Joint T10/T11.3 Activity Working Group AdHoc minutes T11/99-679v0.pdf
November 2, 1999 – Seaside, CA, 11AM – 6PM

1 Introductions:

Facilitator Dale LaFollette called the meeting to order at 11 AM and, as is customary, had the participants introduce themselves.

2 Approve this agenda: T11/99-664v0, Group

The agenda was approved with minor changes reflected in these minutes. Ed Gardner, noting that he and a number of other participants were only interested in the Fibre Channel issues, requested that the Fibre Channel issues (FCP-2) be handled separately from the SCSI issues (SSC and SMC) on the agenda. He preferred that they be handled first so he could leave early. Bob Snively supported Ed's request as did others. Dale agreed to reorder the agenda to support this request. In the future the Fibre Channel issues will be first on the agenda and the SCSI issues second. These minutes have reordered the posted agenda per this decision.

3 Approve 10/05/99 Minutes: T11/99-620v0, Stewart Wyatt

Stewart Wyatt reviewed some comments that Gene Milligan had posted about last month's minutes. He accepted all of the comments, clarifying a few issues with the group, and promised to post a updated version of the minutes with these corrections.

4 Review old action items : Stewart Wyatt

Old Action Items

#1 Dave Baldwin, Emulex. Refer default E_D_TOV issue to FC_FS. Prefer a 2 second to 10 second for point to point connections. Deferred, as Dave was not in attendance. Dave was not in attendance this month either. Charles Binford agreed to take the action item and make the proposal.

#2 Paul Suhler. Proposal to add Hold addition to load/unload command. Updated proposal, post to reflector and continue discussion. Deferred last month as Paul was not in attendance. Completed in this meeting, new action items were created.

#3 Dale LaFollette, write up informative annex on read errors for the FCP-2. Dale was waiting for a template from Bob Snively before completing this item. Completed

New Action Items

#1 Dave Peterson for the next revision of the SSC. Define unique for the medium (GEM#38) and clearer statement defining sequential device positioning (GEM#39). Completed

#2 Group, at Bob Snively's request, review clause 11, Error Recovery Procedure, in the latest FCP-2 draft and the review document, T10/99-247r1, clause 3.25, Permission to do recovery, and clause 3.28, Hold exchange information. Completed

#3 Bob Snively, Reinstate the requirement in the FCP-2 that targets begin error recovery on the boundary required by the initiator. Modifications are required in 99-247r1 clauses 3.29, remove last paragraph, and similar errors are in clause 3.30 and 3.31. Error recovery boundary must be modulo 4 relative offset. Completed though there was considerable discussion in the meeting about the modulo 4 requirement in this meeting – see below.

#4 Bob Snively to provide process associator modification notification and sample text. Completed as process associators will be retained (against Bob's wishes – see below).

#5 Bob Snively make the RSP_CODE and the SCSI Status mutually exclusive. Completed

#6 Bob Snively. The FCP-2 shall require targets to transmit the ACC for the SRR before transmitting any recovered data. The target shall not transmit any additional non-recovered data after transmitting the ACC. Completed

#7 Group at Bob Snively's request, review the change document clause 6.3, Incorrect use of Recovery Abort, and FCP-2 clause 11.5.1. Completed

#8 Charles Binford Propose a new RESP_CODE 0x06: Command cleared by another initiator. Take new status code to SAM-2. Ongoing

#9 Bob Snively add clearing effects of PRLI on mode pages as defined in these minutes in agenda item 10A to the FCP-2. Completed

Dale LaFollette asked the group how many participants would be attending the T10 meeting January, in Australia. Only two of the participants indicated that they would be attending. One of these was Bob Snively, the FCP-2 editor. Dale LaFollette, the facilitator, Dave Peterson, SSC Editor, Erich Oetting, SMC Editor and Stewart Wyatt, Secretary will not be attending. Bob Snively agreed to function as the facilitator, secretary and editor at the January meeting. Dale LaFollette agreed to be the agenda together for that meeting.

5 FCP-2: T10 Working Drafts FCP2R04, Changes to FCP-2, T10/99-350r0, Bob Snively

Bob reviewed his latest change document, T10/99-350r0, which documents the intended changes to produce a revision 4 of the FCP-2. These minutes only reflect the issues where there was significant discussion.

