INTRODUCTION TO THINKSERVER RAID MANAGEMENT TOOLS

CONTENTS

Overview 02
MegaRAID Storage Manager 02
Key Features 02
  Supported Operating Systems 03
  MegaRAID CLI 04
  Key Features 04
  Supported Operating Systems 05
MegaRAID SNMP Agent 05
MegaRAID CIM Provider 05
Obtaining the Tools 05
OVERVIEW

Lenovo offers a suite of management tools to simplify the use and management of ThinkServer systems. In addition, Lenovo makes available management solutions from LSI to manage ThinkServer RAID adapters. These management solutions enable ThinkServer RAID 100, 500, and 700 adapters with LSI technology to be managed through a command line interface (CLI) tool, MegaRAID CLI, or a graphical user interface (GUI) tool, MegaRAID Storage Manager. Additional support is also available for management with industry standard management consoles using CIM, and SNMP. This paper introduces the capabilities offered by these LSI RAID management tools for use on all supported ThinkServer systems with LSI based ThinkServer RAID 100, 500 or 700 adapters. Additional help and specification for installation and use of these tools can be found in the MegaRAID SAS Software User Guide.

MEGARAI D STORAGE MANAGER

MegaRAID Storage Manager is a comprehensive GUI based client / server application that enables configuration and management of storage arrays locally or remotely on multiple servers. The graphical user interface makes it easy to configure, monitor, and maintain storage configurations on ThinkServer RAID adapters. Wizards in the tool simplify the creation and modification of virtual drive configurations. MegaRAID Storage Manager also displays the status of controllers, virtual drives, and drives on the servers being monitored, and with alerts and special icons on the screen, will notify administrators of drive failures and other events that require immediate attention.

KEY FEATURES

An overview of key MegaRAID Storage Manager capabilities are provided in this section. See the MegaRAID SAS Software User Guide See for a complete list of supported function

DASHBOARD VIEW PROVIDING

• Physical and logical views of the storage subsystem with hierarchy of controllers, virtual drives, and drive groups
• Properties of the virtual and physical drives
• Total capacity, configured capacity, and unconfigured capacity
• Background operations in progress
• Actions that can performed, such as creating a virtual drive
• Status icons for controllers, drives, and other devices

Figure 1 - Main Dashboard
INTRODUCTION TO THINKSERVER RAID MANAGEMENT TOOLS

REMOTE SERVER DISCOVERY

• Discovery of managed servers
• Logging into a server

ABILITY TO CONFIGURE THINKSERVER RAID ADAPTERS AND ATTACHED DEVICES

• Controllers, virtual drives, hard disk drives and other devices
• Creating new storage configurations using the Configuration Wizard (Simple Configuration mode and Advanced Configuration mode)
• Adding hot spare drives
• Changing adjustable task rates (background initialization, consistency checks, etc.)
• Changing power settings
• Changing a virtual drive configuration
• Modify drive group wizard
• Migrating a RAID level
• Deleting a virtual disk

ALLOWS MONITORING OR RAID STORAGE SUBSYSTEMS

• Display status of controllers, virtual drives, hard disk drives, and other devices
• Monitoring Battery Backup Units (BBU)
• Display event log file and on-screen alerts
• Monitoring of system events
• Configuring alert notifications and delivery methods
• Monitoring rebuilds and other background activities

MAINTENANCE

• Initiate and control background tasks such as patrol read, and consistency checks
• Initializing a virtual drive
• Scanning for new drives
• Rebuilding a drive
• Making a drive offline or missing
• Updating firmware

MegaRAID Storage Manager has to two installation components. The Client component is MegaRAID Storage Manager software installed on a PC or server that is used to manage and monitor servers remotely over a network. It contains the MegaRAID Storage Manager GUI, and monitor configurator. The Server component is installed on the server to be monitored and provides the management interface to the Client monitor. Installation options combine these components to support various management configuration scenarios. MegaRAID Storage Manager also requires that LAN ports 3071 and 5571 be open in order to function.
**SUPPORTED OPERATING SYSTEMS**

MegaRAID Storage Manager is supported on Windows server and client OS’s, Linux (RedHat and SUSE / SLES), and Solaris. While support is available for VMWare, the MegaRAID Storage Manager server part cannot be installed directly in a VMWare ESXi host. Management is possible only through Common Information Model (CIM) providers. See MegaRAID CIM Provider for more information.

**MEGARAILD CLI**

MegaCLI is a robust, standalone command line interface application. As a command line tool, it may not be well suited for general use, but it does allow complete control of all features and functions of the ThinkServer RAID adapters, and it can be scripted.

