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X3T9.2/91-69

May 13, 1991

John Lohmeyer
Chairman, X3T9.2
3718 N. Rock Road
Wichita, KS 67226

Subject: Conformance of SPP and Fiber Channel

Dear Mr. Lohmeyer:

We have studied the proposed SCSI-3 Packetized Protocol (SPP) in the context of the proposed Fiber Channel architecture and have come to the conclusion that the Fiber Channel actually provides some very useful functions that would largely displace the SPP in supporting SCSI functionality.

The SCSI concept of I/O Process is very similar to the Fiber Channel concept of Exchange. The "nexus" of Originator:Responder:Originator Exchange ID: Responder Exchange ID can adequately and completely identify an I/O Process, so the larger part of the proposed Interface Control Prefix Field is already managed by the Fiber Channel FC-2.

The SCSI Target:LUN:Queue Tag information which may be interesting to a system that is mapping SCSI activities across a Fiber Channel need only be carried in the first Sequence of an Exchange. That first Sequence should carry such address information (if required) as well as other SCSI control objects including the Command Descriptor Block. Subsequent Sequences need not carry that information, since the Fiber Channel "nexus" can be used to uniquely identify the I/O Process.

All the link control functionality normally carried by SCSI Messages is duplicated in Fiber Channel SC-2 link control definitions. The result is that no SCSI link management messages should be carried for the SCSI in any Fiber Channel Sequence.

The Fiber Channel FC-2 defines category definitions for frames. These category definitions can be used to properly define the few relevant types of Sequences for high-level communication of SCSI information. A SCSI definition of a Control Block Sequence, Data Block Sequence, and Status/Sense Block Sequence may be complete and sufficient for a SCSI implementation. If that is the case, then the remaining portions of the Interface Control Fields and the Interface Logical Elements can be eliminated, dramatically simplifying the SCSI implementation on the Fiber Channel. That allows generic Fiber Channel hardware to manage SCSI data without having to interpret non-FC-2 auxiliary headers.

Within an Exchange, the FC-2 provides all the required mechanisms to sequentially manage Sequences. Exchanges can be used as the unit of parallelism and functional overlap, much like the ITLQ nexus is used in SCSI.

Within a Sequence, the FC-2 provides the necessary management for Frame Credit definitions, flow control definitions, abnormal termination, out-of-order frame delivery, and (using the offset field) Modify Data Pointers.

The frame category bits provide all the necessary identification to direct the information contained in a Sequence to the proper buffer area associated with an I/O Process.

Clearly, there are a number of questions that must still be addressed in preparing a true Fiber Channel implementation of SCSI, but the above principles appear to provide the necessary structure for such an effort. We hope to be able to provide a more formal proposal for the June meeting.

Thank you for your attention,

Sincerely,

Robert N. Snively
Sun Microsystems
SCSI Architect
Member, X3T9.2