Clause 1.1, Rules for ELS generation before Login. (These rules may need to be included in the FC-FS.) There was some discussion about the relevance of this effort. Dal Allan

questioned why any should be accepted. Bob Snively noted that Bob Kembel thought that very few rejected. Bill Martin noted that a target would respond to some ELS's with a LOGO. There was some discussion about what the standard actually required, per some previous communication with Bob Kembel. Bob Snively noted two examples that would be useful, ECHO and RLS (Read Link Status) ELS. There was agreement that these should be included. Jim Coomes suggested TEST. Bill Martin added ADISC. The group agreed that these four ELS would be the only ELS allowed before PLOGI (which must be after a FLOGI). RNID and RTIN, used in a new proposal for discovery, were also proposed by Charles and Bill. These were discussed and need more investigation before being included in the list. Charles mentioned another error recovery ELS but could not recall the details. The group agreed to the first four. Additional research needs to be done on the discovery ones. Bob Snively will investigate the discovery ELS.

Clause 1.2, Cross references between Clause 11 and Annex C. Bob Snively indicated that he intended to provide the cross references to improve the readability of the text. Matt Wakeley wanted the diagrams of Annex C incorporated in Clause 11. He noted that first time readers required the diagrams to understand the text. Dal Allan, agreed, stating that all of the information together should be put together in one place. Annex C is currently informative text. Moving it into clause 11 would make it normative. Bob was concerned about making an example normative as alternate implementations should not be prohibited. Dal Allan said it should be presented as a normative example which resolves Bob's concern. After this observation, Bob agreed to make Annex C a normative example and move it into clause 11.

Clause 1.3, DSA-RHA clarification, Jim Coomes. This is the same item that was on the original agenda as item "7 (renumbered to item 6) DSA/RHA: T10/99-226r2, Jim Coomes". Jim came forward and noted the text clarifications he had made. Bob asked if there were any objections to include this text in Rev 4 of the FCP-2. Dal Allan reviewed the clarification to see that the previous concerns had been addressed. He was satisfied when the review indicated the clarifications had been made. There were no other objections raised.

Clause 1.5, LSI 004, Restriction of FCP_CONF usage. Bob Snively suggested that a FCP_CONF should only be used for valid SCSI completion responses (status and sense) and not for task management or link completion reponses. Dal Allan discussed this at length, finally agreeing with Bob as he couldn't come up with an exception. Matt Wakeley was concerned that this distinction might be difficult for a target to distinguish. Stewart Wyatt asked how the initiator would handle an incorrect response. Bob Snively replied by saying the initiators actions would be indeterminate.

The need for a valid RX-ID for recovery was also discussed. In some cases the target must provide a valid RX-ID for the new error recovery routines to work. In particular if the initiator believes the exchange is closed while the target believes it is still open (because of a lost ACC or FCP_RSP). The initiator may reuse the OX-ID resulting in the ABTS from the target aborting the exchange. To clarify the discussion overhead ladder

drawings were made which quickly became so messy that the secretary found them too confusing to be useful.

One interesting observation was made during this discussion. Task Management Function are not SCSI commands. In a class 3 unqueued implementation, the arrival of a TMF does not allow the target to drop the status information for the previous exchange as the arrival of a SCSI command does.

Stewart Wyatt asked if a valid RX-ID would be required for a Class 3 implementation that doesn't support queuing or use FCP-CONF. There does not appear to be a need or requirement for valid RX-ID in this environment.

Dave Peterson questioned the need for using FCP-CONF in Class 2. Dal Allan noted a difference between FCP-CONF and ACK in the hierarchy of an implementation, arguing that an ACK is not a confirmation. Dave was not convinced. Jim Coomes also noted that the FCP_CONF is required to support a classless error recovery solution. Dave reluctantly conceded the point.

Clause 1.7, LSI 030, RO during recovery. Dale LaFollette asked to make a presentation. He presented a hand drawn overhead showing a frame loss in the middle of an IU. He assumed the RO presented in the ACC to the REC would be the last valid data received. Bob Snively noted that the error recovery requires discarding all data in the sequence after the error and recovering everything after the error. Stewart Wyatt noted that during a write operation error recovery, the target could indicated a error value in the ACC and a different value for recovery in the FCP-XFER-RDY or the target could note in the ACC the relative offset it wishes to begin recovery at so that the two values were always the same. Dal Allan was quick to identify the second approach as correct. It was agreed that the target should provide an identical relative offset for both the error recovery ELS as in the transfer ready.

