Joint T10-T11.3 Working Group AdHoc Meeting T11/00-433v0
July 10, 2000 – Colorado Springs, Colorado
9:00 AM – 1:00 PM

1. Introductions: Group

Facilitator Dave Peterson called the meeting to order at 9:00 AM and welcomed the participants. He thanked LSI for hosting the meeting and had the participants introduce themselves.

2. Approval of this agenda T11/00-428v1

Approved with a few additions.

3. Approval of minutes T11/00-398v0
Working group minutes of 6/7/00 Stewart Wyatt

Paul Suhler attended last months meeting but failed to sign the attendance sheet. He has asked that the attendance list in the minutes be updated to reflect his attendance.

4. Review of old action items Stewart Wyatt

#1. Bill Martin requested to review out-of-order proposal for corner case problems. Open

#2. Bob Snively - Add to FC-FS changes to close a sequence with SRR and legalize SRR changing sequence initiative transfer in the exchange error recovery. Propose including SEQ_ID in recovery qualifier.
To be reviewed today and taken to FC-FS

5. Discussion items: T10/00-260r1
T10/00-275r0
FCP-2 Recovery Problem and proposed solution Bob Nixon

Bob Nixon represented Dave Baldwin who couldn't be here today. Document 260r1 is problem statement and a proposed solution while 275r0 is the overheads Bob used in the discussion. This issue has been posted to the reflector and generated an enormous amount of traffic.

The problem is unique to queuing in Class 3. It occurs when a command is received which only requires a response. The initiator receives the response and considers the command to be completed. The target, not knowing for sure that the initiator received the response, retains the exchange information. At a later time the host issues another command with the same OX-ID, but the command is lost before it reaches the target. When the host attempts to recover from the error by sending an REC, the target assumes that the recovery referred to is the first command and responds that the command is completed. The host assumes the second command was delivered and completed.

Here are some comments that came from the discussion. The problem does not occur with Class 2 because the host learns the RX-ID from target when it receives the ACK for

the command. With the RX-ID the two commands can be distinguished. Rob Basham pointed out that even if a target completes a read command in Class 3, it does not know that the host received any of the frames and must reply to a REC with a RX-ID of 0xFFFF even if it has assigned a value. So the problem can potentially occur when the first command is a read. Using FCP_CONF solves the problem for Class 3, however with a double error where the CONF and the subsequent command are lost, the problem remains.

The consensus was that this problem needed to be solved before work could continue on other aspects of FCP-2. The rest of the Joint meeting was devoted to this discussion. Editor Bob Snively stated that solution should simplify the implementation and that he was willing to rewrite FCP-2 to achieve that end.

In Dave's documents he proposed a solution of adding a 32-bit value to the command in the header parameter field, which he called FCP_2Handle. References to the command from an REC or SRR would include the 32-bit value to qualify the command. While there was agreement that this would work, the solution seemed unappealing. A review of the math revealed that the 32-bit value was large enough to protect the command beyond 10 Gigabit/sec transfer rate.

It was observed that the FCP_2Handle and the CRN, while used for different purposes, are similar enough that the same number could be used for both functions, if the size of the CRN was increased to 32-bits.

With this opening, Matt Wakeley started a discussion about a concern he had with the CRN implementation. CRNs are assigned per LUN. After Agilient engineers began implementing this feature, the resources required to keep track of a unique CRN for each possible LUN made the implementation impossible. Matt wanted the CRNs to be assigned on a per target basis. He argued that the target mechanism that directed the incoming commands to the LUN could do the order checking and guarantee that the commands were delivered to the LUN's in order. The following discussion disclosed that for the change Matt was suggesting the CRN would have to be increased from its current 8-bit size to something much larger. Also if a command were missing to the target, command delivery would be held up far all LUNs in the target not just the one with the missing command. No resolution was reached after this discussion.

