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To: T13 Technical: Committee
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Subject: ATA8-AAM, letter ballot comment resolution

Introduction

The following are the letter ballot comments against the ATA8-AAM draft standard and the responses to those comments. Some editorial adjustments have been made to some comments as the result of the format in which the original comments were received and/or to try to make the comment more clear. These adjustments includes separating several comments submitted under one number into separate numbers for better tracking.

The comments are listed by company. The page number is the number of the page where the text to which the comment is addressed is found in the D1700r2-ATA8-AAM.pdf file.

The responses to these comments have been placed in one of three categories:

- a) accepted;
- b) rejected; and
- c) open.

For comment responses categorized as “accepted”, a proposed resolution is included in the ATA8-AAM revision 2b draft standard. For comment responses categorized as “rejected”, no further action will be taken. Any proposed resolution for an “accepted” comment or any “rejected” comment may be reviewed on request.

For comment responses categorized as “open”, the comment will be discussed and resolved by the T13 technical committee. All of the “open” responses are to be reviewed by the technical committee and shall be resolved before forwarding the draft standard to INCITS for further processing. Open issues have the response categorization in **Open** font for ease of identification.

Editor’s notes are included for all “rejected” comments explaining why the comment was rejected. Editor’s notes are included for all “open” comments to help frame the issue and/or offer a proposed solution. Editor’s notes are also included for some “accepted” comments to provide additional perspective.

Current statistics:

	Initial	Rev 0	Rev 1
Accepted		95	106
Rejected		46	50
<u>Open</u>		<u>16</u>	<u>1</u>
Total	157	157	157

1 Intel comments

Intel comment #1, page 17

Table 8 should include Serial ATA II: Extensions to Serial ATA 1.0a.

Response: rejected

Editor's note: the working group agreed that the Serial ATA references should all be changed to Serial ATA Revision 2.5.

Intel comment #2, page 24

Section 4.2.2. The Host, paragraph 3 states: "A host contains application clients and a host port." This should state that a host may contain one or more host ports. Figure 3 should be modified to show this implementation. The current figure could imply a one-to-many relationship. For some implementations (i.e. a single PATA channel supports two devices, or a single SATA port can support multiple device via a port multiplier) this is ok.

Response: rejected

Editor's note: as this draft standard describes, a host contains one and only one host port in one ATA domain. A host port may communicate with more than one device port in the domain through the service delivery subsystem. Figure 3 is introductory. Figure 6 shows this concept in more detail. There are certainly deployed implementations where applications communicate through different host ports, but, from an architecture perspective, each of those ports resides in a different host in a different ATA domain.

Intel comment #3, page 26

Figure 6 needs to be modified to illustrate that the host can implement 1 to n ports. The current figure implies a 1 to many relationship (like USB). That isn't accurate for some implementations (like SATA).

Response: rejected

Editor's note: see the response to Intel comment #2.

Intel comment #4, page 28

First paragraph (following Figure 8), third sentence states, "...as protocol (see 5)." (See 5) needs to be fully identified as 5 ATA protocol model.

Response: accepted

Editor's note: "(see 5)" has been changed to "(see clause 5)".

Intel comment #5, page 28

Fifth paragraph (following Figure 8), first and second sentences state, "Client-server relationships are not symmetrical. An application client may only originate requests for service". How does this reconcile asynchronous operations like the Asynchronous Notification feature define in SATA II, where the device can asynchronously send notification to the host that the device requires servicing?

Response: rejected

Editor's note: the architecture model does not describe asynchronous notification. The working group recommended examining the Removable Media feature set. Upon examination of the feature set, it was determined that the only way a device can inform a host of a media event is in response to a GET MEDIA STATUS command. So, the only asynchronous notification is transport specific (see SATA 2.5). Asynchronous notification could be described in AAM via a proposal.

Intel comment #6, page 31

General comment regarding the use of the term nexus: it seems that it would be more clear to use the term "link" or "connection".

Response: rejected

Editor's note: actually only the terms "nexus loss event" and "nexus loss" are used in the draft standard. A nexus loss is the result of a nexus loss event which is defined in the definitions clause. The term nexus is taken from SCSI where it is used because it is transport agnostic (as opposed to "link").

Intel comment #7, page 34

Table 12: The keys "PI" and "PN" are not used in the table. They should be removed or called out as not being applicable.

Response: accepted

Editor's note: all entries in the table have been double-checked and corrected as necessary.

Intel comment #8, page 37

Section 5.2.2 Nexus loss protocol: there is no discussion of what the device does when link loss occurs. It seems that this should be added.

Response: rejected

Editor's note: there is nothing in ATA that allows a device to do anything if it cannot communicate with a host.

Intel comment #9, page 37

Section 5.2.3.1: the list of device management functions do not specify SET FEATURES commands. While SET FEATURES commands are covered under the Command Protocols, these seems to fall under the device management heading. Perhaps this section needs to be renamed.

Response: rejected

Editor's note: management functions are those that are not invoked by a command. These functions are currently restricted in ATA to hard reset, software reset, and setting the interrupt state. SET FEATURES is a non-data command and follows that protocol.

Intel comment #10, page 38

Section 5.2.3.2 and beyond: References made to "blue dashed lines": we may want to remove the color reference since this not applicable to documents published in black and white.

Response: rejected

Editor's note: not only was this issue discussed at T13 with agreement to this format, but this format is also used in several other standards (e.g., SAS 1.1). The color is very helpful when it is available, but not necessary to understand the figures as the lines are not only a different color, but also a different format.

