To: T10 Technical Committee
From: Bob Sheffield (robert.l.sheffield@intel.com)
Date: 1 June 2006
Subject: 06-262r1: SAT - Example Configurations

Revision history
Revision 0 (30 May 2006) First revision
Revision 1 (1 June 2006) Added modifications to subclause 6.2.4 Multi-initiator and multi-port command queuing, to refer back to the figures in subclause 5.1.

Related documents
SAT-r08 - SCSI / ATA Translation revision 08
06-121r1 SAT-r08_LB_Comment_Resolution.pdf

Overview

Discussion of letter ballot comments in subclause 5.1, the Architecture Overview, led to direction to copy and modify figures from the VPD pages showing basic usage models for SAT into the Architecture Overview showing the three examples listed. This proposal shows the suggested changes, and is intended to resolve letter ballot comments in subclause 5.1 related to the example implementations.

A suggested resolution to a letter ballot comment in subclause 6.2.4 was to describe when a SATL may support multi-initiator and multi-port command queuing in reference to the figures added to subclause 5.1. This proposal also contains the suggested changes to subclause 6.2.4 to resolve letter ballot comments in subclause 6.2.4.

Suggested changes

Modify subclause 5.1 to read as follows:

5 SCSI Architectural Elements

5.1 Overview

Clause 5 defines SCSI / ATA translation elements that impact the representation of the storage domains defined in SAM-3 and ATA8-AAM. Figure 4 shows a SATL providing a communication path between a SCSI application client and an ATA device or an ATAPI device.
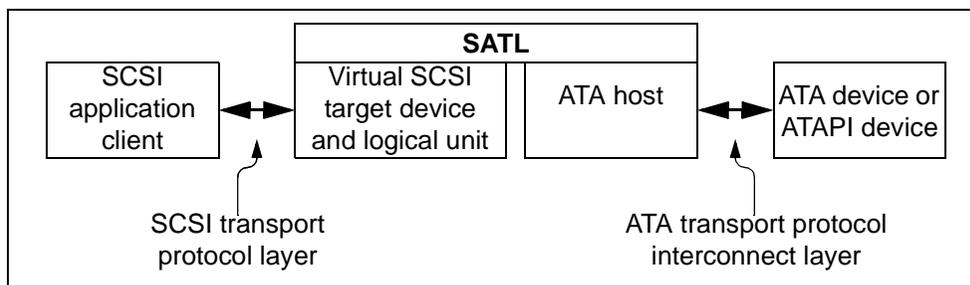

Figure 4 — Example of a SATL between a SCSI application client and an ATA or ATAPI device

The SATL provides the communication path between a SCSI application client and an ATA device or ATAPI device by:

    a) emulating a SCSI logical unit;
    b) integrating an ATA host; and
    c) providing the translation elements to link them together.

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This standard defines SCSI / ATA translation using SCSI and ATA command sets. This standard does not define the mapping of transport capabilities as defined at the SCSI transport protocol layer and the ATA protocol interconnect layer.

An implementation utilizing a SATL may include a SCSI transport. ~~Examples of a SATL implemented in accordance to this standard include:~~ A SATL may appear in different configurations.

The following examples are revised from the unordered list of examples, with figures added.

> EXAMPLE 1 - Figure 5 shows a SATL contained within a SCSI target comprised of ATA devices and/or ATAPI devices using a defined SCSI transport protocol (e.g., Fibre Channel, SCSI parallel interface, or SBP-3).
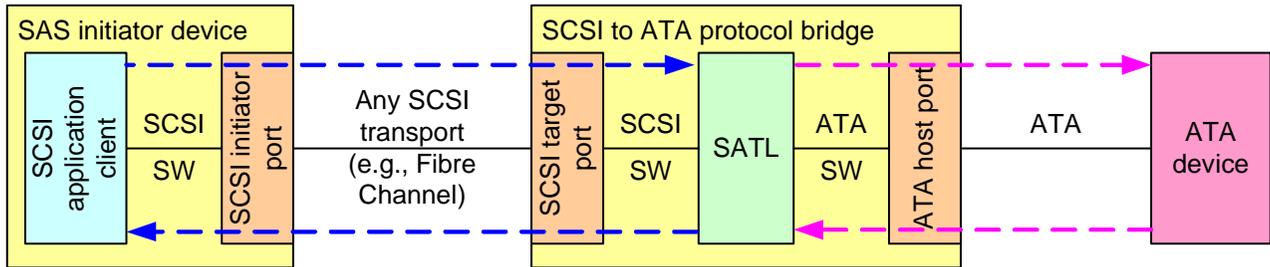

