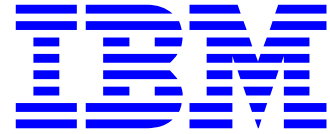


To: INCITS Technical Committee T10  
 From: Ellen Stacey & Kevin Butt  
 Date: Monday, April 06, 2009 11:11 am  
 Document: T10/08-406r2 — SSC-3: Clarifying when Sense Data bits are set



## Revisions

08-406r0	(16 October 2008)	Initial revision
08-406r1	(19 February 2009)	Incorporate changes stemming from January T10 meeting review.
<u>08-406r2</u>	<u>(03 April 2009)</u>	<u>Incorporate changes from last meetings. I accepted all changes in the Annex in the middle of this effort so I lost markings of what changes were made in the March meeting.</u>

## Introduction

It can be difficult and confusing to figure out the basic media events that are communicated and when they may be communicated. This includes when one might see EOM, ILI, Filemark bits in sense data.

I recommend changes be made to read (6), read (16), write (6), write (16), write filemark,

In addition, I recommend that a basic table be implemented for easier reference.

Added text

Deleted text

## Proposal

### 5.6 Write(16) Command

If the device server enables a WRITE(16) command while positioned between EW and EOP, or encounters EW during the processing of a WRITE(16) command, an attempt to finish writing any data may be made as determined by the current settings of the REW and SEW bits in the Device Configuration mode page (see 8.3.3). The command shall terminate with CHECK CONDITION status and the additional sense code shall be set to END-OF-PARTITION/MEDIUM DETECTED. If all data that is to be written is successfully transferred to the medium, the sense key shall be set to NO SENSE or RECOVERED ERROR, as appropriate. If the device server is unable to transfer ~~all the data to the medium-any data~~, buffered or unbuffered, ~~before end-of-partition when early-warning~~ is encountered, the sense key shall be set to VOLUME OVERFLOW. ~~If the SEW bit is set to zero, the EOM bit shall be set to one in the sense data. If the SEW bit is set to one, the EOM and VALID bits shall be set to one in the sense data.~~ The EOM bit shall be set to one. If the SEW bit is set to one then the VALID bit shall be set to one.

## 5.7 WRITE FILEMARKS(16) command

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 If the device server enables a WRITE FILEMARKS(16) command while positioned between EW and EOP, or encounters EW during the processing of a WRITE FILEMARKS(16) command, an attempt to finish writing any buffered logical objects may be made, as determined by the current settings of the REW and SEW bits in the Device Configuration mode page (see 8.3.3). The command shall terminate with CHECK CONDITION status and the additional sense code shall be set to END-OF-PARTITION/MEDIUM DETECTED. If all buffered logical objects to be written are successfully transferred to the medium, the sense key shall be set to NO SENSE or RECOVERED ERROR, as appropriate. If the device server is unable to transfer all the buffered logical objects to the medium ~~any buffered logical objects before~~ end-of-partition ~~when early warning~~ is encountered, the sense key shall be set to VOLUME OVERFLOW. ~~If the SEW bit is set to zero, the EOM bit shall be set to one in the sense data. If the SEW bit is set to one, the EOM and VALID bits shall be set to one in the sense data. The EOM bit shall be set to one.~~ If the SEW bit is set to one then the VALID bit shall be set to one.

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## 6.8 Write(6) Command

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 If the device server enables a WRITE(16) command while positioned between EW and EOP, or encounters EW during the processing of a WRITE(16) command, an attempt to finish writing any data may be made as determined by the current settings of the REW and SEW bits in the Device Configuration mode page (see 8.3.3). The command shall terminate with CHECK CONDITION status and the additional sense code shall be set to END-OF-PARTITION/MEDIUM DETECTED. If all data that is to be written is successfully transferred to the medium, the sense key shall be set to NO SENSE or RECOVERED ERROR, as appropriate. If the device server is unable to transfer all the data to the medium ~~any data~~, buffered or unbuffered, before end-of-partition ~~when early warning~~ is encountered, the sense key shall be set to VOLUME OVERFLOW. ~~If the SEW bit is set to zero, the EOM bit shall be set to one in the sense data. If the SEW bit is set to one, the EOM and VALID bits shall be set to one in the sense data. The EOM bit shall be set to one.~~ If the SEW bit is set to one then the VALID bit shall be set to one.