2 Maxtor comments**Maxtor comment #1, page 1**

Add the ISO part number assigned to ATA8-AAM by T10/05-071r1 (14776-861).

Response: accepted

Maxtor comment #2, page 1

Change the right margin for the top two lines to be the same as the rest of the page.

Response: accepted

Maxtor comment #3, page 12

Delete "normative" in Clause 2 [as clause 2] enumerates the normative references that apply to this standard."

Response: accepted

Maxtor comment #4, page 12

Add “conventions” to the next sentence so that it is, “Clause 3 describes the definitions, symbols, abbreviations, and conventions used in this standard.”

Response: accepted

Maxtor comment #5, page 12

In the next sentence, change “architectural” to “architecture”.

Response: accepted

Maxtor comment #6, page 12

In the next sentence delete “for the ATA architecture” (i.e., change it to, “Clause 5 describes the ATA protocol model.”)

Response: accepted

Maxtor comment #7, page 13

At the top of the page change “INCITS.xxx:200x” to “INCITS xxx-200x”.

Response: accepted

Editor’s note: however, it should be noted that the T10 style guide (and SAS 2, and several other draft standards) show this as “BSR INCITS.***:200x”.

Maxtor comment #8, page 14

In Tables 1, 2, and 3: add cross references to the tables where the details are itemized for the standards and specifications.

Response: accepted

Maxtor comment #9, page 14

In Table 1: delete the ANSI numbers (i.e., to make consistent with table 2).

Response: accepted

Maxtor comment #10, page 15

Change “Packet command feature set” to “PACKET feature set” (check this globally).

Response: accepted

Maxtor comment #11, page 15

In table 2, change “Multimedia” to “SCSI Multimedia” below.

Response: accepted

Maxtor comment #12, page 15

Change “Table 2 shows examples of other related device specifications.” to “Table 3 shows...”

Response: accepted

Maxtor comment #13, page 15

Update CE-ATA Digital Protocol, Revision 1.0 to Revision 1.1, released 29 September 2005.

Response: accepted

Maxtor comment #14, page 16

Change the colon to a period at the end of the sentence, “At the time of publication, the referenced standards

listed in table 5 had been approved:”

Response: accepted

Maxtor comment #15, page 16

In Table 5 and global, change “[ANSI/INCITS 401-2005]” to “[ANSI INCITS 401-2005]”.

Response: accepted

Maxtor comment #16, page 16

In Table 5 add a “]” at the end of “[ANSI/INCITS 402-2005”.

Response: accepted

Maxtor comment #17, page 17

Update SPC-3 to the correct level as it has been published by ANSI INCITS.

Response: accepted

Maxtor comment #18, page 17

In Table 6 and global, delete standards and specifications not referenced in this standard.

Response: accepted

Maxtor comment #19, page 17

In Table 6, preface AT Attachment-8 Parallel Transport (ATA8-APT) draft standard [Project T13/1698-D] with ISO/IEC 14776-881.

Response: accepted

Maxtor comment #20, page 17

In Table 6, preface AT Attachment-8 ATA/ATAPI Command Set (ATA8-ACS) draft standard [Project T13/1699-D] with ISO/IEC 14776-871.

Response: accepted

Maxtor comment #21, page 18

In Table 8, the MultiMediaCard MCA System Specification is only referenced as an example related device specification in table 3, and costs \$1000. Perhaps it should not be mentioned at all.

Response: rejected

Editor’s note: the working group decided to keep the reference in the standard.

Maxtor comment #22, page 18

In Table 8, update the CE-ATA Digital Protocol to Revision 1.1.

Response: accepted

Maxtor comment #23, page 19

Add a definition for “command function”.

Response: reject

Editor’s note: the working group rejected this comment.

Maxtor comment #24, page 20

Add definitions for “ATA” and “ATAPI” in the abbreviations.

Response: accepted

Maxtor comment #25, page 21

Capitalize "NAME" in the following sentence (two places), "Fields containing only one bit are usually referred to as the "name" bit instead of the "name" field."

Response: accepted

Maxtor comment #26, page 24

In note 1 and global: turn off hyphenization in all paragraph formats.

Response: accepted

Maxtor comment #27, page 24

In note 1, change "Serial ATA" to "SATA".

Response: accepted

Maxtor comment #28, page 24

In the third paragraph of 4.2.2 The host, make a new paragraph after "a host port."

Response: accepted

Maxtor comment #29, page 27

Match the plural/singular of application client(s), device server(s), and standard(s) in the text that follows figure 7 to what is in the figure.

Response: accepted

Maxtor comment #30, page 28

In Figure 8, "Service Delivery" should be two words, and "Sub-system" should not have a hyphen.

Response: accepted

Maxtor comment #31, page 28

Global: make the first letter in each a)b)c) list be not capitalized.

Response: accepted

Editor's note: this only applies to items where the item is not a complete sentence. Words have been added in the Conventions clause to define this usage.

Maxtor comment #32, page 31

Add an "and" after, "(A) DMA data-in command protocol (see 5.3.5);"

Response: accepted

Maxtor comment #33, page 31

If DMA data-in and DMA data-out deserve separate descriptions, then Packet DMA data-in and Packet DMA data-out should, too.

Response: accepted

Editor's note: this was accepted by combining DMA data-in and DMA data-out into one protocol (see WD comment #8).

