

## 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)
11. **Number of Commands Terminated by Resets (Lifetime)**
12. **Number of Power Loss Instance with Incomplete Write (Lifetime)**

Device Statistic Information Table

| Byte Offset | Bit   | Description  |
|-------------|-------|--|
| 0           |       | <b>Device Statistic Information Header</b>   |
|             |       | <b>Description:</b> When T13 decides to make a new revision to this structure  |
|             |       | <b>Update Criteria:</b> NA   |
|             |       | <b>Measurement Units:</b> NA   |
|             |       | <b>Initialization:</b> At the time of manufacture  |
|             | 63:48 | <b>Revision number</b> 0001h   |
|             | 47:16 | <b>Reserved</b>  |
|             | 15:0  | <b>Page Number</b> xxxxxh  |
| 8           |       | <b>Number of Reallocation Sectors Used (Lifetime)</b>  |
|             |       | <b>Description:</b> This statistics reports the number of sectors (LBA blocks) that has been reallocated after the device is manufactured. |
|             |       | <b>Update Criteria:</b> Update on Timer: Yes (= 1 hour)  |

|    |       |   |
|----|-------|---|
|    |       | Update on entering Standby state: Yes<br>Update on entering Sleep state: Yes<br>Update on Device Statistics Page Read: Yes<br>Measurement Units: Number of Sectors<br>Initialization: Cleared to 0 <b>at the time of manufacture</b> = yes<br>Preserve over all resets = yes  |
|    | 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<br>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.<br>Update Criteria: Update on Timer: Yes (= 1 hour)<br>Update on entering Standby state: Yes<br>Update on entering Sleep state: Yes<br>Update on Device Statistics Page Read: Yes<br>Measurement Units: Number of Sectors<br>Initialization: Initialized <b>at the time of manufacture</b> to a vendor specific number<br>Preserve over all resets = yes     |
|    | 63    | 1=valid statistic data  |
|    | 62    | Minimum Count Flag.<br>When this bit is cleared 0, the remaining spare sector is exactly number of sectors remaining for spare.<br>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<br>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.<br>Update Criteria: Update on Timer: Yes (= 1 hour)<br>Update on entering Standby state: Yes<br>Update on entering Sleep state: Yes<br>Update on Device Statistics Page Read: Yes<br>Measurement Units: Number of Sectors<br>Initialization: Cleared to 0 <b>at the time of manufacture</b> = yes<br>Preserve over all resets = yes |
|    | 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 occur during background activity are not counted.   |
|    |       | Update Criteria: Update on Timer: Yes (= 1 hour)<br>Update on entering Standby state: Yes<br>Update on entering Sleep state: Yes<br>Update on Device Statistics Page Read: Yes   |
|    |       | Measurement Units: Number of Errors  |
|    |       | Initialization: Cleared to 0 <b>at the time of manufacture</b> = yes<br>Preserve over all resets = yes   |
|    | 63    | 1=valid statistic data   |
|    | 62:56 | Reserved   |
|    | 55:32 | Reserved   |
|    | 31:0  | Number of Reported Uncorrectable Errors (Lifetime)   |
| 40 |       | Number of Reported Device Errors <b>that are not UNC Errors</b> (Lifetime)   |
|    |       | Description: This statistics reports the number of errors reported in the error response of a command that are of these types: CCTO, MED, APRRR, INCS, ILRER and Special Error for Request Sense. The UNC error is not counted in this statistics. |
|    |       | Update Criteria: Update on Timer: Yes (= 1 hour)<br>Update on entering Standby state: Yes<br>Update on entering Sleep state: Yes<br>Update on Device Statistics Page Read: Yes   |
|    |       | Measurement Units: Number of Errors  |
|    |       | Initialization: Cleared to 0 <b>at the time of manufacture</b> = yes<br>Preserve over all resets = yes   |
|    | 63    | 1=valid statistic data   |
|    | 62:56 | Reserved   |
|    | 55:32 | Reserved   |
|    | 31:0  | Number of Reported Device Errors <b>that are not UNC Errors</b> (Lifetime)   |
| 48 |       | Number of Retry Revolutions (Lifetime)   |
|    |       | Description: This statistics reports the number of extra revolutions due to device retry. This statistic is valid for rotational media.  |
|    |       | Update Criteria: Update on Timer: Yes (= 1 hour)<br>Update on entering Standby state: Yes<br>Update on entering Sleep state: Yes<br>Update on Device Statistics Page Read: Yes   |
|    |       | Measurement Units: Number of Revolutions   |
|    |       | Initialization: Cleared to zero <b>at the time of manufacture</b><br>Preserve over all resets = yes  |
|    | 63    | 1=valid statistic data   |

