Fibre Channel Tape Profile (FC-TAPE) Minutes   T11/98-216v0
May 5, 1998, Colorado Springs, Colorado
Stewart Wyatt

1. Introductions: Dale Lafollette, StorageTek, called the meeting to order and welcomed the participants. After introducing himself he asked the participants to introduce themselves.

2. Approval of agenda: The agenda, T11/98-196v0, was approved without change.

3. Approval of 4/22 minutes, T11/98-171v0. Stewart Wyatt noted two omissions: Crossroads document numbers were not included and the editor's meetings scheduled for Monday, June 8. Neil Wanamaker took an action item to provide Stewart with the document numbers.

Doug Hagerman questioned the intent of the meeting. The differences between an editor's meeting and a regular profile meeting were discussed. Dale took an action item to correct the meeting map.

4. Old Action Items: Dale turned the time over to Neil Wanamaker of Crossroads.

A. Error Recovery Qualifier:

Neil was concerned about how to handle frames arriving on a public loop from a failed sequence after the SRR was received. Neil thought this was the biggest issue for public loops. Matthew Wakeley, HP, and others, were concerned to identify the scope of the discussion. This led to a long, wandering discussion. Dale LaFollette noted that we have class 2 and 3, public and private loops, for four different options. Bob Snively, Sun, thought that was too many.

The editor, Dave Peterson, StorageTek, was asked what he thought the state of the profile was. He said he believed that class 3, private loop, is pretty well defined and that for class 2, public loop, error recovery qualifiers after SRR is the major unsolved issue.

While the error detection differs between class 2 and 3, the goal is for a common error recovery procedure. Charles Binford, Symbios, commented that he did not feel that was reflected in the current revision of the profile. Dave Peterson said he was still working getting that into the profile.

Bob Snively, SUN, provided some examples from the FCSI profile. The conclusion was that separate clauses should be provided for each of the options. Common procedures should not be duplicated, but should be documented once and referred to in the separate clauses for the various options.

Much of the discussion seemed to be oriented around class 3 for private loops and class 2 for public loops. Charles Binford was concerned that class 3 was not being considered for public loops and specifically asked that class 3 not be excluded.

The consensus was that a lot of progress had been made in the profile and the last big issue to solve was the issues with out-of-order in public loop environment. From here the discussion diverged into various criticisms of the tape model and how it could be improved. Finally Dal Allan, ENDL, lost patience with the discussion and reminded the participants that the object of the meeting was to solve the existing problem and not to endlessly philosophize.

B. Command Reference Number field Size.

The current proposal allows an 8 bit Command Reference Number (CRN) for use in detecting missing or out-of-order commands. Dale had asked the participants to see if that was an adequate size. Dal Allan defended the size and argued that additional reserved fields should be held for future uses. Dal felt that the CRN could roll over without causing problems.

Doug Hagerman, Digital, asked if in a multiple initiator environment if the initiators would collectively order their commands. He was told that this was a single initiator solution. Multiple initiator interactions are beyond the scope of the profile.

Charles Binford asked if a target supports CRN and an initiator inquired about the reception of a certain command CRN, would a positive response indicate that all of the previous CRN commands had been received. Dal Allan replied that it would not. Charles proposed adding a bit to have the functionality added to the accept. The group did not act on his suggestion.

Another long discussion followed about what the behavior should be when a command arrived out-of-order as detected by a missing CRN. The commands received after the missing command cannot be executed. The target has to wait for the command to arrive.

The target is only aware that a CRN is missing but has no information about the command itself. Bob Snively argued that the HBA does not have the knowledge to relate the CRN to the specific command. So he did not believe that the target can report the CRN to the initiator and have the initiator simply reissue the command.

There was some debate that did not seem to be resolved about when a command was lost whether commands received afterwards would be aborted as part of the recovery or saved and executed after the missing command was recovered.

C. Sense length limit:

Another long discussion followed where the purpose of limiting the sense length was debated. Among the reasons listed were to minimize the buffer space the initiator has to save for responses and keeping the response a single frame sequence. Some argued that the driver uses very little of the sense data anyway while others noted that it was stored in the logs and was useful especially during debugging operations. Finally it was agreed to allow a maximum of 128 bytes of sense data which was the largest request that Dave had received in response to this question over the reflector.

5. Suggested FCP enhancements:

Neil Wanamaker, Crossroads, discussed two overheads, T11/98-195v0

The first was titled, "Command Reference Number".

The first bulleted item was "Enabled by PRLI" Bob Snively noted that since the CRN is a ITL nexus it cannot properly be enabled in the PRLI which is for device (target) characteristics and not for LUNs. A mode select bit would be more appropriate as it is specific to LUN behavior.

The next issue brought up was if untagged and tagged commands could be mixed? It was proposed that a CRN of 0 would indicate an un-queued command while CRNs of 1 to 255 would indicate the command was queued. Some discussion about the relationship and use of task codes to CRNs followed. More discussions followed about whether the initiator or the target should time-out a missing command. This lead into a long discussion about host architectures and the availability of information needed to perform the recovery.