Maxtor comment #34, page 31

Change "Packet DMA" to "Packet DMA data."

Response: rejected

Editor's note: the protocols have been changed so that there is one PACKET Command protocol that

branches to PACKET non-data, PACKET PIO data-in, PACKET PIO data-out, and PACKET DMA elements without calling them separate protocols (see WD comment #8).

Maxtor comment #35, page 31 (and global)

Try to keep tables on one page whenever possible.

Response: accepted

Maxtor comment #36, page 31 (and global)

In the table 10 title: change “transport protocol services” to “protocol services”.

Response: accepted

Maxtor comment #37, page 33

In Table 11, change “where” to “which” (four places).

Response: rejected

Editor’s note: the editor thinks it’s fine the way it is (e.g., “Contains the beginning address of the buffer in the host to where read data or from where write data is to be transferred for a command.”)

Maxtor comment #38, page 34

In table 12, add Power-on/Hardware Reset as an optional argument for Send Management Function Request.

Response: accepted

Maxtor comment #39, page 34

In table 12, add Power-on/Hardware Reset in Management Function Request Received.

Response: accepted

Maxtor comment #40, page 34

In table 12, change the entry in Send Management Function Complete, Error from “DT” to “DM”.

Response: accepted

Maxtor comment #41, page 34

In table 12, change the entry in Management Function Complete Received, Error from “DT” to “DM”.

Response: accepted

Maxtor comment #42, page 34

In table 12 and for all data command protocols, change Host Buffer in the Send Command row to mandatory for data commands (i.e., DC=M and DQ=M).

Response: accepted/rejected

Editor’s note: Host Buffer is mandatory for all “DC” commands (and the change has been made accordingly). However, SERVICE is a “DQ” command, and Host Buffer is NOT mandatory for that command. Therefore, the entry will remain “DQ=O”.

Maxtor comment #43, page 35

Uncapitalize “Type” in the list.

Response: accepted

Maxtor comment #44, page 35

Delete the “\” after “represents one or more arguments that are optional for the transport protocol service or data transfer protocol service (see table 11)”.

Response: accepted

Maxtor comment #45, page 36

In the title of figure 11, uncapitalize “Power”.

Response: accepted

Maxtor comment #46, page 36

Below figure 11, change “power-on reset event” to “power-on event” (three places).

Response: accepted

Maxtor comment #47, page 37

Below figure 12, change “power-on reset event” to “power-on event” (three places).

Response: accepted

Maxtor comment #48, page 37

Change, “The power-on reset event detected by the host may be different from the power-on reset event detected by the device;” to, “The power-on event detected by the device may be different from the power-on event detected by the host;”.

Response: accepted

Maxtor comment #49, page 37

In the first list item 2 on the page, change “(e.g., determining...” to “(e.g., determine...”.

Response: accepted

Maxtor comment #50, page 38

Add “Device” as an argument for the Send Management Function Request in list item B.

Response: rejected

Editor’s note: in this case, the host port knows the device to which it is sending the request.

Maxtor comment #51, page 38

End list item B with a period and the sentence that ends with, “... is included in a Send Management Function Request” with a semicolon.

Response: accepted

Maxtor comment #52, page 38

Change, “One and only one of the arguments (i.e., Power-on/Hardware Reset, Software Reset, Enable Interrupts, or Disable Interrupts) is included in a Send Management Function Request.” to:

“One and only one of the following arguments is included in a Send Management Function Request:

- a) Power-on/Hardware Reset;
- b) Software Reset;
- c) Enable Interrupts; or
- d) Disable Interrupts;”

Response: accepted

Editor’s note: this section was rewritten to also resolve Seagate comment #27.

Maxtor comment #53, page 38

In list item C, change “Enabled Interrupts” to “Enable Interrupts”.

Response: accepted

Maxtor comment #54, page 41

After, "A device does not report an error if the error occurs after status has been sent to the host but before completion of the data transfer for the command." add, Add "A PIO data-in command may be defined to include a checksum in its data so the application client can verify it was received without error (e.g., see IDENTIFY DEVICE and IDENTIFY PACKET DEVICE in ATA8-ACS)."

Response: accepted

Maxtor comment #55, page 42

Change list item 7 from, "7) If the Error argument was present in the Send Command Function Complete response, then the host port may stop sending data and go to step 9;" to "If the Error argument was present in the Send Command Function Complete response, and the host is not sending data, then go to step 9. If the Error argument was present in the Send Command Function Complete response, and the host is sending data, then the host may stop sending data and goto step 9;"

Response: accepted

Maxtor comment #56, page 48

Fix the skew on the time line in figure 21

Response: accepted

Maxtor comment #57, page 48

Add CDB as an argument to the Receive Data-Out request for all Packet command protocols.

Response: rejected

Editor's note: CDB is not an attribute that can be provided by ATA8-ACS or one of the ATA transport protocols.

Maxtor comment #58, page 49

Delete, "The Packet PIO data-in command protocol is differentiated from the Packet DMA command protocol by returning status before transferring each DRQ data block, as opposed to transferring status after all data for the command is transferred." because there is a final PACKET status delivered after the last DRQ data block.

Response: accepted

Editor's note: this was resolved during the rewriting of the PACKET command protocol.

Maxtor comment #59, page 50

In figure 22 and the subsequent text, add another Send Command Function Complete from the device at the end (in SATA, it is a Device-to-Host Register FIS).