|       |                                   |  |
|-------|-----------------------------------|--|
|       | 62:56                             | Reserved   |
|       | 55:32                             | Reserved   |
|       | 31:0                              | Number of Retry Revolutions (Lifetime)   |
| 56    |                                   | Number of Soft Errors (Lifetime)   |
|       |                                   | <p><b>Description:</b> 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.</p> <p><b>Update Criteria:</b> Update on Timer: Yes (= 1 hour)<br/>Update on entering Standby state: Yes<br/>Update on entering Sleep state: Yes<br/>Update on Device Statistics Page Read: Yes</p> <p><b>Measurement Units:</b> Number of Errors</p> <p><b>Initialization:</b> Cleared to 0 <b>at the time of manufacture</b> = yes<br/>Preserve over all resets = yes</p>  |
|       | 63                                | 1=valid statistic data   |
|       | 62:56                             | Reserved   |
|       | 55:48                             | Reserved   |
|       | 47:0                              | Number of Soft Errors (Lifetime)   |
|       | 64                                |  |
|       |                                   | <p><b>Description:</b> This statistics reports the number of events that the device has to abort its write operation due to detection of write fault conditions. The aborting of write is occurring on the operation that device is writing to the media. The aborted write maybe recovered by retries or other recovery procedure. The fault condition is defined as the normal write has to be retried to ensure write operation is performed correctly. This event can be but not limited to off track write prevention or power noise. In case of power loss, the event may not be recorded.</p> <p><b>Update Criteria:</b> Update on Timer: Yes (= 1 hour)<br/>Update on entering Standby state: Yes<br/>Update on entering Sleep state: Yes<br/>Update on Device Statistics Page Read: Yes</p> <p><b>Measurement Units:</b> Number or Events</p> <p><b>Initialization:</b> Cleared to 0 <b>at the time of manufacture</b> = yes<br/>Preserve over all resets = yes</p> |
| 63    | 1=valid statistic data            |  |
| 62:56 | Reserved                          |  |
| 55:32 | Reserved                          |  |
| 31:0  | Number of Write Faults (Lifetime) |  |
| 72    |                                   | Number of Seek Error (Lifetime)  |
|       |                                   | <p><b>Description:</b> This statistics reports the number of seek errors</p>   |

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|----|-------|---|
|    |       | <p>Update Criteria: detected since the device is manufactured.<br/>Update on Timer: Yes (= 1 hour)<br/>Update on entering Standby state: Yes<br/>Update on entering Sleep state: Yes<br/>Update on Device Statistics Page Read: Yes</p> <p>Measurement Units: Number of Errors</p> <p>Initialization: Cleared to 0 <b>at the time of manufacture</b> = yes<br/>Preserve over all resets = yes</p>   |
|    | 63    | 1=valid statistic data  |
|    | 62:56 | Reserved  |
|    | 55:32 | Reserved  |
|    | 31:0  | Number of Seek Error (Lifetime)   |
| 80 |       | <p><b>Number of Spin-up Failures (Lifetime)</b></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>Update Criteria: Update on Timer: Yes (= 1 hour)<br/>Update on entering Standby state: Yes<br/>Update on entering Sleep state: Yes<br/>Update on Device Statistics Page Read: Yes</p> <p>Measurement Units: Number or Errors</p> <p>Initialization: Cleared to 0 <b>at the time of manufacture</b> = yes<br/>Preserve over all resets = yes</p>   |
|    | 63    | 1=valid statistic data  |
|    | 62:56 | Reserved  |
|    | 55:32 | Reserved  |
|    | 31:0  | Number of Spin-up Failures (Lifetime)   |
| 88 |       | <p><b>Number of Commands Terminated by Resets (Lifetime)</b></p> <p>Description: This statistics reports the number of events that command is terminated by a reset before it reports the command completion. The reset can be either Soft Reset, Device Reset if the device is ATAPI, or Hard Reset. This statistics is for device to record the number of events host has generated reset to terminate the command execution.</p> <p>Update Criteria: Update on Timer: Yes (= 1 hour)<br/>Update on entering Standby state: Yes<br/>Update on entering Sleep state: Yes<br/>Update on Device Statistics Page Read: Yes</p> <p>Measurement Units: Number or Events</p> <p>Initialization: Cleared to 0 at the time of manufacture = yes<br/>Preserve over all resets = yes</p> |
|    | 63    | 1=valid statistic data  |
|    | 62:56 | Reserved  |
|    | 55:32 | Reserved  |
|    | 31:0  | Number of Commands Terminated by Resets (Lifetime)  |
| 96 |       | <b>Number of Power Loss Instance with Incomplete Write (Lifetime)</b>   |

|       |   |
|-------|---|
|       | <p><b>Description:</b> This statistics reports the number of events that the device has to abort its write operation due to power loss. The aborting of write is occurring on the operation that device is writing to the media. The power loss aborted write cannot be reported to the host due to loss of power. Device support this statistics needs to shall track of aborted write at the time when power is lost.</p> <p><b>Update Criteria:</b> Update on Timer: No<br/>Update on entering Standby state: No<br/>Update on entering Sleep state: No<br/>Update on Device Statistics Page Read: No<br/>Update on Power-up: Yes</p> <p><b>Measurement Units:</b> Number or Events</p> <p><b>Initialization:</b> Cleared to 0 at the time of manufacture = yes<br/>Preserve over all resets = yes</p> |
| 63    | 1=valid statistic data  |
| 62:56 | Reserved  |
| 55:32 | Reserved  |
| 31:0  | Number of Power Loss Instance with Incomplete Write (Lifetime)  |