-10
  1.4.7 Configuration Mismatch Screen 1-11
  1.4.8 Configuration Wizard Option 1-12
  1.4.9 Adapter Selection Option 1-12
  1.4.10 Physical View\Logical View Option 1-12
1.5 Configuring RAID Arrays and Logical Drives 1-12

Customer Feedback
Chapter 1
WebBIOS Configuration Utility

This chapter describes the WebBIOS Configuration Utility and consists of the following sections:

- Section 1.1, “General Description”
- Section 1.2, “Quick Configuration Steps”
- Section 1.3, “Starting the WebBIOS Utility on the Host Computer”
- Section 1.4, “Screen and Option Descriptions”
- Section 1.5, “Configuring RAID Arrays and Logical Drives”

1.1 General Description

The WebBIOS Configuration Utility (CU) provides a web-based utility to configure and manage RAID volumes. The utility configures disk arrays and logical drives. Its operation is independent of the operating system because the utility resides in the MegaRAID BIOS.

The WebBIOS CU performs the following actions:

- Displays adapter properties
- Scans devices
- Creates physical arrays
- Defines logical drives
- Displays logical drive properties
- Initializes logical drives
- Checks data for consistency
- Displays the physical properties of devices
The WebBIOS CU provides a configuration wizard to guide you through the configuration of logical drives and physical arrays.

### 1.2 Quick Configuration Steps

This section provides the steps to configure arrays and logical drives using the WebBIOS CU. The following sections describe how perform each action using the WebBIOS CU. The steps are:

1. **Step 1.** Power-on the system.
2. **Step 2.** Start the WebBIOS CU by pressing \(<\text{Ctrl}\>+<\text{H}\>\).
3. **Step 3.** Start the Configuration Wizard.
4. **Step 4.** Select a configuration method.
5. **Step 5.** Create arrays using the available physical drives.
6. **Step 6.** Define the logical drive(s) using the space in the arrays.
7. **Step 7.** Initialize the new logical drives.

### 1.3 Starting the WebBIOS Utility on the Host Computer

While the host computer boots, hold the \(<\text{Ctrl}\>\) key and press the \(<\text{H}\>\) key when the following appears:

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Press \(<\text{Ctrl}\>+<\text{H}\>\) for WebBIOS

After you press \(<\text{Ctrl}\>+<\text{H}\>\), the Adapter Selection screen displays. This screen lists the adapters, adapter numbers, and firmware versions. Select an adapter and press the **Start** button to begin the configuration.

**Note:** If there is a configuration mismatch between the disks and the non-volatile random access memory (NVRAM), the CU displays the Select Configuration screen.
1.4 Screen and Option Descriptions

This section describes the various WebBIOS screens and options.

1.4.1 Toolbar Options

Table 1.1 describes the WebBIOS toolbar icons.

Table 1.1 WebBIOS Toolbar Icon Descriptions

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Home Icon" /></td>
<td>Click on this icon to return to the main screen.</td>
</tr>
<tr>
<td><img src="image" alt="Back Icon" /></td>
<td>Click on this icon to return to the page you accessed immediately before the current page.</td>
</tr>
<tr>
<td>Icon</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td><img src="image1" alt="Icon" /></td>
<td>Click on this icon to exit the WebBIOS program.</td>
</tr>
<tr>
<td><img src="image2" alt="Icon" /></td>
<td>Click on this icon to display the adapters that you can select.</td>
</tr>
<tr>
<td><img src="image3" alt="Icon" /></td>
<td>Click on this icon to scan for adapters connected to your system.</td>
</tr>
<tr>
<td><img src="image4" alt="Icon" /></td>
<td>Click on this icon to display the properties of the adapter, such as the firmware version, BIOS version, RAM size, and initiator ID.</td>
</tr>
<tr>
<td><img src="image5" alt="Icon" /></td>
<td>Click on the icon to access the Configuration Wizard so that you can configure the arrays and logical drives.</td>
</tr>
<tr>
<td><img src="image6" alt="Icon" /></td>
<td>Click on this icon to turn off the sound on the alarm.</td>
</tr>
<tr>
<td><img src="image7" alt="Icon" /></td>
<td>Click on this icon to display the WebBIOS version, browser version, and HTML interface engine.</td>
</tr>
</tbody>
</table>
1.4.2 Main Screen

When you press <Ctrl><H> on the host computer, the WebBIOS CU displays the main screen.