Response: accepted

Editor's note: this was added as optional since it isn't required for parallel ATA.

Maxtor comment #60, page 55

In item b below figure 24, change "...one; (see ATA8-ACS));" to "...one (see ATA8-ACS));"

Response: accepted

Maxtor comment #61, page 55

This standard should show how the ATA with the Packet command and its protocols serves as a SCSI transport protocol and implements the SCSI transport protocol services defined in SAM-2 (not SAM-3).

SCSI Send SCSI Command (I_T_L_x nexus, CDB, Task Attribute, [Data-In Buffer Size], [Data-Out Buffer], [Data-Out Buffer Size], [Autosense Request]) maps to the PIO Write at the beginning of this sequence.

Its arguments map as follows:

- a) I_T_L_x nexus: Maps to an I_T_L nexus since there is no SCSI queuing. I is the host port, T is the device port, L is zero;
- b) CDB is the payload delivered with PIO Write [Task Attribute] is not used (PACKET has untagged tasks);
- c) Data-In Buffer Size] or [Data-Out Buffer Size] maps to the size of the ATA [Host Buffer] argument that should be included in ATA Send Command (see other comments);
- d) [Data-In Buffer] or [Data-Out Buffer] map to the ATA Host Buffer argument that should be included in ATA Send Command (see other comments);
- e) [Autosense Request] is not used, since PACKET doesn't support autosense; and
- f) [Command Reference Number] is not used, since PACKET doesn't support it.

The others are basically:

- a) SCSI Command Received -> ATA Command Received;
- b) SCSI Send Data In -> ATA Send Data-In;
- c) SCSI Receive Data Out -> ATA Receive-Data-Out;
- d) SCSI Send Command Complete -> ATA Send Command Function Complete; and
- e) SCSI Command Complete Received -> ATA Command Function Complete Received.

Response: reject

Editor's note: the working group rejected this comment.

3 Seagate comments

Seagate comment #1, page global

It is premature to send this document all the way through the letter ballot process before ATA8-ACS and ATA8-APT, because

- 1) there will almost certainly be changes required to ATA8-AAM when those other documents are fully reviewed;
- 2) there are flaws or uncertainties or misunderstandings in the protocols that could break existing implementations;
- 3) the document is incomprehensible to some very experienced ATA implementers:
 - A) people who understood ATA7 have difficulty reading ATA8- AAM;
 - B) The client-server model is not commonly used in the storage industry. Extracting "requirements" from this notation is difficult without experience;
 - C) People do not (clearly) see how it relates to even existing implementations.

Response: **open**

Editor's note: ATA8-AAM will not be forwarded to INCITS for further processing until all comments are resolved and all companies who voted "no" are willing to change their vote to "yes". This item will remain open until AAM is ready for forwarding. It should also be noted that the client-server model is fundamental to the SCSI architecture model, so, in reality, the client-server model is used in virtually EVERY type of storage EXCEPT ATA (e.g., parallel SCSI, SAS, Fibre Channel, 1394, iSCSI).

Seagate comment #2, page 13

Figure 1 does not show distinction between the "command" standard and the "transport" standards (or) does not convey any clear information.

Response: rejected

Editor's note: this comment may be revisited upon receipt of a specific proposal.

Seagate comment #3, page 15

Reference the SATA-IO 2.5 spec in table 3.

Response: accepted

Seagate comment #4, page 17

The SAT spec is not referred to in table 6.

Response: accepted

Editor's note: actually, it is, but it will be deleted based on input from T13 to remove items that are not used elsewhere in the draft.

Seagate comment #5, page 17

In table 7: Technical: reports TR27 and TR37 are not "under development", they are fully published (conflict with text of section before the table).

Response: accepted

Editor's note: These items were deleted based on input from T13 to remove items that are not used elsewhere in the draft.

Seagate comment #6, page 17

In table 7: please add TR reference for "disable data transfer after error".

Response: rejected

Editor's note: This item will not be included based on input from T13 to remove items that are not used elsewhere in the draft.

Seagate comment #7, page 20

3.4.9 (line 3) clarify that the SENDER shall clear..."

Response: accepted

Editor's note: This item was deleted based on input from T13 to remove items that are not used elsewhere in the draft.

Seagate comment #8, page 21

In 3.5.1, move definition for "specify" to section 3.1.

Response: rejected

Editor's note: the definitions clause is for words that are defined to have something other than their standard English meaning. In this case, the editor is choosing to use one of the standard English meanings for this word in specific cases. Therefore, this is a convention, not a definition.

Seagate comment #9, page 21

In 3.5.1, move definition for "send" and "transmit" to section 3.1

Response: rejected

Editor's note: see the response to Seagate comment #8.

Seagate comment #10, page 22

In 3.5.3, move definition of unordered list to after ordered lists and before unordered list as they may be nested within ordered lists.

Response: accepted

Editor's note: this was included in the rewrite of this clause.

Seagate comment #11, page 23

In 4.2.1, change "... capable of communicating with ..." to "... physically connected ...". Otherwise, it assumes

that the power-on and/or hardware reset protocols happen before a SATA domain can exist.

Response: accepted

Seagate comment #12, page 28

In 4.4, change “The request is complete when the server response...” to “The request is complete when the device server response...”

Response: accepted

Editor’s note: all references to “client request” and “server response” in this clause have been made consistent with figure 8.

