FUJITSU

SAS3 12 Gb/s MegaRAID® Tri-Mode

Device Driver Installation

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Certified documentation according to DIN EN ISO 9001:2008

To ensure a consistently high quality standard and user-friendliness, this documentation was created to meet the regulations of a quality management system which complies with the requirements of the standard DIN EN ISO 9001:2008.

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Based on the Broadcom manual:

12 Gb/s MegaRAID® Tri-Mode Device Driver Installation User Guide
February 16, 2018, MR-TM-Driver-IG104, Version 1.4

Not all functions and features documented in this User Guide are supported or released on Fujitsu RAID controllers.

For a comprehensive list of changes to this document, see the Revision History.

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Table of Contents

Chapter 1: Overview

This chapter provides an overview of the operating system (OS) drivers for the MegaRAID® RAID controllers.

Subsequent chapters provide installation instructions for the OSs. Use the latest updates provided by the OS manufacturer, and review the `readme` file that accompanies the driver for any updated information. You find the `readme` files under http://www.fujitsu.com/global/services/computing/server/ia/driver/index.html.

For Japan:
http://www.fujitsu.com/jp/products/computing/servers/primergy/downloads/

> **NOTE** The MegaRAID controllers do not support all of the same operating systems. Refer to the documentation for your MegaRAID RAID controller for information about the OSs that the controller supports.

1.1 Driver Description

You can install the MegaRAID controllers in any IBM AT-compatible computer that has a PCI Express (PCIe) local bus. The MegaRAID controllers can run under various operating systems.

To use the controller with these operating systems, you must install software drivers. Fujitsu provides software drivers for the following operating systems:

- Microsoft Windows
- Linux (Red Hat and SLES)
- VMware

1.1.1 Driver Functions

The MegaRAID controllers provide drivers that bring up to 12Gb/s Serial Attached SCSI performance and 6.0 Gb/s SATA III performance to host adapter, workstation, and server designs. The controllers support internal and external storage devices, which let you use a system that supports enterprise-class SAS and desktop-class SATA III drives.

The SAS controllers integrate eight high-performance SAS/SATA or NVMe III PHYs and a PCI Express bus master DMA core. Each of the eight PHYs is capable of up to 12Gb/s SAS link rates, and 6.0Gb/s SATA III link rates.

The SAS RAID controllers support the SAS protocol as described in the *Serial Attached SCSI Standard, version 3.0*, and the Serial ATA III (SATA III) protocol defined by the *Serial ATA specification, version 3.0*. SATA III is an extension to SATA 2.0.

The drivers perform these functions:

- They use the PCI Express protocol
- They provide multiple RAID storage adapters (RSAs)
- They provide the ability to see newly configured logical drives in the configuration software utility without rebooting the system

1.1.2 Driver Updates

Because Fujitsu regularly updates device drivers, a feature might be added to your driver that is not included in the most recent documentation. If you have a question about a feature, consult the `readme` file that accompanies the driver, or contact your MegaRAID support representative. Be sure to use the latest service packs provided by the OS manufacturer.

You can download the latest drivers and software on the Fujitsu website at http://ts.fujitsu.com/support/.

For Japan:
http://www.fujitsu.com/jp/products/computing/servers/primergy/downloads/

1.2 Supported Operating Systems

The following table lists the supported operating systems, device driver files, driver RPMs, driver ISO, and driver deb packages for the MegaRAID controllers.

Some of the device driver files are available on the *ServerView Installation DVD* that accompanied your PRIMERGY server. Fujitsu updates the device drivers frequently. Also, ensure that you have the current version of these driver files, download the latest drivers from the Fujitsu website at http://ts.fujitsu.com/support/.

For Japan:
http://www.fujitsu.com/jp/products/computing/servers/primergy/downloads/

Refer to the `readme` file that accompanies the driver package for any updated information.

It is recomended to use the *ServerView Installation DVD* to configure your RAID controller and perform a guided installation of supported OS versions.

For manual installation the chapters below give hints and guidelines on how to add RAID driver for certain OS.

Table 1 Supported Operating Systems

Operating System	Version/Flavors	Installation Instructions
Microsoft Windows	**Microsoft Windows Server versions:** ■ Windows Server 2019 ■ Windows Server 2016 RS1 ■ Windows Server 2012 R2 Update 1 ■ Windows Server 2012 R2 ■ Windows Server 2012 [a]	Microsoft Windows Driver Installation
Red Hat Linux	■ Red Hat Enterprise Linux 8.0 or later ■ Red Hat Enterprise Linux 7.3 or later ■ Red Hat Enterprise Linux 6.9	Red Hat Linux Driver Installation
SUSE Linux Enterprise Server	■ SUSE Linux Enterprise Server 15 or later ■ SUSE Linux Enterprise Server 12 SP2 or later ■ SUSE Linux Enterprise Server 11 SP4	SUSE Linux Enterprise Server Driver Installation
VMware	■ VMware ESXi 7.0 or later ■ VMware ESXi 6.7 or later ■ VMware ESXi 6.5 Update 1 ■ VMware ESXi 6.0 Update 3	VMware Driver Installation

Table 1 Supported Operating Systems (Continued)

Operating System	Version/Flavors	Installation Instructions
Citrix XenServer [b)	■ Citrix XenServer 7.2 ■ Citrix XenServer 7.1	Citrix XenServer Driver Installation
CentOS [c)	■ CentOS-7.3 ■ CentOS-7.2 ■ CentOS-6.9 ■ CentOS-6.8 ■ CentOS-6.7	CentOS Driver Installation
Oracle Linux [d)	■ Oracle Linux 7.4 ■ Oracle Linux 7.3 ■ Oracle Linux 7.2 ■ Oracle Linux 6.9 ■ Oracle Linux 6.8 ■ Oracle Linux 6.7	Red Hat Linux Driver Installation

a)   depends on server system release

b)   depends on server system release

c)   depends on server system release

d)   depends on server system release

Chapter 2: Microsoft Windows Driver Installation

This chapter describes how to install the device driver and update the existing device driver on Microsoft Windows.

2.1 MegaRAID Primary Storage

In the MegaRAID primary storage configuration, the Windows OS is installed on virtual drives provided by the MegaRAID controller. The MegaRAID controllers include pre-boot configuration utilities, such as HII, that create the virtual drive before the installation of the Windows OS starts.

To install the Windows OS, prepare a USB flash drive, CD-ROM, or diskette, as appropriate, with the MegaRAID driver.

