RPX MegaRAID Drivers User's Guide

Order Number 695580-001

Information in this document is provided in connection with Intel products. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Intel's Terms and Conditions of Sale for such products, Intel assumes no liability whatsoever, and Intel disclaims any express or implied warranty, relating to sale and/or use of Intel products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright or other intellectual property right. Intel products are not intended for use in medical, life saving, or life sustaining applications.

Intel retains the right to make changes to specifications and product descriptions at any time, without notice.

Copies of documents which have an ordering number and are referenced in this document, or other Intel literature, may be obtained from:

Intel Corporation
P.O. Box 5937
Denver, CO 80217-9808

or call in North America 1-800-548-4725, Europe 44-0-1793-431-155, France 44-0-1793-421-777, Germany 44-0-1793-421-333, other Countries 708-296-9333.

† Third-party brands and names are the property of their respective owners.

American Megatrends, Inc. has generously given Intel permission to reproduce this copyrighted publication.

© Copyright 1995-1997 American Megatrends, Inc.
All rights reserved.

American Megatrends, Inc.
6145F Northbelt Parkway
Norcross, GA 30071

Copyright © Intel Corporation, 1998.

This publication contains proprietary information which is protected by copyright. No part of this publication can be reproduced, transcribed, stored in a retrieval system, translated into any language or computer language, or transmitted in any form whatsoever without the prior written consent of the publisher.

American Megatrends, Inc. shall in no event be held liable for any loss, expenses, or damages of any kind whatsoever, whether direct, indirect, incidental, or consequential (whether arising from the design or use of this product or the support materials provided with the product). No action or proceeding against American Megatrends may be commenced more than two years after the delivery of product to Licensee of Licensed Software.

Licensee agrees to defend and indemnify American Megatrends from any and all claims, suits, and liabilities (including attorney's fees) arising out of or resulting from any actual or alleged act or omission on the part of Licensee, its authorized third parties, employees, or agents, in connection with the distribution of Licensed Software to end-users, including, without limitation, claims, suits, and liability for bodily or other injuries to end-users resulting from use of Licensee's product not caused solely by faults in Licensed Software as provided by American Megatrends to Licensee.

Table of Contents

1 Overview
Documentation Overview 5

2 Windows NT Drivers
Driver Files 7
Driver Installation 7
- Create Driver Disks 7
- Fresh Installation 7
- Adding RAID to an Existing Installation 8
- Install the Utilities 8

Configure Logical Drive 9
Non-Disk Devices 9

3 Novell NetWare 4.x Drivers
Driver Files 11
Driver Installation 11
- Create Driver Disks 11
- Fresh Installation 12
- Adding RAID to an Existing Installation 12

Utilities 12
- Install the Utilities 12

4 SCO UnixWare 2.1.x Drivers
Unix Driver Features 15
Driver Installation 15
- Create Driver Disks 15
- Fresh Installation 15
- Adding RAID to an Existing Installation 16

Utilities 16

Tables
1. RPX Module Documentation Sources 5
2. Windows NT Driver Files 7
3. Novell NetWare Driver File 11
4. Novell NetWare Utility Files 13
5. SCO UnixWare Utility Files 16

1 Overview

MegaRAID can operate under MS-DOS† or any DOS-compatible operating system using the standard AT BIOS INT 13h Hard Disk Drive interface. To operate with other operating systems, you must install software drivers. MegaRAID provides software drivers for the following operating systems:

- Microsoft Windows† NT† Version 4.x
- Novell† NetWare† Version 4.x
- SCO† UnixWare† V2.x

Documentation Overview

Table 1. RPX Module Documentation Sources

Documentation	Description	Where Found
RPX Module Setup Guide	Quick install instructions for the RPX module.	Inside RPX Module CD-ROM jewel case.
RPX Module AMI MegaRAID User's Guide	User's guide for AMI MegaRAID applications, including setup and management utilities.	.PDF file on the RPX Module CD-ROM
RPX MegaRAID Drivers User's Guide	Operating system specific driver installation instructions for RPX MegaRAID.	.PDF file on the RPX Module CD-ROM
M440LX Server System Product Guide	Overall product user's guide including RPX module installation and removal instructions	.PDF file on the country kit CD-ROM

2 Windows NT Drivers

The MegaRAID Windows NT version 4.x software drivers are provided on the RPX CD-ROM and must be copied to a diskette. These two drivers are miniport drivers.

The MegaRAID Windows NT drivers support:

- Four SCSI adapters per host system
- Eight logical drives per adapter
- Six non-disk devices per adapter. Use SCSI IDs 1 through 6 for non-disk devices.

Driver Files

The MegaRAID Windows NT driver files are:

Table 2. Windows NT Driver Files

File	Description
MRAID35X.SYS	The Windows NT V4.x driver.
OEMSETUP.INF	Used by Windows NT Setup to add SCSI Drivers.
TXTSETUP.OEM	Used by Windows NT for fresh installation.