Seagate comment #13, page 29

In 4.5, please insert section header before “The following transport protocol...”: “Transport protocol services”.

Response: accepted

Seagate comment #14, page 29

In 4.5, please underline these because they are important terms (or put in section 3.1): transport protocol service requests, transport protocol service indications, transport protocol service responses, and transport protocol service confirmations.

Response: accepted

Editor’s note: rather than underlining, these have been made bold and separated from the definition with a colon.

Seagate comment #15, page 29

In 4.5, please insert section header before ‘When a device server invokes ...’: “Data Transfer protocol services”.

Response: accepted

Seagate comment #16, page 31

In 5.1.1, where should these protocols go (ref. SATA 1.0a): BIST and power management (slumber, partial)?

Response: rejected

Editor’s note: in that these are transport-specific protocols, the working group rejected this comment?

Seagate comment #17, page 31

In 5.1.1, This SATA protocol has no connection in AAM: NCQ.

Response: rejected

Editor’s note: if NCQ is to be included, the DMA queued protocol should describe it. If this protocol does not describe NCQ, then proposals should be submitted to correct any issues in the standard.

Seagate comment #18, page 32

In table 10, change ‘function complete’ to ‘function status’, and change ‘completion response’ to ‘completion status’.

Response: rejected

Editor’s note: the model does not intend to imply any relation between “function complete” and traditional ATA status. Though most of the “function complete”s contain a Status argument, this is not always the case. For example, there is currently a case where the Management Function Complete Received indication contains a Status argument that is NOT the traditional ATA status, and there could be more cases in future. In addition, this terminology is consistent with SAM.

Seagate comment #19, page 32

In table 10, add: transport event notification received, type=transport protocol service indication, from host port to application client.

Response: rejected

Editor's note: this indication is in the first row of the table. However, the table was split across two pages with the number of orphan rows being one. The table is now on one page.

Seagate comment #20, page 33

In table 11, add argument: packet.

Response: rejected

Editor's note: there is no definition for what a "packet" is. There are only transfers that are not 512 bytes long,

Seagate comment #21, page 34

In table 12 and all references to send data-in: add arguments for PD protocol: Input/Output and Command/Data. Remove argument for all protocols: Host Buffer

Response: accepted

Editor's note: the requested action for Input/Output and Command/Data was taken, however the device may be required to use the Host Buffer argument to establish context for DMA commands when transferring data to the host.

Seagate comment #22, page 34

In table 12 and all references to receive data-out: add arguments for Packet protocols: Input/Output and - Command/Data. Remove argument for all protocols: Host Buffer.

Response: accepted

Editor's note: the requested action for Input/Output and Command/Data was taken, however the device may be required to use the Host Buffer argument to establish context for DMA commands when transferring data to the host.

Seagate comment #23, page 35 (and global for all protocols)

Before showing the figure, show the SYNTAX and ARGUMENTS for the call.

Response: rejected

Editor's note: this comment may be revisited upon receipt of a specific proposal.

Seagate comment #24, page 36 (and global for all protocols)

When calling a protocol, please put the call syntax on a separate line instead of embedded within the text of a bulleted item.

Response: accepted

Editor's note: in an attempt to make calls and services more distinct, they have all been capitalized and made bold.

Seagate comment #25, page 36 (and global for all protocols)

In 5.2.1.3, bulleted item 3, change "...to make available the response..." to "...to make the response available..."

Response: accepted

Seagate comment #26, page 37

In 5.2.2.2 change "Figure 13 shows the processing of the power-on procedure call." to "Figure 13 shows the

processing of the Nexus loss procedure call.”

Response: accepted

Seagate comment #27, page 37

In 5.2.3.1, regarding, “...one and only one device management function shall be requested by the host in each device management sequence...”: does this mean that PATA cannot set bits for nIEN and SRST at the same time?

Response: accepted

Editor’s note: this section was rewritten to also resolve Maxtor comment #52.

Seagate comment #28, page 38

In 5.2.3.2: setting of nIEN at the host may not cause any involvement of the device at all (enable/disable interrupts).

Response: rejected

Editor’s note: this standard does not describe what occurs exclusively inside a host or a device. “Only externally observable behavior...” is described in this standard.

Seagate comment #29, page 38

In 5.3.2.2, bulleted items 3 and 4: the Count argument must also be included in these procedure calls.

Response: accepted

Editor’s note: as was noted in the working group, response to SMART RETURN STATUS is in the Count field.

Seagate comment #30, page 39

ATA8-ACS has no list of non-data commands. The list may be inferred from table 94.

Response: rejected

Editor’s note: the working group decided that this standard is not the place for lists of commands.

Seagate comment #31, page 39 (and global for all protocols)

Beginning in 5.3.2.2, regarding, “If the LBA, Count, and/or Features arguments contain command-specific information, then that information is defined in the ATA8-ACS standard.” Drop the “If” at the beginning, and just say that these are defined in the ATA8-ACS standard.

Response: accepted

Editor’s note: all redundant information has been removed from the protocols and a footnote has been added to table 11.

Seagate comment #32, page 40

Regarding, “Receipt of an EXECUTE DEVICE DIAGNOSTICS command or a DEVICE RESET command may cause a device server to perform one or more device-specific actions...”: All commands, not just the listed ones, may cause device-specific actions. What is unique here are the transport specific actions.

Response: accepted

Editor’s note: the working group decided to delete the paragraph.