Other areas of discussion included the impact of a solution on FC-SB, effect on SAM-2, concerns about crossing FC-2 and FC-4 layer boundaries, defining a new FCP_CMND IU that included the FCP_2Handle or using the CDB control byte for the FCP_2Handle (rejected because there are only 3-bits available). It was getting to be lunchtime without the discussion coming to any consensus. The Joint meeting was adjourned. The principal discussants were invited to eat lunch together to come up with a proposal for discussion in the SCSI CAP meeting in the afternoon.

When the afternoon session started, Bob Snively summarized the lunch discussion by noting that there are two "orthogonal" problems. The first is the issue of ordering commands and the second is the "Baldwin" problem. There were four identified solutions.
#1 Baldwin's proposed solutions.
#2 Requiring Class 2 where use of RX-ID is required.

#3 A combined solution of both problems where an expanded CRN is used as the FCP_2Handle.
#4 Something else.

Several rounds of voting occurred. The second and fourth solutions did not receive significant support. The votes were split between first and third solutions. Baldwin's solution had one more vote than the combined solution. Bob Snively announced that he, Dave Baldwin and Bob Nixon would develop a proposal based on Baldwin's proposal for the next meeting.

Another issue that was discussed was the elements of the recovery qualifier. Currently SEQ_CNT is included and SEQ_ID is not. This approach is unintuitive and when a recovery qualifier is in effect, requires avoiding a specific range of SEQ_CNTs irrespective of the SEQ_ID. Some of the participants felt that retiring the SEQ_ID would be easier to implement than the current SEQ_CNT requirement. Bob had a proposal to take to FC-FS to make this change. In the initial discussion the proposal was criticized and Bob said he would not pursue it. However as the meeting progressed, Bob's proposal received additional support and so may not be dead.

6. FCP-2 Bob Snively
a. Draft of Annex D T10/00-266r0
b. T10/00-230r3 FCP-2 items that need to be included in FC-FS. T10/00-230r3

The later part of the SCSI CAP meeting was spent reviewing the draft of Annex D.

7. SSC-2 Status Dave Peterson

First draft should be available within two weeks. Dave said the changes included large block addresses and set capacity commands, along with some SCSI-3 additions. George Penokie asked if support for persistence reservation was included. An action item was taken to check the draft for this support.

8. Unscheduled business: Dave Peterson
Call for new Secretary. Dave made a plea for someone to replace Stewart Wyatt without receiving any response.

9. Next meeting requirements:

Dal recommended that the T10 week just have the SCSI CAP meeting and expanded to cover the entire day since the joint group has not found a replacement secretary.

10. Review new action items: Stewart Wyatt

Old Action items:
#1. Bill Martin requested to review out-of-order proposal for corner case problems.
#2. Bob Snively - Add to FC-FS changes to close a sequence with SRR and legalize SRR changing sequence initiative transfer in the exchange error recovery.

New Action items:

#1. Bob Snively, Bob Nixon and Dave Baldwin – publish a resolution to the FCP-2 problem recovering the proper command based on Dave Baldwin's proposed solution.
#2 Dave Peterson check on persistent reservation in SSC-2.
#3. Carl Zeitler review R_A_TOV verses REC_TOV in D.5, also D.8, D.10.

11. Adjournment: Group

The group adjourned for lunch at 11:30PM. The discussion continued in SCSI CAP meeting in the afternoon which ran from 1:00PM until roughly 6:00PM.

Attendance:

Dave Peterson	STK	Stewart Wyatt	HP
George Penokie	IBM	Matt Wakeley	Agilient
Rob Basham	IBM	Ken Moe	SUN
Bob Snively	Brocade	Ralph Weber	ENDL
Bob Nixon	Emulex	Steve Sletten	STK
Neil Wanamaker	Crossroads	John Tyndall	Crossroads
Jim Coomes	Seagate	Dave Ford	NetApp
Pak Seto	Interphase	Dal Allan	ENDL
Nathan Hastad	General Dynamics Info.Sys		
Erich Oetting	StorageTek	Carl Zeitler	Compaq
Ed Gardner	Ophidian Designs		