To: T10 Technical Committee
From: Wayne Bellamy (wayne.bellamy@HP.com), Hewlett-Packard
Date: June 6, 2005
Subject: T10/05-136r2 SAT - REASSIGN BLOCKS command

Revision History

Revision 0 (March 31, 2005) first revision
Revision 1 (May 16, 2005) second revision
   Change Details:
1) per 4-18-05 SAT T10 WG: Removed note below 1st para. in section 9.6.1.
2) per 4-18-05 SAT T10 WG: Add "perform a write with vendor specific data to the LBA if the READ VERIFY SECTOR(S) command fails"..to section 9.6.1 or Table 1 and section 9.6.2.
3) per 4-18-05 SAT T10 WG: "Spell it out" if the command does not support more than one LBA in the parameter list in section 9.6.2.
4) per 5-19-05 SAT T10 WG teleconference: Several changes and additions per the call. I was requested to post this progress even if not finished.

Revision 2 (June 1, 2005) third revision
   Change details: (per 6-1-05 SAT T10 WG)
1) Changed "LBA" to "LBAs" to allow multiple blocks to be reassigned by the command in section 9.6.1 and 9.6.2 and edited associated verbage in these areas.
2) Changed operation code description or reference data in the table to include "Otherwise, see section 9.6.1" as requested.
3) Section 9.6.1 edited to include data from the table, using numbering and lettering as requested.
4) Removed unnecessary text in section 9.6.2 as requested by the WG.

Related Documents

(T10) sat-r04 – SCSI to ATA Translation (SAT), Revision 4
(T10) sbc-2r16 – SCSI Block Commands -2, Revision 16
(T13) ata7v1r4b – AT Attachment with Packet Interface -7 Volume1, Revision 4b

Overview

1. Most SCSI implementations and many popular operating systems use the REASSIGN BLOCKS command even though the REASSIGN BLOCKS command is an optional SCSI command per SBC-2.
2. Complexity of the emulation of the REASSIGN BLOCKS command is (was) estimated to be minimal.

Suggested Changes

9.6 REASSIGN BLOCKS command (07h)

9.6.1 Command summary
The REASSIGN BLOCKS command requests that the device server reassign defective logical blocks to another area on the medium set aside for this purpose (see SBC-2). Non-packet devices do not support or have a direct translation for the REASSIGN BLOCKS command. The SATL device server shall emulate the SCSI REASSIGN BLOCKS command as defined in Table 1.

[NOTE TO EDITOR: Based on 6-1-05 SAT meeting further editing of the "tabled data" AND the new section 9.6.1 is complete to comply with the WG.]

Table 1- REASSIGN BLOCKS command CDB fields

Field	SATType	Description or reference
OPERATION CODE	E	The SATL shall issue an ATA READ VERIFY SECTOR(S) command for each LBA provided in the REASSIGN BLOCKS command parameter list. One command is issued per each LBA. If the non-packet device supports the 48-bit Address feature set, the ATA READ VERIFY SECTOR(S) EXT command may be issued instead. If each ATA READ VERIFY SECTOR(S) command completes successfully the SATL shall return GOOD status for the REASSIGN BLOCKS command. (Otherwise, see 9.6.1.)
LONGLBA	I	(see SBC-2)
LONGLIST	I	(see SBC-2)
CONTROL	I	(see 6.4)

9.6.1 READ VERIFY SECTOR(S) emulation unsuccessful

An ATA READ VERIFY SECTOR(S) command may not complete successfully for an LBA included in the REASSIGN BLOCKS command parameter list. If an ATA READ VERIFY SECTOR(S) command does not complete successfully, the SATL shall:

1) Issue a write command (see Table 46) with vendor specific data to the LBA that failed the ATA READ VERIFY SECTOR(S) command.
   a) If the write command completes successfully the SATL shall issue a second ATA READ VERIFY SECTOR(S) command to the same LBA. If the second ATA READ VERIFY SECTOR(S) command completes successfully, the SATL shall:
      i.   return GOOD status for the REASSIGN BLOCKS command, or
      ii. continue to the next ATA READ VERIFY SECTOR(S) command for the next LBA of the parameter list.

   If the second ATA READ VERIFY SECTOR(S) command fails, the REASSIGN BLOCKS command shall be terminated with CHECK CONDITION status with the sense key set to MEDIUM ERROR and the additional sense code set to UNRECOVERED READ ERROR – AUTO REALLOCATE FAILED.
   b) If the write command fails, the REASSIGN BLOCKS command shall be terminated with CHECK CONDITION status with the sense key set to HARDWARE ERROR and the additional sense code set to WRITE ERROR – AUTO REALLOCATION FAILED.

9.6.2 REASSIGN BLOCKS parameter list

The REASSIGN BLOCKS command parameter list provided in the data-out buffer contains the defective LBAs to be reassigned. The LBAs provided in the parameter list shall be utilized for the LBAs in any ATA READ VERIFY SECTOR(S), ATA READ VERIFY SECTOR(S) EXT, or write commands (see Table 46) issued by the SATL emulation.

The SATL device server shall support the LONGLBA and LONGLIST fields (see SBC-2).