

To: T10 Technical Committee
 From: Rob Elliott, HP (elliott@hp.com)
 Date: 27 February 2004
 Subject: 04-075r0 SBC-2 Obsolete more features

Revision history

Revision 0 (27 February 2004) First revision

Related documents

sbc2r12 - SCSI Block Commands - 2 revision 12

Overview

A number of items in sbc2r12 should be made obsolete.

1. The **FORMAT UNIT CDB INTERLEAVE field** seems useless. RBC's version of FORMAT UNIT doesn't include the field. MMC-4's version of FORMAT UNIT requires it be zero.
2. The **FORMAT UNIT parameter list DISABLE SAVING PARAMETERS (DSP) bit** changes the SPC-3 expectation that saved pages are saved forever by letting them be lost during a format. If they can be lost, then a unit attention would be needed, which SPC-3 does not mention. This is not something software would want, and there don't seem to be any drives requiring it be supported. RBC's version of FORMAT UNIT doesn't define the field. MMC-4's version of FORMAT UNIT puts a different bit in that location (the TRY-OUT bit) so its presence may confuse software.
3. The **Notch and Partition mode page** contains these fields:
 - a) notched device
 - b) logical or physical notch
 - c) maximum number of notches
 - d) active notch
 - e) starting boundary
 - f) ending boundary
 - g) pages notched

It still refers to cylinders and heads; all other references to them have been made obsolete. It introduces the possibility that mode pages don't apply to the whole logical unit, just the "active notch," a mode page policy not comprehended by SPC-3. The boundary fields are not large enough to support 8-byte LBAs.

4. The **Device Status Output/Input diagnostic pages**, also proposed to be made obsolete by 04-031r1, formerly held spindle synchronization fields, which are all obsolete. The page just contains obsolete, reserved, and vendor-specific fields, and doesn't seem to be implemented by any disk drives.

Suggested changes

~~3.1.28 notch: All or part of the medium having a consistent set of geometry parameters. Notches are used to increase storage capacity by optimizing the number of bytes per track between the inner and outer tracks.~~

~~4.11 Notched devices~~

~~A notched (also known as zoned) device has areas of the medium with geometry changes. In the simplest case, the entire medium consists of a single notch. Multiple notches are often used to increase capacity of the device. On a disk, the inner tracks are physically shorter than the outer tracks. As a result, if each track is made to store the same number of data bits, the data is packed more densely on the inner tracks than the outer tracks. By using notches, the outer tracks may contain a different number of sectors than the inner tracks, while balancing the data density. This results in increased capacity.~~

5.3 FORMAT UNIT command

5.3.1 FORMAT UNIT command overview

The FORMAT UNIT command (see table 12) formats the medium into application client addressable logical blocks per the application client defined options. In addition, the medium may be certified and control

structures may be created for the management of the medium and defects. The degree that the medium is altered by this command is vendor-specific.

The simplest mandatory form of the FORMAT UNIT command (i.e., a FORMAT UNIT command with no parameter data) accomplishes medium formatting with little application client control over defect management. The device server implementation determines the degree of defect management that is to be performed. Two additional mandatory forms of this command increase the application client's control over defect management. Several optional forms of this command further increase the application client's control over defect management, by allowing the application client to specify:

- a) defect list(s) to be used;
- b) defect locations;
- c) that logical unit certification be enabled; and
- d) exception handling in the event that defect lists are not accessible.

The device server shall save all the savable mode parameters to non-volatile memory during the format operation.

During the format operation, the device server shall respond to commands as follows:

- a) In response to all commands except REQUEST SENSE and INQUIRY, the device server shall return CHECK CONDITION status unless a reservation conflict exists, in which case RESERVATION CONFLICT status shall be returned;
- b) In response to the INQUIRY command, the device server shall respond as commanded; and
- c) In response to the REQUEST SENSE command, unless an error has occurred, the device server shall return a sense key of NOT READY with the additional sense code set to LOGICAL UNIT NOT READY FORMAT IN PROGRESS, with the sense key specific bytes set for progress indication (see SPC-3). See SPC-3 for a description of deferred error handling that may occur during the format operation.

NOTE 1 The MODE SELECT parameters, if any, should be set prior to issuing the FORMAT UNIT command.

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~~The INTERLEAVE field specifies the interleave that is used when performing the format operation. This allows the logical blocks to be related in a way that may facilitate matching the transfer rate between the application client and the peripheral. An interleave of zero specifies that the device server use its default interleave. An interleave of one specifies that consecutive logical blocks be placed in contiguous ascending order. All other values are vendor specific.~~

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~~A disable saving parameters (DSP) bit set to zero specifies that the device server shall save all the savable mode parameters to non-volatile memory during the format operation. A DSP bit set to one specifies that the device server shall not save the MODE SELECT savable parameters to non-volatile memory during the format operation. Mode pages that are not reported as savable are not affected by the DSP bit.~~

6.2 Diagnostic parameters

6.2.1 Diagnostic parameters overview

This subclause defines the descriptors and pages for diagnostic parameters used with direct-access devices. The diagnostic page codes for direct-access devices are defined in table 1.

