

# Intel<sup>®</sup> Integrated RAID Controller SRCMRU

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Specification Update

December 2002

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## *Revision History*

Date	Version	Description
12/13/02	012	No changes.
11/15/02	011	Added specification change #2.
10/15/02	010	No changes.
09/09/02	009	Added Errata #17., #18. and a "Compatibility" issue. See second item in table. Changed product name from SRCMRU to SRCMRU.
06/13/02	008	Added Errata #16.

06/26/02	006	Updated the " <a href="#">Software Version Identification Matrix</a> " to include data for build IIR-1.3.2e. Added Errata #15. Changed product name from PZMR to SRCMRU.
04/17/02	004	Added Errata #12., #13. and #14. Added Documentation changes #9.
03/20/02	003	Added Errata #11. and #12. Added Specification clarification #2. Added Documentation changes #8.
2/20/01	002	Added Errata #6., 7., 8., 9., and 10. Added Documentation changes #5., 6. and 7.
12/19/01	001	This is the new specification update document.

## Preface

This document is an update to the specifications contained in the Affected Documents/Related Documents table below. This document is a compilation of device and documentation errata, specification clarifications and changes. It is intended for hardware system manufacturers and software developers of applications, operating systems, or tools.

Information types defined in Nomenclature are consolidated into the specification update and are no longer published in other documents.

This document may also contain information that was not previously published.

## Affected Documents/Related Documents

Title	Order
Intel® Integrated RAID Controller SRCMRU Technical Product Specification	251755
Intel® Integrated RAID Controller Software Installation and User's Guide	273479
Intel® Integrated RAID Controller SRCMRU Hardware Installation and User's Guide	251752
Intel® Integrated RAID Controller Quick Start Guide	273477

## Nomenclature

**Errata** are design defects or errors. These may cause the RAID Controller's behavior to deviate from published specifications. Hardware and software designed to be used with any given stepping must assume that all errata documented for that stepping are present on all devices.

**Specification Changes** are modifications to the current published specifications. These changes will be incorporated in any new release of the specification.

**Specification Clarifications** describe a specification in greater detail or further highlight a specification's impact to a complex design situation. These clarifications will be incorporated in any new release of the specification.

**Documentation Changes** include typos, errors, or omissions from the currently published specifications. These will be incorporated in any new release of the specification.

Note: Errata remain in the specification update throughout the product's lifecycle, or until a particular stepping is no longer commercially available. Under these circumstances, errata removed from the specification update are archived and available upon request. Specification changes, specification clarifications and documentation changes are removed from the specification update when the appropriate changes are made to the appropriate product specification or user documentation (datasheets, manuals, etc.).

# ***Summary Table of Changes***

The following table indicates the errata, specification changes, specification clarifications, or documentation changes which apply to this RAID controller product. Intel may fix some of the errata in future firmware or driver releases, and account for the other outstanding issues through documentation or specification changes as noted. This table uses the following notations:

## **Codes Used in Summary Table**

### **Global Build Version**

X: Errata exists in the global build version indicated.

(No mark)

or (Blank box): This erratum is fixed in the listed global build version or specification change does not apply to listed global build version.

### **Reference**

(Number): IBD tracking number

### **Page**

(Page): Page location of item in this document.

### **Status**

Doc: Document change or update will be implemented.

Fix: This erratum is intended to be fixed in a future step of the component.

Fixed: This erratum has been previously fixed.

NoFix: There are no plans to fix this erratum.

Eval: Plans to fix this erratum are under evaluation.

## Errata

No.	Global Build Version			Ref	Page	Status	Errata
	1.2.4e	1.3.2e					
1.	x			51	16	Eval	The controller cache setting resets to the default value (On) after reboot
2.	x			297	16	Eval	Unable to install OS from SCSI CD-ROM connected to SCSI channel A or channel B
3.	x			394	16	Eval	SCB2 Boot Failure
4.	x			435	16	Eval	The Hot Plug dialog box in StorCon+ does not have a Cancel button
5.	x			486	17	Eval	Unnecessary file, Wnaspi32.Dll, on CD-ROM distribution
6.	x			86	17	Eval	Puling Hot Fix Drive Not Detected By Storage Console
7.	x			519	17	Eval	Apparent 16 Disk Limitation with FreeBSD
8.	x			526	17	Eval	Unsigned Driver Warning During Software Installation
9.	x			530	18	Eval	Unable to Open NWPA.NLM File During Netware 5.0 Installation
10.	x			536	18	Eval	Unable to Load HAM Driver for Netware 4.2
11.	x			518	18	Eval	Firmware Update from DOS is not allowed after interrupting a firmware update
12.	x			598	18	Eval	RAID controller not recognizing migrated RAID 5 volume
13.		x		646	19	Eval	Unable to repair RAID 1 Host Drive when member drive is removed from a powered-down system
14.		x		659	19	Eval	Migrated RAID Volumes not recognized by new Host Operating System
15.		x		833	19	Eval	The 'Repair Array Drives' Wizard does not detect a failed RAID10 array as FAILED and will not repair the array.
16.		x		527	20	Eval	RAID levels 4 and 5 are non-redundant in some cases during the array expansion process.
17.		x		848	21	Eval	XROM Storage Console might not run after selecting <Ctrl><G> during POST.
18.		x		1093	21	Eval	RAID level 0 large sequential writes may execute below Ultra320 speeds.

