

# Proposal to Align DCO with ATA/ATAPI-7

To: T13 Technical committee  
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## Change History:

R0: Initial proposal

R1: Extended 'allowed' terminology to current items, *and to DEVICE CONFIGURATION IDENTIFY*

## 1 Introduction

In the course of the development of ATA/ATAPI-7, several new features were approved. It is desirable that some of these features be controllable by the Device Configuration Overlay (DCO).

- Streaming feature set
- Time-limited Read/Write Mode feature set
- SMART Selective self test
- SMART Conveyance self test
- Forced Unit Access (FUA )
- SATA-2 features

## 2 Proposed Changes

*Changes are proposed to the DEVICE CONFIGURATION IDENTIFY and DEVICE CONFIGURATION SET commands.*

### **6.9.3 DEVICE CONFIGURATION IDENTIFY**

#### **6.9.3.8 Description**

*(add the following to this section)*

*The term 'is allowed' indicates that the device may report that a feature is supported and/or enabled.*

*If the device is not 'allowed' to report support, then the device shall report that the selected feature is both 'not supported' and (as appropriate) 'not enabled.'*

*The manner in which the device reports such support are typically (but not exclusively) via the IDENTIFY DEVICE, IDENTIFY PACKET DEVICE, SET FEATURES or SMART commands.*

**Table 20 – Device Configuration Overlay data structure**

<b>Word</b>	<b>Content</b>
0	Data structure revision
1	Multiword DMA modes supported 15-3 Reserved 2 1 = Reporting support for Multiword DMA mode 2 and below is allowed supported 1 1 = Reporting support for Multiword DMA mode 1 and below is allowed supported 0 1 = Reporting support for Multiword DMA mode 0 is allowed supported
2	Ultra DMA modes supported 15-7 Reserved 6 1 = Reporting support for Ultra DMA mode 6 and below is allowed supported 5 1 = Reporting support for Ultra DMA mode 5 and below is allowed supported 4 1 = Reporting support for Ultra DMA mode 4 and below is allowed supported 3 1 = Reporting support for Ultra DMA mode 3 and below is allowed supported 2 1 = Reporting support for Ultra DMA mode 2 and below is allowed supported 1 1 = Reporting support for Ultra DMA mode 1 and below is allowed supported 0 1 = Reporting support for Ultra DMA mode 0 is allowed supported
3-6	Maximum LBA
7	Command set/feature set supported 15-14 Reserved 13 1 = Reporting support for SMART Conveyance self-test is allowed 12 1 = Reporting support for SMART Selective self-test is allowed 11 1 = Reporting support for Forced Unit Access is allowed 10 1 = Reporting support for Time-limited Read/Write feature set is allowed 9 1 = Reporting support for Streaming feature set is allowed 8 1 = Reporting support for 48-bit Addressing feature set is allowed supported 7 1 = Reporting support for Host Protected Area feature set is allowed supported 6 1 = Reporting support for Automatic acoustic management is allowed supported 5 1 = Reporting support for READ/WRITE DMA QUEUED commands is allowed supported 4 1 = Reporting support for Power-up in Standby feature set is allowed supported 3 1 = Reporting support for Security feature set is allowed supported 2 1 = Reporting support for SMART error log is allowed supported 1 1 = Reporting support for SMART self-test is allowed supported 0 1 = Reporting support for SMART feature set is allowed supported
8	Reserved for serial ATA
9-254	Reserved
255	Integrity word 15-8 Checksum 7-0 Signature

**6.9.3.8.1 Word 0: Data structure revision**

Word 0 shall contain the value ~~0004h~~ 0002h.

**6.9.3.8.5 Word 7: Command/features set supported**

Word 7 bit 0 if set to one indicates that the device is ~~capable of supporting~~ allowed to report support for the SMART feature set.

Word 7 bit 1 if set to one indicates that the device ~~is capable of supporting~~ allowed to report support for SMART self-test including the self-test log.

Word 7 bit 2 if set to one indicates that the device is ~~capable of supporting~~ allowed to report support for SMART error logging.

Word 7 bit 3 if set to one indicates that the device is ~~capable of supporting~~ allowed to report support for the Security feature set.

Word 7 bit 4 if set to one indicates that the device is ~~capable of supporting~~ allowed to report support for the Power-up in Standby feature set.

Word 7 bit 5 if set to one indicates that the device is ~~capable of supporting~~ allowed to report support for the READ DMA QUEUED and WRITE DMA QUEUED commands.

Word 7 bit 6 if set to one indicates that the device is ~~capable of supporting~~ allowed to report support for the Automatic Acoustic Management feature set.

Word 7 bit 7 if set to one indicates that the device is ~~capable of supporting~~ allowed to report support for the Host Protected Area feature set.

Word 7 bit 8 if set to one indicates that the device is ~~capable of supporting~~ allowed to report support for the 48-bit Addressing feature set.