Figure 1.2 WebBIOS Main Screen

From the main screen you can scan the devices connected to the controller, select a MegaRAID adapter if multiple adapters are in the system, alternate between the physical devices view and the logical devices view, and access other screens. The main screen provides the following options:

- Adapter Properties
- Scan Devices
- SCSI Channel Properties
- Logical Drives
- Physical Drives
- Configuration Wizard
- Adapter Selection
- Physical View
1.4.3 Adapter Properties Screen

The Adapter Properties screen allows you to view and configure the software and hardware of the selected adapter. You access the Adapter Properties screen from the WebBIOS main screen.

Figure 1.3 WebBIOS Adapter Properties Screen

Table 1.2 describes the Adapter Properties menu options.

Table 1.2 WebBIOS Adapter Properties Menu Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firmware Version</td>
<td>This option displays the firmware version number.</td>
</tr>
<tr>
<td>BIOS Version</td>
<td>This option displays the BIOS version number.</td>
</tr>
<tr>
<td>Battery Backup</td>
<td>This option indicates whether battery backup is present. If present, click Present to display the following battery details: temperature, voltage, progress of charging, number of cycles, and reset option.</td>
</tr>
<tr>
<td>RAM Size</td>
<td>This option displays the size of the random access memory (RAM).</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Cluster Mode</td>
<td>Use this option to enable or disable cluster mode. The default is <strong>Disabled</strong>. When this is disabled, the system operates in standard mode. A cluster is a grouping of independent servers that can access the same data storage and provide services to a common set of clients.</td>
</tr>
<tr>
<td>Initiator ID</td>
<td>Identifying number for the MegaRAID card. The default is 7. You can change the Initiator ID only when you are in cluster mode. You cannot change the ID while in standard mode. The ID can be a number from 0 to 15. We recommend that you use 6 or 7. When you are in standard mode, the ID is always 7.</td>
</tr>
<tr>
<td>Rebuild Rate</td>
<td>Use this option to select the rebuild rate for drives attached to the selected adapter. The default is 50 percent. The rebuild rate is the percentage of system resources dedicated to rebuilding a failed drive. A rebuild rate of 100 percent means the system is totally dedicated to rebuilding a failed drive.</td>
</tr>
<tr>
<td>FlexRAID PowerFail</td>
<td>Use this option to enable the FlexRAID PowerFail feature, which allows drive reconstruction to continue when the system restarts after a power failure. The default is <strong>Enabled</strong>.</td>
</tr>
<tr>
<td>Alarm Control</td>
<td>Select this option to enable, disable, or silence the onboard alarm tone generator. The default is <strong>Disabled</strong>.</td>
</tr>
<tr>
<td>Adapter BIOS</td>
<td>This option enables the adapter BIOS. The default is <strong>Enabled</strong>.</td>
</tr>
<tr>
<td>Set Factory Defaults</td>
<td>This option loads the default MegaRAID WebBIOS CU settings. The default is <strong>No</strong>.</td>
</tr>
<tr>
<td>ChkConst Restore</td>
<td>When enabled, this option allows the firmware to fix medium errors found during a data consistency check. The medium error is logged in the NVRAM. The default is <strong>Disabled</strong>.</td>
</tr>
<tr>
<td>Force Boot Option</td>
<td>Use this option to force a boot option. The options are <strong>Off</strong>, <strong>On</strong>, and <strong>Disabled</strong>. The default is <strong>On</strong>.</td>
</tr>
<tr>
<td>Bios Stops on Error</td>
<td>When set to <strong>On</strong>, the BIOS stops in case of a problem with the configuration. This gives you the option to enter the configuration utility to resolve the problem. The default is <strong>Off</strong>.</td>
</tr>
<tr>
<td>BIOS Echoes Messages</td>
<td>When set to <strong>On</strong> (the default), all controller BIOS messages display during bootup.</td>
</tr>
<tr>
<td>Bios Config AutoSelection</td>
<td>Use this option if there is a mismatch between configuration data in the drives and NVRAM, so you can select a method to resolve it. The options are <strong>NVRAM</strong>, <strong>Disk</strong>, and <strong>User</strong>. The default is <strong>Disk</strong>.</td>
</tr>
</tbody>
</table>
### 1.4.4 Scan Devices Option

When you select the Scan Devices option on the Main screen, WebBIOS checks the physical and logical drives for any changes of the drive status. WebBIOS displays the results of the scan in the physical and logical drive descriptions.

