Proposed **Serial ATA**

Draft **International Organization**

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Title : Apply SATA 2.5 Design Guide 2 for all devices

Proposed change to Serial ATA Revision 3.0

This is an internal working document of the Serial ATA International Organization. As such, this is not a completed standard and has not been approved. The Serial ATA International Organization may modify the contents at any time. This document is made available for review and comment only.

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Document History

Version	Date	Comments
1	03/17/2009	Initial draft.

1 Introduction

Serial ATA Revision 2.5 Design Guide 002 ("SATA25_Supp_002.pdf") contains material describing the situation when a software reset is sent by the host after the OOB sequence has completed but before the device has sent the signature FIS34h.

It inserted language into the Port Multiplier section, but the material really applies to all device types.

This document proposes to insert the language into a different section of the specification and to remove similar language from the port multiplier section.

2 Summary of Design Guide 2 Recommendation

"Recommended Host Behavior:
It is recommended that host software not issue SRST prior to successful reception of the Signature FIS by the host, unless the host is Port Multiplier aware. In a scenario of a failed/timed out power up or hardware reset, the recommended recovery is the issuance of a hard reset (i.e. COMRESET). "

"Recommended Device Behavior:
In the case that a device has not sent a Signature FIS (e.g. prior to completion of spin-up) and receives X_RDY from the host, a device may hold off responding with R_RDY until its application layer is in a state which it is able to process a new command/control FIS from the host controller including SRST. In some cases, this may be held off until after transmission of the Signature FIS. A device is required to respond to the host's X_RDY transmission, but the response may be deferred as mentioned above. "

3 Proposed Changes to Serial ATA Revision 3.0

[editor note: New text is marked as underlined in blue color. Material to be deleted ~~is red with strikethrough markings.~~]

9.6.4 Link Receive State Diagram

Table 71 – State Diagram Link Receive

LR1: L_RcvChkRdy	Transmit R_RDY$_P$.		
	1. X_RDY$_P$ received from Phy.	→	L_RcvChkRdy
	2. SOF$_P$ received from Phy.	→	L_RcvData
	3. Any Dword other than (X_RDY$_P$ or SOF$_P$) received from Phy.	→	L_IDLE
	4. PHYRDYn	→	L_NoCommErr[1]
	NOTES: 1. The Link layer shall notify the Transport layer of the condition and fail the attempted transfer.		

LR2: L_ RcvWaitFifo	Transmit SYNC$_P$.		
	1. X_RDY$_P$ received from Phy and FIFO space available.	→	L_RcvChkRdy
	2. X_RDY$_P$ received from Phy and FIFO space not available.	→	L_RcvWaitFifo
	3. Any Dword other than X_RDY$_P$ received from Phy.	→	L_IDLE
	4. PHYRDYn	→	L_NoCommErr[1]
	NOTES: 1. The Link layer shall notify the Transport layer of the condition and fail the attempted transfer.		

LR1: L_RcvChkRdy state: This state is entered when X_RDY$_P$ has been received from the Phy layer.

When in this state, the Link layer shall transmit R_RDY$_P$ and wait for SOF$_P$ from the Phy layer.

In the case that a device has not sent a Signature FIS (e.g. prior to completion of spin-up) and receives X_RDY from the host, a device may hold off responding with R_RDY until its application layer is in a state which it is able to process a new command/control FIS from the host controller including SRST. In some cases, this may be held off until after transmission of the Signature FIS. A device is required to respond to the host's X_RDY transmission, but the response may be deferred as mentioned above.

Transition LR1:1: When the Link layer receives X_RDY$_P$ from the Phy layer, the Link layer shall make a transition to the LR1: L_RcvChkRdy state.

13.15.4.1.1 Considerations when Port Multiplier Not Present

Directly attached devices may not be prepared to receive a software reset from the host prior to transmission of the Signature FIS.

It is recommended that host software not issue software reset prior to successful reception of the Signature FIS by the host, unless the host is Port Multiplier aware.

~~Devices may receive a software reset prior to transmission of the Signature FIS if the host is Port Multiplier aware. In the case that a device has not sent a Signature FIS and receives X_RDYP from the host, a device may hold off responding with R_RDYP until its application layer is in a state that is able to process a new command/control FIS from the HBA, including software reset. In some cases, the device may hold off transmission of R_RDYP until it is prepared to transmit the Signature FIS.~~