The driver is distributed in a series of nested compressed files. Use an existing Windows device to extract the files for the driver-loading device (USB, CD-ROM, or diskette) by using the appropriate Windows driver. Only two driver choices exist across the supported Windows versions: one for 32-bit systems or one for 64-bit systems.

2.1.1 Storage Configuration

The procedures in this section describe how to create the virtual drive used for the Windows OS. You can add other virtual drives to the running OS after the Windows OS has been installed. The MegaRAID preboot utilities, such as HII, create virtual disk for the Windows OS and are accessible during the power-on self-test (POST) part of the boot-up process.

Refer to the *12Gb/s MegaRAID Tri-Mode Software User Guide* for more information.

2.2 Primary OS Storage on the MegaRAID Controller

For the Windows Server 2012 OS, the MegaRAID driver is added after the other installation steps.

The operating system loads and decompresses the core files from the boot DVD first.

Perform the following steps to set up the primary operating system storage on your MegaRAID controller:

1. After the **Install Windows Language selection** window, the **Install Now** window appears, followed by the OS selection, license agreement, and installation type.
   On new installations, the **Custom** installation type is the only option.
2. On the next Windows installation window, a Load Driver link introduces the MegaRAID driver.
   For the Windows Server 2012 OS, you can add a driver from the CD, DVD, diskette, or USB flash drive.
3. Click **Browse**, and select the device and the folder with the previously extracted drivers.
4. In the next Windows installation window, select the driver to be installed.
5. Click **Next**.
   If no driver appears, two common problems might have occurred:
   — The folder with the files was not selected.
   — The wrong driver (32-bit as compared to 64-bit) was selected.
6. After the driver is loaded, follow the rest of the standard Windows installation steps:

2.3 Drivers and Operating Systems

On MegaRAID for Windows drivers, the release order structure of `win_megasas_drv_rel` driver is shown below:

`win_megaraid_drv_rel`, this binary zip file should be used for RAID mode.

When installing the MegaRAID drivers on the Windows OS, see Table 2, Drivers and Operating Systems to locate the driver and its respective operating system.

Table 2 Drivers and Operating Systems

Driver	Windows Operating System	Architecture
Win8.1_x86	Windows 8.1 and Windows Server 2012 R2	x86
Win8.1_x64	Windows 8.1 and Windows Server 2012 R2	x64
Win10_x86	Windows 10 and Windows Server 2016, 2019	x86
Win10_x64	Windows 10 and Windows Server 2016, 2019	x64

WDCFG is a utility for configuring driver runtime parameters that are automatically installed as part of driver installation. However, WDCFG is dependent on the Visual C++ Runtime package from Microsoft. If the Visual C++ Runtime package is not installed on the local machine where WDCFG is running, the `wdcfg.exe - System Error` message is displayed. If this error appears, you must download and install the latest Microsoft Visual C++ runtime package from https://www.microsoft.com/en-us/download/details.aspx?id=48145.

2.4 Secondary Storage on the MegaRAID Controller with the Windows Server 2012 OS

As the MegaRAID controller is installed and the previously installed Windows OS starts, the Windows Server 2012 OS prompts with **Found New Hardware**.

Perform the following steps to set up secondary storage for the Windows Server 2012 OS:

1. Select **Locate and Install**.
2. Select **Don't Search Online**.
3. Select **Show Me Other Options**
4. Select **Browse My Computer**.
5. Click **Browse**.
6. In the **Browse for Folder** window, locate the previously extracted driver files from the local boot diskette, CD, DVD, network, or USB device.
7. Click **OK**.
8. Click **Next**.
9. Click **Install**.

   The Hardware wizard displays the following message: `The software for this device has been successfully installed.`
10. Reboot the system.

    The system does not require a reboot when the MegaRAID controller driver is loaded for the first time.

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Chapter 2: Microsoft Windows Driver Installation
Using the Device Manager to Install MegaRAID on the Windows Server 2012 OS

2.5   Using the Device Manager to Install MegaRAID on the Windows Server 2012 OS

If you do not install the MegaRAID driver at boot time, the MegaRAID driver is added or updated in the Windows environment using the Device Manager. Many methods exist to start the Device Manager, including one general method for all supported versions of the Windows OS.

Perform the following steps to add or update the MegaRAID driver in the Windows environment using the Device Manager:

1. Select **Start > Search > devmgmt.msc > Enter** (for all versions except the Windows 2003 OS).

    In the Device Manager, a MegaRAID controller with no driver appears under the heading **Other Devices** as a **RAID Controller** or **Unknown Device**, depending on the system history.

2. Right-click and select either **RAID Controller** or **Unknown Device**, as appropriate.

3. If the device does not appear, double-click **Storage controllers** to expose any detected controllers that are supported by an existing driver.

4. If you locate the MegaRAID controller, right-click on the controller.

    The driver installation steps are the same no matter where the device was found.

5. Click **Update Driver Software**.

6. Click **Browse My Computer** to search for driver software.

7. Click the **Browse** button.

8. In the **Browse for Folder** window, locate the previously extracted driver files from the local boot disk, CD, DVD, network, or USB device.

9. Click **OK**.

10. Click **Next**.

11. Click **Install**.

    The Update Driver Software wizard shows the message: `The software for this device has been successfully installed.`

12. Reboot the system.

2.6   Installing the MegaRAID Driver on the Microsoft Windows Server 2016 OS

To install the MegaRAID driver on the Windows Server 2016 operating system, you must download the Windows Server 2016 driver from the Broadcom website at https://www.broadcom.com/support/download-search.

Consider the following points before you install the driver.

■   If you want to use the MegaRAID controller as secondary storage, install the OS with the MegaRAID controller installed. The OS automatically configures the controller with the in-box driver.

■   When the Microsoft OS is running on the machine with the MegaRAID controller, upgrade to the latest Broadcom MegaRAID driver.

2.6.1 Driver Upgrades

Perform the following steps to upgrade the Windows driver.

1. Download the updated driver and put it on a USB drive, CD, or DVD disc.
2. Boot the Microsoft Windows Server 2016 OS, and then move the mouse to the upper- or lower-right corner of the screen to expose the desk icons for **Search**, **Share**, **Start**, **Devices**, and **Settings** as shown in the following figure.

Figure 1 Settings Option
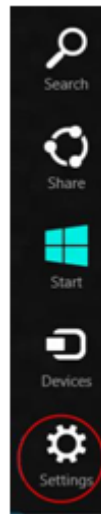
3. Click **Settings**.
4. On the **Settings** bar, click **Control Panel**, as shown in the following figure.