## Specification Changes

No.	Global Build Version			Ref	Page	Specification Changes
	1.2.4e					
1.	x			N/A	22	No GOST Certification
2.	x			N/A	22	Support for additional SCSI controllers

## Specification Clarifications

No.	Global Build Version			Ref	Page	Specification Clarifications
	1.2.4e					
1.	x			118	23	Additional attempts to update firmware are unsuccessful after an interruption of a previous firmware update
2.	x			447	23	State of the array drive during expansion and failure

## Documentation Changes

No.	Document Revision			Ref	Page	Documentation Changes
	1.0.5	1.1	1.1.3			
1.	x			228	24	Clarification of Destructive versus Non-destructive Builds
2.	x			440	24	Incorrect list of compatible adapters for Array Roaming
3.	x			N/A	24	Correction to jumper block
4.	x			N/A	24	Correction to section, "Recovery or Update of the Firmware in the Flash Memory"
5.		x		546	25	Change to the Warning in the Software Installation and User's Guide, Section B.1, Chaining
6.		x		536	25	Change to the installation Procedure in the Software Installation and User's Guide, Section 5.2.1, New Installation of NetWare 4.20 with the SRCRX.HAM Driver
7.		x		530	26	Change to the installation Procedure in the Software Installation and User's Guide, Section 5.2.2, New Installation of NetWare 5.0 with the SRCRX.HAM Driver

8.			x	621	27	Addition to Intel® Integrated RAID Software Installation and User's Guide regarding Error State Messages and Patching to a Failed State
9.			x	447	28	Intel® Integrated RAID Software Installation and User's Guide, Version 1.1.4, Section 9.5.4.1, Array Drive Menu for Existing Array Drives - Expand Array Drive

## Identification Information

### Software Version Identification Matrix

This matrix identifies the various software module version numbers for a given global build version. It is possible that a new release may not affect all software modules. It is also possible that a new module can be released individually without a release revision.

#### Global Build Contents

SRCMRU	Global Build Version				
	IIR-1.2.6j	IIR-1.3.2e			
Item Description	Version	Version	Version	Version	Version
<b>ASPI Drivers</b>					
DOS	3.00	3.00			
<b>SRCX000 Drivers</b>					
DOS	4.00a	4.03a			
<b>Utilities</b>					
rawrite.exe	2.00	2.00			
fru.exe	4.16	4.17			
genno.exe	1.0.0	1.0.0			
sleep.exe	1.0.0	1.0.0			
autorun.exe (DemoShield)	6.3.16.0	6.03			
setup.exe (InstallShield)	2.11.15.0	1.10.00			
install.exe (menu)	1.0.0	1.0.0			

<b>Firmware Flash Image</b>					
SRC_RXFW	2.32.00-R016	2.33.01-R01B			
Controller BIOS	1.33.0	1.38.0			
Host BIOS	6.05c	6.08B			
<b>STORCON</b>					
Win2K	2.02	2.09			
WinNT	2.02	2.09			
WinXP		2.09			
UnixWare 7.1	2.02	2.09			
LINUX	2.02	2.09			
DOS	2.02	2.09			
Netware	2.02	2.09			
<b>STORCON+</b>					
WIN2K/WINNT	3.00	3.01			
<b>RAIDMAIL UTILITY</b>					
WINXP/WIN2K/WINNT	2.0.0.1	2.01			
<b>SNMPDLL</b>					
WINXP/WIN2K/WINNT	3.00	3.01			
<b>SRCD</b>					
Netware	1.10	1.11			
LINUX	1.10	1.11			
UnixWare 7.11		1.11			
OpenServer		1.11			
<b>RCSSERVICE</b>					

WINXP/WIN2K/WINNT		2.00			
<b>RAIDSRC.SYS</b>					
WINXP/WIN2K/WINNT	3.01	3.01			
<b>srch.o Driver</b>					
UnixWare 7.1	2.30	2.31			
<b>GDTH Driver</b>					
LINUX	2.03	2.04			

## Module Identification Methods

### Firmware Version Identification

A firmware version is provided on a CD-ROM from Intel Corporation. The firmware version is in the following format:

w.xx.yy-Rzzz

Where:

w.xx = Major Version

yy-Rzzz = Minor Version

The release version is not identifiable in software.

### Adapter Firmware Version Identifier

There are two methods for identifying the firmware version installed on the RAID adapter. While the system is booting, the RAID controller firmware initializes and displays the information shown in [Figure 1](#) to the screen. The firmware version is displayed next to the words "FW-Version".

An alternative method is to use Storage Console for identifying the adapter firmware version. Within Storage Console, select the applicable controller and locate the firmware version at the bottom right corner of the window. See [Figure 2](#).