The remaining files are management utilities.

Driver Installation

Create Driver Disks

1. Insert a formatted diskette in the diskette drive.
2. Insert the RPX module CD-ROM in the CD-ROM drive.
3. Change directories on the CD-ROM to \drivers\NT.
4. Copy all of the files to the diskette.

Fresh Installation

Use fresh installation if you are installing Windows NT for the first time and want to include the MegaRAID drivers and utilities.

Installing from CD-ROM

Make sure the Windows NT installation CD is in the CD-ROM drive.

1. Follow the standard Windows NT installation procedures.
2. The installation procedure scans for a disk controller. Choose S to skip detection.
3. Select Specify additional SCSI adapters.

4. Choose Other… from the list of displayed devices.
5. The installation program will prompt for the Manufacturer supplied hardware support disk. Insert the Windows NT driver diskette (created above) into the diskette drive and load the AMI driver.
6. You also need to select a driver for your CD-ROM drive at this time.

Installing from Diskettes

Make sure the Windows NT installation CD is in the CD-ROM drive.

1. Follow the standard Windows NT installation procedures.
2. The installation procedure scans for a disk controller. Choose S to skip detection.
3. Select Specify additional SCSI adapters.
4. Choose Other… from the list of displayed devices.
5. The installation program will prompt for the Manufacturer supplied hardware support disk. Insert the Windows NT driver diskette (created above) into the diskette drive and load the AMI driver.
6. You also need to select a driver for your CD-ROM drive at this time.

Adding RAID to an Existing Installation

If you are already running Windows NT and want to add the MegaRAID Windows NT driver and utilities, insert the Windows NT driver diskette (created above) into the diskette drive.

Installing the Drivers

1. Open Control Panels.
2. Double click on SCSI Adapters.
3. Click the Add button.
4. Click on Have Disk.
5. Select the drive letter corresponding to your diskette drive and click OK.
6. Select the American Megatrends 960RX RAID adapter and click OK.
7. Reboot after the driver is installed.

Install the Utilities

1. Run setup.exe from the Windows NT driver diskette (created above).
2. Follow the instructions. This creates a program group from which you can run Power Console.

Configure Logical Drive

Logical drives can be configured via the MegaRAID Power Console, a GUI RAID Management Utility. The Logical drives can also be configured in Windows NT using Disk Administrator.

See the *MegaRAID User's Guide* for additional information about Power Console.

Non-Disk Devices

Non-disk SCSI devices can be installed on any SCSI channel. The SCSI ID for the non-disk devices must be between 1 and 6, and must be unique irrespective of the channel.

3 Novell NetWare 4.x Drivers

The MegaRAID NetWare version 4.x software driver is provided on the RPX CD-ROM and must be copied to a diskette. The MegaRAID NetWare driver and utilities support logical drives configured on the SCSI bus. This driver supports up to four MegaRAID Adapters.

NOTE

The logical drives configured on the host adapter are registered with the operating system as separate logical units on Target ID 0.

Driver Files

The MegaRAID Novell NetWare driver file is:

Table 3. Novell NetWare Driver File

File	Description
MEGA4XX.DSK	This is the MegaRAID host adapter module driver. It conforms to the Novell NetWare 4.1 DDFS architecture. This driver is a reentrant module. It registers one adapter every time the NetWare LOAD command is issued. It also provides an IOCTL mechanism used by the ASPI driver and the MegaRAID configuration utility to interact with MegaRAID.
MEGAMGR.NLM	This is the MegaRAID Configuration and Management utility. Do not unload this NLM using the UNLOAD console command. See the MegaRAID User's Guide for additional information about MegaRAID Manager.
MEGAMON.NLM	The MegaRAID Monitor reports events on the adapter. Event categories are: Severe, Warning, and Information. The notification is broadcast to the supervisor, displayed locally on the console, and displayed remotely.

Driver Installation

Create Driver Disks

1. Insert a formatted diskette in the diskette drive.
2. Insert the RPX module CD-ROM in the CD-ROM drive.
3. Change directories on the CD-ROM to \drivers\netware.
4. Copy all of the files to the diskette.

Fresh Installation

Use fresh installation if you are installing Novell NetWare for the first time and want to include the MegaRAID drivers and utilities.

Follow the instructions in the *Novell NetWare Installation Guide* to install NetWare on the server.

1. Configure MegaRAID and initialize all drives by running MegaRAID BIOS Setup or MegaRAID Manager. See the *MegaRAID User's Guide* for additional information.
2. Create a 50 MB active DOS partition on the first logical drive. Format the drive and transfer DOS to that drive. Boot from this drive. This drive should appear as Drive C:.
3. If installing the operating system from a CD-ROM, you may need DOS CD-ROM drivers. Install the CD-ROM drivers and make sure that the CD-ROM drive can be accessed from DOS.
4. Follow the Novell NetWare 4.x installation instructions. Insert the MegaRAID NetWare 4.X drivers diskette (created above) when needed.

