

Joint T10/T11.3 Activity Working Group AdHoc Meeting
Nashua, NH 5/15/00 9:00 AM – 12:00 PM

T11/00-296v0

Stewart Wyatt, Hewlett Packard, Secretary

1. Introductions:

Dale LaFollette

Dale LaFollette called the meeting to order shortly after 9 AM. He thanked Hitachi Cable for sponsoring the meeting and had the participants introduce themselves.

2. Approve this Agenda:

T11/00-242v0

Dale LaFollette

The agenda was approved. Bob Snively requested that the FCP-2 review be last item discussed.

3. Approve 04/05/00 Minutes:

T11/00-242v0

Stewart Wyatt

Approved.

4. Review Old Action Items:

Stewart Wyatt

Old Action Items:

#1 Bob Snively – FS end exchange cases needs to include class 3 of lost FCP_CONF.

Check for other new end exchange cases. Ongoing

#2 Neil Wanamaker – Revise proposal defining behavior when both target and initiator bits are set in PRLI. Completed

#3 Charles Binford – Proposal for target to inform initiator of cleared commands. Will be presented Wednesday.

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

Ongoing

#5 Carl Zeitler: Proposal extending RR_TOV proposal for action next month. On today's agenda.

New Action Items

#6. Review Dave's SSC-2 proposal, T10/00-173r0, for the SSC-2, prior to next month's T10 meeting. Completed

#7. Paul Suhler: Update T10/00-161r1, noting that the command applies to the "mounted" media and persists with that media through power cycles, resets and remounts. Completed

#8. Group: Compare Carl's error recovery diagram to see the impact of removing REC from the Class 2 error recovery by reviewing T10/00-137r1 and r2. Completed

#9. Carl Zeitler: On a lost command check to see if the LS bit needs to be set to abort the exchange. Completed

#10. Bob Snively: Text clarifying the differences between the cases of exchange and sequence recovery and queuing and non-queuing environments. In letter ballot resolution comments.

- #11. Carl Zeitler: Return the SRR to all of the error recovery cases and change the text to state that the exchange remains open in class 3. Completed
- #12. Dave Peterson to talk to Jim Nelson to see that all of the error recovery changes are implemented in FC-FS. See document T10/00-230r0 or T11/00-284v0
- #13. Carl Zeitler Review diagram D.5?? and propose a solution to identify the correct exchange to abort. Submit the problem to the reflector for wider comment. Completed
- #14. Charles Binford: Whether the added REC-TOV for out-of-order recovery should be required for in-order recovery. Completed

+++ Joint T10/T11.3 +++

5. FCP-2	T10 FCP2R04	Bob Snively
Letter Ballot Results/Comments	T10/00-005r0	
Letter Resolutions	T10/00-150r3	
FCP-2 to FC-FS	T11/00-284v1	

The joint meeting completed all of the agenda items before adjourning except for this one. The FCP_2 review occupied the entire SCSI CAP during the afternoon and evening.

While not officially the subject of these minutes, the secretary is including some comments for the sake of completeness. Bob Snively completed the review of the letter ballot comments that he wanted to review with the committee before the meeting adjourned at 7:30 PM.

Bob stated that he expects to update the Letter Ballot Resolutions document to the next revision (T10/00-150r4) by the next meeting. During this next meeting (June) he hopes to get a final resolution on comments that were not resolved during the first pass. The following month, July, he will again update the letter ballot comments and will issue a revision 5 of the FCP-2. He expects there will be another letter ballot before the standard is completed.

6. New/Old Business:

A. Action Items	T11/00-137r3	Carl Zeitler
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The document is titled "Ladder Diagrams for Error Recovery For FCP-2 Rev 04 Out-Of-Order Delivery- Annex D."

Carl summarized the changes he made to the out-order proposal. The highlights included: putting SRR back in the Class2 recovery. Carl made a decision to Abort the Exchange when multiple error errors occur, the only exception being the failure of a REC. The use of REC to determine status for recovery in Class 2 optional is made optional.

Carl reviewed the updated diagrams D.3 Class 2, D.5 Class 2, D.5a Class 2.

Charles Binford asked a question about continuously increasing sequence count, which led to a long discussion. Bob Snively reminded the group that Sequence ID is not a qualifier in FC-PH, but the Sequence Count is. The consequence of this is that when

frames are lost and a recovery qualifier is installed, the combination of the OX-ID, RX-ID and SEQ_CNT cannot be reused. After completing error recovery of a sequence error, the SEQ_CNT of the missing frames cannot be reused in that Exchange until RRQ expires.

In the discussion it was noted that the current revision of the FCP-2 requires starting the SEQ_CNT at zero after an error. This needs to be changed for out-of-order error recovery. Charles Binford observed that the SEQ_CNT cannot wrap until the RRQ expires. Stewart Wyatt noted that this requirement has an impact on hardware. Normally the generation of data frames is handled automatically in hardware including the SEQ_CNT. Excluding a SEQ_CNT range would require firmware intervention in existing designs. Both sides need to know what the next expected SEQ_CNT will be.