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## 6.9 WRITE FILEMARKS(6) command

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If the device server enables a WRITE FILEMARKS(6) command while positioned between EW and EOP, or encounters EW during the processing of a WRITE FILEMARKS(6) command, an attempt to finish writing any buffered logical objects may be made, as determined by the current settings of the REW and SEW bits in the Device Configuration mode page (see 8.3.3). The command shall terminate with CHECK CONDITION status and the additional sense code shall be set to END-OF-PARTITION/MEDIUM DETECTED. If all buffered logical objects to be written are successfully transferred to the medium, the sense key shall be set to NO SENSE or RECOVERED ERROR, as appropriate. If the device server is unable to transfer all the buffered logical objects to the medium ~~any buffered logical objects before end-of-partition when early warning~~ is encountered, the sense key shall be set to VOLUME OVERFLOW. ~~If the SEW bit is set to zero, the EOM bit shall be set to one in the sense data. If the SEW bit is set to one, the EOM and VALID bits shall be set to one in the sense data.~~ The EOM bit shall be set to one. If the SEW bit is set to one then the VALID bit shall be set to one.

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Editors Note 1 - KDB: The entire Annex D is new

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## Annex D

(informative)

## D.1 Sense data error indications for read and write operations

Table D.1 — Sense data error indications for read and write operations [\(part 1 of 2\)](#)

Condition	Operation	Sense Key	Additional Sense Code	EOM	FM
Filemark encountered <sup>a</sup>	Read(16), Read Reserve(16), Read(6), Read Reverse(6), Space(6) <sup>a</sup> , Space(16) <sup>a</sup>	NO SENSE or RECOVERED ERROR	FILEMARK DETECTED	0	1
End-of-data encountered before EW <sup>d</sup>	Read(16), Read(6), Space(6), Space(16)	BLANK CHECK	END OF DATA ENCOUN- TERED	0	X
End-of-data encountered between EW and end-of-partition/medium <sup>d</sup>	Read(16), Read(6), Space(6), Space(16)	BLANK CHECK	END OF DATA ENCOUN- TERED	REW <sup>b</sup>	X
EW encountered and REW <sup>b</sup> is set to one in the Device Configuration mode page (see 8.3.3)	Read(16), Read Reserve(16), Read(6), Read Reverse(6), Space(6), Space(16)	NO SENSE or RECOVERED ERROR	END OF PARTI- TION / MEDIUM ENCOUN- TERED	1	X

Key:  
X = not specified.

<sup>a</sup> The application client is only notified of filemarks on space commands when processing a Space(6) or Space(16) command with the CODE field set to logical blocks (i.e., 0000b).

<sup>b</sup> These values represent the current settings of the corresponding fields in the Device Configuration mode page (see 8.3.3)

<sup>c</sup> The information field is only valid if the VALID bit is set to one in the sense data

<sup>d</sup> End-of-data is not returned after end-of-partition.

<sup>e</sup> At least one logical block was unable to be written. A Read Position command may be used to determine which blocks were successfully written. A Recover Buffered Data command, if supported by the device server, may be used to read the unwritten data from the logical object buffer.

<sup>f</sup> The Read Position command should be used to determine the amount of data transferred.

<sup>g</sup> It is only possible to encounter BOP on a Space command when the COUNT field is a negative value.

<sup>h</sup> This condition occurs one or more times.

<sup>i</sup> This row is only valid when the SEW bit is set to one in the Device Configuration mode page (see 8.3.3).