Figure 2 Settings Bar
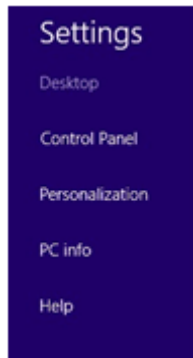
5. In the **Control Panel**, click **Hardware and Sound**.

The following figure appears.

Figure 3 Hardware and Sound
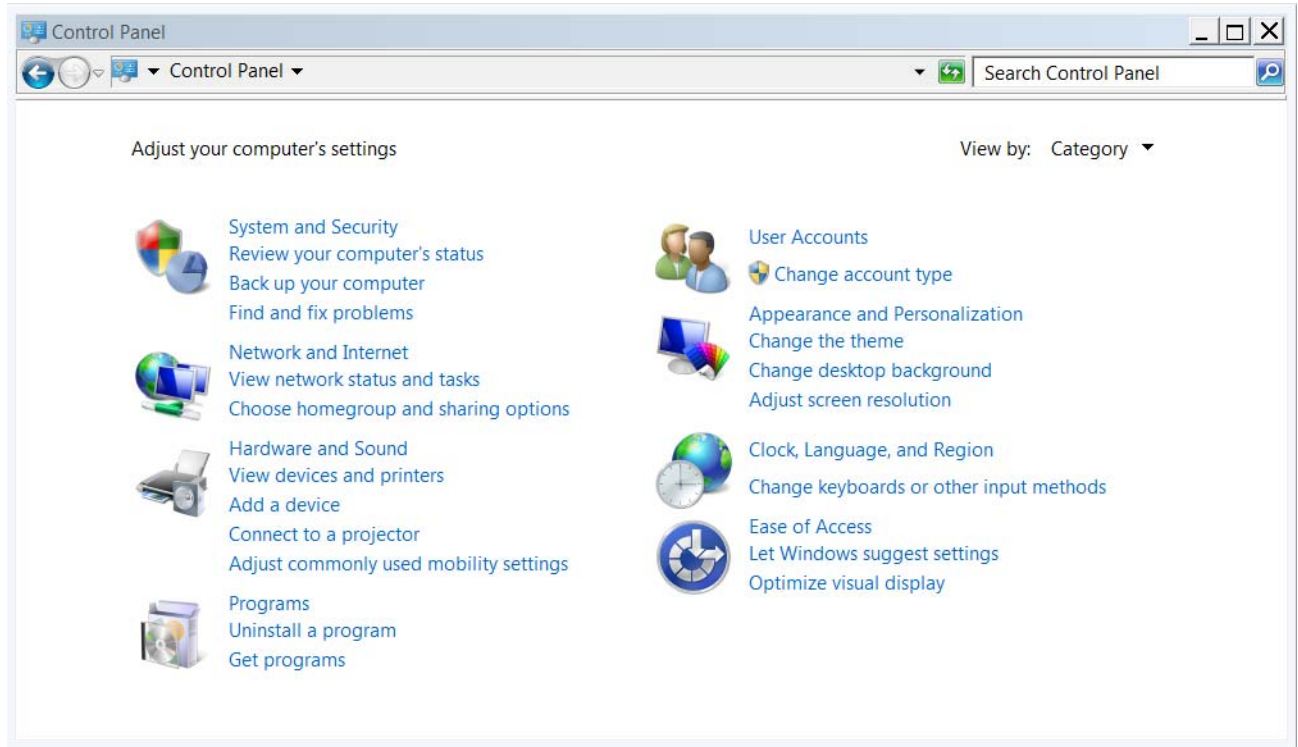
6. In the **Hardware and Sound** screen, click **Device Manager** under the **Devices and Printers** heading.
    The following figure appears.

Figure 4 Device Manager
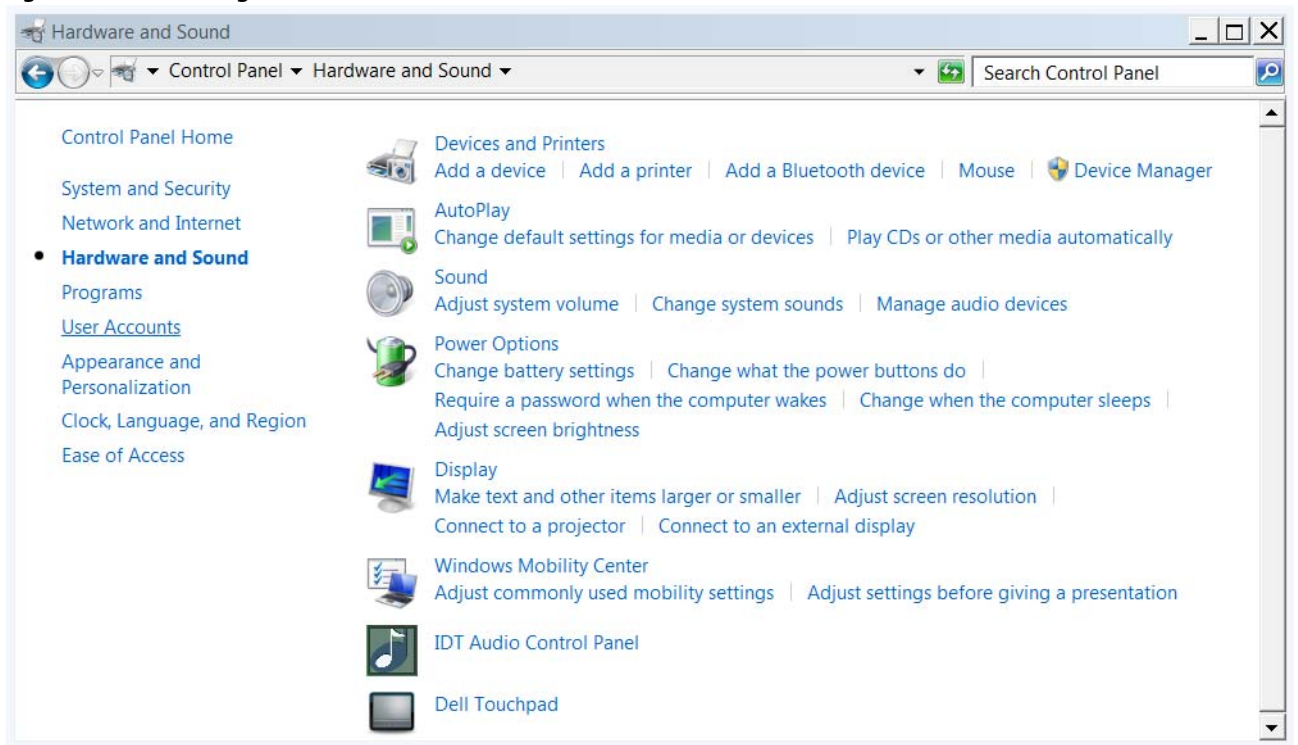
7. In the **Device Manager**, expand the sub-menu under **Storage controllers**, and right-click **Update Driver Software**, as shown in the following figure.