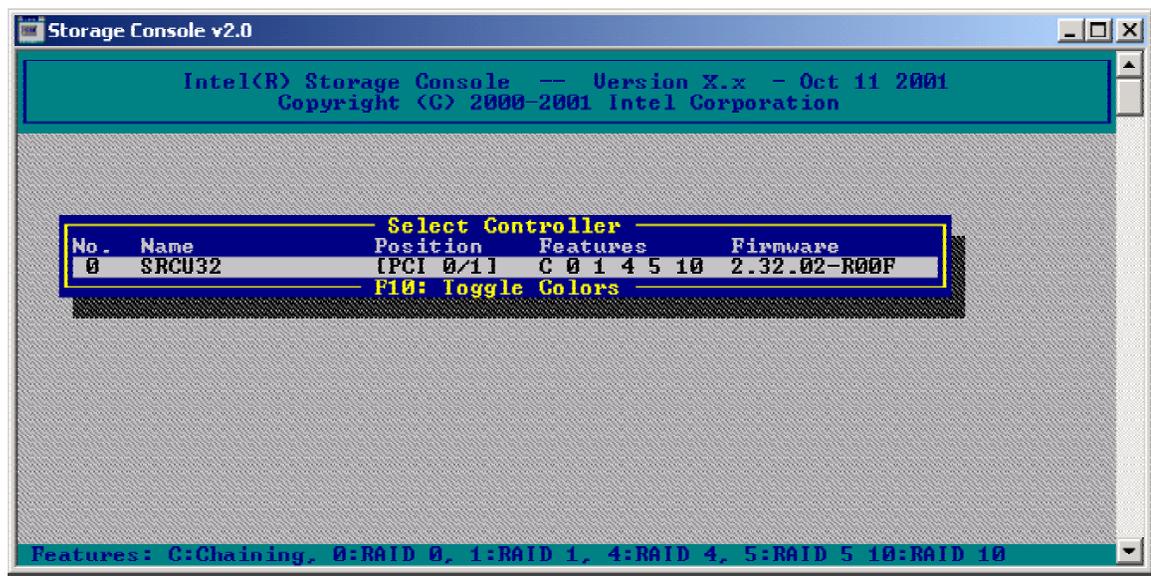
Figure 1. Firmware Version Displayed During Bootup

```

PCI Storage RAID Controller BIOS Version 6.00b
Copyright (C) 1991-2001 by Intel Corporation Jul 19 2001
All rights reserved!
BIOS at 0x0000C9000-0x0000CE7FF
1 Controller(s) found, Selftests OK, scanning SCSI Bus ...
[PCI 7/14] DPMEM (B) at 0xFA000000-0xFA003FFF, INT A = IRQ 11.
[PCI 7/14] SRCMR - HWL0 - 32 MB SDRAM/ECC - 2048kB Flash-RAM
[PCI 7/14] SN 00FE2211 FW-Version 2.32.00-R002 - Jul 18 2001..
[PCI 7/14] ECC support enabled.
[PCI 7/14] SCSI-B ID:1 LUN:0 -- QUANTUM ATLAS_U__9_SCA 160MB/s.
[PCI 7/14] SCSI-B ID:2 LUN:0 -- QUANTUM ATLAS_U__9_SCA 160MB/s
[PCI 7/14] SCSI-B ID:4 LUN:0 -- QUANTUM ATLAS 10K 9SCA 160MB/s
[PCI 7/14] SCSI-B ID:3 LUN:0 -- QUANTUM ATLAS 10K 9SCA async
[PCI 7/14] SCSI-B ID:5 LUN:0 -- QUANTUM ATLAS IV 9 SCA async..
[PCI 7/14] Private RAID-5 Host Drive 0 installed (ready)_

>>> Press <Ctrl><G> to enter Intel(R) Storage Console <<<
  
```

Figure 2. Firmware Version and Application Version Displayed in Storage Console  
Console Version Identifier



### Storage Console Version Identifier

Storage Console (StorCon) is a full-featured monitoring and configuration utility with a text-based user interface. StorCon manages all aspects of the RAID subsystem as well as many features of the RAID adapter.

There are two methods for running the StorCon program. As part of the IIR controller's Flash-RAM, it can be loaded at system boot level by pressing <Ctrl>+<G> when prompted. StorCon can also be launched as an application within a host OS.

The StorCon version is displayed on the top middle area of the StorCon window. See [Figure 3](#).

### Storage Console Plus Version Identifier

Storage Console Plus (StorCon+) is a graphical user interface implementation of StorCon. StorCon+ has similar features and functionality to StorCon, with few exceptions. However, StorCon+ runs on Microsoft Windows-based systems only.

The StorCon+ version is displayed on the of the StorCon+ window. See [Figure 3](#).



# Compatibility

The following products have demonstrated the inability to co-exist in the same system as the RAID Controller.

Product	Note
Seagate SCSI (Scorpion 40 DDS4 DAT Tape Drive)	Backup and verify errors reported using NT Tape Backup.
Intel® Server Board SDS2	<p>Intel has identified a compatibility issue with the combination of the Intel® Server Board SDS2 and the Intel® SRCMRU RAID controller. As a result, Intel is no longer offering this as a validated product combination. Under certain stress conditions, noise present on the PCI bus shared between the SRCMRU controller and the SDS2 server board may result in a signaling error and could affect the data stored on the RAID array.</p> <p>If you are concerned that you or your customers may be affected by this issue, please contact Intel Customer Support or your Intel Sales Representative for issue resolution. When contacting Customer Support, please reference this Technical Advisory (TA-585-2) and have the following information ready:</p> <ul style="list-style-type: none"><li>• SDS2 server board serial number, this number is located on a white label on the component side of the server board.</li><li>• SRCMRU RAID controller serial number, this number is located on a white label on the component side of the RAID controller.</li></ul>

# Errata

## 1. The controller cache setting resets to the default value (On) after reboot

**OS:** All

**Problem:** If no host drive is present on the adapter, the adapter's cache setting cannot be set to `Off` via the Controller menu in StorCon.