*Word 7 bit 9 8 if set to one indicates that the device is allowed to report support for Streaming feature set.*

*Word 7 bit 10 8 if set to one indicates that the device is allowed to report support for Time-limited Read/Write mode feature set.*

*Word 7 bit 11 8 if set to one indicates that the device is allowed to report support for Force Unit Access commands.*

*Word 7 bit 12 8 if set to one indicates that the device is allowed to report support for SMART Selective self-test.*

*Word 7 bit 13 8 if set to one indicates that the device is allowed to report support for SMART Conveyance self-test.*

**6.9.4.8.xxx Word 8: Reserved for serial ATA**

*This word is reserved for future serial ATA use.*

## **6.9.4 DEVICE CONFIGURATION SET**

### **6.9.4.8 Description**

*(add the following to this section)*

*The term 'is allowed' indicates that the device may report that a feature is supported and/or enabled.*

*If the device is not 'allowed' to report support, then the device shall report that the selected feature is both 'not supported' and 'not enabled.'*

*The manner in which the device reports such support are typically (but not exclusively) via the IDENTIFY DEVICE, IDENTIFY PACKET DEVICE, SET FEATURES or SMART commands.*

**Table 22 – Device Configuration Overlay data structure**

Word	Content
0	Data structure revision
1	Multiword DMA modes supported 15-3 Reserved 2 1 = <i>Reporting support for Multiword DMA mode 2 and below <del>are supported</del> is allowed</i> 1 1 = <i>Reporting support for Multiword DMA mode 1 and below <del>are supported</del> is allowed</i> 0 1 = <i>Reporting support for Multiword DMA mode 0 <del>is allowed</del> is-supported</i>
2	Ultra DMA modes supported 15-7 Reserved 6 1 = <i>Reporting support for Ultra DMA mode 6 and below <del>is allowed</del> are supported</i> 5 1 = <i>Reporting support for Ultra DMA mode 5 and below <del>is allowed</del> are supported</i> 4 1 = <i>Reporting support for Ultra DMA mode 4 and below <del>is allowed</del> are supported</i> 3 1 = <i>Reporting support for Ultra DMA mode 3 and below <del>is allowed</del> are supported</i> 2 1 = <i>Reporting support for Ultra DMA mode 2 and below <del>is allowed</del> are supported</i> 1 1 = <i>Reporting support for Ultra DMA mode 1 and below <del>is allowed</del> are supported</i> 0 1 = <i>Reporting support for Ultra DMA mode 0 <del>is allowed</del> is-supported</i>
3-6	Maximum LBA
7	Command set/feature set supported <b>15-14</b> Reserved <b>13</b> 1 = <i>Reporting support for SMART Conveyance self-test is allowed</i> <b>12</b> 1 = <i>Reporting support for SMART Selective self-test is allowed</i> <b>11</b> 1 = <i>Reporting support for Forced Unit Access is allowed</i> <b>10</b> 1 = <i>Reporting support for Time-limited Read/Write feature set is allowed</i> <b>9</b> 1 = <i>Reporting support for Streaming feature set is allowed</i> 8 1 = <i>Reporting support for 48-bit Addressing feature set <del>is allowed</del> supported</i> 7 1 = <i>Reporting support for Host Protected Area feature set <del>is allowed</del> supported</i> 6 1 = <i>Reporting support for Automatic acoustic management <del>is allowed</del> supported</i> 5 1 = <i>Reporting support for READ/WRITE DMA QUEUED commands <del>is allowed</del> supported</i> 4 1 = <i>Reporting support for Power-up in Standby feature set <del>is allowed</del> supported</i> 3 1 = <i>Reporting support for Security feature set <del>is allowed</del> supported</i> 2 1 = <i>Reporting support for SMART error log <del>is allowed</del> supported</i> 1 1 = <i>Reporting support for SMART self-test <del>is allowed</del> supported</i> 0 1 = <i>Reporting support for SMART feature set <del>is allowed</del> supported</i>
<b>8</b>	<b>Reserved for serial ATA</b>
<b>9-254</b>	<b>Reserved</b>
255	Integrity word 15-8 Checksum 7-0 Signature

**6.9.4.8.1 Word 0: Data structure revision**

Word 0 shall contain the value ~~0004h~~ 0002h.

**6.9.4.8.5 Word 7: Command/features set supported**

Proposed changes:

Add the following paragraphs to this section.

Word 7 bit 13 is cleared to zero to disable support for the SMART Conveyance self-test. Subsequent attempts to start this test via the SMART EXECUTE OFF-LINE IMMEDIATE command shall cause that command to abort. In addition, the SMART READ DATA command shall clear bit 5 to zero in the "Off-line data collection capabilities" field.

Word 7 bit 12 is cleared to zero to disable support for the SMART Selective self-test. Subsequent attempts to start this test via the SMART EXECUTE OFF-LINE IMMEDIATE command shall cause that command to abort. In addition, the SMART READ DATA command shall clear bit 6 to zero in the "Off-line data collection capabilities" field.

Word 7 bit 11 is cleared to zero to disable support for the Force Unit Access commands and has the effect of clearing bits 6 and 7 to zero in word 84 and word 87 of the IDENTIFY DEVICE or IDENTIFY PACKET DEVICE response.

Word 7 bit 10 is cleared to zero to disable support for the Time-limited Read/Write mode feature set and has the effect of clearing bits 11 and 12 to zero in word 84 and word 87 and clearing the value in word 116 of the IDENTIFY DEVICE or IDENTIFY PACKET DEVICE response.

Word 7 bit 9 is cleared to zero to disable support for the Streaming feature set and has the effect of clearing bits 4, 9 and 10 to zero in word 84 and word 87 and clearing the value in words (99:95) and word 104 of the IDENTIFY DEVICE or IDENTIFY PACKET DEVICE response.

**6.9.4.8.xxx Word 8: Reserved for serial ATA**

This word is reserved for future serial ATA use.