Bob Snively noted that there are three methods that have emerged for error recovery. First is Exchange recovery. The second is in-order Sequence recovery with a short (zero) R_A_TOV. Finally, out-of-order Sequence recovery requires a longer R_A_TOV. Out-of-order sequence recovery requires control of SEQ_CNT, a non-zero R_A_TOV and the ability to reassemble out-of-order frames.

Bob asked the group where we should go with out-of-order recovery. Should it be included in FCP-2 or delayed to FCP-3. Bob added the caveat that he does not expect to be the editor for an FCP-3. Dave Peterson stated that he would be willing to serve as editor for FCP-3 if Bob is unable. Bob seemed to be leaning towards including the material, noting that it didn't require that much change. Dave Peterson objected. He thought the changes were significant and that more work was needed. He did not want to see FCP-2 delayed.

Carl presented two overheads, "D.?? Class 2 FCP_CONF Lost (Possibility 1)" and "D.??? Class 2 FCP_CONF Lost (Possibility 2)". Dave Peterson argued against using FCP_CONF in Class 2 at all. Carl thought it was still useful as a higher level acknowledgement. Possibility 1 was selected at Charles Binford's suggestion, which involves resending the FCP_CONF.

Carl proposed that error recovery not be attempted if multiple errors appear or the appearance of multiple errors occurs in an exchange. Carl provided an example of what he meant by the appearance of multiple errors using the overheads titled "D.5? Class 2 Multiple Error Condition, Abort the Exchange" and in "D.5?? Multiple Error Condition, Exchange Ambiguities, Abort the Exchange".

Bob returned to the argument of what should be done with Carl's out-of-order diagrams. Expressing his desire to see Carl's work documented. Dave Peterson repeated his concern that including out-of-order significantly changes the document. Charles Binford was concerned about requirements for out-of-order delivery that will reduce in-order performance. He suggested marking these cases with an asterisk and making them optional for compliance testing. Carl wanted to keep them the same noting that he has a proposal to reduce the timeout values that he would be presenting later in the meeting.

Bob suggested including Carl's diagrams as a new Annex E while making minor changes to the current Annex D to make them as compatible as possible. (Bob's words were "exactly parallel".) Then in Clause 12.1.2, Sequence Level Error Recovery, retain the in-order requirement with a note referencing the new Annex E for considerations of the impact of future out-of-order delivery. Annex E would include leading text noting the out-of-order effects on continuously increasing SEQ_CNT, non trivial recovery qualifier, and nominal reassembly of out of order frames. This proposal appeared to be accepted.

T11/00-145v2 "RR_TOV Considerations"

Carl had created a version 1, which had been posted to the reflector and was on the original meeting disk. After the discussion started Carl circulated the version 2 in which he had corrected some errors.

Carl calculated that RR_TOV needed to be 7 times REC_TOV to accommodate multiple errors in an Exchange. With the assumption he had previously propose that the Exchange be aborted if multiple errors occurred the RR_TOV is reduced to 3 times R_A_TOV.

On REC Recovery, Carl suggested reissuing it earlier (R_A_TOV instead of 2*R_A_TOV) since no state change occurs. A double error results in aborting the Exchange.

+++ T10 +++

8. New/Old Business:

A. SSC-2 Project Proposal T10/00-173r0 Dave Peterson

Dave reviewed his proposal with the group. A few editorial changes were noted. Dave got clarification from Gene Milligan on a few questions as well. Bob Snively moved that that the proposal be accepted as modified. Stewart Wyatt seconded. A straw poll was taken which passed 8 to 0. Eric Oetting will present the proposal to T10 latter this week.

+++ ADMIN +++

9. Next Meeting Requirements: Dale LaFollette

Dale will ask for the same amount of time as was requested for this meeting.

10. Review New Action Items: Stewart Wyatt

#1 Bob Snively – FS end exchange cases needs to include class 3 of lost FCP_CONF.
Check for other new end exchange cases. Ongoing

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

#3 Dave Peterson: update the SSC-2 proposal T10/00-173 as modified.

#4 Eric Oetting: Present the SSC-2 proposal to T10.

#5 Bob Snively Reconcile the statement that SEQ_CNT restarts are 0 in clause 8.1 with the RRQ requirements.

#6 Carl Zeitler and Charles Binford check out the validity of establishing a recovery qualifier without an RRQ. A specific case is noted in T11/00-145v2, D.14b Class 3, SRR Response Lost – does it need a recovery qualifier?

11. Adjournment:

Dale LaFollette

The joint meeting adjourned late at 12:15. The T10 SCSI CAP meeting was rescheduled to start at 1:30 where FCP-2 Letter Ballot Resolutions continued.

Attendance:

Dale LaFollette	STK	Bob Snively	Brocade Communications
Stewart Wyatt	HP	Eric Oetting	STK
Suren Sleah	Cam Corp	Carl Zeitler	Compaq
Charles Binford	LSI Logic	Jim Coomes	Seagate
Neil Wanamaker	Crossroads Systems	John Tyndall	Crossroads Systems
John Scheible	IBM	Ralph Weber	ENDL
Ken Moe	SUN	David Peterson	STK
Charles Monia	ADAPTEC	George Penokie	IBM