

Proposal for the Device Statistic Information Additions Device Error Statistics Group

To: T13 Technical Committee
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This document shows the list of candidates of device error statistic information to be included in the Device Statistic Information Log. Each of the candidates will be reviewed and included in the standard after approval. Supporting of each of the item on the list is optional.

Summary of Device Statistic Information Candidates:

1. Device Statistic Information Header
2. Number of Reallocation Sectors Used (Lifetime)
3. Number of **Remaining** Spare Sectors for Reassign
4. **Number of Reallocation Candidate Sectors**
5. Number of Reported Uncorrectable Errors (Lifetime)
6. Number of **Retry** Revolutions (Lifetime)
7. Number of Soft Errors (Lifetime)
8. Number of Write Faults (Lifetime)
9. Number of Seek Error (Lifetime)
10. Number of Spin-up Failures (Lifetime)

Device Statistic Information Table

Byte Offset	Bit	Description
0		Device Statistic Information Header
		Description: When T13 decides to make a new revision to this structure
		Update Criteria: When event occurs
		Measurement Units: Number sequence Initialization: Set to 0001h at the factory
	63:48	Revision number
	47:0	Reserved
8		Number of Reallocation Sectors Used (Lifetime)
		Description: This statistics reports the number of sectors (LBA blocks) that has been reallocated after the device is manufactured. Update Criteria: Update on Timer: Yes (= 1 hour) Update on entering Standby state: Yes Update on entering Sleep state: Yes Update on Device Statistics Page Read: Yes

		Measurement Units: Number of Sectors Initialization: Cleared to zero at the factory
	63	1=valid statistic data
	62:56	Reserved
	55:32	Reserved
	31:0	Number of Reallocation Sectors Used (Lifetime)
16		Number of Remaining Spare Sectors for Reassign Description: This statistics reports the number of sectors (LBA blocks) that are available to be used for the bad sector reallocated after the device is manufactured. Update Criteria: Update on Timer: Yes (= 1 hour) Update on entering Standby state: Yes Update on entering Sleep state: Yes Update on Device Statistics Page Read: Yes Measurement Units: Number of Sectors Initialization: Initialized in the factory to a vendor specific number
	63	1=valid statistic data
	62	Minimum Count Flag. When this bit is cleared 0, the remaining spare sector is exactly number of sectors remaining for spare. When this bit is set to 1, the remaining spare sector is a minimum count for spare.
	61:56	Reserved
	55:32	Reserved
	31:0	Number of Remaining Spare Sectors for Reassign
24		Number of Reallocation Candidate Sectors Description: This statistics reports the number of sectors (LBA blocks) that are candidate for the reallocation. Criteria for adding or removing sectors from the candidate list are vendor specific. Update Criteria: Update on Timer: Yes (= 1 hour) Update on entering Standby state: Yes Update on entering Sleep state: Yes Update on Device Statistics Page Read: Yes Measurement Units: Number of Sectors Initialization: Cleared to zero at the factory
	63	1=valid statistic data
	62:56	Reserved
	55:32	Reserved
	31:0	Number of Reallocation Candidate Sectors
32		Number of Reported Uncorrectable Errors (Lifetime) Description: This statistics reports the number of errors that are reported as Uncorrectable (UNC) errors in the error response of a command. UNC errors