**Implication:** When the adapter's write cache is not turned off before a Windows NT installation, the installation will not complete correctly. This issue appears ONLY during the migration to NTFS. If the write back is enabled, the system will go into an endless loop because the NTFS information is not written to disk before the reboot (it is still in cache).

**Workaround:** Create a host drive before attempting to change the adapter's write cache setting in StorCon.

**Status:** Eval. See the ["Summary Table of Changes"](#).

## 2. Unable to install OS from SCSI CD-ROM connected to SCSI channel A or channel B

**OS:** UnixWare 7.1.1, Red Hat Linux 6.2 SBE2, Red Hat Linux 7.1

**Problem:** When host drives are detected on one channel of the adapter, the SCSI CD-ROM located on the other channel of the adapter is not detected during OS installation.

**Implication:** The OS installation CD will not boot from a SCSI CD-ROM connected on either channel A or B, and as a result, the OS cannot be installed from the SCSI CD-ROM.

**Workaround:** Use a boot floppy disk or CD in an IDE CD-ROM drive to install the OS.

**Status:** Eval. See the ["Summary Table of Changes"](#).

## 3. SCB2 Boot Failure

**OS:** Red Hat Linux 7.1

**Problem:** The SCB2 platform will not boot when the SRCMRU adapter is installed and the system BIOS has legacy USB support enabled.

**Implication:** The system is not able to boot to the operating system.

**Workaround:** Disable the legacy USB support in the SCB2 platform. The USB mouse is still usable with legacy USB disabled.

**Status:** Eval. See the ["Summary Table of Changes"](#).

#### 4. The Hot Plug dialog box in StorCon+ does not have a Cancel button

**OS:** Windows 2000, Windows NT 4.0

**Problem:** In StorCon+, the Cancel button is missing from the Hot Plug dialog box.

**Implication:** StorCon+ appears to prevent the cancellation of a hot plug replacement of a hard drive.

**Workaround:** If you no longer wish to do a hot plug replacement of a hard drive, cancel out of the StorCon Hot Plug dialog box by pressing the Escape (Esc) button.

**Status:** Eval. See the "[Summary Table of Changes](#)".

#### 5. Unnecessary file, Wnasp32.Dll, on CD-ROM distribution

**OS:** Windows 2000

**Problem:** The file, Wnasp32.Dll, is on the SRCMRU gold CD-ROM distribution unnecessarily.

**Implication:** Users may attempt to utilize this module with unexpected results.

**Workaround:** None

**Status:** Eval. See the "[Summary Table of Changes](#)".

#### 6. Pulling Hot Fix Drive Not Detected By Storage Console

**OS:** ALL

**Problem:** If a Hot Fix drive fails or is pulled from the system, there is no indication by StorCon that a drive has failed.

**Implication:** It is expected behavior that a hot fix drive could be replaced without action by the controller. The controller waits for a manual action from the user and/or if a drive is required (in the event of an array drive failure).

**Workaround:** To prevent this behavior, uninstall the Hot Fix and then reassign it to the drive once the disk has been replaced. If the Hot Fix is missing when an array fails, the failed disk must be replaced before a Hot Fix drive can be placed into the system.

**Status:** Eval. See the "[Summary Table of Changes](#)".

#### 7. Apparent 16 Disk Limitation with FreeBSD

**OS:** FreeBSD

**Problem:** When booting to the OS, the system only shows 16 devices available.

**Implication:** FreeBSD does not have a limitation on the number of drives. This behavior occurs because the default installation of FreeBSD has 16 device files (i.e. /dev/da0 to /dev/da15) created in /dev/directory. Without additional device nodes created, accessing the Host Drives beyond da15 is not possible.

**Workaround:** After the system boots up, create the nodes using the following procedure:

1. From the command line, type, `cd /dev` and press <Enter>.
2. From the command line, type: `type: sh MAKEDEV da##` (where ## > 15, e.g. da18) and press <Enter>.
3. Repeat the step for any additional devices. To check the number of devices in the system, use the command "dmesg | more".
4. Once you have created the required device nodes, bring up the /stand/sysinstall application and go to configure -> Fdisk. The screen correctly displays all the drives in the system.

**Status:** No Fix. See the "[Summary Table of Changes](#)".

## 8. Unsigned Driver Warning During Software Installation

**OS:** Windows 2000 and Windows XP

**Problem:** During installation, a pop-up window will appear indicating the presence of an unsigned driver. This does not affect the functionality of the product.

**Implication:** Pop-up warning window during installation.

**Workaround:** None. Bypass and continue with installation.

**Status:** Eval. See the "[Summary Table of Changes](#)".

## 9. Unable to Open NWPA.NLM File During Netware 5.0 Installation

**OS:** NetWare 5.0

**Problem:** The described behavior occurs if NWPA.NLM cannot be copied successfully to the server boot directory during NW5.0 installation. This can happen if NWPA.NLM was loaded from another driver.