A limited subset of the MegaCLI functionality is also available at pre-boot through the ThinkServer RAID adapter firmware. This function is accessed by pressing CTRL-Y during BIOS initialization.

**KEY FEATURES**

An overview of key MegaCLI features are provided in this section. See the MegaRAID SAS Software User Guide See for a complete list of commands and their usage.

Provides ability to display information about and configure ThinkServer RAID adapters and attached devices including battery backup units, physical and virtual disks

- Create, delete, and modify virtual disk configurations
- View and change properties for the virtual drives, physical drives, and the controller
- Configure and control background tasks including virtual drive initialization, consistency checks, rebuild, reconstruction and patrol reads
- Load and save controller configuration from and to a file
- Scan, preview, and import foreign configurations

**COMMAND DESCRIPTION**

<table>
<thead>
<tr>
<th>COMMAND</th>
<th>DESCRIPTION</th>
</tr>
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<tbody>
<tr>
<td>MegaCLI -AdpAllInfo -aAll</td>
<td>Get information about each adapter</td>
</tr>
<tr>
<td>MegaCLI –AdpAllLog –a0</td>
<td>All-In-Log – Retrieves all logs from controller</td>
</tr>
<tr>
<td>MegaCLI –FwTermLog –Dsply –a0</td>
<td>Retrieves FW TTY log since last power cycle</td>
</tr>
<tr>
<td>MegaCLI –PDList –a0</td>
<td>Get info about all connected PD</td>
</tr>
<tr>
<td>MegaCLI –EncInfo –a0</td>
<td>Get info about attached enclosures</td>
</tr>
<tr>
<td>MegaCLI –LDInfo –lAll –aAll</td>
<td>Get info about all virtual disks</td>
</tr>
<tr>
<td>MegaCLI –CfgClr –a0</td>
<td>Clear entire configuration</td>
</tr>
<tr>
<td>MegaCLI –CfgAllFreeDrv –r0 –a0</td>
<td>Create a RAID 0 virtual drive on all free drives</td>
</tr>
<tr>
<td>MegaCLI –CfgLdAdd –r1[4:1,4,2] –strip-sz256 –a0</td>
<td>Create a RAID 1 virtual drive with stripe size of 256, using specified physical disks.</td>
</tr>
<tr>
<td>MegaCLI –AdpFwFlash –f SAS9240_FW Image.rom –a0</td>
<td>Flash controller firmware</td>
</tr>
</tbody>
</table>

Table 1 - Example MegaCLI Commands

Allows monitoring of RAID Storage systems

- Display information about virtual drives, the controller, and other storage components
- Show progress of ongoing operations on drives and virtual drives
- Display event logs using filters to show relevant messages on the console or in a log file

Allows creation of scripts that can call the CLI tool

- Create and use scripts with the scriptable CLI tool
- Exit with predefined success or failure exit codes
- Display help for how to use the command line options
- Update firmware on the controller
- Some examples of MegaCLI commands demonstrate the power of this application.
**INTRODUCTION TO THINKSERVER RAID MANAGEMENT TOOLS**

**SUPPORTED OPERATING SYSTEMS**

MegaCLI is available for DOS, and Windows as a standalone executable. The tool is also supported in Linux, Solaris, SCO OpenServer, SCO Unixware, Netware, and FreeBSD. The function is the same under each Operating System.

**MEGARAI D SNMP AGENT**

A Simple Network Management Protocol (SNMP)-based management application can monitor and manage devices through SNMP extension agents. The MegaRAID SNMP subagent is available in the MSM Install package, and reports information about the RAID controller, virtual drives, physical devices, enclosures, and other items per SNMP request. The agent is also used to send SNMP alerts for RAID events or issues that might require immediate administrative attention.

The LSI MegaRAID SNMP agent is supported on Linux, Solaris, and Windows operating systems.

**MEGARAI D CIM PROVIDER**

An LSI MegaRAID Common Information Model (CIM) provider is available to support exchange of management information over networks with other systems management applications, for example Microsoft System Center.

In addition, use of the CIM provider is required in order to enable management of RAID on VMware hosts. The LSI CIM Provider is installed into ESXi, interacts with the RAID controller hardware, and interfaces with the CIM Object Manager (or CIMOM). MegaRAID Storage Manager installed on a remote machine interfaces with the CIMOM to provide management support.

**OBTAINING THE TOOLS**

The tools discussed in this document are available from Lenovo for supported ThinkServer platforms, operating systems, and ThinkServer RAID adapters.

http://support.lenovo.com/

MegaRAID Storage Manager for other host operating systems can be obtained from LSI.

[Click here to download the users guide on MegaRAID SAS Software]