Dale then displayed another hand drawn overhead to illustrate his concern about requiring modulo four recovery. (These minutes of Dale's overheads are somewhat simplified but illustrate his concern.)

Imagine a transfer of a number of fixed blocks of a size of 1001 bytes. The target chooses to make each block a single sequence transfer. Consequently the first sequence has an RO of 0 and 3 fill bytes. The second sequence has an RO of 1001 and 3 fill bytes and so forth. The observation that Dale noted is that most of the sequences are starting at a non multiple of 4 relative offset boundary and so this requirement would preclude this type of fixed block operation which Dale's hardware has been designed to support.

The reaction of the group was not supportive of eliminating this requirement. Bob Snively noted a modulo 4 restriction in the PLDA and wanted to carry that forward into the FCP-2 to include tapes in the restriction. (Someone suggested that this situation is better described as a multiple of 4 not a modulo 4 issue.) While Dale's request was to remove the restriction, the group moved in the opposed direction to eliminate the need for

it. Stewart Wyatt explained that while initiators may never use the non multiple of 4 error recovery, leaving it in the standard will require support from targets to pass compliance tests. If the function is not required it should be removed to avoid the costs of implementing it.

A vote was taken (one vote per company) of adding a multiple of 4 length restriction to fixed block sizes in the SSC-2 and the FCP-2. This passed with 12 in favor and none opposed. There was some discussion about making changes this late in the SSC-2. Dal Allan encouraged making the change now.

Bob Snively accepted an action item to verify the multiple of 4 byte block length change is acceptable for both the SSC-2 and FCP-2 by posting a proposal to the reflector and bringing it up at the SCSI plenary. The motions that Bob took to the plenary are (1) To change the SSC to require that fixed block length transfers shall be 0 modulo 4 bytes in length and (2) the FCP-2 to require that any FCP IU must start on a multiple of 4 byte relative offset.

Dale LaFollette mentioned an implementation error that he had observed. The SRR is not an ELS and does not have an ELS TYPE code. It is a FC-4 Link Service (per FC-PH). FC-PH does not assign an abbreviation for a FC-4 Link Service and the group chose not to make one.

Clause 2.1, Clarification that link error recovery works if in-order. Bob Snively asked if anyone had an example that would break the current error recovery if out-of-order were allowed. Charles Binford offered one example where the text would have to be rewritten to allow out-of-order recovery and suggested he could come up with several more. Bob Snively thought it would take a significant amount of work to fix the document to support out-of-order. He thought it would be especially difficult to catch all of the corner cases.

Dal Allan and Carl Zeitler both felt that this would be important for larger fabrics and WAN type implementations that would appear in the future. They both supported adding out-of-order error recovery tools in the current version of the FCP-2. Bob Snively countered that the bulk of the market will operate in-order and placing special requirements on this market segment is unnecessary. Others in the group wanted to see the current FCP-2 completed as soon as possible without adding features like this that would delay it further. Another issue was raised by Bob Snively was that he did not intend to be the editor of another revision. Dave Peterson promptly volunteered to edit another revision of the FCP including out-of-order. Dave and Dal will review current document to identify problems with out-of-order error recovery.

Clause 2.2, Behavior of PRLI. The FCP-2 needs to allow any number of process associators. Bob will attempt to review the document to identify the changes and prepare a review for the group.

Clause 2.3, Obsolete process associators. Bob Snively acknowledged that he had lost the decision to obsolete process associators and that they would remain in the FCP-2.

Clause 2.4, Incorrect use of Recovery abort. The document is inconsistent in its requirement for recovery abort. This needs to be corrected. Charles noted that his proposal will reduce the ambiguity. (This proposal introduces new status values sent to hosts when commands are canceled by other initiators, which reduces the ambiguous case to those that are in flight.) Bob is also going to change the text from profile to standard language.

Bob reviewed some comments from Stewart Wyatt of HP. He accepted all of the comments, most of which were editorial. The only significant discussion to develop was a tangent about the definition of residuals. Stewart felt that some of the discovery steps described in the annex Dave Peterson wrote were not applicable to targets. There was agreement from the group on this point. Dave Peterson promised to review the annex.

Next Bob reviewed clause 4.0, which covered comments from StorageTek. These were all accepted without any discussion.

Matt Wakeley, HP, had emailed comments to Bob after he had left for these meetings. An overhead was made of Matt's comments for discussion. His comments were accepted with minimal discussion.