You can find the version of the existing driver by right-clicking **Properties** and selecting the **Driver** tab.

Figure 5 Update Driver Software Option
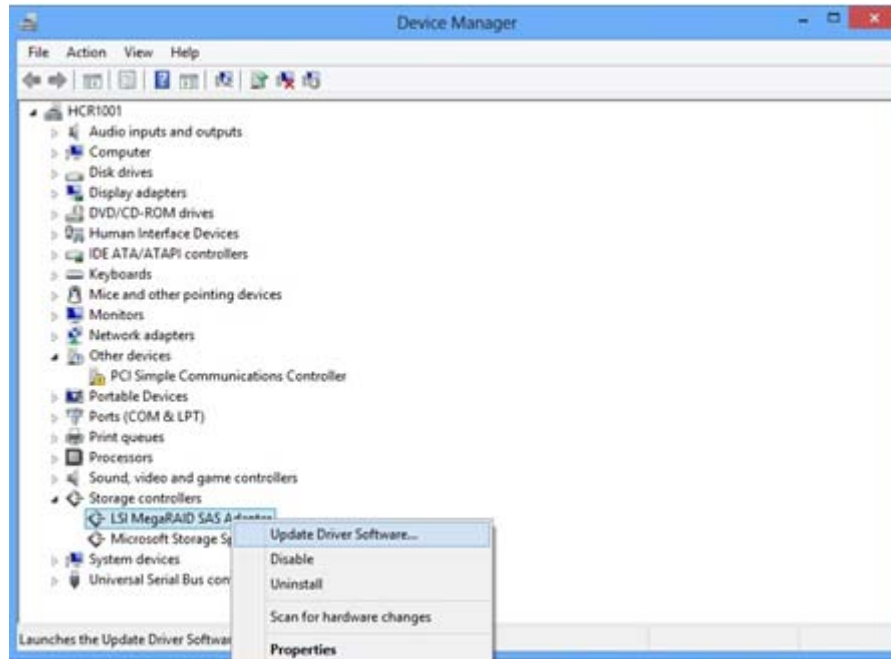
8. In the **Update Driver Software** wizard, select **Browse My Computer** to locate the updated driver on the USB, diskette, CD, or DVD.

9. When the driver is found, click **Install** to confirm, as shown on the following screen.

Figure 6 Windows Security Dialog

The installation wizard presents progress screens and announces the completion of the installation.

10. After the driver is installed, reboot the system.

2.7 Installing the MegaRAID Driver on the Windows Server 2012 OS

The Microsoft Windows Server 2012 operating system package includes a MegaRAID driver in the box.

The type of installation to use depends on how you plan to use your MegaRAID controller:

■ If you use the MegaRAID controller as secondary storage, you should install the OS without the MegaRAID controller, shut down the system, install the controller, and let the OS automatically configure the controller with the in-box driver.

■ After the Windows Server 2012 OS is running on the machine with the MegaRAID controller, you should upgrade to the latest Broadcom MegaRAID driver. The following section describes how to upgrade the driver.

2.7.1 Upgrading the Driver for the Windows Server 2012 OS

Perform the following steps to upgrade the driver.

1. Download the updated driver from https://www.broadcom.com/support/download-search, and put it on a USB, diskette, CD, or DVD.
2. Boot the Windows Server 2012 OS.
3. Click the **Server Manager** button to start Server Manager, if it does not start automatically.

   The button to start Server Manager is the first item on the left of the start bar, as shown in the following figure.

Figure 7 Server Manager Button

The **Server Manager** page appears.

4. In **Server Manager**, select **Tools**, and select **Computer Management**, as shown in the following figure.

Figure 8 Computer Management Option
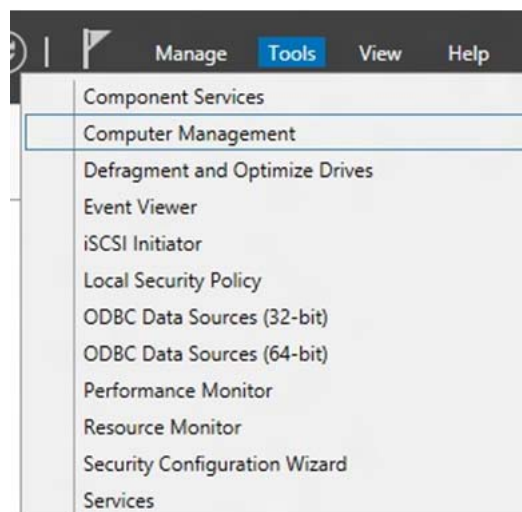
The **Computer Management** window appears.

5. In the left frame of the **Computer Management** window, select **Device Manager**.

Figure 9 Device Manager Option
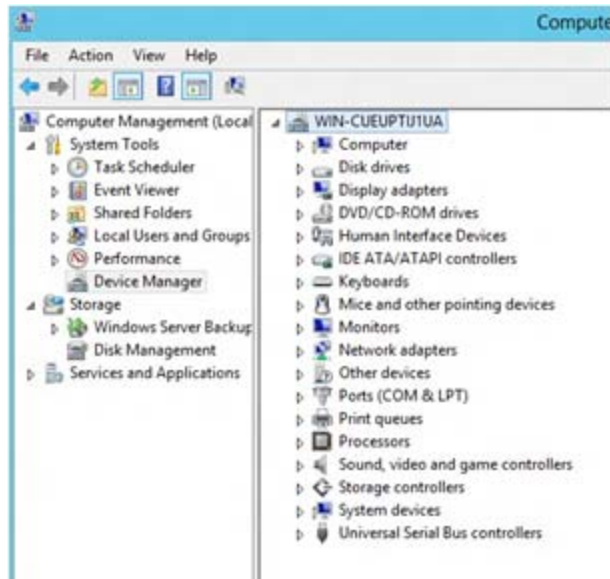
The **Device Manager** window appears.