### 1.4.5 Logical Drive Screen

You can access the Logical Drive screen by clicking on a logical drive in the logical drive list on the main screen. The Logical Drive screen provides options to:

- Set logical drive policies (read, write, I/O, virtual sizing)
- Initialize the logical drives
- Check consistency
- Display the logical drive properties
- Boot from a logical drive

---

### Table 1.2 WebBIOS Adapter Properties Menu Options (Cont.)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinup Parameters</td>
<td>Use this option to set the timing for spinning up the hard disk drives in the computer. The options are Automatic, 2 per 6 sec, 4 per 6 sec, or 6 per 6 sec. The default is 2 per 6 sec.</td>
</tr>
<tr>
<td>Fast Initialization</td>
<td>When enabled, zeros are written to the first sector of the logical drive so that initialization occurs in 2 - 3 seconds. The options are Enabled and Disabled. The default is Disabled.</td>
</tr>
<tr>
<td>PCI Delay Trans</td>
<td>This option enables PCI delay transfers, which are used to improve performance on some older system boards. The choices are Enabled and Disabled. The default is Enabled.</td>
</tr>
<tr>
<td>Auto Rebuild</td>
<td>Use this option to automatically rebuild drives when they fail. The options are Enabled and Disabled. The default is Enabled.</td>
</tr>
<tr>
<td>Class Emulation Mode</td>
<td>This option selects I2O or Mass Storage as the class emulation mode. The default is Mass Storage. This option allows the firmware to use I2O drivers or regular drivers.</td>
</tr>
<tr>
<td>Temporary RAID Offline</td>
<td>This option allows the firmware to bring all the drives in an array back online, except for the first failed drive. The default is Enabled. Enabling this option gives you access to the array. If disabled, you cannot access the array if there are two or more failed drives in the array.</td>
</tr>
</tbody>
</table>
- Remove a physical drive from an array
- Select drive migration only or drive migration with addition (drive migration is the transfer of a set of hard drives in an existing configuration from one controller to another)

You can press **Go** to perform the selected action or **Reset** to delete any changes.

**Figure 1.4  WebBIOS Logical Drive Screen**

1.4.5.1 **Initialization**

The Initialize option initializes the selected logical drive by writing zeroes to the entire volume (if fast initialization is selected, zeroes are written to the first sector only).

**Note:** After you define a logical drive, WebBIOS asks you for initialization of the logical drive. Choosing to initialize is not recommended, as a background initialization run anyway.
1.4.5.2  Check Consistency

This option verifies that the redundancy data is correct and available for arrays using RAID 1, 5, 10, or 50. If a difference in the data is found, MegaRAID assumes that the data is accurate and automatically corrects the parity value.
1.4.5.3 Logical Drive Deletion

This option is used to delete a logical drive. The controller supports the ability to delete any unwanted logical drives and use that space for a new logical drive.

1.4.6 Physical Drive Screen

This screen displays the physical drives for each channel or port. This screen displays the properties for the selected physical drive, including drive size, drive state, SCSI level, and drive health. You can use this screen to make hotspares and format a hard drive.

Figure 1.5 WebBIOS Physical Drive Screen
1.4.7 Configuration Mismatch Screen

A configuration mismatch occurs when the configuration data in the NVRAM and the hard drives are different. You can use the Configuration Mismatch screen to resolve the mismatch by doing one of the following:

- Select **Create New Configuration** to delete the previous configuration and create a new configuration
- Select **View Disk Configuration** to restore the configuration from the hard drive
- Select **View NVRAM Configuration** to restore the configuration from the NVRAM

Figure 1.6 WebBIOS Configuration Mismatch Screen
1.4.8 Configuration Wizard Option

This option enables you to clear a configuration, create a new configuration, or add a configuration. Section 1.5, “Configuring RAID Arrays and Logical Drives,” provides detailed steps for using the Configuration Wizard.

1.4.9 Adapter Selection Option

When you select the Adapter Selection option on the main screen, MegaRAID displays a list of the MegaRAID adapters in the system. You can select an adapter and begin configuration.

1.4.10 Physical View/Logical View Option

This option toggles between views of the physical drives and logical drives.