Table D.1 — Sense data error indications for read and write operations [\(part 1 of 2\)](#)

Condition	Operation	Sense Key	Additional Sense Code	EOM	FM
EW encountered and REW <sup>b</sup> is set to zero in the Device Configuration mode page (see 8.3.3)	Read(16), Read Reserve(16), Read(6), Read Reverse(6), Space(6), Space(16)	N/A	N/A	X	X
End-of-partition/medium encountered before end-of-data	Read(16), Read(6), Space(6), Space(16)	MEDIA ERROR	Dependent on the operation	1	X
Beginning-of-partition/medium encountered	Read Reverse(16) Read Reverse(6) Space(6) <sup>g</sup> , Space(16) <sup>g</sup>	NO SENSE or RECOVERED ERROR	BEGINNING-OF-PARTITION/MEDIUM DETECTED	1	X
EW encountered and data successfully written. <sup>h</sup>	Write(6), Write(16), Write Filemarks(6), Write Filemarks(16)	NO SENSE or RECOVERED ERROR	END OF PARTITION / MEDIUM ENCOUNTERED	1	X
End-of-partition/medium encountered without successfully writing data. <sup>e</sup>	Write(6), Write(16), Write Filemarks(6), Write Filemarks(16)	VOLUME OVERFLOW	END OF PARTITION / MEDIUM ENCOUNTERED	1	X

## Key:

X = not specified.

- <sup>a</sup> The application client is only notified of filemarks on space commands when processing a Space(6) or Space(16) command with the CODE field set to logical blocks (i.e., 0000b).
- <sup>b</sup> These values represent the current settings of the corresponding fields in the Device Configuration mode page (see 8.3.3)
- <sup>c</sup> The information field is only valid if the VALID bit is set to one in the sense data
- <sup>d</sup> End-of-data is not returned after end-of-partition.
- <sup>e</sup> At least one logical block was unable to be written. A Read Position command may be used to determine which blocks were successfully written. A Recover Buffered Data command, if supported by the device server, may be used to read the unwritten data from the logical object buffer.
- <sup>f</sup> The Read Position command should be used to determine the amount of data transferred.
- <sup>g</sup> It is only possible to encounter BOP on a Space command when the COUNT field is a negative value.
- <sup>h</sup> This condition occurs one or more times.
- <sup>i</sup> This row is only valid when the SEW bit is set to one in the Device Configuration mode page (see 8.3.3).

Table D.2 — INFORMATION field and position for read and write operations [\(part 2 of 2\)](#)

Condition	Operation	VALID	INFORMATION <sup>c</sup>		Position
			FIXED = 1 <sup>f</sup>	FIXED = 0	
Filemark encountered <sup>a</sup>	Read(16), Read(6)	1	Transfer length minus length actually read	Transfer length	On EOP side of file- mark
	Read Reserve(16), Read Reverse(6)	1	Transfer length minus length actually read	Transfer length	On BOP side of file- mark
	Space(6) <sup>a</sup> , Space(16) <sup>a</sup>	1	Count of blocks traversed		After file- mark
End-of-data encountered before EW <sup>d</sup>	Read(16), Read(6), Space(6), Space(16)	1	Transfer length minus length actually read	Transfer length	On EOP side of last logical block (at end-of-data )
End-of-data encountered between EW and end-of-partition/medium <sup>d</sup>	Read(16), Read(6), Space(6), Space(16)	1	Transfer length minus length actually read	Transfer length	On EOP side of last logical block (at end-of-data )
EW encountered and REW <sup>b</sup> is set to one in the Device Configuration mode page (see 8.3.3)	Read(16), Read Reserve(16), Read(6), Read Reverse(6), Space(6), Space(16)	1	Transfer length minus length actually trans- ferred	Transfer length minus actual block length	After the last logical block transferred

**Key:****X = not specified.**

- <sup>a</sup> The application client is only notified of filemarks on space commands when processing a Space(6) or Space(16) command with the CODE field set to logical blocks (i.e., 0000b).
- <sup>b</sup> These values represent the current settings of the corresponding fields in the Device Configuration mode page (see 8.3.3)
- <sup>c</sup> The information field is only valid if the VALID bit is set to one in the sense data
- <sup>d</sup> End-of-data is not returned after end-of-partition.
- <sup>e</sup> At least one logical block was unable to be written. A Read Position command may be used to determine which blocks were successfully written. A Recover Buffered Data command, if supported by the device server, may be used to read the unwritten data from the logical object buffer.
- <sup>f</sup> The Read Position command should be used to determine the amount of data transferred.
- <sup>g</sup> It is only possible to encounter BOP on a Space command when the COUNT field is a negative value.
- <sup>h</sup> This condition occurs one or more times.
- <sup>i</sup> This row is only valid when the SEW bit is set to one in the Device Configuration mode page (see 8.3.3).