6. In the **Device Manager**, expand the submenu under **Storage controllers**.

7. Right-click the **LSI MegaRAID Controller** option, and click **Update Driver Software**, as shown in the following figure.

Figure 10 Update Driver Software Option
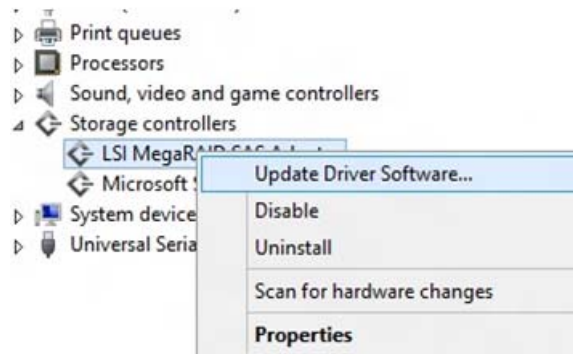
To find the version of the existing driver, right-click the **LSI MegaRAID Controller** option. Click **Properties**, and select the **Drivers** tab as shown in the following figure.

Figure 11 Driver Version
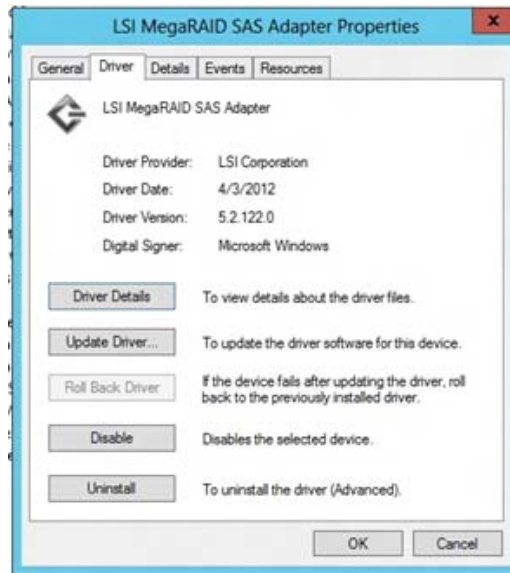
8. In the **Update Driver Software** wizard, click the **Browse** button to locate the updated driver on the USB, diskette, CD, or DVD.

Figure 12 Update Driver Software Wizard

After you locate the updated driver, the **Windows Security** dialog appears.

9. Click the **Install** button in the **Windows Security** dialog, as shown in the following figure.

Figure 13 Windows Security Dialog

The installation wizard presents progress screens and announces the completion of the installation.

Figure 14 Installation Complete Screen

10. Reboot the system after the driver is installed.

Chapter 3: Red Hat Linux Driver Installation

This chapter describes how to install the device driver, update the existing device driver, and uninstall the device driver on Red Hat Enterprise Linux (RHEL).

Refer to the release notes that accompanied the driver for information on an existing RHEL system.

> **NOTE** Usually inbox drivers should be used coming with for RHEL, CentOS, and Oracle Linux operating systems. There maybe more actual drivers available from Fujitsu download site.

3.1 Installing the Driver on a New Red Hat Enterprise Linux 6.x or 7.x OS

You can install the MegaRAID device driver on a new system from the Red Hat Enterprise Linux CD, DVD, or from a driver update diskette.

> **NOTE** MegaRAID supports PPC 64-bit architecture for Red Hat Enterprise Linux 6, but the preboot application is not supported due to the PPC BIOS limitations.

> **NOTE** Do not install the operating system on the PPC virtual drive for the PPC 64-bit architecture.

3.1.1 Installing from a CD or a DVD

Perform the following steps to install the MegaRAID device driver in a new RHEL OS from the RHEL installation media:

1. Refer to your system documentation, if needed, and boot the server with the installation CD, diskette, or DVD.
2. Follow the installation procedure for the Red Hat OS.

   If you do not provide a driver disk at boot time, the driver is loaded automatically during the installation process.

3.1.2 Creating a Driver Update Disk with a USB Drive

You can transfer a driver disk image to a USB flash drive with the rawrite tool from DOS or the `dd` utility in Linux. On a Linux machine, you can use the `dd` command to burn a driver ISO image on a USB drive.

Perform the following steps to create a driver update disk (DUD) with a USB drive.

1. Insert a USB flash drive into a Linux machine, making sure that the USB drive is not mounted.
2. Type the following command:

   ```
   "$ dd if=<driver.iso> of=/dev/sdx"
   ```

   Where `/dev/sdx` is the USB drive.

> **NOTE** Make sure that you pick the correct DUD image from the Broadcom release bundle. The DUD image should match with the installed OS kernel version.

3. Press **Enter**.
4. Mount the USB flash drive to verify its contents.

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Installing the Red Hat Enterprise Linux 6.x or 7.x Driver in an Existing Installation

5. Make sure the DUD image is in ISO 9660 format or MS-DOS format by typing the following command:

   ```
   $df -T
   ```

6. Press **Enter**.

   The file system type and other information about the mounted devices appear.

3.1.3 Installing from a Driver Update Diskette

Perform the following steps to create the driver update diskette by using the Linux driver image and to install the MegaRAID device driver in a new Red Hat Enterprise Linux OS:

1. Boot the server with the installation CD or DVD.

   Refer to your system documentation, if needed.

2. Enter the following boot option to load the driver update disk during installation:

   ```
   linux dd
   ```

NOTE	If you do not get a command prompt to enter the `linux dd` boot option, press **Esc**. You might need to refer to your distribution-specific RPM package or installation method.

3. Press **Enter** to continue the installation.

4. When prompted, insert the driver diskette.

   The utility locates and loads the driver for your controller.

5. Press **Alt+Ctrl+F4** to verify that the driver is loaded.

6. Press **Alt+Ctrl+F1** to return to the installation.

7. Follow the Red Hat installation procedure to complete the installation.

3.2 Installing the Red Hat Enterprise Linux 6.x or 7.x Driver in an Existing Installation

You can install the device driver in an existing Red Hat Enterprise Linux system from the Red Hat Enterprise Linux installation CD.

Perform the following steps to add the Red Hat Enterprise Linux 6 or 7 driver to an existing installation:

1. Turn on the power to the system.

   The system initializes the hardware. The system then detects the controller and invokes Kudzu, the RHEL hardware configuration utility.

