

Proposal for the Device Statistic Information Additions Device Usage Statistics Group

To: T13 Technical Committee
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Date: Apr 4, 2008

This document shows the list of candidates of device usage 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.

The statistics shall follow these rules:

1. Device statistics shall be preserved across hardware reset
2. Device statistics shall be preserved across software reset
3. Device statistics shall be preserved across device reset
4. The device shall not exit standby to update the log (e.g., do not spin up).

Summary of Device Statistic Information Candidates:

1. **Device Statistic Information Header**
2. Power-on Hours (Lifetime)
3. Spindle Motor Power-on Hours (Lifetime)
4. Head-Flying Hours (Lifetime)
5. Head Load Events (Lifetime)
6. Active/Idle Power Loss Events (Lifetime)
7. Write Data Amount (Lifetime)
8. Write Command Count (Lifetime)
9. Read Data Amount (Lifetime)
10. Read Command Count (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: NA
		Measurement Units: NA
		Initialization: at the time of manufacture
63:48		Revision number 0001h
47:16		Reserved
15:0		Page Number 0004h

8	Power-on Hours (Lifetime)	
	Description:	This value reports number of power-on hours since the device was manufactured. The power-on hours is defined as the amount of time the power has been applied to the device and the device is operational. The device is operational when it is in Active/Idle/Standby state. The Sleep state is not an operational state. The power-on hours is sampled and recorded into a volatile counter with a resolution of one minute or shorter interval. This volatile counter is accumulated into a non-volatile location per the following update criteria. The report of the power on hours is truncated to the hour unit.
	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:	Hours
	Initialization:	Cleared to 0 at the time of manufacture = yes Preserve over all resets = yes
63	1=valid statistic data	
62:56	Reserved	
55:32	Reserved	
31:0	Unsigned DWORD Power-on Hours (Lifetime)	
16	Spindle Motor Power-on Hours (Lifetime)	
	Description:	This value reports number of hours the spindle motor is powered on since the device was manufactured. The spindle motor power on time is sampled and recorded into a volatile counter with a resolution of one minute or shorter interval. This volatile counter is accumulated into a non-volatile location per the following update criteria. The report of the power on hours is truncated to the hour unit.
	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:	Hours
	Initialization:	Cleared to 0 at the time of manufacture = yes Preserve over all resets = yes
63	1=valid statistic data	
62:56	Reserved	
55:32	Reserved	
31:0	Unsigned DWORD Spindle Motor Power-on Hours (Lifetime)	

24	Head-Flying Hours (Lifetime)		
	Description:	This value reports number of hours the device head(s) is flying over the surface of the media since the device was manufactured. The head-flying time is sampled and recorded into a volatile counter with a resolution of one minute or shorter interval. This volatile counter is accumulated into a non-volatile location per the following update criteria. The report of the head-flying hours is truncated to the hour unit.	
	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:	Hours	
	Initialization:	Cleared to 0 at the time of manufacture = yes Preserve over all resets = yes	
63	1=valid statistic data		
62:56	Reserved		
55:32	Reserved		
31:0	Unsigned DWORD Head-Flying Hours (Lifetime)		
32	Head Load Events (Lifetime)		
	Description:	This value records number of events the device loads its head(s) over the surface of the media. If the device is a ramp load device, this event counts the number of time for the head moves from the ramp to the media. If the device is a contact start stop device, this event counts the number of time the head moves away from the landing zone.	
	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:	Head load events	
	Initialization:	Cleared to 0 at the time of manufacture = yes Preserve over all resets = yes	
	63	1=valid statistic data	
	62		
	61:56	Reserved	
55:33	Reserved		
32	1=Ramp loaded device 0=Not ramp loaded device		
31:0	Unsigned DWORD Head Load Events (Lifetime)		
40	Active/Idle Power Loss Events (Lifetime)		

		<p>Description: Power loss when the device is in Active or Idle state.</p> <p>Update Criteria: Update on Timer: No (=1 hour) Update on entering Standby state: No Update on entering Sleep state: No Update on Device Statistics Page Read: No Update on following power on: Yes</p> <p>Measurement Units: Events</p> <p>Initialization: Cleared to 0 at the time of manufacture = yes Preserve over all resets = yes</p>
	63	1=valid statistic data
	62:56	Reserved
	55:32	Reserved
	31:0	Unsigned DWORD Active/Idle Power Loss Events (Lifetime)
48		Write Data Amount (Lifetime)
		<p>Description: This statistic reports the amount of data for write commands that complete successfully.</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: Logical blocks</p> <p>Initialization: Cleared to 0 at the time of manufacture = yes Preserve over all resets = yes</p>
	63	1=valid statistic data
	62:0	Unsigned Integer Value Write Data Amount (Lifetime)
56		Write Command Count (Lifetime)
		<p>Description: This statistic reports the number of write commands that complete successfully.</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 commands</p> <p>Initialization: Cleared to 0 at the time of manufacture = yes Preserve over all resets = yes</p>
	63	1=valid statistic data
	62:56	Reserved
	55:0	Unsigned Integer Value Write Command Count (Lifetime)
64		Read Data Amount (Lifetime)
		<p>Description: This statistic reports the amount of data for read commands that complete successfully.</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: Logical blocks Initialization: Cleared to 0 at the time of manufacture = yes Preserve over all resets = yes
	63	1=valid statistic data
	62:56	Reserved
	55:0	Unsigned Integer Value Read Data Amount (Lifetime)
72		Read Command Count (Lifetime)
		Description: This statistic reports the number of read commands that complete successfully. 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 commands Initialization: Cleared to 0 at the time of manufacture = yes Preserve over all resets = yes
	63	1=valid statistic data
	62:56	Reserved
	55:0	Unsigned Integer Value Read Command Count (Lifetime)