Minutes of SAS Protocol Teleconference - May 21, 2002

The teleconference was held from 10:00 am to 1:10 pm CDT. At least the following people were present on the call:

Steve Byan
Ting Chan
Dan Colegrove
Jim Coomes
Rob Elliott
Bill Galloway
Ed Gardner
Dana Hall
Tim Hoglund
Arie Krantz
John Lohmeyer
Lafe Moon
Dave Noeldner
Matt Otto
Jim Reif
Scott Younger

The agenda was:

- Scrambler bit order [Coomes]
- CRC code sample [Coomes]
- SAS OOB timing (02-198) [Elliott]
- Review of SAS document (02-157) [Elliott]
- SAS PHY MARGIN CONTROL request (02-179) [Roberts]
- BREAK impact to transport layer [Hall]
- Define behavior if extra ACK or NACK received [Hall]
- Primitive to say all credit has been sent [Galloway]
- AEN on SAS (02-196) [Penokie]
- Hash in or out? [Galloway]
- What does it mean to ignore or discard a frame? [Galloway]
- SAS Identification State Machine (02-197) [Penokie]

Items added at the meeting:

- Seagate questions [Coomes]
- SMP Protocol [Hall]
- Hard Reset Primitive [Hall]

**** Scrambler bit order [Coomes]**

Deferred. The group gave Jim some guidance on scrambler issues.

**** CRC code sample [Coomes]**

Deferred.

**** SAS OOB timing (02-198) [Elliott]**

Rob Elliott presented 02-198, SAS OOB timing.

There was a question of whether we should require devices to support ALIGNS during OOB at rates below its minimum supported data rate. Dana Hall asked if the PHY group had considered this issue. The group agreed that for SAS-1, it would not hurt to leave in the sentence, "This includes rates below its lowest supported rates". We may need to revisit this issue for a future version of SAS.

Rob agreed to prepare a rev 1 for the June 5-7 meeting.

**** Review of SAS document (02-157) [Elliott]**

Deferred.

**** SAS PHY MARGIN CONTROL request (02-179) [Roberts]**

Deferred.

**** BREAK impact to transport layer [Hall]**

Dana Hall said he would prepare a proposal for the June 5-7 meeting.

**** Define behavior if extra ACK or NACK received [Hall]**

Dana Hall said he would prepare a proposal for the June 5-7 meeting. Rob reported that George Penokie had said that an ACK received before an EOF currently would be treated as an ACK for the current frame.

**** Primitive to say all credit has been sent [Galloway]**

Bill Galloway asked whether anyone would object to treating this as a transaction layer to transaction layer signal. The transport layer would merely notify the higher layer that it has been received. In this case, Bill would define a set of such primitives, with this one being the first one defined in the set. There was some discussion about which layer would actually have the information to source this primitive.

Bill said he would prepare a proposal for the June 5-7 meeting.

**** AEN on SAS (02-196) [Penokie]**

Rob Elliott presented George's proposal (02-196). Rob was concerned that the proposal would remove the identification of who sent the AEN. This would mean that all initiators would need to poll all devices to find out who sent the AEN.

Bill Galloway said that the total population of SAS devices is small enough in a domain that the polling should not be an issue.

The question is whether we should use the primitive-based AEN method (with no source device identification) or should we use a frame-based AEN method. The problem with the frame-based AEN is which devices to send it to, which is difficult for power-on notification.

We need to ask our software people which they like best. We will keep this issue on the agenda for the June 5-7 meeting.

**** Hash in or out? [Galloway]**

Deferred. Bill said he would prepare a proposal for the June 5-7 meeting.

**** What does it mean to ignore or discard a frame? [Galloway]**

Deferred.

**** SAS Identification State Machine (02-197) [Penokie]**

In the absence of George Penokie, John Lohmeyer presented 02-197. None of the group had previously reviewed the proposal, which was uploaded the day before. Rob asked people to review the interaction of this state machine to the other state machines.

Jim Coomes will review the time from losing both the signal and dword sync before starting OOB.

Rob Elliott will add a 1 millisecond delay before starting OOB.

This topic was deferred to the June 5-7 meeting.

