

To: INCITS T10 Committee

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Subject: SSC-2: Sequential-Access Device log page

There is a desire by IBM to have a method by which a device server can provide an indication to an application client of how much tape has been used and how much is available for use. We propose additional parameters be added to the Sequential-Access Device log page in SSC-2.

8.2.2 Sequential-Access Device log page

The Sequential-Access Device log page defines data counters associated with data bytes transferred to and from the media and to and from the application client, and native logical capacity remaining on the media, and a list parameter of binary information on cleaning.

The default value for parameters 0 through 3 shall be zero.

NOTE 37 The data in parameters 0 and 1 are intended to provide an indication of the compression ratio for the written data. Parameters 2 and 3 are intended to provide an indication of the compression ratio for read data. Parameter 4 is intended to define the granularity of parameters 6, 7, and 8. Parameter 5 is intended to provide a compression ratio used for parameters 6, 7, and 8. Parameters 6, 7, and 8 are intended to provide an indication of available capacity remaining on the media.

Support of the Sequential-Access Device log page is optional. Support of the individual parameters in the Sequential-Access Device log page are optional. If parameter 6, 7, or 8 is supported then parameters 4 and 5 shall be supported.

Table 50 defines the parameter codes for the Sequential-Access Device log page.

Parameter Code	Description
0000h	Number of data bytes received from application clients during WRITE command operations.
0001h	Number of data bytes written to the media as a result of WRITE command operations, not counting ECC and formatting overhead.
0002h	Number of data bytes read from the media during READ command operations, not counting ECC and formatting overhead.
0003h	Number of data bytes transferred to the initiator(s) during READ command operations.
<u>0004h</u>	<u>Granularity of parameters 6, 7, and 8. The values in parameters 6, 7, and 8 is to be multiplied by $2^{\text{GRANULARITY}}$</u>
<u>0005h</u>	<u>Compression ratio used to calculate capacity. This value/10 is the compression ratio used in reporting the capacity in parameters 6, 7, and 8. If no media is accessible in the drive this value shall be zero and parameters 6, 7, and 8 are invalid and should be ignored. A value of 10 indicates native uncompressed capacities are used.</u>
<u>0006h</u>	<u>Approximate remaining native logical capacity from tape position of the current partition. There is no guarantee that this amount of data can be written to media before reaching EW. At BOP this value shall equal the value in parameter 7. At EW and any position on the EOP side of EW a value of zero shall be returned.</u>
<u>0007h</u>	<u>Approximate native logical capacity between BOP and EW of the current partition.</u>
<u>0008h</u>	<u>Approximate native logical capacity between BOP and EOP of the current partition.</u>
<u>0009h - 00FFh</u>	Reserved
0100h	Cleaning required.
0101h - 7FFFFh	Reserved
8000h - FFFFh	Vendor-specific parameters
<u>NOTE: All capacity values used in parameters 6, 7, and 8 assume that compression is disabled, if possible. If this media does not support an uncompressed format, the capacity assumes that compression is enabled using average data. The capacity also assumes that the media is in good condition, and that normal data and block sizes are used.</u>	

EXAMPLE: If you have a media whose nominal native capacity is 200 GB with EW at 1G prior to EOP and you are positioned at the point that is 75% of the logical length of the media, then you would use the following to determine parameters 0004h, 0006h, and 0008h.

$$\text{Since 25\% of logical length is remaining, } 200 \text{ GB} * 25\% = 50 \text{ GB} \quad (\text{EQ 1})$$

$$200 \text{ GB} = 214\,748\,364\,800 \text{ Bytes} = 2^{20} * 204\,800 \quad (\text{EQ 2})$$

$$199 \text{ GB} = 215\,822\,106\,624 \text{ Bytes} = 2^{20} * 203\,776 \quad (\text{EQ 3})$$

$$50 \text{ GB} = 53\,687\,091\,200 \text{ Bytes} = 2^{20} * 51\,200 \quad (\text{EQ 4})$$

Since the values are reported in MBs, parameter 0004h = 20 (14h). Since values assume native uncompressed capacities, parameter 0005h = 10 (Ah). EQ 4 gives parameter 0006h = 51 200 (C800h), EQ 3 gives parameter 0007h = 203 776 (031C00h), and EQ 2 gives parameter 0008h = 204 800 (032000h). The parameter length for parameters 7, and 8 would be 3. The parameter length for parameter 6 would be 2. The parameter length for parameters 4 and 5 would be 1.

0.0.1 Alternate Proposal for this information in a new log page.

8.2.4 Device Capacity log page

The Device Capacity log page defines data associated with nominal logical capacity of the media. The intended use of this log page is to provide an indication to the application client of the percentage of media remaining available for use.

NOTE 37 The data in parameter 0 is intended to define the granularity of parameters 2, 3, and 4. Parameter 1 is intended to provide a compression ratio used for parameters 2, 3, and 4. Parameters 2, 3, and 4 are intended to provide an indication of available capacity remaining on the media.

Support of the Device Capacity log page is optional. If the Device Capacity log page is supported then parameters 0 and 1 shall be supported. Support of all other parameters in the Device Capacity log page are optional.

Table 50 defines the parameter codes for the Device Capacity log page.

Parameter Code	Description
0000h	Granularity of parameters 2, 3, and 4. The values in parameters 2, 3, and 4 is to be multiplied by $2^{\text{GRANULARITY}}$
0001h	Compression ratio used to calculate capacity. This value/10 is the compression ratio used in reporting the capacity in parameters 2, 3, and 4. If no media is accessible in the drive this value shall be zero and parameters 2, 3, and 4 are invalid and should be ignored. A value of 10 indicates native uncompressed capacities are used.
0002h	Approximate remaining native logical capacity from tape position of the current partition. There is no guarantee that this amount of data can be written to media before reaching EW. At BOP this value shall equal the value in parameter 3. At EW and any position on the EOP side of EW a value of zero shall be returned.
0003h	Approximate native logical capacity between BOP and EW of the current partition.
0004h	Approximate native logical capacity between BOP and EOP of the current partition.
0005h - 7FFFh	Reserved
8000h - FFFFh	Vendor-specific parameters
NOTE: All capacity values used in parameters 2, 3, and 4 assume that compression is disabled, if possible. If this media does not support an uncompressed format, the capacity assumes that compression is enabled using average data. The capacity also assumes that the media is in good condition, and that normal data and block sizes are used.	

EXAMPLE: If you have a media whose nominal native capacity is 200 GB with EW at 1G prior to EOP and you are positioned at the point that is 75% of the logical length of the media, then you would use the following to determine parameters 0002h, 0003h, and 0004h.

Since 25% of logical length is remaining, $200 \text{ GB} * 25\% = 50 \text{ GB}$ (EQ 5)

$200 \text{ GB} = 214\,748\,364\,800 \text{ Bytes} = 2^{20} * 204\,800$ (EQ 6)

$199 \text{ GB} = 215\,822\,106\,624 \text{ Bytes} = 2^{20} * 203\,776$ (EQ 7)

$50 \text{ GB} = 53\,687\,091\,200 \text{ Bytes} = 2^{20} * 51\,200$ (EQ 8)

Since the values are reported in MBs, parameter 0000h = 20 (14h). Since values assume native uncompressed capacities, parameter 0001h = 10 (Ah). EQ 4 gives parameter 0002h = 51 200 (C800h), EQ 3 gives parameter 0003h = 203 776 (031C00h), and EQ 2 gives parameter 0004h = 204 800 (032000h). The parameter length for parameters 3, and 4 would be 3. The parameter length for parameter 2 would be 2. The parameter length for parameters 0 and 1 would be 1.