		<p>occur during background activity are not counted.</p> <p>[Editor's note: Do we need to have a counter to include the background ECC error? This is for the large group to discuss.]</p> <p>Update Criteria: Update on Timer: Yes (= 1 hour) Update on entering Standby state: Yes Update on entering Sleep state: Yes Update on Device Statistics Page Read: Yes</p> <p>Measurement Units: Number of Errors</p> <p>Initialization: Cleared to zero at the factory</p>
	63	1=valid statistic data
	62:56	Reserved
	55:32	Reserved
	31:0	Number of Reported Uncorrectable Errors (Lifetime)
40		<p>Number of Reported Device Errors (Lifetime)</p> <p>Description: This statistics reports the number of errors reported in the error response of a command that are of these types: ABRT, CCTO, IDNF, ICRC, MED, APRRR, INCS, ILRER and Special Error for Request Sense. The UNC error is not counted in this statistics.</p> <p>[Editor's Note: Special Error for Request Sense may have host error that will not be reported. How can we describe this since the error information has not been defined in the ACS2 yet?]</p> <p>Update Criteria: Update on Timer: Yes (= 1 hour) Update on entering Standby state: Yes Update on entering Sleep state: Yes Update on Device Statistics Page Read: Yes</p> <p>Measurement Units: Number of Errors</p> <p>Initialization: Cleared to zero at the factory</p>
	63	1=valid statistic data
	62:56	Reserved
	55:32	Reserved
	31:0	Number of Reported Device Errors (Lifetime)
48		<p>Number of Retry Revolutions (Lifetime)</p> <p>Description: This statistics reports the number of extra revolutions due to device retry. This statistic is valid for rotational media.</p> <p>Update Criteria: Update on Timer: Yes (= 1 hour) Update on entering Standby state: Yes Update on entering Sleep state: Yes</p>

		Update on Device Statistics Page Read: Yes
		Measurement Units: Number of Revolutions
		Initialization: Cleared to zero at the factory
	63	1=valid statistic data
	62:56	Reserved
	55:32	Reserved
	31:0	Number of Retry Revolutions (Lifetime)
56		Number of Soft Errors (Lifetime)
		Description: This statistics reports the number of soft errors device encountered during the read operation. Soft error is defined as error that requires more than two reads attempts. The error correction that does not require retry is not counted. This counter is incremented by one for each sector that encounters the soft error.
		Update Criteria: Update on Timer: Yes (= 1 hour) Update on entering Standby state: Yes Update on entering Sleep state: Yes Update on Device Statistics Page Read: Yes
		Measurement Units: Number of Errors
		Initialization: Cleared to zero at the factory
	63	1=valid statistic data
	62:56	Reserved
	55:48	Reserved
	47:0	Number of Soft Errors (Lifetime)
64		Number of Write Faults (Lifetime)
		Description: This statistics reports the number of write fault errors. Write fault is defined as an internal write problem that requires retry. This counter is incremented by one for each event that encounters the write fault.
		Update Criteria: Update on Timer: Yes (= 1 hour) Update on entering Standby state: Yes Update on entering Sleep state: Yes Update on Device Statistics Page Read: Yes
		Measurement Units: Number of Events
		Initialization: Cleared to zero at the factory
	63	1=valid statistic data
	62:56	Reserved
	55:32	Reserved
	31:0	Number of Write Faults (Lifetime)
72		Number of Seek Error (Lifetime)
		Description: This statistics reports the number of seek errors detected since the device is manufactured.
		Update Criteria: Update on Timer: Yes (= 1 hour) Update on entering Standby state: Yes Update on entering Sleep state: Yes

		<p>Update on Device Statistics Page Read: Yes</p> <p>Measurement Units: Number of Errors</p> <p>Initialization: Cleared to zero at the factory</p>
	63	1=valid statistic data
	62:56	Reserved
	55:32	Reserved
	31:0	Number of Seek Error (Lifetime)
80		<p>Number of Spin-up Failures (Lifetime)</p> <p>Description: This statistics reports the number of spin-up errors since the device is manufactured. The criteria for spin-up failure are vendor specific.</p> <p>[Editor's note: Can this counter be updated if the drive fails to spin-up? Consider to change the title to "Number of times fails to become ready" instead of "Spin-up."]</p> <p>Update Criteria: Update on Timer: Yes (= 1 hour) Update on entering Standby state: Yes Update on entering Sleep state: Yes Update on Device Statistics Page Read: Yes</p> <p>Measurement Units: Number or Errors</p> <p>Initialization: Cleared to zero at the factory</p>
	63	1=valid statistic data
	62:56	Reserved
	55:32	Reserved
	31:0	Number of Spin-up Failures (Lifetime)