**** Seagate questions [Coomes]**

Jim Coomes had the following questions:

1) The primitive table (table 24) does not show devices receiving the Hard Reset Primitive and should.

2) How much error checking should be done on an IDENTIFY frame? Rob Elliott: check CRC and frame size.

3) Should retries occur during the individual steps of initialization? Bill Galloway: Loop back to the beginning. Rob Elliott: Section 7.5.1 talks about doing retries on the IDENTIFY frame. Bill: This could lead to infinite loops. Rob said he would write a proposal for the following changes to this section:

- If no IDENTIFY received in 1 ms, go back to OOB.
- If an extra IDENTIFY is received, ignore it.
- If inside a connection, ignore it; BREAK will eventually follow.

4) Table 54. The XFR_RDY information unit type is 3 in SAS but 5 in FC. Was this intentional? Answer: No.

5) 7.11.3 It appears we (every post that sends an OPEN) need to remember the AWT value we sent in the OPEN frame (rather than just using the current value of the timer) in the event we receive an OPEN frame and need to compare to see who wins? Answer: Yes, both values are needed. Bill will attempt to clarify the wording.

6) SMP - These frames don't have ACK's or R_RDY's so they'll need to be handled differently from normal SMP frames. Do we really need to support any of these? What is the required response time to service these functions?

The question became whether targets should be required to support SMP. At the moment, the far-end loop-back test is entered with SMP. Do we really need this test since the PHY group has questioned why it was included (after we thought they requested it!)?

7) 7.7.1.2 Far-end loop-back, Are there any timing requirements from the receipt of the SMP PHY Control Function to invoke far-end loop-back until we actually switch the mode? In other words, can the firmware detect this and do the switch or would the hardware have to automatically? Same question with turning off via BREAK/CLOSE/OOB?

Add to agenda for joint meeting with PHY group June 5-7.

8) Loss of Word Sync - Do we do OOB after 1 ms loss of word sync?

Part of Jim Coome's action item, above.

9) Hard Reset - Should we respond only during the link reset? (We'll probably provide a configuration bit to ignore or respond to the Hard Reset outside of link reset.)

Deferred to June 5-7 meeting.

10) 7.5.1 If we receive a second IDENTIFY, we need to send ours again. I know this is in the event that ... (rest of question omitted -- it is similar to question 3).

Deferred to June 5-7 meeting.

**** SMP Protocol [Hall]**

This item was covered under the Seagate questions.

**** Hard Reset Primitive [Hall]**

This item was covered under the Seagate questions.

**** Recommendations to T10:**

Recommendations from May 14, 2002 teleconference:
  that 02-169r2 be accepted for inclusion in the SAS working draft
  that 02-170r1 be accepted for inclusion in the SAS working draft

Recommendations from May 21, 2002 teleconference:
  none.

**** Meeting Schedule**

A SAS Protocol teleconference is scheduled for June 18, 2002:

Call information:
   Tuesday June 18, 2002
   11:00 am -- 2:00 pm EDT
   10:00 am -- 1:00 pm CDT
    9:00 am -- noon   MDT
    8:00 am -- 11:00 am PDT

   USA Toll Free Number: 877-417-9828
            Toll Number: +1-706-679-9028
        Conference Code: 719 533 7560

WebEx Session: http://seagate.webex.com/
 Meeting Name: SAS Protocol teleconference
     Password: to be announced on T10 reflector

Face-to-face SAS Protocol meetings are scheduled for:

June 5-7, 2002 in Minneapolis, MN, starting at 9:00 am on Wednesday and ending at noon on Friday. See http://www.t10.org/ftp/t10/sas0605.txt for meeting information. There will also be a concurrent SAS Physical meeting.

June 24-26, 2002 in Denver, CO starting at 9:00 am on Monday and ending at noon on Wednesday. See http://www.t10.org/ftp/t10/sas0624.txt for meeting information. (No concurrent Physical meeting.)

July 15-16, 2002 in Colorado Springs, CO with T10. See http://www.t10.org/ftp/t10/announce/ann-m050.pdf for meeting information and http://www.t10.org/ftp/t10/mtg_map.txt for meeting times. There will also be a concurrent SAS Physical meeting.