Seagate comment #33, page 40

In 5.3.3.1 1, regarding, “See the ATA8-ACS...”: ATA8-ACS has no list of PIO data-in commands. The list may be inferred from table 94.

Response: rejected

Editor’s note: the working group decided that this standard is not the place for lists of commands.

Seagate comment #34, page 40

In 5.3.3.2, bulleted item 2: the device does not see the Host Buffer argument.

Response: accepted

Editor's note: based on input from the working group, the Host Buffer argument was removed from the device components for the **PIO Data-In Command** procedure call.

Seagate comment #35, page 40

In 5.3.3.2, bulleted item 3: change "...fetches the data for the command...", to, "...prepares the data to be transferred to the host...".

Response: accepted

Editor's note: all instances of "fetch" have been changed accordingly.

Seagate comment #36, page 40

In 5.3.3.2, bulleted item 4: it is unclear how this will map to a DRQ interrupt.

Response: accepted

Editor's note: based on input from the working group, a new argument (the Interrupt argument) was added to the relevant protocol services.

Seagate comment #37, page 41

In 5.3.3.2 bulleted item 6: the device does not use or save the Host Buffer argument.

Response: accepted

Editor's note: based on input from the working group, the Host Buffer argument was removed from the device components for the **PIO Data-In Command** procedure call.

Seagate comment #38, page 41

Add a new bullet in 5.3.3.2 to show the host port using the Host Buffer argument. This may result in a change to Figure 16.

Response: rejected

Editor's note: how this argument is used by the host port is application specific and beyond the scope of this standard.

Seagate comment #39, page 41

In 5.3.3.2, Note 4: change "the CFA...", to, "The CFA...".

Response: accepted

Editor's note: all notes now have the first word capitalized.

Seagate comment #40, page 41

In 5.3.4.1: also indicate how PIO data-out differs from PIO data-in.

Response: rejected

Editor's note: this comment may be revisited upon receipt of a specific proposal.

Seagate comment #41, page 42

In 5.3.4.2, change "PIO data-in" to "PIO data-out".

Response: accepted

Seagate comment #42, page 42

In 5.3.4.2, bulleted item 2: the device does not see the Host Buffer argument.

Response: accepted

Editor's note: based on input from the working group, the Host Buffer argument was removed from the device components for the **PIO Data-Out Command** procedure call.

Seagate comment #43, page 42

Add a new bullet in 5.3.4.2 to show the host port using the Host Buffer argument. This may result in a change to Figure 17.

Response: rejected

Editor's note: how this argument is used by the host port is application specific and beyond the scope of this standard.

Seagate comment #44, page 43

In 5.3.5.2, bulleted item 2: the device does not see the Host Buffer argument.

Response: rejected

Editor's note: based on input from the working group, the Host Buffer argument is used for DMA procedure calls.

Seagate comment #45, page 43

In 5.3.5.2, bulleted item 4: the device does not use or save the Host Buffer argument.

Response: rejected

Editor's note: based on input from the working group, the Host Buffer argument is used for DMA procedure calls.

Seagate comment #46, page 43

In 5.3.5.2, bulleted item 4: change "fetches" to "prepares" (more generic, does not imply that the data was stored).

Response: accepted

Editor's note: see Seagate comment #35.

Seagate comment #47, page 43

In 5.3.5.2, bulleted item 4: insert this text, "The Receive Data-In request may also contain transport-specific information that is transmitted by the host port to the device port"

Response: accepted

Editor's note: this is now in list item 5, included as part of the rewriting of the DMA Command protocol.

Seagate comment #48, page 44

Add a new bullet in 5.3.5.2 to show the host port using the Host Buffer argument. This may result in a change to Figure 18.

Response: rejected

Editor's note: how this argument is used by the host port is application specific and beyond the scope of this standard.

Seagate comment #49, page 44

In 5.3.5.2, DRQ Data block is not a referenced argument in any procedure call.

Response: accepted

Editor's note: this argument is not used for the DMA protocol and will be removed. However, this argument is used for PIO data-in and PIO data-out and will not be removed from those protocols.

Seagate comment #50, page 45

In 5.3.6.2, bulleted item 2: the device does not see the Host Buffer argument.

Response: rejected

Editor's note: based on input from the working group, the Host Buffer argument is used for DMA procedure calls.

Seagate comment #51, page 45

Add a new bullet in 5.3.6.2 to show the host port using the Host Buffer argument. This may result in a change to Figure 19.

Response: rejected

Editor's note: how this argument is used by the host port is application specific and beyond the scope of this standard.

Seagate comment #52, page 45

In 5.3.6.2, DRQ Data block is not a referenced argument in any procedure call.

Response: accepted

Editor's note: this argument is not used for the DMA protocol and will be removed. However, this argument is used for PIO data-in and PIO data-out and will not be removed from those protocols.

Seagate comment #53, page 45

In 5.3.6.2, the Features argument is always command-specific.

Response: accepted

Editor's note: all redundant information has been removed from the protocols and a footnote has been added to table 11 (see Seagate comment #31).

Seagate comment #54, page 45

In 5.3.7.1, delete sentence 2, "The DMA queued command protocol is differentiated from the PIO data-in command protocol by returning status after all data is transferred or when an error occurs, as opposed to transferring status before transferring each DRQ data block."

Response: accepted

Seagate comment #55, page 45

In 5.3.7.1, reword the second paragraph.