1.5 Configuring RAID Arrays and Logical Drives

This section provides detailed steps for using the Configuration Wizard to configuring RAID arrays and logical drives. Figure 1.7 displays the first screen for the Configuration Wizard.

Step 1. Start the Configuration Wizard by selecting the Configuration Wizard icon on the WebBIOS main screen.

The first screen offers the following options:

- Clear Configuration, to clear the existing configuration
- New Configuration, which clears the existing configuration (any data in previously defined configuration will be lost)
- Add Configuration, which retains the old configuration, then adds new drives to it (this does not cause any data loss)
Step 2. Select the type of configuration and press **Next**.

The next screen displays the configuration methods.

**Configuration With Redundancy** is recommended. You can select one of the following:

- Custom Configuration
- Auto Configuration With Redundancy
- Auto Configuration Without Redundancy, Auto

Step 3. Select a configuration method and press **Next**.

The **Array Definition** screen displays. This screen is used to add ready drives to create an array.

Step 4. Hold `<Ctrl>` while selecting ready drives on the **Physical Drives** window, then click on **Accept Array** to add the drives to the arrays shown in the **Arrays** window.

If you need to undo the changes, press the **Reclaim** button.
Step 5. After you create the arrays, click on **Next**.

The **Logical Drive Definition** screen displays. You can use this screen to select the RAID level, stripe size, read policy, cache policy, spanning option, and logical drive size.

Step 6. Set the following options to define the logical drive:

a. Select the RAID level.

b. The possible RAID levels for the logical drive display in the drop-down menu. Select the stripe size.

**Figure 1.8 WebBIOS Logical Drive Definition Screen**

![WebBIOS Logical Drive Definition Screen](image)

The stripe size parameter specifies the size of the segment written to each disk in a RAID configuration.

You can set the stripe size to 2, 4, 8, 16, 32, 64, or 128 Kbytes. A larger stripe size produces higher read performance. If your computer regularly performs random read requests, choose a smaller stripe size. The default is 64 Kbytes.

c. Select the read policy.

The read ahead parameter enables the read-ahead feature for the logical drive. You can set this parameter to **No Read**...
Ahead, Read-ahead, or Adaptive. No Read Ahead is the default setting. No Read Ahead specifies that the controller does not use read-ahead for the current logical drive. Read-ahead specifies that the controller uses read-ahead for the current logical drive. Adaptive specifies that the controller begins using read-ahead if the two most recent disk accesses occurred in sequential sectors.

d. Select the write policy.

You can set the write policy to Write Back or Write Thru. The default setting is Write Thru caching. In Write Back caching, the controller sends a data transfer completion signal to the host when the controller cache receives all the data in a transaction. In Write Thru caching, the controller sends a data transfer completion signal to the host after the disk subsystem receives all the data in a transaction. Write Thru caching has a data security advantage over write-back caching. Write Back caching has a performance advantage over Write Thru caching.

Caution: Do not use write back caching for any logical drive in a Novell NetWare volume.

e. Select the cache policy.

The cache policy applies to reads on a specific logical drive. The default is Direct I/O. It does not affect the read ahead cache. The options are Cached I/O or Direct I/O. Cached I/O buffers all reads in cache memory and is the default setting. Direct I/O does not buffer reads in cache memory. Direct I/O does not override the cache policy settings. Direct I/O transfers data to cache and the host concurrently. If the same data block is read again, the host reads it from cache memory.

f. Configure the spanning mode.

Enable or disable the spanning mode for the current logical drive. If spanning is enabled, the logical drive can occupy space in more than one array. If spanning is disabled, the logical drive can occupy space in only one array.

To span arrays, the arrays must have the same stripe width and must be consecutively numbered. If these criteria are not met, CU ignores the span setting.
g. Select the size of the logical drive in Mbytes.

h. Click on the **Accept** button to accept the changes or click on the **Reset** button to delete the changes and return to the previous settings.

i. Click on **Next**.

---

### Step 7. Check the configuration preview.

The WebBIOS CU displays a preview of the configuration.

### Step 8. Click on **Accept** to save the configuration or click on **Back** to return to the previous screens and change the configuration.
Customer Feedback

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<table>
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<th>Good</th>
<th>Average</th>
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<td>Competeness of information</td>
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<tr>
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