**Implication:** HAM driver is not loaded after reboot.

**Workaround:** NWPA.NLM has to be updated in the server boot directory after the first part of the installation is completed. The solution is to remove all entries from the storage driver list during installation and to reinsert them with the SRCRX.HAM at the first position. This will cause the installation process to first copy the NWPA.NLM file from our installation disk to the server boot directory before loading it. See 'Documentation Changes' later in this document for details on this procedure.

**Status:** No Fix. See the ["Summary Table of Changes"](#).

## 10. Unable to Load HAM Driver for Netware 4.2

**OS:** NetWare 4.2

**Problem:** The described behavior occurs if NWPA.NLM cannot be copied successfully to the server boot directory. This may happen because the user choose an incorrect driver directory for driver installation or if the installation was aborted or if another storage driver is installed prior to the IIR driver being installed.

**Implication:** HAM driver is not loaded.

**Workaround:** The solution is to remove all entries from the storage driver list during installation and to reinsert them with the SRCRX.HAM at the first position on the driver list. This will cause the installation process to copy the NWPA.NLM file from our installation disk to the server boot directory before loading it. See 'Documentation Changes' later in this document for details on this procedure.

**Status:** No Fix. See the ["Summary Table of Changes"](#).

## 11. Firmware Update from DOS is not allowed after interrupting a firmware update

**OS:** MS-DOS

**Problem:** After interrupting a firmware update, the RAID controller will not update firmware from a bootable DOS disk but instead displays a number of error messages.

**Implication:** Unable to update the firmware.

**Workaround:** After an interrupted firmware update, if subsequent attempts to flash the firmware fail, use the following DOS command: `fru -o`

**Status:** No Fix. See the ["Summary Table of Changes"](#).

## 12. RAID controller not recognizing migrated RAID 5 volume

**OS:** Windows 2000

**Problem:** After having moved drives in a RAID 5 volume from one server (i.e Server A) to another (i.e. Server B), the controller in Server B does not appear to recognize the RAID 5 volume.

**Implication:** Migrated RAID 5 volume not available to new server.

**Workaround:** After being migrated, the Host Drive on the new server will typically be assigned a high Host Drive number (e.g. 254). This problem can be solved

by reassigning the RAID5 Host Drive from the high number 254 to a smaller number (e.g. 3, 4, 5, etc.).

**Status:** Eval. See the "[Summary Table of Changes](#)".

### **13. Unable to repair RAID 1 Host Drive when member drive is removed from a powered-down system**

**OS:** POST

**Problem:** The failure to repair an array occurs when a drive is removed from a previously configured drive array while the server is powered off.

**Implication:** When a server is booted from a powered down state, the server containing the array is in a FAIL state because an array drive member is MISSING. The repair wizard will not work for RAID 1 arrays where the drive is detected as MISSING. The information for a missing RAID 1 array is available if the RAID 1 component failed during the uptime of the controller. Auto Hot Plug does not start when this information is missing.

**Workaround:** Procedure for workaround:

1. Start StorCon and observe that the RAID 1 Host Drive is in FAIL state.
2. Insert the drive back into the slot and scan the bus.
3. Go to the 'Configure Array Drives' menu, select a working drive (not the missing drive), and select the 'Add RAID 1 component' option.

**Status:** Eval. See the "[Summary Table of Changes](#)".

### **14. Migrated RAID Volumes not recognized by new Host Operating System**

**OS:** Windows 2000, Windows XP

**Problem:** When migrating (roaming) a Host Drive from host system A to Host system B, the Operating System on Host system B does not recognize the migrated drive array.

**Implication:** The migrated Host Drive is unusable.

**Workaround:** For a migrated RAID array to be recognized by the new host operating system, the host system must first be rebooted.

**Status:** Eval. See the "[Summary Table of Changes](#)".

### **15. The 'Repair Array Drives' Wizard does not detect a failed RAID10 array as FAILED and will not repair the array.**

**OS:** All

**Problem:** In some instances, Storage Console correctly reports a RAID10 host drive in the FAIL state; however the 'Repair Array Drives' Wizard does not detect the RAID10 host drive as FAILED and will not repair the array. Two instances that this is known to happen are:

- If a RAID10 host drive is in the FAIL state when the computer is booted up and the RAID controller does not detect the failed component in the system (e.g., the failed hard disk drive is not in the system and is detected as missing).
- If the 'Repair Array Drives' wizard is used to repair one of the failed mirrors in a RAID10 array where multiple mirrors have experienced a failed component (e.g. drive #1 in mirror 1 and drive #1 in mirror 2 have failed). Once the first failed mirror is repaired, all remaining failed mirrors will no longer be detected as FAILED by the 'Repair' wizard.

**Implication:** The 'Repair Array Drives' wizard, located in the Storage Console, cannot be used to repair the FAILED RAID10 array. The array must be repaired manually.