Doug Hagerman wanted the profile to require that all initiators support the CRN though a target could choose to ignore it. Dale Lafollette wanted to be compliant with the profile with being required to support either queuing or CRN. Dal Allan argued for one recovery process requiring CRN support. Targets who don't support it can lie it (like in immediate commands) and rely on other means to insure ordering.

The second bulleted item on Neil's overhead was, "Embed command sequence number in byte 0 of FCP_CNTL field of FCP_CMND". This had been discussed previously and accepted.

The third bullet item was "Target presents Response Code for lost commands"

Doug Hagerman argued an uphill battle that the appropriate activity is to keep trying to recover the missing command until some higher level timer indicates that a complete failure has occurred. If the command cannot be recovered then the path must have been broken and something catastrophic has happened.

Dal Allan lead a side discussion to argue that handling out-of-order commands need not require an unreasonably large amount of resources to be implemented in a tape. Dal felt that by using Queue full to limit the number of commands outstanding a target could implement a limited amount of command reordering inexpensively. Neil Wanamaker warned that using queue full and busy are not necessarily clean approaches to some hosts.

The next issue was how to handle the clear queue task management function. Doug argued that all commands needed to be executed in the order they were received including task management functions. He described the target's queue as having two parts: the commands received in order and ready for execution and the commands waiting to enter the queue that need to be checked to see if they are in order or are waiting for an out-of-order command to arrive. The Clear Queue task management function should enter the queue and be executed in order like any other command.

However a concern remained. How does the queue recovered after an error so that both the target and the initiator are in synch? After much discussion Matthew Wakeley suggested having the initiator re-login into the target, causing an implicit logout, as a means of clearing the queue and resetting the CRN. A target wanting to reset the queue and reset the CRN could logout either explicitly or implicitly.

It was decided that Task Management Functions would have CRNs.

The conclusion of this discussion resulted in complete change of the text for this bullet.

The final bullet was "Delivery confirmation via FCP_XFER_RDY, FCP_DATA, FCP_RSP, REC, ACK" which was accepted.

Neil put up his second overhead which was titled, "FCP_CONFIRM"

The first bullet read "Enabled by PRLI". This prompted a discussion as to whether this was a target or a LUN feature. After some discussion it was decided to make the feature mandatory and eliminate the requirement to negotiate it. The effect of this decision is to require a compliant host to implement the FCP_CONFIRM and provide it whenever the target requested it by setting the bit in the FCP_RSP. The overhead noted that when the target requests the confirm, that the response is not the last sequence of the exchange and so the F_CTL Last Sequence bit is not set. The FCP_CONFIRM always has the Last Sequence bit set. The FCP needs to have the definition of the FCP_RSP be changed from last sequence to middle or last sequence in an exchange.

At the conclusion of this discussion the schedule of the profile was discussed. Dal Allan prefers to use a letter ballot to a comment review to bring observers into active participation. A lot of people will ignore a comment review but take a letter ballot more seriously. The profile needs to be much more solid to avoid burying the editor in comments.

6. New business:

Roger Cummings, DPT, reported that Gerry Houlder, Seagate, had introduced a proposal to prevent loop port bypass in Mode Page 19h which he thought should be included in the profile. The document number is T10/98-106 rev. 1.

7. FC-TAPE draft review, T11/98-124v4

Editor Dave Peterson took the floor and displayed an overhead with the issues he wanted feedback on:

1. Require/recommend "Continuously Increasing Sequence Count". Currently allowed, should it be required? No - it should remain allowed.
2. Add text for N_Ports? This question would copy the tables in clause 7 of the FLA - allowing direct connection (point-to-point instead of loop) of tape to fabric. Matthew Wakeley thought it should be included.
A side discussion started about having an editor's meeting to continue work on the profile during

the five weeks before the June meeting. The conclusion was to call a one day editor's meeting on Thursday, May 28th in Denver starting at 9 AM. Dale took an action item to locate a place for a meeting assuming about 20 participants. The participants will find there own rooms if needed.

4. In section 9.1.4 is ABTS needed (for class 3 private loop)? Yes for commonality.

5. Remove Annex E or just E.3 (annex on hot plugging)? Leave it in make it positive

6. Table 5. Added info Cat 5, prohibit all others? (Table 4 in rev 103) This issue is about using relative offset. Matthew felt it should remain allowed but suggested some word changes which Dave noted.

7. Base the document on FC-AL-2? Doug suggested that the profile should claim compatibility and worry about specifics later.

9. Class 3 for public loop? Class 2 for public loop? This issue had been discussed previously. Matthew Wakeley said the public/private clauses should be class dependent.

8. Go through REV1.03 marked pages with group. Some review of the document occurred as the meeting was concluding

8. Meeting Adjourned

Recap of Action Items:

1. Neil Wanamaker to provide document numbers for last month's minutes.

2. Stewart Wyatt to revise last month's minutes.

3. Dale LaFollette to correct next month's meeting map. An tape profile review meeting is scheduled for Monday, May 6, 5 to 9 PM in St. Petersburg.

4. Dale LaFollette to obtain a meeting place near the Denver airport on May 28th starting at 9 AM for a one day tape profile review.

5. Dave Peterson requests more participation and discussion to the questions that he posts on the reflector.