Bob concluded by stating his goal of creating a revised change document, 325r1, which would include all of the comments received to date and these discussions, as soon as possible. He also wanted to include issues that Dave and Matt had identified in their notes. He will then create FCP-2 rev 4 and publish both. Bob expects this draft to be suitable for a wider review. He expects this to be completed in December. At that point he wants to request that the chairman to open a letter ballot at the earliest possible opportunity.

The issue of mixing command and data as well as data and responses sequences was raised. Bob notes that this would break the error recovery procedure.

A formal vote (one vote per company) was taken of Bob's proposal to forward revision 4 as described. 12 were in favor and 0 were opposed.

6 DSA/RHA T10/99-247r2 Jim Coomes.

This item was discussed during the FCP-2 discussion in agenda item 5, reviewing clause 1.3 of the FCP-2 change document.

7 SSC:T10 Working drafts SSC-R21 LB Comment Resolution T10/99-228r3 Dave Peterson.

Dave did not have any issues nor has he received any comments about revision 21. The only open issue was the restriction proposed earlier in this meeting to add a block length restriction to a multiple of 4. Dal thinks it should go to public review. Dale asked for a

company vote that SSCR21, as amended by today's discussion, be forwarded for further processing (public review). The results were 7 in favor, 0 opposed, with 3 abstaining.

8 Partial Medium Load: T10/99-263r1, Paul Suhler

Paul noted some problems with the referenced document and used some hand written overheads for his presentation. The first overhead showed removable medium device states. The states included Empty, Loadable, MAM Accessible and Load. The MAM Accessible state is entered from by a "load and hold" or an "unload and hold state" state transition.

The second slide proposed adding a bit indicating support for this feature in the standard inquiry page. No objection was raised to this proposal at first, later in the discussion the proposal was withdrawn when it was found to be unnecessary because the support would be indicated in the mode pages.

Paul proposed three Autoload control options: Load to ready state, load to hold, and unload, which would be controlled by mode pages. While two bits would be sufficient to specify these options, Erich Oetting suggested reserving three. The conclusion was to propose using Control Mode page Byte 5 bits 2 to 0.

Ralph Weber less excited about the inquiry page, With the mode page control, the need for the inquiry is removed. He felt the proposal should not require both a MAM and a Hold bit.

Paul reviewed two comments he had received from IBM. The first was that this was only applicable to tapes and not to other removable media. Dal Allan and Stewart Wyatt disagreed citing, both noted the long time that CDs in personal computers take to come ready after loading new media. The second proposal was to use a mode page to modify the existing read and write commands to avoid creating new ones. The group thought this would be awkward. Both comments were rejected by the group.

The next discussion was how to report status in the new states, Paul discussed the distinction between Unit Attention or Not Ready. The decision was to report a unit attention condition when moving from Empty to any other state or from Loadable to MAM accessible. A second issue defined the ASC/ASCQ on a per state basis (ASC=3Ah) rather than per transition.

Finally Paul showed proposed text changes for the SSC. This could either be for a public review comment for the current version (most of the changes are going into the SPC-2) or for a future revision of the SSC.

Dal Allan wanted to include this in the current revision even if it is not in a finalized state as it could be corrected by public review comments. He said this could be accomplished without requiring a second public review. At this point Dale LaFollette asked Stewart Wyatt to read back the previous motion for forwarding the SSC. The group carefully

reviewed and reworked Paul's proposed changes to the SSC. The changes include adding a bit (MAMA) to Table 9 Load Unload Command and the following text:

If the LOAD bit is set to one and the Medium Auxiliary Memory Accessible (MAMA) bit is set to zero, the medium in the logical unit shall be loaded and positioned to the beginning-of-partition zero. If the LOAD bit is zero and the MAMA bit is zero, the medium in the logical unit shall be positioned for removal at the extreme position along the medium specified by the EOT bit. Following successful completion of an unload operation, the device server shall return CHECK CONDITION status with the sense key set to NOT READY for all subsequent medium-access commands until a new volume is mounted or a load operation is successfully completed.
If the LOAD bit is set to one and the MAMA bit is set to one and the medium has not been moved into the logical unit, then the medium shall be moved in, but not positioned for access; EOT and RETEN shall be zero. Following successful completion, the device shall return GOOD STATUS and generate a Unit Attention condition for all initiators with Additional Sense Code and Additional Sense Code Qualifier of MEDIUM AUXILIARY MEMORY ACCESSIBLE. The Medium Auxiliary Memory shall be accessible.
If the LOAD bit is set to zero and the MAMA bit is set to one and the medium is in the logical unit, then the medium shall be positioned as specified by the RETEN and EOT bits or shall be unthreaded (whichever is appropriate for the medium type) but shall not be ejected. Following successful completion, the device shall return GOOD STATUS and generate a Unit Attention condition for all initiators with Additional Sense Code and Additional Sense Code Qualifier of MEDIUM AUXILIARY MEMORY ACCESSIBLE. The Medium Auxiliary Memory shall be accessible.