2. Enter the `-ivh driver.rpm` command.

   The following RAID controller is added to your system: `LSI MegaSAS`

3. Select the **Configure the device** option.

4. Highlight the **Configure** tab, and press **Enter**.

   The system configures the controller and installs the appropriate driver in the kernel.

   The system boots and displays the devices connected or configured on the controller.

3.3   Installing or Updating the Red Hat Linux System Driver

Perform the following steps to install or update to the latest version of the Red Hat Linux system driver by using the generic Red Hat Package Managers (RPMs):

1. Boot the system.
2. Go to Console (your terminal GUI).
3. Perform the following steps to install the <kmod> RPM. In this example, the driver version is 07.701.16.00-1.
   a. Uninstall the earlier version, if needed.
   b. Extract the packaging from the Linux system by typing one of the following commands and pressing **Enter**:

   ```
   # tar -zxvf megaraid_sas_components.gz
   ```

   c. For RHEL5 architecture = x86_64, type the following commands and press **Enter**:

   ```
   # cd rhel5_oel5_centos5/rpms-1# rpm -ivh
   kmod-megaraid_sas-06.602.03.00-1-el5.8.x86_64.rpm
   ```

   d. For RHEL6 architecture = x86_64, type the following commands and press **Enter**:

   ```
   # cd rhel6_oel6_centos6/rpms-1# rpm -ivh
   kmod-megaraid_sas-06.602.03.00_el6.2-1.x86_64.rpm
   ```

   > **NOTE**   You must to select the correct RPM from the available bundled RPMs. Otherwise, you will see an RPM installed, but it will be for a different kernel version.

4. Reboot the system to load the driver.

3.4   Uninstalling the Red Hat System Driver

> **NOTE**   When you uninstall the existing version of the driver, the driver rolls back to previous version of the driver.

Perform the following steps to uninstall the <kmod> RPM. In this example, the driver version is 06.602.03.00.

1. Type the following command and press **Enter**:

   ```
   # rpm -qa | grep megaraid_sas
   ```

2. Find the string that contains the text megaraid_sas, and copy the string.
3. Type the following commands and press **Enter**:

   ```
   # rpm -e megaraid_sas-06.602.03.00-1-rhel5

   # reboot
   ```

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Chapter 4: SUSE Linux Enterprise Server Driver Installation
Installing the Driver in a New SUSE Linux Enterprise Server System

Chapter 4: SUSE Linux Enterprise Server Driver Installation

This chapter describes how to install the device driver, update the existing device driver, and uninstall the device driver on SLES environments. Usually inbox drivers coming with the SUSE SLES CD or DVD should be used. There maybe more up to date driver available from Fujitsu download site.

4.1   Installing the Driver in a New SUSE Linux Enterprise Server System

You can install the MegaRAID device driver in a new system from the SUSE SLES Linux CD or DVD, or from a driver update diskette.

NOTE	If you use Service Pack (SP) 1 or SP 2, you must load the driver. If you use SP 3 RC 2, the MegaSAS driver is already on the SUSE SLES Linux CD.
NOTE	MegaRAID supports PPC 64-bit architecture for the SUSE Linux Enterprise Server System, but the preboot application is not supported due to the PPC BIOS limitations.
NOTE	Do not install the operating system on the PPC virtual drive for the PPC 64-bit architecture.

4.1.1   Installing the Driver from a CD or a DVD

Perform the following steps to install the driver in a new SUSE Linux Enterprise Server system from the SUSE Linux Enterprise Server installation CD or DVD:

1. Boot the server with the SUSE Linux Enterprise Server Service Pack CD or DVD.

    The system BIOS must support booting from a CD-ROM. BIOS settings might require changes to allow CD-ROM booting. Refer to your system documentation.
2. Follow the installation procedure for the SUSE OS.

    If you do not provide a driver disk at boot time, the driver is loaded automatically during the installation process.

4.1.2   Creating a Driver Update Disk with a USB Drive

You can transfer a driver disk image to a USB flash drive with the rawrite tool from DOS or the `dd` utility in Linux. On a Linux machine, you can use the `dd` command to burn a driver ISO image on a USB drive.

Perform the following steps to create a driver update disk (DUD) with a USB drive.

1. Insert a USB flash drive into a Linux machine, making sure that the USB drive is not mounted.
2. Type the following command:

        "$ dd if=<driver.iso> of=/dev/sdx"

    Where `/dev/sdx` is the USB drive.

NOTE	Make sure that you pick the correct DUD image from the Broadcom release bundle. The DUD image should match with the installed OS kernel version.

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Installing or Updating the SUSE Linux Enterprise Server Driver

3. Press **Enter**.

4. Mount the USB drive to verify its contents.

5. Make sure the DUD image is in ISO 9660 format or MS-DOS format by typing the following command:

   ```
   $df –T
   ```

6. Press **Enter**.

   The file system type and other information about the mounted devices appear.

4.1.3   Installing from a Driver Update Diskette

To install the MegaSAS device driver in a new SUSE Linux Enterprise Server, create the driver update diskette by using the Linux driver image.

Perform the following steps to install the driver:

1. Refer to your system documentation, if needed, and boot the server with the installation CD or DVD.

2. At the installation message, perform one of the following actions:
   — Press **F5** for SUSE Linux Enterprise Server 10.
   — Press **F6** for SUSE Linux Enterprise Server 11.
   — Press **F6** for SUSE Linux Enterprise Server 12.

3. Continue the installation procedure and, when prompted, insert the driver update diskette.
   The utility locates and loads the driver for your controller.

