



Date: 15 February 2024  
 To: T10 Technical Committee  
 From: Ralph O. Weber  
 Subject: SAT-6 SATL manages NCQ ATA PASS-THROUGH commands

## Introduction

As agreed during the November and January CAP Ad Hocs, SAT-x already contains the fundamental details regarding SATL management of ATA NCQ tags (i.e., the ATA NCQ TAG field in an NCQ command). The difficulty is that, for ATA PASS-THROUGH commands, how the tags are read depends on the spin doctor who reads them.

The goal of this proposal is to remove the ATA PASS-THROUGH ambiguities, without breaking all the dishes in the SAT China Shop.

## Revision History

- r0 Initial revision
- r1 The tone and details of the proposal were changed based in numerous CAP and hallway discussions regarding what SAT already says and how the SATL descriptions might be improved.

Unless otherwise indicated additions are shown in underlined blue, deletions in ~~red-strikethrough~~, and comments in green. Differences between this revision and the previous revision, if any, are highlighted with change bars.

## Proposed Changes in SAT-6 (based on SAT-5 r10)

### 6.2.1 Comparison of SCSI task set management and ATA queuing

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**Table 7 – Comparison of SCSI task set management and ATA queuing methods**

Feature <sup>a</sup>	SCSI	NCQ
...	...	...
Queue <u>tag assignment and queue</u> full management	Target device manages <u>tag assignments</u> and indicates <u>full</u> via TASK SET FULL status	ATA host managed ( <u>i.e., SATL managed</u> )
...	...	...

...

6.2.3 Mapping of SCSI commands to ATA NCQ commands

Whether or not the SATL also queues commands internally, a A SATL that translates SCSI commands to an ATA device using NCQ (see clause 8 and 12.2.2), ~~whether or not the SATL also queues commands internally,~~ shall either:

- a) indicate support for the basic task management model in standard INQUIRY data and follow the rules for the basic task management model (see SAM-2); or
- b) indicate support for the full task management model in standard INQUIRY data and set the QERR field of the Control mode page (see 10.4.6) as follows:
  - A) a value of 01b if the SATL does not resend an ATA NCQ commands aborted by the ATA device due to an error condition on any one of the ATA NCQ commands; or
  - B) a value other than 01b if the SATL resends all other ATA NCQ commands (i.e., except the one in error, or as described in 6.2.7) aborted by the ATA device due to an error condition on any one of the ATA NCQ commands.

For each SCSI command that the SATL translates to ATA NCQ commands-~~<<<Delete gratuitous space.>>>~~, the SATL shall allocate an available tag value (e.g., for NCQ, the value corresponding to the position of a bit set to zero in the SACTIVE field (see SATA-3.5a)). The SATL shall maintain a mapping between allocated ATA queued command tags and the corresponding SCSI command identifier (see SAM-5).

... ~~<<<No other changes are proposed in 6.2.3.>>>~~

12.2.2 ATA PASS-THROUGH commands

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12.2.2.2 ATA PASS-THROUGH (12) command

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Table 200 – PROTOCOL field

Code	Description
...	...
Ch	NCQ (see SATA 3.5a) <sup>a</sup>
...	...
<sup>a</sup> <u>The SATL manages allocates tag values (see 6.2.3) and the CDB bits for the ATA NCQ TAG field (see ACS-5) are not passed through.</u>	

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