A vote was taken to modify the previous motion forwarding the SSC. This vote was to add the MAMA bit to the SSCr22 as referenced 99-263r1 as modified. The results were 7 in favor and 0 opposed. No one abstained (those who abstained in the previous vote had already left for dinner as the meeting dragged on.)

Paul agreed to update his document with the results of today's discussions and Dave Peterson will include the modified text in the SSC Rev 22.

Finally the group specified the changes to be made to the SSC to incorporate the previously agreed upon block length restrictions:

Add to clause 5.3.6 READ BLOCK LIMITS: "In fixed-block mode the value of the maximum BLOCK LENGTH and the MINIMUM BLOCK LENGTH shall be a multiple of four." Add reference to clause 5.3.6 in the model in clause 5.2.4 last paragraph.

9 New Business

9A. SMC-2, T10-218r2, Erich Oetting

Erich reported that this project has been approved and that he will be creating a rough draft.

9B. Data CRC: Dale LaFollette

Dale asked if there were any objections to creating a proposal for adding a CRC field in the RSP in which a target would report a cumulative CRC on the preceding data transfers. This proposal was to remedy the lack of protection on a PCI bus. Dale's customers have expressed concern about the weaknes of the PCI bus parity implementation which has one bit of parity for 32 bit wide bus. Dale indicated support for this feature would be optional. After some discussion to clarify the details, no objection was offered by any of the participants.

11 Next Meeting Requirements: Group

Next meeting during T11 week will require three hours in the afternoon. The status of the next T10 meeting to be held next January in Australia does not appear to have significant attendance as noted earlier and not time was specified.

12 Review New Action Items: Stewart Wyatt

Deferred Action Items

#1. Charles Binford, LSI Logic. Refer default E_D_TOV issue to FC_FS. Prefer a 2 second to 10 second for point to point connections.

#2. Charles Binford, LSI Logic. Propose a new RESP_CODE 0x06: Command cleared by another initiator. Take new status code to SAM-2. Ongoing

New Action Items

#1 Dale LaFollette, STK. Prepare agenda for the January T10 meeting in Australia

#2 Bob Snively, SUN Microsystems. Facilitate and take minutes for the January 2000 Joint Activity meeting in Australia.

#3 Bob Snively, SUN Microsystems. Investigate whether it is appropriate to include the discovery ELS (RTIN and RNID) in the list of ELS to be accepted before completing login.

#4 Bob Snively, SUN Microsystems. Move the diagrams of Annex C into clause 11, making them a normative example.

#5 Bob Snively, SUN Microsystems. Verify the multiple of 4 byte block length change is acceptable for both the SSC-2 and FCP-2 by posting a proposal to the reflector and bringing it up at the SCSI plenary.

#6 Dave Peterson and Dal Allan. Review the current FCP-2 for limitations to out-of-order error recovery implementations.

#7. Bob Snively. Identify the problems with allowing unlimited process associators and prepare a review.

#8 Dave Peterson. Review Annex E SCSI Device Discovery Procedure, to determine what the differences are for target and initiator requirements are.

13Adjournment: Group

The meeting adjourned at 6 PM.

Attendance:

Dale LaFollette	StorageTek	Stewart Wyatt	HP
Erich Oetting	StorageTek	Charles Monia	Adaptec
Jim Coomes	Seagate	Charles Binford	LSI Logic
Matt Wakeley	HP/Agiliant	Edward A. Gardner	Ophidian Designs
David Ford	Clariion	Dal Allan	ENDL
Jim Hafner	IBM	Bill Dawkins	Dell
Mike Taylor	Exabyte	Bob Snively	SUN Microsystems
Neil Wanamaker		Divya Vijayaraghavan	LSI Logic
Carl Zeitler	Compaq	Bill Martin	Gadzook Networks
Roger Cummings	DPT	Craig Stuber	JNI
Pak Seto	Quantum	David Peterson	STK