Response: rejected

Editor's note: this comment may be revisited upon receipt of a specific proposal.

Seagate comment #56, page 46

Split the DMA queued command protocol into separate data-in and data-out figures.

Response: rejected

Editor's note: per other comments and consensus of the group, the DMA data-in and data-out protocols were combined into one protocol, and the PACKET protocols were combined into one protocol.

Seagate comment #57, page 46

Split the DMA queued command protocol into separate data-in and data-out protocols.

Response: rejected

Editor's note: see Seagate comment #56.

Seagate comment #58, page 46

In 5.3.7.2: it is not clear (enough) where the queue concept is mentioned in this protocol description.

Response: rejected

Editor's note: there is no requested action in this comment

Seagate comment #59, page 46

In 5.3.7.2, bulleted item 2: the device does not see the Host Buffer argument.

Response: accepted

Editor's note: since queuing for the PACKET feature set has been made obsolete, the Host Buffer argument has been removed from all device protocol services for the PACKET command protocols.

Seagate comment #60, page 47

In 5.3.8, consider making a separate procedure for sending the packet data, since it is common to several other protocols.

Response: accepted

Editor's note: this was resolved during the rewriting of the PACKET command protocol.

Seagate comment #61, page 48 (and several places following)

In 5.3.8, regarding specifying values for the Input/Output and Command/Data arguments: no other protocols specify values for arguments. Why should this be different?

Response: accepted

Seagate comment #62, page 48 (and several places following)

In 5.3.8, bulleted items 1 through 6: group these and identify them as send packet data to device. Maybe make them steps 1a, 1b, 1c, 1d, etc.

Response: accepted

Editor's note: this was resolved during the rewriting of the PACKET command protocol.

Seagate comment #63, page 48 (and several places following)

In 5.3.8: how do the host and device decide/agree on how many packet bytes there are?

Response: rejected

Editor's note: this comment may be revisited upon receipt of a specific proposal.

Seagate comment #64, page 48 (and several places following)

In 5.3.8.2.2, bulleted item 3 (and others following), change, "...the Input/Output argument contains zero, and the Command/Data argument contains one...", to, "the Input/Output argument indicates 'from the host', and the Command/Data argument indicates 'command/status'..."

Response: accepted

Editor's note: this was resolved during the rewriting of the PACKET command protocol.

Seagate comment #65, page 48 (and several places following)

In 5.3.8.2.2, bulleted item 5 (and others following): how will this translate to settings for DRQ? Input/Output? Command/Data?

Response: rejected

Editor's note: this comment may be revisited upon receipt of a specific proposal.

Seagate comment #66, page 49

In 5.3.8.2.2, bulleted item 8: change, "...the Input/Output argument contains zero, and the Command/Data argument contains one", to, "...the Input/Output argument indicates 'to the host', and the Command/Data argument indicates 'command/status'...".

Response: accepted

Editor's note: this was resolved during the rewriting of the PACKET command protocol.

Seagate comment #67, page 49

In 5.3.8.2.2, bulleted items 6 and 7: the order of these steps may be vendor specific.

Response: accepted

Editor's note: since queuing for the PACKET feature set has been made obsolete, the Host Buffer argument has been removed from all device protocol services for the PACKET command protocols.

Seagate comment #68, page 49

In 5.3.8.2.2, bulleted item 9: when presenting status at the end of receiving the packet data:

- a) DRQ=0;
- b) Input/Output argument indicates "to the host"; and
- c) Command/Data argument indicates "Command".

There may be a time when the status is BSY+RDRY+DSC, before presenting DRQ.

Note: Bulleted items 9 and 11 may be implemented as a single step by a device, making a single status presentation:

- a) DRQ=1;
- b) Input/Output argument indicates "to the host"; and
- c) Command/Data argument indicates "data".

Response: rejected

Editor's note: this comment may be revisited upon receipt of a specific proposal.

Seagate comment #69, page 51

In 5.3.8.3.2, bulleted item 11: the device does not use or save the Host Buffer argument.

Response: accepted

Editor's note: since queuing for the PACKET feature set has been made obsolete, the Host Buffer argument has been removed from all device protocol services for the PACKET command protocols.

Seagate comment #70, page 53

In 5.3.8.4.2, bulleted items 6 and 7: the order of these steps may be vendor specific.

Response: rejected

Editor's note: this comment may be revisited upon receipt of a specific proposal.

Seagate comment #71, page 53

In 5.3.8.4.2, bulleted item 6: when presenting status at the end of receiving the packet data:

- a) DRQ=0;
- b) Input/Output argument indicates “to the host”; and
- c) Command/Data argument indicates “Command”.

There may be a time when the status is BSY+RDRY+DSC, before presenting DRQ.

Note: Bulleted items 6 and 9 may be implemented as a single step by a device, making a single status presentation:

- a) DRQ=1;
- b) Input/Output argument indicates “to the host”; and
- c) Command/Data argument indicates “data”.

Response: rejected

Editor’s note: this comment may be revisited upon receipt of a specific proposal.

Seagate comment #72, page 49

In 5.3.8.4.2, bulleted item 11: change, “...the Input/Output argument contains one, and the Command/Data argument contains zero...”, to, “...the Input/Output argument indicates ‘from the host’, and the Command/Data argument indicates ‘data’...”.

Response: accepted

Editor’s note: this was resolved during the rewriting of the PACKET command protocol.