4. Press **Alt**+**Ctrl**+**F4** to verify that the driver is loaded.

5. Press **Alt**+**Ctrl**+**F1** to return to the installation.

6. Follow the SUSE installation procedure to complete the installation.

4.2   Installing or Updating the SUSE Linux Enterprise Server Driver

4.2.1   Installing the Driver by Using the Generic RPMs

Perform the following steps to install or upgrade to the latest version of the SLES 10, 11, or 12 driver by using the generic RPMs:

1. Boot the system.

2. Go to Console (your terminal GUI).

3. Perform the following steps to install the <kmod> RPM. In this example, the driver version is 06.602.03.00.

   a. Uninstall the earlier version, if needed.

   b. Extract the packaging from the Linux system by typing the following command and pressing **Enter**:

      ```
      # tar –zxvf megaraid_sas_components.gz
      ```

   c. For SLES10 (Service Pack 4) architecture = `x86_64` flavor = `default`, type the following commands and press **Enter**:

      ```
      # cd sles10/rpms-1

      # rpm -ivh
      lsi-megaraid_sas-kmp-default-06.602.03.00_sles10sp4-1.x86_64.rpm
      ```

   d. For SLES11 (Service Pack 2), architecture = x86_64 flavor = default, type the following commands and press **Enter**:

```
# cd sles11/rpms-1

# rpm -ivh
lsi-megaraid_sas-kmp-default-06.602.03.00_sles11sp2-1.x86_64.rpm
```

> **NOTE** You must select the correct RPM from the available bundled RPMs. Otherwise, you will see an RPM installed, but it will be for a different kernel version.

    e.   For SLES12, architecture = `x86_64` flavor = `default`, type the following commands and press **Enter**:

```
# cd sles12/rpms-1

# rpm -ivh lsi-megaraid_sas-kmp-default-06.602.03.00_sles12-1.x86_64.rpm
```

4.   Reboot the system to load the driver.

4.2.2 Installing or Updating the Driver by Using the DKMS RPMs

Perform the following steps to install or update to the latest version of the SLES system driver by using the DKMS RPMs. In this example, the driver version is 06.602.03.00-1.

> **NOTE** This DKMS packaging is provided only for SLES10 (x86_64) and SLES11(x86_64) pre-compiled binaries.

1.   Extract the packaging from the Linux system by typing the following commands and pressing **Enter**:

```
# tar -zxvf megaraid_sas-release.tar.gz
# cd dkms-1
# tar -zxvf megaraid_sas-06.602.03.00-1.dkms.tar.gz
```

2.   Install the DKMS framework by typing the following commands and pressing **Enter**:

```
# rpm -ivh dkms-2.0.2.21.1-1.noarch.rpminstall DKMS rpm
# rpm -ivh megaraid_sas-06.602.03.00-1dkms.noarch.rpm
```

3.   Reboot to load the driver with the newer version by typing the following command and pressing **Enter**:

```
# reboot
```

4.3 Uninstalling the SUSE Linux Enterprise Server Driver

> **NOTE** When you uninstall the existing version of the driver, the driver rolls back to previous version of the driver.

Perform the following steps to uninstall the <kmod> RPM. In this example, the driver version is 06.602.03.00.

1.   Type the following command and press **Enter**:

```
# rpm -qa | grep megaraid_sas
```

2.   Find the string that contains the text `megaraid_sas`, and copy the string.

The driver name and version associated with `megaraid_sas` is copied, so that it is easier for you to uninstall the exact version of the driver.

3.   Type the following commands and press **Enter**:

    `# rpm -e` and paste the text string that you have copied.

```
# reboot
```

Chapter 5: VMware Driver Installation

This chapter describes how to install the device driver and update the existing device driver on VMware. It is recommended to use the Custom Image DVD for PRIMERGY server to install VMware OS.

5.1 Installing Asynchronous Drivers on the VMware 6.*x* OS

An existing ESXi host can install drivers from a specific VIB file or from an `<offline-bundle>.`zip file.

5.1.1 Using esxcli and the Asynchronous Driver VIB File in an Existing ESXi Installation

An existing ESXi host can install asynchronous drivers from an asynchronous driver VIB file. The VIB file is copied to the ESXi host by using the datastore browser, and then installed using the `esxcli` utility in the ESXi Shell.

> **NOTE** This procedure requires remote ESXi network connectivity using the vSphere client.

Perform the following steps to install the asynchronous drivers:

1. Extract the contents of the asynchronous driver zip file.
2. Identify the `<offline-bundle>`.zip file.
3. Extract the contents of the `<offline-bundle>`.zip file.
4. Identify the `async-driver.vib` file.
5. Log in to the ESXi host using vSphere client with administrator privileges, such as root.
6. Using the Datastore Browser, upload the `async-driver.vib` file to an ESXi host's datastore.
7. Place the host into Maintenance mode.

> **NOTE** You can place the host into Maintenance mode through the vSphere client, or by adding the `--maintenancemode` option to the `esxcli` command.

8. Log in as root to the ESXi console through SSH or iLO/DRAC.
9. To install drivers from the VIB file (this action requires an absolute path), type the following command, and press **Enter**.

    ```
    esxcli software vib install -v /path/async-driver.vib
    ```

    For example:

    ```
    esxcli software vib install -v /vmfs/volumes/datastore/async-driver.vib
    ```

10. Reboot the ESXi host.
11. Exit Maintenance mode.

> **NOTE** You can update an ESX host remotely by using the `esxcli` utility, which is part of the vSphere CLI. For more details on using this utility, refer to the vSphere Command-Line Interface Documentation page.

5.1.2 Using esxcli and an Offline Bundle Async Driver Zip File in an Existing ESXi Installation

In this procedure, you copy the offline bundle zip file to the ESXi host by using the Datastore Browser and install it by using the `esxcli` utility in the ESXi shell.

> **NOTE**   This procedure requires remote ESXi network connectivity using vSphere client.

Perform the following steps to install the async drivers:

1. Extract the contents of the async driver zip file.
2. Identify the `<offline-bundle>`.zip file.
3. Log in to the ESXi host using vSphere client with administrator privileges, such as root.
4. Using the Datastore Browser, upload the `<offline-bundle>`.zip file to an ESXi host's datastore.
5. Place the host into Maintenance mode.

> **NOTE**   You can place the host into Maintenance mode through the vSphere client or by adding the `--maintenancemode` option to the `esxcli` command.

6. Log in as root to the ESXi console through SSH or iLO/DRAC.
7. To install drivers using the offline bundle (this action requires an absolute path), type the following command, and press **Enter**.

```
esxcli software vib install –d /path/<offline-bundle>.zip
```

For example:

```
esxcli software vib install –d /vmfs/volumes/datastore/<offline-bundle>.zip
```

8. Reboot the ESXi host.
9. Exit Maintenance mode.

5.1.3 Installing an Upgrade

The upgrade process is similar to a new installation, except for the `esxcli` command.

■ To upgrade, type the following command, and press **Enter**.
  — If you are upgrading using a `.vib` file:

```
esxcli software vib update -v /filepath/FILENAME.VIB
```

  — If you are upgrading using a `.zip` file:

```
esxcli software vib update -d /fielpath/FILENAME.ZIP
```

> **NOTE**   Before you run the `esxcli` command, enter the ESXi host into Maintenance mode. You can enter the host into Maintenance mode through the vSphere Client, or by adding the `–maintenancemode` option to the `esxcli` command.