Adding RAID to an Existing Installation

If you are already running Novell NetWare and want to add the MegaRAID NetWare driver and utilities, do the following

1. Run the MegaRAID configuration by pressing <CTRL-M> after the AMI BIOS banner is displayed during the system boot.
2. Configure the NetWare drive as RAID 0. Do not initialize the drive.
3. Reboot.
4. Copy the MegaRAID NetWare files from the MegaRAID NetWare diskette (created above) into your \NWSERVER directory.
5. Edit the STARTUP.NCF file and replace the HBA driver load statement with "LOAD MEGA4XX.DSK".

NOTE

If the SYS volume does not mount, the AMI driver cannot recognize the previously created NetWare partition. This has been seen with some older Seagate drives. In this case, backup the non-system files and perform a fresh installation or attach the drive to the on-board narrow SCSI adapter or an adapter on the primary bus.

Utilities

Install the Utilities

1. Copy all files with a .NLM extension from the MegaRAID NetWare 4.X drivers diskette to a subdirectory of your choice.
2. Load the .NLM files as needed.

See the *MegaRAID User's Guide* for additional information about the utilities.

Table 4. Novell NetWare Utility Files

File	Description
MEGAMGR.NLM	This is the MegaRAID Configuration and Management utility. Do not unload this NLM using the UNLOAD console command. See the MegaRAID User's Guide for additional information about MegaRAID Manager.
MEGAMON.NLM	The MegaRAID Monitor reports events on the adapter. Event categories are: Severe, Warning, and Information. The notification is broadcast to the supervisor, displayed locally on the console, and displayed remotely.

4 SCO UnixWare 2.1.x Drivers

The MegaRAID UnixWare version 2.1.x software drivers are provided on the RPX CD-ROM and must be copied to a diskette. Follow the standard installation procedure as specified in the *SCO UnixWare 2.1.x Installation Handbook* to install the MegaRAID UnixWare drivers.

Unix Driver Features

The MegaRAID UnixWare driver is a **PDI** SCSI host adapter driver. It supports:

- up to four host adapters per host system
- up to eight logical drives per adapter
- up to five non-disk devices per adapter (SCSI ID 0 and SCSI ID 1 are reserved for SCSI disk devices)
- IOCTL for managing the adapter environment

Driver Installation

Create Driver Disks

You must have an x86 system running DOS, Windows, or Windows NT to create the UnixWare drivers diskette. The following process creates a UnixWare diskette with the appropriate drivers and utilities. You will not be able to read this diskette under DOS, Windows, or Windows NT.

1. Insert the RPX module CD-ROM in the CD-ROM drive.
2. Change directories on the CD-ROM to \drivers\unixware.
3. Type the following command:

   ```
   rwfloppy -w unixware.116
   ```

4. Follow the instructions on the screen.

Fresh Installation

Use fresh installation if you are installing SCO UnixWare for the first time and want to include the MegaRAID drivers and utilities. You must have UnixWare version 2.1.3 or later to perform a fresh installation.

1. Insert the boot diskette in the drive and reset the system.
2. Proceed with a normal install.
3. When prompted for the HBA diskette, insert the MegaRAID UnixWare driver diskette created above.
4. When asked if you have another HBA diskette, insert the UnixWare HBA diskette.
5. Proceed with the installation, following the interactive instructions.

Adding RAID to an Existing Installation

If you are already running UnixWare and want to add the MegaRAID UnixWare driver and utilities, you must be running version 2.1.3. If you are running version 2.1.2 or earlier, you must install ptf3254, which can be downloaded from ftp://ftp.sco.com/UW21.

1. Log in as root.
2. If you are running UnixWare 2.1.3 or later, skip this step. Insert the ptf 3254 diskette and execute:

   ```
   pkgadd -d diskette1 ptf3254
   ```

   at the command line prompt.
3. Insert the MegaRAID UnixWare driver diskette and execute:

   ```
   pkgadd -d diskette1 mega
   ```

   at the command line prompt.
4. Follow the screen instructions to complete the installation.

To bring the RPX volumes on-line, use the diskadd command as superuser or root.

Utilities

Table 5. SCO UnixWare Utility Files

File	Description
/etc/megamgr	megamgr is an executable file that provides an object-oriented hierarchical interface to the SCSI adapter. megamgr configures new drives, reconstructs failed disks (if they are part of the redundant logical drives), displays adapter and disk performance, and manages channels and adapters. See the *MegaRAID User's Guide* for information about MegaRAID Manager.
/etc/amirdmon	amirdmon is a monitoring utility that is activated when the computer enters multi-user mode. It tracks the adapter state changes, displays the state change messages, and posts mail to *root* and */dev/console.*

To invoke MegaRAID Manager, type megamgr as root. MegaRAID Manager was installed automatically during the package add.

See the *MegaRAID User's Guide* for additional information about MegaRAID Manager.