**Workaround:** If the Storage Console reports a RAID10 host drive in the FAIL state, but the Repair Array Drives option does not list any failed arrays, then follow this procedure to manually repair the failed array:

1. From the Storage Console main menu, press F4 to display the Advanced Menu.
2. Select `Configure Host Drives`.
3. Press the up/down arrows until the RAID10 host drive is selected.
4. Press F4 to display the `Array/Logical Drive` window.
5. Press F4 again to display the RAID 1/Logical Drive(s) window.
6. One of the entries in this menu will be of type `Disk`. Make a note of the number for this entry. See the left column to get the number.
7. Press ESC three times.
8. Select `Configure Logical Drives` from the Advanced Menu.
9. Press the up/down arrows until the logical drive noted in step 6 is selected, then press Enter.
10. Select `Add RAID-1 Component`.
11. Either select one of the disks shown, or hot-plug a new disk.
12. Wait for the RAID-1 component to finish building. Afterwards, the RAID10 array will be in the READY state.

**Status:** Eval. See the ["Summary Table of Changes"](#).

## 16. RAID levels 4 and 5 are non-redundant in some cases during the array expansion process.

**OS:** All

**Problem:** When expanding a RAID 5 or RAID 4 array to unused space on the existing drives (using extra space on the drives that are already part of the array), the array will change to a non-redundant state until the expansion process has completed. This means that if a drive fails during this type of expansion, data may be lost.

Note the following:

- This does NOT affect expansion to space on new drives. The array does NOT change to a non-redundant state during an expansion when expanding the array to space on a new drive or new drives.
- This does NOT affect arrays that were initially setup to use the entire capacity of the drives used in the array (default).
- After successfully expanding a RAID 4 or 5 array, the array will be redundant in all cases.
- RAID 4 arrays are partially redundant in the errata case described. A RAID 4 array can withstand the loss of the parity drive (and only the parity drive) during an expansion to unused space on the existing drives.

**Implication:** A redundant array becomes non-redundant during the time period of the expansion. If a hard drive fails or becomes inaccessible during the expansion process, the entire array may be lost.

**Workaround:** Only expand arrays to space on new drives. Do not expand arrays to space on existing drives in the array without ensuring that a valid, current backup exists.

**Status:** Eval. See the "[Summary Table of Changes](#)".

## 17. XROM Storage Console might not run after selecting <Ctrl><G> during POST.

**OS:** All. Not OS-specific.

**Problem:** Support for the Boot BIOS Specification (BBS) was added to the controller BIOS. This feature has provided some extra functionality; however, when BBS is enabled, the XROM storage console utility will not run on some motherboards. Both BBS and non-BBS modes are supported. The default setting is BBS enabled. Non-BBS mode may be required in order to use storage console during POST.

**Implication:** On some systems, you may need to disable BBS during POST to run the XROM storage console utility.

**Workaround:** If storage console does not run after selecting <Ctrl><G>, use one of the following workarounds to start the storage console:

- During POST, select <Ctrl><X> to turn off BBS. The system will be rebooted. After the reboot, try entering <Ctrl><G> again to get into storage console. Some motherboards may also require modifying a setting in the system BIOS (for example, putting "Legacy Option ROM #1" at the top of the hard drive boot order). Please check the motherboard's BIOS boot sequence settings and documentation to determine whether this is necessary.
- Boot from the RAID software CD and select Storage Console. This will run the storage console utility directly from the CD. The storage console utility is exactly the same on the CD as it is on the XROM.

**Status:** Eval. See the ["Summary Table of Changes"](#).

### **18. RAID level 0 large sequential writes may execute below Ultra320 speeds.**

**OS:** Identified under Windows 2000

**Problem:** On some systems (depending on the chipset, processor, memory, etc.), large sequential writes in a RAID 0 volume may execute at Ultra 160 speeds or slightly better.

**Implication:** In typical usage models (real life scenarios) this erratum should have minimal, if any, impact. There is no impact to RAID levels 1,4,5, or 10, and there is no impact to read operations or to small (typically 4k) sequential writes.

Large block (typically 64K) sequential IO patterns are generally used in benchmark cases to measure the maximum throughput of a controller card in a RAID 0 volume.

**Workaround:** None.

**Status:** Eval. See the ["Summary Table of Changes"](#).

# Specification Changes

## 1. No GOST Certification

This product does not have GOST certification; however, Table 16 of the Technical Product Specification v1.1 indicates incorrectly that the product has certification for GOST 29216-91 Emissions and GOST R 50628-95 Immunity.

## 2. Support for additional SCSI controllers

The SRCMRU controller now supports two Ultra320 SCSI controllers that were not originally documented in version 1.0 of the SRCMRU technical product specification (TPS). These new controllers are listed below:

- Adaptec\* AIC-7901 single-channel Ultra320 SCSI controller
- Adaptec AIC-7902 dual-channel Ultra320 SCSI controller

# Specification Clarifications

## 1. Additional attempts to update firmware are unsuccessful after an interruption of a previous firmware update

There are 2 options for programming the firmware, Firmware Update or Firmware Recovery. When the current firmware is intact and functional, you would use Firmware Update to overwrite the existing firmware with a new image. However, if a previous firmware update is interrupted accidentally, the firmware becomes unusable, resulting in errors. Reprogram the firmware by using the Firmware Recovery Utility (FRU) instead of Firmware Update. Refer to the Hardware Guide for detailed instructions on using FRU.