Figure 5 — SATL contained within a SCSI target device

> EXAMPLE 2 - Figure 6 shows an ATA Host Bus Adapter (HBA) directly connected to ATA device(s) and/or ATAPI devices, and providing SCSI transport protocol layer services to a SCSI application client in accordance with SAM-3.
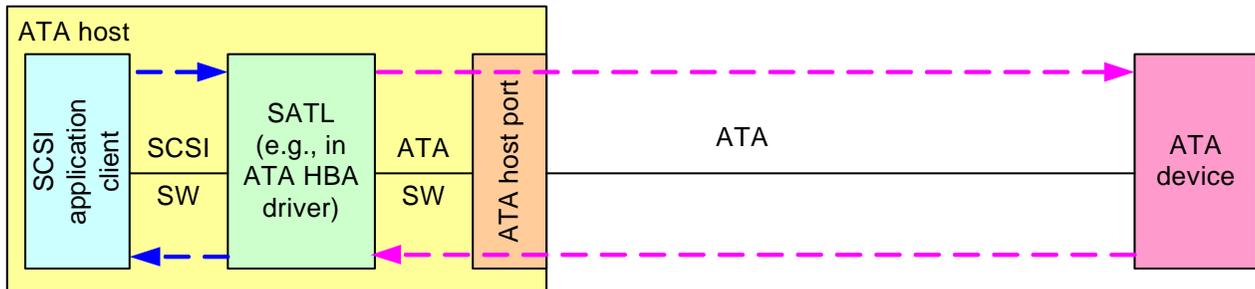

Figure 6 — ATA HBA directly connected to ATA devices and/or ATAPI devices

> EXAMPLE 3 - Figure 7 shows a SAS STP initiator port (see SAS-1.1) connecting to ATA devices and/or ATAPI devices. The STP initiator port includes a SATL to provide the SCSI transport protocol layer services to the application client.
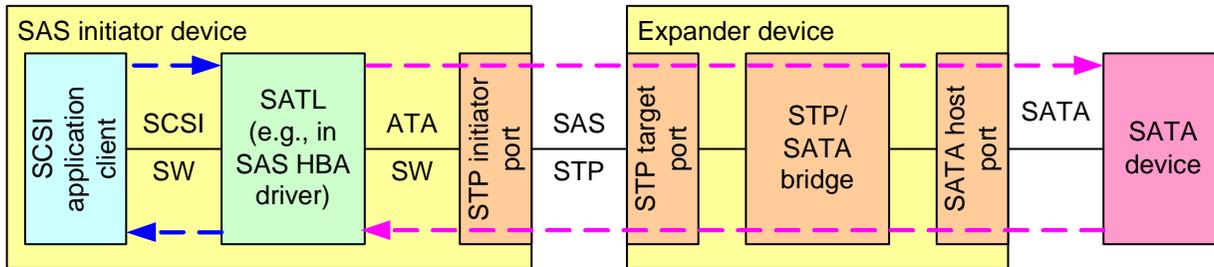
Figure 7 — SAS STP initiator port connected to ATA devices and/or ATAPI devices

Editor's Note 1: The following unordered list is being merged with a similar list in clause 4 and moved to Scope clause, per other LB comments.

This standard defines SCSI/ATA Translation rules for:

a)   generating responses to SCSI task management requests;
b)   returning standard INQUIRY data and VPD pages;
c)   mapping of ATA IDENTIFY DEVICE data to common and protocol-specific VPD pages;
d)   mapping SCSI tasks to ATA commands (e.g., SATA NCQ);
e)   mapping SCSI mode page fields to the capabilities provided by underlying ATA devices;
f)   implementing mode pages, and the effects of mode page settings on ATA-domain operations;
g)   returning log pages;
h)   implementing read and write commands;
i)   implementing the ATA PASS-THROUGH command;
j)   returning SCSI sense data with respect to conditions that may occur in the ATA domain; and
k)   mapping ATA responses to SCSI responses.

Modify subclause 6.2.4 as follows:

6.2.4 Multi-initiator and multi-port command queuing

In some configurations the SATL may receive SCSI requests from multiple initiator ports. If the SATL is accessed through a SCSI target port the SATL may be accessible by more than one SCSI initiator port and through more than one SCSI target port. As receives SCSI requests from multiple initiator ports (e.g., the configuration shown in figure 5), as specified in SAM-3, the task tags maintained in the SATL mapping of task tags to NCQ tags or TCQ tags shall be qualified by the I_T_nexus I_T nexus from which the command was received. When translating from an NCQ tag or TCQ tag to the corresponding SCSI task tag, the SATL shall determine the correct SCSI I_T_nexus I_T nexus using the qualification information associated with the SCSI task tag. The SATL may return TASK SET FULL even if the SATA ATA device has available NCQ tags or TCQ tags in order to maintain tags available for other initiators.