intel® Technical Advisory

5200 NE Elam Young Parkway
Hillsboro, OR 97124

January 9, 2005

Intel® RAID Controllers SRCU32, SRCU42L, SRCS14L, & SRCZCR with Firmware 2.42.00.R072 or 2.42.01.R078 with a RAID 10 Configuration Rebuild Checkpoint Failure

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Products Affected

Product Name	Order Code	Description
SRCU32	SRCU32	Intel® RAID Controller SRCU32
SRCU42L	SRCU42L	Intel® RAID Controller SRCU42L
SRCS14L	SRCS14L	Intel® RAID Controller SRCS14L
SRCZCR	SRCZCR	Intel® RAID Controller SRCZCR

Description

Controllers listed above with firmware versions 2.42.00-R072 or 2.42.01-R078 that are used in a RAID 10 configuration may experience a rebuild checkpoint failure, if a drive fails and is detected again at the next reboot.

Intel introduced "check-pointing" during build and rebuild in firmware versions 2.42.00-R072 and 2.42.01-R078 (global release 1.10.8 & 1.10.9). Rather than restarting a rebuild during system reboot, check-pointing tracks rebuild progress and allows a rebuild to restart where it stopped should a reboot occur prior to the completion of the rebuild. Check-pointing is used in RAID 1, RAID 4, RAID 5, and RAID 10 configurations.

However, if one drive of a RAID10 fails during operation, a rebuild has not started, and the failed drive is left in the system during a reboot, the failed drive may be detected and become part of the array again. In this situation a rebuild will start and immediately stop even though the missing mirror component is no longer in synch with the other array members.

Steps to induce the failure are as follows:
1. Setup up a RAID 10 Host Drive, do not configure a hot fix drive
2. Fail 1 drive (in a real world scenario, the drive does not respond to the controller anymore; for reproduction pull the drive from the hot plug backplane)
3. Shutdown the system
4. Keep the failed drive in the system (or plug it back into the backplane for reproduction)
5. Restart the system
6. The failed drive will be detected again
7. A Rebuild will start and will be terminated immediately.

This issue is not observed with RAID 1, RAID 4, or RAID 5 configurations.

Root Cause

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The failure to complete the rebuild is due to the conflicting checkpoint in the metadata remaining on the drives, which is indicating to the controller that the build is complete. This issue results from an error in resetting the check-point at the completion of a rebuild, which should be reset to zero at the end of the previous build.

Corrective Action / Resolution
Intel has modified the RAID controller firmware 2.42.02.R07A to include check-point reset to zero to correct this issue when the array transitions from "ready (good)" to "fail (degraded)". The updated version of firmware is available for download at http://support.intel.com/support/motherboards/server/ .

Workarounds
1. Configure a hot fix drive, should a drive fail, a rebuild will start automatically. It is advised to allow the rebuild to complete prior to rebooting the system.
2. Repair the RAID10 during operation by using hot plug or manual repair options and allow the rebuild to start prior to reboot. It is advised to allow the rebuild to complete prior to rebooting the system.
3. Remove failed disks before a reboot.
4. Updated RAID controller firmware to version 2.42.02.R07A or later.
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Please contact your Intel Sales Representative if you require more specific information about this issue.

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