5.1.4 Installing the Device Driver through the VMware Update Manager

The VMware Update Manager (VUM) is a plug-in for the Virtual Center Server (vCenter Server). You can use the VUM utility to install a VIB by importing the associated offline bundle package (a zip file that contains the VIB and metadata). You can then create an add-on baseline and remediate the host or hosts with this baseline.

Refer to the vCenter Server documentation for more information about the VUM.

Chapter 6: Citrix XenServer Driver Installation

This chapter describes how to install the device driver and update the existing device driver on Citrix XenServer.

> **NOTE** The XenServer OS driver support is for 32-bit and 64-bit systems.

6.1 Creating a Driver Update Disk with a USB Drive

You can transfer a driver disk image to a USB flash drive with the rawrite tool from DOS, or the `dd` utility in Linux. On a Linux machine, you can use the `dd` command to burn a driver ISO image on a USB drive.

Perform the following steps to create a driver update disk (DUD) with a USB drive.

1. Insert a USB flash drive into a Linux machine, making sure that the USB drive is not mounted.
2. Type the following command:

   ```
   "$ dd if=<driver.iso> of=/dev/sdx"
   ```

   Where `/dev/sdx` is the USB drive.

   > **NOTE** Make sure that you pick the correct DUD image from the Broadcom release bundle. The DUD image should match with the installed OS kernel version.

3. Press **Enter**.
4. Mount the USB flash drive to verify its contents.
5. Make sure the DUD image is in ISO 9660 format or MS-DOS format by typing the following command:

   ```
   $df -T
   ```

6. Press **Enter**.

   The file system type and other information about the mounted devices appear.

6.2 Installing the XenServer 7 OS on Storage Managed by a MegaRAID Controller (Primary Storage)

Broadcom distributes the XenServer 7 drivers in an ISO image. You can update the drivers during the installation, or you can update them when new drivers become available.

> **NOTE** For primary storage, before you install the Broadcom driver, you must have your MegaRAID controller already installed in the system. Refer to the installation guide that came with your controller for the installation instructions. You can download the installation guide at www.broadcom.com/support/download-search.

Perform the following steps to install the XenServer 7 OS driver at boot time on storage managed by a MegaRAID controller.

1. Download the ISO image to install the Citrix XenServer OS.

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2. Using the ISO image, perform the following steps to make a USB flash drive as the driver update disk (DUD).

    a. Copy the ISO image.

    b. Using the Linux command, type the following command in Text mode:

    ```
    dd if=image of=target
    ```

    For example,

    ```
    dd if=megaraid_sas-08.255.02.00-2.6.27.42-0.1.1.xs5.6.0.44.111158.iso of
    =/dev/sdb
    ```

    Where `/dev/sdb` is the USB drive location.

3. Boot the computer from the main installation CD.

4. For the DUD installation, press **F9** from the initial boot screen.

5. Accept the End User License Agreement (EULA), then proceed.

    The installer reads from the boot disk, and then loads several screens showing the MegaRAID SAS driver.

6. After you return to the initial boot screen, remove the USB drive, and then proceed as normal.

    After the initial boot messages, the installer does some hardware detection and initialization. A screen appears that prompts you to select which keyboard key map you want to use for the installation.

7. Select the desired key map and click **OK** to proceed.

8. Select the option to install or upgrade the XenServer OS, and click **OK** to proceed.

    The next screen displays a message stating that the setup program will install XenServer on the computer, and a warning that the installation will overwrite data on any hard drives that you select to use for the installation.

9. Click **OK**.

    The XenServer End User License Agreement (EULA) appears.

10. Click **Accept EULA**.

    If you have multiple local hard disks, you are prompted to choose the primary disk for the installation.

11. Select the desired disk and click **OK** to proceed.

    After you select the primary disk, you are prompted to choose whether you want any of the other drives to be formatted for use by the XenServer OS for VM storage.

12. Click **OK** to proceed.

    The next screen prompts you to specify the source of the installation packages.

13. If you are installing from a CD, select **Local media (CD-ROM)**.

    The next screen prompts you to choose whether to verify the integrity of the installation media.

14. Click **Skip verification** to bypass verification of the installation media.

    Verifying the installation media can take some time.

15. Click **OK** to proceed.

    You are prompted to set a root password.

16. For network configuration, use the default setting and continue to click **OK**.

    You are prompted to select the general geographical area for the time zone.

17. Choose the time zone from the displayed list of geographical areas, and then click **OK** to proceed.

    You are prompted to choose a method for setting the system time. The options are **Using NTP** or **Manual time**.

18. Select **Using NTP**.

    You are prompted for the IP address and the gateway.

19. Use the default setting, and click **OK** to continue.

    From this point forward, the installation begins to copy files to the hard drive, and a progress bar appears.

6.3   Installing or Updating the XenServer 7 OS Driver

Perform the following steps to install or update to the latest version of the MegaRAID SAS driver:

1. Boot the system.
2. Go to the Console (your terminal GUI).
3. Install the DKMS driver RPM.
    Uninstall the earlier version first, if needed.
4. Install the MegaRAID SAS driver RPM.
    Uninstall the earlier version first, if needed.
5. Reboot the system to load the driver.

Chapter 7: CentOS Driver Installation

To install, update, and uninstall the device driver on CentOS operating systems, see Chapter 3: Red Hat Linux Driver Installation

NOTE   An optimized, single unified binary is provided for RHEL, CentOS, and Oracle Linux operating systems.

Appendix A: 64 VD Driver Support and Known Limitations

This appendix describes which drivers are supported and known limitations for the MegaRAID 6Gb/s SAS RAID controller and the MegaRAID 12Gb/s SAS RAID controller.

A.1 Operating System Driver Support

The following table describes the operating system driver support matrix for the MegaRAID 6Gb/s SAS RAID controller and the MegaRAID 12Gb/s SAS RAID controller.

Table 3 Operating System Support Matrix

OS Driver	Less than or Equal to 64 Virtual Drive Support
Windows	Yes
Linux (Native)	Yes
VMware (Native/Legacy)	Yes

A.2 Known Driver LimitationsVersion 1.4

No known limitations.

Revision History

Version 1.4, October 15, 2020

The following document change was made.

- Updated Section 1.2, Supported Operating Systems.
- Updated Section 2.3, Drivers and Operating Systems

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- Updated Section 1.2, Supported Operating Systems.

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