## 2. State of the array drive during expansion and failure

In the *Expand Array Drive* section in the Software Installation and User's Guide it states:

"To migrate or expand a RAID 4/5 array drive, the state must be ready. The data on the array drive remains intact and is not affected by the expansion. The additional capacity is introduced as a new host drive. If a logical drive fails during the expansion, the expansion process continues until the expansion is finished and the array drive changes into the fail state."

The Array Drive enters the BUILD state if the Array Drive is expanded using free space and enters the IDLE state if a drive failure occurs during expansion.

# Documentation Changes

## 1. Clarification of Destructive versus Non-destructive Builds

The following paragraph clarifies the differences between a Destructive Build and a Non-destructive Build. This paragraph should be included above the last Note of section 10.4.1.2 of the Software Guide v1.0.5:

The type of initialization build determines how the redundancy information is calculated. There are 2 build types, the Destructive Build and the Non-destructive Build. Only available if StorCon is loaded with <Ctrl>+<G>, the Destructive Build deletes any pre-existing data by writing a "0" pattern across all hard disks. This initialization process is very fast since no read I/Os or parity calculation is involved. However, the initialization build must be successfully finished before leaving StorCon, otherwise, the build mode is automatically changed to Non-destructive during the next boot. The Non-destructive Build reads the data blocks, calculates the parity from the contents of the data blocks, and stores it to the corresponding sectors on the disks. This process takes 5-10 times longer than the Destructive Build typically, but the Non-destructive Build can run in the background, for example, during the installation of the operating system.

## 2. Incorrect list of compatible adapters for Array Roaming

The following text should replace the content in section 3.4 of the Hardware Guide, v1.0.5 and section 4.3.7 of the Technical Product Specification v1.1:

Array Roaming allows the user the ability to move a complete RAID array from one computer system to another computer system and preserve the RAID configuration information and user data on that RAID array. ||Compatible RAID controllers must control the RAID subsystems of the two computer systems (see list of compatible controllers in this section). The transferred RAID array may be brought online while the target server continues to run if the hard disk drives and disk enclosure support hot plug capabilities. The hard disk drives are not required to have the same SCSI ID in the target system that they did in the original system that they are removed from. The RAID array drive that is being roamed must not be of type Private. This includes all non-private host, array, and logical drives.

Warning: || The SRCMRU adapter, with firmware 2.32.xx, is not compatible with the previous series of the SRCU31LA adapter (firmware versions 5.xx) and the previous series of the SRCU31A adapter (firmware versions 4.xx). Do not attempt RAID Array Drive Roaming between RAID controllers that are not compatible with the SRCMRU adapter. Unpredictable behavior may include, but is not limited to, data loss or corruption.

Compatible adapters include:

- SRCU31LA - Firmware version 2.32.xx
- SRCU31A - Firmware version 2.32.xx
- SRCU32 - Firmware version 2.32.xx
- SRCMRU - Firmware version 2.32.xx

Note: Compatibility refers only to how data and RAID configuration information are written to the hard disks. Compatible adapters have the same data file format.

### 3. Correction to jumper block

The Hardware Guide v1.0.5 has the wrong jumper block, J2B1, in the descriptions for Flash Recovery mode and on the figure labels. The correct jumper block is J1B1.

### 4. Correction to section, "Recovery or Update of the Firmware in the Flash Memory"

The text in section 2.3.1 of the Hardware Guide v1.0.5 should be deleted. The information should be replaced with section A.1, "Firmware Update Procedure via XROM StorCon" and section A.2, "Firmware Recovery Procedure via Flash Recovery Utility (FRU)" of the Hardware Guide that is posted on the web at <http://support.intel.com>.

### 5. Change to the Warning in the Software Installation and User's Guide, Section B.1, Chaining

The following replaces both warnings in section B.1. (SCR # 546)

**Warning:** Disk Chaining does not offer any form of data protection and can result in loss of data. It is recommended to not use logical drives of the type *chain* as components of array drives.

*Affected Docs: Intel® Integrated RAID Software Installation and User's Guide, 273479-001*

### 6. Change to the installation Procedure in the Software Installation and User's Guide, Section 5.2.1, New Installation of NetWare 4.20 with the SRCRX.HAM Driver

The following replaces section 5.2.1. (SCR #536)

**New Installation of NetWare 4.20 with the SRCRX.HAM Driver**

1. Create a driver diskette from the RAID Software Suite CD-ROM. See Section 2.2, *Create the RAID Driver Installation Diskette* for instructions.
2. Start the OS installation from the NetWare CD-ROM. (NetWare 4.2x CD-ROMs are NOT bootable so you must have a bootable DOS partition installed on your target hard drive and have the appropriate DOS driver for your CD-ROM.)
3. At the driver summary menu select *modify drivers*.
4. Note all listed drivers (you will need these names later) and REMOVE ALL drivers from the list.
5. Insert the driver diskette into drive A:
6. Press <Enter> at the IIR driver list.
7. Press <Insert> at the IIR controller driver menu.
8. Press <F3> and change the path to A:\DRIVERS\4XX then press <Enter>.
9. Select the SRCRX.HAM driver.
10. Add back all drivers noted in step 4.
11. Continue the NetWare installation as normal by following the screen prompts.

