October 2917, 2002

To: T10 Technical Committee
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Re: Allowing STP Initiators to close connections

Currently in the SAS specification, section 7.15.3 requires that an STP initiator port shall not originate closing a STP connection. I believe this rule was intended to simplify the expander's role in managing connections, and would eliminate any need for the expander to handle the case where the connection is closed while the SATA target is sending a FIS to the initiator.

However, this restriction can be a problem for an initiator that is connected to both SSP and STP targets. Since connections are opened and closed very frequently in SSP protocol, it will be common for initiators to allocate resources (such as DMA engines, data buffers, etc) for an SSP task, and attempt to reestablish a connection to a SSP target. A conflict can arise when an overriding (based on AWT) STP connection is established that also requires the same resources, after they have already been allocated for another purpose.

Revision 0 of this proposal attempted to list specific conditions in the ATA protocol where an initiator could originate a CLOSE for a STP connection. This was discussed in the STP study group, and it was requested to make this more generic instead of specifying a number of specific conditions. The group generally felt that an STP connection could get closed whenever there was not a frame transmission in progress, characterized between the R_RDY transmission until the end of the frame.

Proposed changes to the SAS rev 1b specification are:

Section 7.12.7 Closing a connection – Add a reference to section 9.3.1 in the second paragraph.

Section 7.15.3 Preparing to close an STP connection – Move entire section of info to section 9.3.1. Remove the first sentence restriction.

Section 9.3.1 SATA tunneling –

1. Add the following paragraph:
An initiator or expander device shall not originate closing a STP connection after ~~it has sent~~sending a SATA_X_RDY or SATA_R_RDY until after ~~it has~~ both ~~sent~~ sending and receiv~~ed~~ing SATA_SYNC. An initiator or expander device shall transmit a CLOSE primitive ~~if it receives~~after receiving a CLOSE primitive.

2. The sentence after table 72 regarding SATA primitive in connections is not complete. Recommend to remove the list of specific primitives and just end sentence with "as defined by SATA."