

**From:** Gerry Houlder, Seagate Technology <gerry.houlder@seagate.com>  
**Subj:** May 28 Interface Power Management Telecon minutes  
**Date:** May 28, 2008

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This teleconference occurred on May 28, 2008 at 2:00 pm CDT. The teleconference was hosted by Gerry Houlder (Seagate) and 15 attendees were recorded. Attendees were as follows:

Gerry Houlder (Seagate)  
Kevin Marks (Dell)  
Kiran Vedanabhatia  
Kishore Karthik  
Bill Martin (Emulex)  
Dan Colgrove (Hitachi GST)  
Pak Seto  
Paul Wassenburg (Marvel)  
Tim Symons (PMC-Sierra)  
Yanini Shastry  
Wayne Belamy (HP)  
Martin Schulze (ST Micro)  
George Penokie (LSI)  
Amit Shah (Intel)  
Mark Evans (WD)

The agenda included discussion of these proposals:  
08-015r2 – SAS: Add low power transceiver options  
08-206r0 – SAS-2+: low power transceiver options  
08-249r0 – SAS-2+: Link Layer Power Management

There was also discussion of SCSI reflector message from Rob Elliott that presented his opinions for a different approach to low power management (use a new address frame instead of primitives to invoke low power mode). Since Rob was unable to attend, there wasn't much discussion of his email other than notice that use of address frames involve more levels of the state machines while primitives can be handled at the link layer or lower with small impact to higher level machines.

There was general agreement that the waveform in 08-015r2 depicting typical recover sequence from low power mode is the correct approach. There was general agreement that the goal of doing the recovery with less than 100 us of synchronization time is reasonable, but folks were asked to review this further with their hardware needs. Suggestions were made to add some more detail to this figure. We also discussed (with no conclusion) whether a different primitive besides ALIGN(0) should be used as the synchronization primitive.

We noted that the 206 proposal defines similar SP state machine states as the 015 proposal but accomplishes the work in fewer new states. Folks were asked to review this off-line to determine if we can get by on the fewer states or not.

The use of the Protocol Specific Port mode page to give permission to targets to initiate low power mode negotiation was discussed. I was asked to add a separate permission bit for partial mode. There was discussion of whether similar permission bit(s) should be defined in a Phy Control SMP function so an initiator can do similar control of expanders. There was discussion of whether these permission bits should be reflected in the capability bits in the Identify frame (e.g., set the bit in its outgoing Identify frame only if the Allow bits were set in the mode page). There was no agreement on this issue.

The addition of capability bits (per the 249 proposal) to the Identify frame was liked by most but some wondered if this was needed. It was noted that this provides each end with a clue to determine whether it should initiate power management negotiation with the other end.

The addition of power mode bits to Discover and Discover List SMP functions was noted and received general support.

The group agreed that another telecon should be scheduled for June 18, 2:00 pm. Gerry Houlder will make the arrangements and send email to the reflector with the details.

George Penokie noted that SATA power management is entirely incompatible with SAS. The SAS power management primitives are properly defined as only being valid outside of any connection (SSP, SMP, or STP). Using SATA power management inside of an STP connection seems impractical and using SAS power management to control STP is impossible. There might be a way to define an expander register that somehow allows it to use SATA power management when power management is appropriate, but this is entirely outside the scope of the SAS power management proposals.

The teleconference ended at 4:00 pm (2 hours in length).