*Affected Docs: Intel® Integrated RAID Software Installation and User's Guide, 273479-001*

### **7. Change to the installation Procedure in the Software Installation and User's Guide, Section 5.2.2, New Installation of NetWare 5.0 with the SRCRX.HAM Driver**

The following replaces section 5.2.2. (SCR #530)

#### **New Installation of NetWare 5.0 with the SRCRX.HAM Driver**

**Important:** The SRCRX.HAM driver depends on a later version of the NWPA.NLM than was shipped on the NetWare 5.0 CD. Without the NWPA.NLM update, the SRCRX.HAM driver will fail to load. The following procedure will allow you to upgrade the NWPA.NLM on the fly during OS installation.

1. Create a driver diskette from the RAID Software Suite CD-ROM. See Section 2.1 for details to create this disk.
2. Start the OS installation from the NetWare bootable CD-ROM.
3. The NetWare installation will eventually display a "Welcome" screen asking you to verify the startup directory (C:\NWSERVER).

4. Press <Alt>+<F10> to exit the installation.
5. At the NetWare console prompt, type "down" and press <Enter> (the installation exits to the boot drive's DOS prompt).
6. Insert the driver diskette into drive A:.
7. If your NetWare startup directory is drive C:, then run A:\INSTALL\NWUPDATE.BAT, otherwise create a subdirectory named NWUPDATE at the root of your boot drive and copy all the files from A:\DRIVERS\5XX to the NWUPDATE subdirectory.
8. Leave the NetWare 5.0 bootable CD in place, but remove the driver diskette from drive A:.
9. Reboot the server. After rebooting the server, the NetWare 5.0 Install will start again.
10. Right after the Accept the License Agreement screen, select the "Continue with Existing Partition" option.

**Note:** If you chose to install a "New Server," you may encounter the following warning dialog box:

"Warning: A previously installed version of NetWare was detected in C:\NWSERVER. If you choose to install a new server, all data on the existing server will be lost. <Press ENTER to continue>"

If the warning dialog box appears, press <Enter>.

11. Continue the NetWare installation as normal by following the screen prompts.
12. During filecopy you may encounter the error message: File "C:\NWSERVER\NWPA.NLM" cannot be opened.
13. Ignore this error message, press <Enter> to continue and choose "Continue copying next file".
14. Complete the NetWare installation as normal by following the screen prompts.
15. When you are prompted for restarting the server choose "NO".
16. Go to the NetWare console prompt, type "down". Press <Enter> (the installation exits to the boot drive's DOS prompt).
17. Insert the driver diskette again into the A: drive.
18. Call A:\INSTALL\NWUPDATE.BAT with the path to your server startup directory as a parameter. e.g. A:\INSTALL\NWUPDATE C:\NWSERVER
19. Reboot your system.

*Affected Docs: Intel® Integrated RAID Software Installation and User's Guide, 273479-001*

## **8. Addition to Intel® Integrated RAID Software Installation and User's Guide regarding Error State Messages and Patching to a Failed State**

The User Documentation does not mention that an array in the error state can be patched at the time of boot up. The following information on patching arrays will be added to future revisions of the *Intel Integrated RAID Software Installation and User's Guide*:

### **Error State Messages**

If a RAID4 or a RAID5 array drive is in the error state and the firmware boots, the following messages are displayed (e.g. for RAID-5 array drive 1):

"RAID-5 Host Drive 1: Multiple drives have failed"  
"Array is in ERROR state and read only"  
"Check disks, cables, termination, termpower, LVDS operation, power supply, etc."

### **Patching to a Failed State**

If the array drive can be patched to fail state (all member drives are available; only the one which failed first may be missing) the following messages are displayed:

"If the problem is resolved you can choose 'y' to patch the array to fail state (y/n)"

Entering "y" results in a patch to fail. The default behavior is performing the patch.

If the patch was successful, the array status is set to Fail/Patch and the following message is displayed:

"Patching the array drive was successful"

If the patch failed, the following message is displayed:

"Patching the array drive was not possible"

If the patch was not performed or if the patch failed, the following messages are displayed:

"Use the controller setup program to analyze the problem"  
"Press RETURN to continue"

*Affected Docs: Intel® Integrated RAID Software Installation and User's Guide, 273479-001*

## **9. Intel® Integrated RAID Software Installation and User's Guide, Version 1.1.4, Section 9.5.4.1, Array Drive Menu for Existing Array Drives - Expand Array Drive**

Intel® Integrated RAID Software Installation and User's Guide, Version 1.1.4, Section 9.5.4.1, Array Drive Menu for Existing Array Drives - Expand Array Drive should read as follows:

To migrate or expand a RAID 4/5 array drive, the state must be READY. The data on the array drive remains intact and is not affected by the expansion.

Warning: When starting an expand process, the unused capacity of the current array components (i.e. "*Use free Logical Drive space*") is activated. At this point the array is put in the non-redundant Build process. If during this process a disk fails, then the array changes to *Idle = not functioning*. Therefore it is very important to create a full backup before this process is started.

If a logical drive fails during the expansion, the expansion process continues until the expansion is finished and the array drive changes into the FAIL state. If the Array Drive is expanded using free space, the Array Drive enters a BUILD state. If a drive failure occurs during expansion the Array Drive enters an IDLE state.

*Affected Docs: Intel® Integrated RAID Software Installation and User's Guide, 273479-001*