Seagate comment #73, page 54

In 5.3.8.5.2, bulleted items 6 and 7: the order of these steps may be vendor specific.

Response: rejected

Editor’s note: this comment may be revisited upon receipt of a specific proposal.

Seagate comment #74, page 54

In 5.3.8.5.2, bulleted item 6: when presenting status at the end of receiving the packet data:

- a) DRQ=0;
- b) Input/Output argument indicates “to the host”; and
- c) Command/Data argument indicates “Command”.

There may be a time when the status is BSY+RDRY+DSC, before presenting DRQ.

Note: Bulleted items 6 and 8 may be implemented as a single step by a device, making a single status presentation:

- a) DRQ=1;
- b) (8a=data-in) Input/Output argument indicates “to the host”;
- c) (8b=data-out) Input/Output argument indicates “from the host”; and
- d) Command/Data argument indicates “data”.

Response: rejected

Editor’s note: this comment may be revisited upon receipt of a specific proposal.

Seagate comment #75, page 55

In 5.3.8.5.2, bulleted item 14: change, “...the Input/Output argument contains one, and the Command/Data argument contains one”, to, “...the Input/Output argument indicates ‘to the host’, and the Command/Data argument indicates ‘command’...”.

Response: accepted

Editor's note: this was resolved during the rewriting of the PACKET command protocol.

4 WD comments

WD comment #1, page 13

The last sentence in clause 1.1 ("Conforming implementations may employ any design technique that does not violate interoperability."): WD is concerned because interoperability is determined by spec compliance, and we have no interoperability specification requirements, claims or verification process. This clause should be deleted.

Response: rejected

Editor's note: however, at the recommendation of the working group, the sentence was changed to, "Conforming implementations may employ any design technique that does not violate this standard."

WD comment #2, page 14

In the paragraph below figure 1 ("...an implementation claiming ATA compliance shall conform to the applicable implementation requirements defined in this standard and the appropriate ATA implementation standards."): This "shall" means this new document adds new requirements in order to claim ATA compliance. This was not anticipated, and we cannot accept that future devices now have to conform to this new standard. This requirement might be acceptable if the implementation was claiming compliance to AAM, rather than ATA.

Response: rejected

Editor's note: AAM is part of the ATA family of standards. AAM should not add new requirements but only document those that exist. However, at the recommendation of the working group, the sentence was changed to "...an implementation claiming compliance to this standard shall conform to the applicable implementation requirements defined in this standard and the appropriate ATA implementation standards."

WD comment #3, page 14

In the paragraph below figure 1 ("In the event of a conflict between this document and other ATA standards under the jurisdiction of technical committee T13, the requirements of this standard shall apply.): This is not acceptable to WD. It was not expected when the scope of the project was approved that the document would include a priority precedence in technical matters. We feel there are too many differences; differences in the glossary and key words between this and other volumes for example. This document is already in conflict with other ATA standards. In the event of conflict, the other ATA should take precedence until the docs are all aligned.

Response: rejected

Editor's note: without a precedence, a device has to conform with all ATA standards to which it claims compliance, even if a conflict exists. As discussed at the working group, with the move to separate standards, there is always the potential for differences between the standards. In fact, it may be impossible for all ATA standards to always be completely aligned. However, it is the responsibility of T13 to eliminate these differences as they are discovered.

WD comment #4, page 20

The definition for "obsolete" is different from the one used in the ATA8-ACS draft standard:

obsolete: A keyword indicating that the designated bits, bytes, words, fields, and code values that may have been defined in previous standards are not defined in this standard and shall not be reclaimed for other uses in future standards. However, some degree of functionality may be required for items designated as "obsolete" to provide for backward compatibility.

Obsolete commands should not be used by the host. Commands defined as obsolete may be command aborted by devices conforming to this standard. However, if a device does not command abort an obsolete command, the minimum that is required by the device in response to the command is command completion.

Response: accepted

Editor's note: the definition for "obsolete" was removed from the draft because it was not used anywhere in the text.

WD comment #5, page 20

The definition for prohibited: I think I like yours better. However, this does not align with ATA tradition.

Response: accepted

Editor's note: the definition for "prohibited" was removed from the draft because it was not used anywhere in the text.

WD comment #6, page 44

5.3.5 DMA data-in command protocol: there is no DMA data-in protocol.

Response: accepted

Editor's note: the DMA data-in and DMA data-out protocols have been combined into one DMA protocol.

WD comment #7, page 44

5.3.6 DMA data-out command protocol: there is no DMA data-out protocol.

Response: accepted

Editor's note: the DMA data-in and DMA data-out protocols have been combined into one DMA protocol.

WD comment #8, page 48

5.3.8.2 PACKET non-data command protocol: there is no Packet non-data protocol.

Response: accepted

Editor's note: this was resolved during the rewriting of the PACKET command protocol.

WD comment #9, page 49

5.3.8.3 PACKET PIO data-in command protocol: there is no PIO data-in command protocol.

Response: accepted

Editor's note: this was resolved during the rewriting of the PACKET command protocol.

WD comment #10, page 51

5.3.8.4 PACKET PIO data-out command protocol: there is no PACKET PIO data-out command protocol.

Response: accepted

Editor's note: this was resolved during the rewriting of the PACKET command protocol.

WD comment #11, page 54

5.3.8.5 PACKET DMA command protocol description: there is no PACKET DMA command protocol.

Response: accepted

Editor's note: this was resolved during the rewriting of the PACKET command protocol.