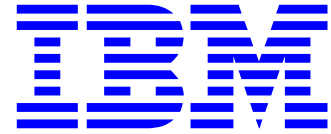


To: INCITS Technical Committee T10  
From: Ellen Stacey & Kevin Butt  
Date: Thursday, February 19, 2009 3:34 pm  
Document: T10/08-406r1 — SSC-3: Clarifying when Sense Data bits are set



**Revisions**

- 08-406r0 (16 October 2008) Initial revision
- 08-406r1 (19 February 2009) Incorporate changes stemming from January T10 meeting review.

**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**

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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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## 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 buffer 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**

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

<sup>a</sup> The application client is only notified of filemarks on space commands when spacing blocks.

<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> It is impossible to get end-of-data after end-of-partition.

<sup>e</sup> If the SEW bit in the Device Configuration mode page is set to zero, then there may be data remaining in the buffer that was unable to be written to the medium. If the SEW bit in the Device Configuration mode page is set to one, then an attempt was made to write all the data including the buffered data to medium. That attempt was unsuccessful. 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.

Table D.1 — Sense Data Error indications for read and write operations

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	Varies	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. NOTE: this condition may occur one or more times for valid media when end-of-data is after EW.	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. NOTE: media validity is in question until the application client handles this condition. <sup>e</sup>	Write(6), Write(16), Write Filemarks(6), Write Filemarks(16)	VOLUME OVERFLOW	END OF PARTITION/MEDIUM ENCOUNTERED	1	X

<sup>a</sup> The application client is only notified of filemarks on space commands when spacing blocks.

<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> It is impossible to get end-of-data after end-of-partition.

<sup>e</sup> If the SEW bit in the Device Configuration mode page is set to zero, then there may be data remaining in the buffer that was unable to be written to the medium. If the SEW bit in the Device Configuration mode page is set to one, then an attempt was made to write all the data including the buffered data to medium. That attempt was unsuccessful. 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.

Table D.2 — Information Field contents for read and write operations

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	After last 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	After last 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
<p><sup>a</sup> The application client is only notified of filemarks on space commands when spacing blocks.</p> <p><sup>b</sup> These values represent the current settings of the corresponding fields in the Device Configuration mode page (see 8.3.3)</p> <p><sup>c</sup> The information field is only valid if the VALID bit is set to one in the sense data</p> <p><sup>d</sup> It is impossible to get end-of-data after end-of-partition.</p> <p><sup>e</sup> If the SEW bit in the Device Configuration mode page is set to zero, then there may be data remaining in the buffer that was unable to be written to the medium. If the SEW bit in the Device Configuration mode page is set to one, then an attempt was made to write all the data including the buffered data to medium. That attempt was unsuccessful. 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.</p> <p><sup>f</sup> The Read Position command should be used to determine the amount of data transferred.</p> <p><sup>g</sup> It is only possible to encounter BOP on a Space command when the COUNT field is a negative value.</p> <p><sup>h</sup> For a Space command the position after the command when encountering BOP is undefined.</p>					

Table D.2 — Information Field contents for read and write operations

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 block
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 <sup>h</sup>
EW encountered and data successfully written. NOTE: this condition may occur one or more times for valid media when end-of-data is after EW.	Write(6), Write(16), Write Filemarks(6), Write Filemarks(16)	SEW <sup>b</sup>	Transfer length minus length actually transferred to medium <sup>3</sup>	Transfer length <sup>3</sup>	After block(s) written
End-of-partition/medium encountered without successfully writing data. NOTE: media validity is in question until the application client handles this condition. <sup>e</sup>	Write(6), Write(16), Write Filemarks(6), Write Filemarks(16)	SEW <sup>b</sup>	Transfer length minus length actually written	Transfer length	At end-of-partition/medium

<sup>a</sup> The application client is only notified of filemarks on space commands when spacing blocks.

<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> It is impossible to get end-of-data after end-of-partition.

<sup>e</sup> If the SEW bit in the Device Configuration mode page is set to zero, then there may be data remaining in the buffer that was unable to be written to the medium. If the SEW bit in the Device Configuration mode page is set to one, then an attempt was made to write all the data including the buffered data to medium. That attempt was unsuccessful. 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> For a Space command the position after the command when encountering BOP is undefined.

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

Table D.3 —

Error Condition	Fixed	SILI	Block Length	Sense Error	ILI	Information	Position <sup>a</sup>
<b>Underlength</b>	0	0	X	NO SENSE / NO ADDITIONAL SENSE	1	Requested length minus block size	After block
	0	1	X	None	0	N/A	After block
	1	0	Non- zero	NO SENSE / NO ADDITIONAL SENSE	1	Requested length minus blocks read not including incorrect block	After incorrect block
<b>Overlength</b>	0	0	X	NO SENSE / NO ADDITIONAL SENSE	1	Requested length minus block size	After block
	0	1	0	None	0	N/A	After block
	0	1	Non- zero	NO SENSE / NO ADDITIONAL SENSE	1	Requested length minus block size	After block
	1	0	Non- zero	NO SENSE / NO ADDITIONAL SENSE	1	Requested length minus blocks read not including incorrect block	After incorrect block

<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 Revers (16) command.