**T10/06-092 revision 0**

Date: 2/17/06

To: T10 Committee (SCSI)

From: George Penokie (IBM)

Subject: FCP-4: Indication of REC Support

# 1 Overview

Currently the only way to determine if a target port supports the REC ELS is for an initiator port to issue the REC. If the target rejects it then the initiator assumes it is not supported. This method causes problems for systems because it generates errors that require behavioral changes. That is difficult for applications and drivers to accomplish after login.

This proposal adds a bit into the PRLI request that may be used by the target to indicate support for the REC ELS.

# 2 Changes to FCP-4

### 4.6 Retransmission of unsuccessfully transmitted IUs

Error detection and IU retransmission algorithms are defined in clause 12.

The Read Exchange Concise (REC) ELS may be used by the initiator FCP_Port to determine the state of an ongoing Exchange. See 6.5. ~~Target FCP_Ports that do not support REC indicate this by performing a Link Service Reject (LS_RJT). See 8.3~~. Support for the REC ELS by both the initiator FCP_Port and target FCP_Port is indicated by the REC_SUPPORT bit in the PRLI request FCP Service Parameter page and PRLI accept FCP Service Parameter page (see 6.3.4 and 6.3.5).

If the target FCP_Port responds with the REC_SUPPORT bit set to one and an error is identified by any of the detection mechanisms defined in clause 12, then the initiator FCP_Port may use the REC ELS to determine the nature of the error.

Target FCP_Ports that do not support the REC_SUPPORT bit indicate they do not support REC by performing a Link Service Reject (LS_RJT) in response to an REC ELS. See 8.3.

If an error is identified by any of the mechanisms defined in clause 12 and if the data retransmission capability is supported by both the initiator FCP_Port and target FCP_Port as indicated by the RETRY bit in the PRLI request FCP Service Parameter page and PRLI accept FCP Service Parameter page (see 6.3.4 and 6.3.5):

a) the initiator FCP_Port may request retransmission using the Sequence Retransmission Request (SRR) FCP FC-4 Link Service Request. See 8.2; and
b) the initiator FCP_Port and target FCP_Port shall support REC and task retry identification (see 4.7).

### 4.8 Discovery of FCP capabilities

A number of Fibre Channel Protocol capabilities require the knowledge and agreement of both the target FCP_Port and the initiator FCP_Port that such capabilities may or shall be used. Table 1 provides references to the discovery process for each of the Fibre Channel Protocol capabilities.

**Table 1 - Discovery of FCP-3 capabilities**

| Capability | Discovery mechanism | Reference |
|---|---|---|
| Initiator FCP_Port | Process Login | 6.3 |
| Target FCP_Port | Process Login | 6.3 |
| Initiator FCP_Port accepts data overlay | Process Login | 6.3.4 |
| Target FCP_Port performs data overlay | Disconnect-Reconnect mode page EMDP bit | 10.2.8 |
| Initiator FCP_Port generates FCP_CONF IU | Process Login | 6.3 |
| Target FCP_Port requests FCP_CONF IU | Process Login | 6.3 |
| Initiator FCP_Port performs REC | None required, Process Login allowed | 4.6 and 6.3 |
| Target FCP_Port accepts REC | Process Login [a] ~~LS_RJT if REC not accepted~~ | 4.6 and 6.3 |
| Initiator FCP_Port performs SRR | Process Login | 6.3 |
| Target FCP_Port accepts SRR | Process Login | 6.3 |
| Initiator FCP_Port provides CRN | Fibre Channel Logical Unit Control mode page EPDC bit | 4.4 and 10.3 |
| Target FCP_Port accepts CRN | Fibre Channel Logical Unit Control mode page EPDC bit | 4.4 and 10.3 |
| Task Retry Identification | Process Login | 6.3 |

[a] If the target FCP_Port does not support the REC SUPPORT bit in PRLI, then the target FCP_Port may LS_RJT an REC ELS (see 4.6).

### 6.3.4 PRLI request FCP Service Parameter page format

The FCP Service Parameter page for the PRLI request is shown in Table 2.