Table 1 — Diagnostic page codes

Diagnostic page code	Description	Reference
00h	Supported diagnostic pages	SPC-3
01h - 1Fh	SCSI enclosure services diagnostic pages	SES-2
20h - 3Fh	Diagnostic pages assigned by SPC-3	SPC-3
40h	Translate Address Output diagnostic page	
40h	Translate Address Input diagnostic page	
41h	Obsolete	
41h	Device Status Input diagnostic page	0.0.1
42h - 7Fh	Reserved for this standard	
80h - FFh	Vendor-specific diagnostic pages	

~~6.2.4 Device Status Output diagnostic page~~

~~The Device Status diagnostic pages allow the application client to query the device regarding operational status of the device. The format of the Device Status Output diagnostic page sent with SEND DIAGNOSTIC is shown in table 2.~~

~~Table 2 — Device Status Output diagnostic page~~

Byte\Bit	7	6	5	4	3	2	1	0
0	PAGE CODE (41h)							
1	Reserved							
2	(MSB)							
3	PAGE LENGTH (0008h)						(LSB)	
4	Reserved							
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0.0.1 6.2.5 Device Status Input diagnostic page

The format of the Device Status Input diagnostic page retrieved with RECEIVE DIAGNOSTIC RESULTS is shown in table 3.

Table 3 — Device Status Input diagnostic page

Byte\Bit	7	6	5	4	3	2	1	0	
0	PAGE CODE (41h)								
1	Reserved								
2	(MSB)	PAGE LENGTH (n-3)						(LSB)	0
3	Reserved								
4	Reserved								
5	Reserved								
6	Reserved				Obsolete				
7	Reserved				Obsolete				
8	Reserved								
47	Reserved								
48	Vendor specific								
n	Vendor specific								

6.3.1 Mode parameters overview

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In some cases the mode pages do not apply to the entire logical unit. This is controlled by the Notch And Partition mode mode (see 6.3.3).

6.3.3 Notch And Partition mode page

The Notch And Partition mode page (see table 91) contains parameters for direct-access devices that implement a variable number of blocks per cylinder and support this mode page. Each section of the block device with a different number of blocks per cylinder, than other sections, is referred to as a notch.

The parameters savable (PS) bit is only used with the MODE SENSE command. This bit is reserved with the MODE SELECT command. A PS bit set to one indicates that the device server is capable of saving the modepage in a non-volatile vendor-specific location.

A notched device (ND) bit set to zero indicates that the block device is not notched and that all other parameters in this mode page shall be returned as zero by the device server. A ND bit set to one indicates that the block device is notched. For each supported active notch value this mode page defines the starting and ending boundaries of the notch.

A logical or physical notch (LPN) bit set to zero specifies that the boundaries are based on the physical parameters of the block device. The cylinder is considered most significant, the head least significant. A LPN bit set to one specifies that the notch boundaries are based on logical blocks of the block device.

The MAXIMUM NUMBER OF NOTCHES field indicates the maximum number of notches supported by the logical unit. This field shall be reported as unchangeable.

The ACTIVE NOTCH field indicates the notch to which this and subsequent MODE SELECT and MODE SENSE commands shall refer, until the active notch is changed by a subsequent MODE SELECT command. The value of the active notch shall be greater than or equal to 0000h and less than or equal to the maximum number of notches. An active notch value of zero indicates that this and subsequent MODE SELECT and MODE SENSE commands refer to the parameters that apply across all notches.

~~The STARTING BOUNDARY field indicates the beginning of the active notch or, if the active notch is zero, the beginning boundary of the logical unit. If the LPN bit is set to one, then the four bytes represent an LBA. If the LPN bit is set to zero, then the three most significant bytes shall represent the cylinder number and the least significant byte shall represent the head number. This field shall be reported as unchangeable. When used with the MODE SELECT command this field is ignored.~~

~~The ENDING BOUNDARY field indicates the ending of the active notch or, if the active notch is zero, the ending of the logical unit. If the LPN bit is set to one, then the four bytes represent an LBA. If the LPN bit is set to zero, then the three most significant bytes shall represent the cylinder number and the least significant byte shall represent the head number. This field shall be reported as unchangeable. When used with the MODE SELECT command this field is ignored.~~

~~Each notch shall span a set of consecutive logical blocks on the block device, the notches shall not overlap, and no logical block shall be excluded from a notch.~~

~~The PAGES NOTCHED field is a bit map of the mode page codes that indicates mode pages that contain parameters that may be different for different notches. The most significant bit of this field corresponds to PAGE CODE 3Fh and the least significant bit corresponds to PAGE CODE 00h. If a bit is set to one, then the corresponding mode page contains parameters that may be different for different notches. If a bit is set to zero, then the corresponding mode page contains parameters that are constant for all notches. This field shall be reported as unchangeable.~~