To:        T10 Technical Committee
From:      Rob Elliott, HP (elliott@hp.com)
Date:      17 December 2002
Subject:   T10/03-028r0 SBC-2 Block Limits mode page

## Revision History
Revision 0 (17 December 2002) first revision

## Related Documents
sbc2r08 - SCSI Block Commands - 2 revision 8

## Overview
Some block targets have maximum transfer lengths on their simple read and write commands; e.g. they might refuse a command requesting more than 16 MB by returning CHECK CONDITION/ILLEGAL REQUEST/INVALID FIELD IN CDB.

Some block targets, particularly RAID controllers, have noticeable performance degradation when transfer lengths exceed a certain threshold and/or are not multiples of a certain granularity.

A read-only mode page to return these transfer length limitations is proposed.

## Related
There is a maximum size reported for XOR write commands in the XOR Control mode page.

SSC-2 has a READ BLOCK LIMITS command for tape drives.  It returns: granularity, maximum block length limit, and minimum block length limit.  The opcode (05h) is marked vendor-specific for block devices.

## Suggested Changes
**5.2.xx XYZ command [each command with a TRANSFER LENGTH field]**

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The TRANSFER LENGTH field specifies ....  The transfer length field is constrained by the MAXIMUM TRANSFER LENGTH field in the Block Limits mode page (see 6.1.3.10).


**5.2.27 VERIFY (10) command**
**5.2.28 VERIFY (12) command**
**5.2.29 VERIFY (16) command**
Change VERIFICATION LENGTH to TRANSFER LENGTH since data is transferred.


**5.3.2 ERASE (10) command**
**5.3.3 ERASE (12) command**
Change TRANSFER LENGTH to ERASE LENGTH since no data is transferred.


**6.1.3.1 Mode parameters overview**

Add mode page code 06h   Block Limits mode page


**6.1.3.10 Block Limits mode page [new]**
The Block Limits mode page (see Table xx) provides the initiator with the means to obtain certain operating parameters of the target. All fields in this mode page are read-only.

**Table xx. Block Limits mode page**

| | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | PS (0b) | Reserved | | PAGE CODE (06h) | | | | |
| 1 | | PAGE LENGTH (0Ah) | | | | | | |
| 2 | (MSB) | | OPTIMAL TRANSFER LENGTH GRANULARITY | | | | | |
| 3 | | | | | | | | (LSB) |
| 4 | (MSB) | | MAXIMUM TRANSFER LENGTH | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | (LSB) |
| 8 | (MSB) | | OPTIMAL TRANSFER LENGTH | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | (LSB) |

The PS bit is defined in SPC-3. Since all fields in this mode page are read-only, this bit is set to zero.

The OPTIMAL TRANSFER LENGTH GRANULARITY field specifies the optimal transfer length granularity in blocks for a single PRE-FETCH, READ, READ LONG, VERIFY, WRITE, WRITE AND VERIFY, WRITE LONG, XDREAD, XDWRITE, XDWRITEREAD, XDWRITE EXTENDED, or XPWRITE command. Transfer lengths not equal to a multiple of this value may incur significant delays in processing.

The MAXIMUM TRANSFER LENGTH field specifies the maximum transfer length in blocks that the target accepts for a single PRE-FETCH, READ, READ LONG, VERIFY, WRITE, WRITE AND VERIFY, WRITE LONG, XDREAD, XDWRITE, XDWRITEREAD, XDWRITE EXTENDED, or XPWRITE command. Requests for transfer lengths exceeding this limit result in CHECK CONDITION status with a sense key of ILLEGAL REQUEST and an additional sense code of INVALID FIELD IN CDB. A value of zero means there is no reported limit on the transfer length.

The OPTIMAL TRANSFER LENGTH field specifies the optimal transfer length in blocks for a single PRE-FETCH, READ, READ LONG, VERIFY, WRITE, WRITE AND VERIFY, WRITE LONG, XDREAD, XDWRITE, XDWRITEREAD, XDWRITE EXTENDED, or XPWRITE command. Transfer lengths exceeding this value may incur significant delays in processing.

### 6.1.3.10 XOR Control mode page
...

The MAXIMUM TRANSFER LENGTH field specifies the maximum transfer length in blocks that the target accepts for a single XDWRITE, XDWRITE EXTENDED, XDWRITE, or XPWRITE command.

The MAXIMUM REBUILD READ TRANSFER SIZE field specifies the maximum transfer length in blocks that the target shall use for commands issued as a temporary initiator (e.g., READ and XPWRITE commands) during a rebuild operation. This field does not limit the rebuild size.