Table D.2 — INFORMATION field and position for read and write operations [\(part 2 of 2\)](#)

Condition	Operation	VALID	INFORMATION <sup>c</sup>		Position
			FIXED = 1 <sup>f</sup>	FIXED = 0	
EW encountered and REW <sup>b</sup> is set to zero in the Device Configuration mode page (see 8.3.3)	Read(16), Read Reserve(16), Read(6), Read Reverse(6), Space(6), Space(16)	N/A	N/A	N/A	After last requested logical object
End-of-partition/medium encountered before end-of-data	Read(16), Read(6), Space(6), Space(16)	1	Transfer length minus length actually transferred	Transfer length	At end-of-partition/medium
Beginning-of-partition/medium encountered	Read Reverse(16) Read Reverse(6) Space(6) <sup>g</sup> , Space(16) <sup>g</sup>	1	Transfer length minus length actually transferred	Transfer length	At beginning-of-partition/medium
EW encountered and data successfully written. <sup>h, i</sup>	Write(6), Write(16), Write Filemarks(6), Write Filemarks(16)	1	Transfer length minus length actually transferred to medium	Transfer length	After block(s) written
End-of-partition/medium encountered without successfully writing data. <sup>e, i</sup>	Write(6), Write(16), Write Filemarks(6), Write Filemarks(16)	1	Transfer length minus length actually written	Transfer length	At end-of-partition/medium

**Key:**X = not specified.

- <sup>a</sup> The application client is only notified of filemarks on space commands when processing a Space(6) or Space(16) command with the CODE field set to logical blocks (i.e., 0000b).
- <sup>b</sup> These values represent the current settings of the corresponding fields in the Device Configuration mode page (see 8.3.3)
- <sup>c</sup> The information field is only valid if the VALID bit is set to one in the sense data
- <sup>d</sup> End-of-data is not returned after end-of-partition.
- <sup>e</sup> At least one logical block was unable to be written. A Read Position command may be used to determine which blocks were successfully written. A Recover Buffered Data command, if supported by the device server, may be used to read the unwritten data from the logical object buffer.
- <sup>f</sup> The Read Position command should be used to determine the amount of data transferred.
- <sup>g</sup> It is only possible to encounter BOP on a Space command when the COUNT field is a negative value.
- <sup>h</sup> This condition occurs one or more times.
- <sup>i</sup> This row is only valid when the SEW bit is set to one in the Device Configuration mode page (see 8.3.3).

## D.2 Summary of Length Errors on Read Type Commands

Table D.3 — Summary of length error on read type commands

Error Condition	Fixed	SILI	BLOCK LENGTH field in mode parameter header	Sense Error	ILI	Information	Position <sup>a</sup>
Underlength	0	0	X	NO SENSE / NO ADDITIONAL SENSE	1	Requested length minus block size	After logical block
	0	1	X	None	0	N/A	After logical block
	1	0	Non- zero	NO SENSE / NO ADDITIONAL SENSE	1	Requested length minus blocks read not including incorrect block	After incorrect logical block
Overlength	0	0	X	NO SENSE / NO ADDITIONAL SENSE	1	Requested length minus block size	After logical block
	0	1	0	None	0	N/A	After logical block
	0	1	Non- zero	NO SENSE / NO ADDITIONAL SENSE	-	Requested length minus block size	After logical block
	1	0	Non- zero	NO SENSE / NO ADDITIONAL SENSE	1	Requested length minus blocks read not including incorrect block	After incorrect logical block

Key;  
X = don't care

<sup>a</sup> After block means on the EOP side of the block for a Read (6) or Read (16) command and on the BOP side of the block for a Read Reverse (6) or Read Reverse (16) command.