

To: INCITS Technical Committee T10
From: Ellen Stacey & Kevin Butt
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Document: T10/08-406r0 — SSC-3: Clarifying when Sense Data bits are set



Revisions

08-406r0 (16 October 2008) Initial revision

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

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Proposal

5.3 Read(16) Command

If the device server encounters end-of-partition **prior to encountering end-of-data** during a READ(16) command, CHECK CONDITION status shall be returned, the sense key shall be set to MEDIUM ERROR, and the EOM and VALID bits shall be set to one in the sense data. The medium position following this condition is not defined. If the FIXED bit is one, the INFORMATION field shall be set to the requested transfer length minus the actual number of logical blocks read. If the FIXED bit is zero, the INFORMATION field in the sense data shall be set to the requested transfer length.

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 the physical end of tape~~ ~~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.

OR

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 any data, buffered or unbuffered, when early warning is encountered, the sense key shall be set to VOLUME OVERFLOW. ~~If EOP is encountered before all the data is or can be successfully transferred to the medium, the key will 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.

5.7 WRITE FILEMARKS(16) command

6.4 Read(6) Command

If the device server encounters end-of-partition ~~prior to encountering end-of-data~~ during a READ(6) command, CHECK CONDITION status shall be returned, the sense key shall be set to MEDIUM ERROR, and the EOM and VALID bits shall be set to one in the sense data. The medium position following this condition is not defined. If the FIXED bit is one, the INFORMATION field shall be set to the requested transfer length minus the actual number of logical blocks read. If the FIXED bit is zero, the INFORMATION field in the sense data shall be set to the requested transfer length.

6.8 Write(6) 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 the physical end of tape 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.

6.9 WRITE FILEMARKS(6) command

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 the physical end of tape ~~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.

4.2.12.5 Summary of Position Dependent Conditions Encountered During Read and Write Commands

EOM	FM	Sense Key	<u>Additional Sense Code</u>	Operation	Condition
0	1	NO SENSE or RECOVERED ERROR	FILEMARK DETECTED	Read(6), Read(16)	Filemark encountered ₁
0	1	NO SENSE or RECOVERED ERROR	FILEMARK DETECTED	Read Re-verse(6)	Filemark encountered ₂
0	1	NO SENSE or RECOVERED ERROR	FILEMARK DETECTED	Space(6) ¹ , Space(16) ¹	Filemark encountered ₃
0	X	BLANK CHECK	END OF DATA ENCOUNTERED	Read(6), Read(16),....	End-of-data encountered before EW
REW ²	X	BLANK CHECK	END OF DATA ENCOUNTERED	Read(6), Read(16),...	End-of-data encountered between EW and end-of-partition/medium
1	X	NO SENSE or RECOVERED ERROR	END OF PARTITION / MEDIUM ENCOUNTERED	Read(6), Read(16),...	EW encountered and REW ² is 1 in the Device Configuration mode page (see 8.3.3)
X	X	N/A	N/A	Read(6), Read(16),...	EW encountered and REW ² is 0 in the Device Configuration mode page (see 8.3.3)
1	X	MEDIA ERROR	Varies	Read(6), Read(16),...	End-of-partition/medium encountered before end-of-data
1	X	NO SENSE or RECOVERED ERROR	END OF PARTITION / MEDIUM ENCOUNTERED	Write(6), Write(16), Write Filemarks(6), Write Filemarks(16) ...	EW encountered and data successfully written. (if attempted???) – NOTE: this condition will be true one or more times for valid media.

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1	X	VOLUME OVERFLOW	END OF PARTITION / MEDIUM ENCOUNTERED	Write(6), Write(16), Write Filemarks(6), Write Filemarks(16) ...	End-of-partition/medium encountered without successfully writing data. NOTE: media validity is in question until the application client handles this condition.

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VALID	INFORMATION (if VALID)		Position	Condition
	FIXED = 1	FIXED = 0		
1	Transfer length minus length actually read	Transfer length	After filemark	Filemark encountered ₁
1	Transfer length minus length actually read	Transfer length	Before filemark	Filemark encountered ₂
1	Count of blocks traversed		After filemark	Filemark encountered ₃
1	Transfer length minus length actually read	Transfer length	After last block (at end-of-data)	End-of-data encountered before EW
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
1	Transfer length minus length actually read	Transfer length minus actual block length	After the last logical block transferred	EW encountered and REW ² is 1 in the Device Configuration mode page (see 8.3.3)
N/A	N/A	N/A	After last requested block	EW encountered and REW ² is 0 in the Device Configuration mode page (see 8.3.3)
1	Transfer length minus length actually read	Transfer length	Undefined	End-of-partition/medium encountered before end-of-data

SEW ²	Transfer length minus length actually written ³	Transfer length ³	After block(s) written	EW encountered and data successfully written. (if attempted???) – NOTE: this condition will be true 1 or more times for valid media.
SEW ²	Transfer length minus length actually written ³	Transfer length ³	At end-of-partition/medium	End-of-partition/medium encountered without successfully writing data. NOTE: media validity is in question until the application client handles this condition.

Notes:

1 The client is only notified of filemarks on space commands when spacing blocks.

2 These values represent the current settings of the corresponding fields in the Device Configuration mode page (see 8.3.3)

3 The information field is only valid if the VALID bit is set in the sense data

4.1.12.6 Summary of Length Errors on Read Commands

	Fixed	SILI	Block Length	Sense Error	ILI	Information	Position
Underlength	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-0	NO SENSE / NO ADDITIONAL SENSE	1	Requested length minus blocks read not including incorrect block	After incorrect block
Overlength	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-0	NO SENSE / NO ADDITIONAL SENSE	1	Requested length minus block size	After block

	1	0	Non-0	NO SENSE / NO ADDITIONAL SENSE	1	Requested length minus blocks read not including incorrect block	After in- correct block
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