**Table 2 - FCP Service Parameter page, PRLI request**

| FCP service parameter | Word | Bit |
|---|---|---|
| SCSI FCP (08h) | 0 | 31–24 |
| Reserved for TYPE code extension | 0 | 23–16 |
| ORIGINATOR PROCESS_ASSOCIATOR VALID | 0 | 15 |
| RESPONDER PROCESS_ASSOCIATOR VALID | 0 | 14 |
| ESTABLISH IMAGE PAIR | 0 | 13 |
| Reserved | 0 | 12–0 |
| ORIGINATOR PROCESS_ASSOCIATOR | 1 | 31–0 |
| RESPONDER PROCESS_ASSOCIATOR | 2 | 31–0 |
| Reserved | 3 | 31–~~10~~ 11 |
| REC_SUPPORT | 3 | 10 |
| TASK RETRY IDENTIFICATION REQUESTED | 3 | 9 |
| RETRY | 3 | 8 |
| CONFIRMED COMPLETION ALLOWED | 3 | 7 |
| DATA OVERLAY ALLOWED | 3 | 6 |
| INITIATOR FUNCTION | 3 | 5 |
| TARGET FUNCTION | 3 | 4 |
| OBSOLETE | 3 | 3 |
| OBSOLETE | 3 | 2 |
| READ FCP_XFER_RDY DISABLED (shall be one) | 3 | 1 |
| WRITE FCP_XFER_RDY DISABLED | 3 | 0 |

**Word 3, Bit 10: REC_SUPPORT:** When the REC ELS supported (REC_SUPPORT) bit is set to one, the Originator is indicating that it supports, as an initiator FCP_Port, the transmission of the REC ELS. The capability of the initiator FCP_Port to retransmit unsuccessfully transmitted data is determined by the RETRY bit (i.e., a REC_SUPPORT bit set to one does not indicate the initiator FCP_Port supports retransmission of data). When the REC_SUPPORT bit is set to zero the Originator is providing no information about whether it supports transmission of the REC ELS.

### 6.3.5 PRLI accept FCP Service Parameter page format

The FCP Service Parameter page for the PRLI accept is shown in Table 3.

**Table 3 - FCP Service Parameter page, PRLI accept**

| FCP service parameter | Word | Bit |
|---|---|---|
| SCSI FCP (08h) | 0 | 31–24 |
| Reserved for TYPE Code Extension | 0 | 23–16 |
| ORIGINATOR PROCESS_ASSOCIATOR VALID | 0 | 15 |
| RESPONDER PROCESS_ASSOCIATOR VALID | 0 | 14 |
| IMAGE PAIR ESTABLISHED | 0 | 13 |
| Reserved | 0 | 12 |
| ACCEPT RESPONSE CODE | 0 | 11–8 |
| Reserved | 0 | 7–0 |
| Originator Process_Associator | 1 | 31–0 |
| Responder Process_Associator | 2 | 31–0 |
| Reserved | 3 | 31–~~10~~ 11 |
| REC_SUPPORT | 3 | 10 |
| TASK RETRY IDENTIFICATION REQUESTED | 3 | 9 |
| RETRY | 3 | 8 |
| CONFIRMED COMPLETION ALLOWED | 3 | 7 |
| DATA OVERLAY ALLOWED | 3 | 6 |
| INITIATOR FUNCTION | 3 | 5 |
| TARGET FUNCTION | 3 | 4 |
| OBSOLETE | 3 | 3 |
| OBSOLETE | 3 | 2 |
| READ FCP_XFER_RDY DISABLED (shall be one) | 3 | 1 |
| WRITE FCP_XFER_RDY DISABLED | 3 | 0 |

**Word 3, Bit 10: REC_SUPPORT:** When the REC ELS supported (REC_SUPPORT) bit is set to one, the Responder indicates that it supports, as a target FCP_Port, the receipt of the REC ELS. The capability of the target FCP_Port to retransmit unsuccessfully transmitted data is determined by the RETRY bit (i.e., a REC_SUPPORT bit set to one does not indicate the target FCP_Port supports retransmission of data). When the REC_SUPPORT bit is set to zero, the Responder is indicating that it may not support receipt of the REC ELS.