

To: T10 Technical Committee
 From: Bob Sheffield (Robert.L.Sheffield@intel.com)
 Date: 12 March 2007
 Subject: 07-128r0: SAS-2 Target handling of retransmit write DATA frames

Revision history

Revision 0 (12 March 2007) First revision

Related documents

SAS-2-r08 - Serial Attached SCSI - 2 (SAS-2) revision 08
 06-371r0 SAS2: Transport-layer handling of extraneous retransmit DATA frames
 06-467r3: SAS-2 Initiator handling of retransmit read DATA frames
 06-490r0 SAS-2: Transport layer initiator read data flowchart

Overview

06-467r3 makes it clear an initiator port in the ST_ITS6: Receive_Data_In state receiving retry read DATA frames may discard data in the retry frame that overlaps data previously received and verified. This proposal adds text to the ST_TTS5:Receive_Data_Out state to make the ST_TTS handling of retry write DATA frame consistent with the ST_ITS.

Suggested changes

Modify subclause 9.2.6.3.3.6 as follows:

9.2.6.3.3.6 ST_TTS5:Receive_Data_Out state

9.2.6.3.3.6.1 State description

On entry into this state the Write Data Received variable is set to the Requested Write Data Offset state machine variable.

If this state receives a Data-Out Arrived message, then this state shall verify the write DATA frame received with the Data-Out Arrived values as specified in table 173. If the verification test fails, then this state sends the message specified in table 173 to the ST_TFR state machine.

Table 173 — Reception Complete message for write DATA frame verification failures

Message sent to ST_TFR ^a	Condition
Reception Complete (Data Offset Error)	Transport layer retries are disabled, and the DATA OFFSET field is not equal to the Write Data Received variable.
	The DATA OFFSET field is: a) less than the Requested Write Data Offset state machine variable; or b) greater than or equal to the Requested Write Data Offset state machine variable plus the Requested Write Data Length state machine variable.
Reception Complete (Too Much Write Data)	The number of bytes in the DATA field in the write Data information unit plus the Write Data Received variable is greater than the Request Byte Count Data-Out state machine argument.
Reception Complete (Information Unit Too Short)	The number of bytes in the DATA field is zero.
^a If more than one condition is true, then this state shall select which message to send to the ST_TFR state machine using the following order: 1) Reception Complete (Data Offset Error); 2) Reception Complete (Too Much Write Data); or 3) Reception Complete (Information Unit Too Short).	

If:

- a) transport layer retries are enabled;
- b) the CHANGING DATA POINTER bit is set to zero; and
- c) the value in the DATA OFFSET field is not equal to the Write Data Received variable,

then this state should discard all Data-Out Arrived messages until the CHANGING DATA POINTER bit is set to one. This state shall resume processing additional Data-Out Arrived messages when it receives a Data-Out Arrived message with the CHANGING DATA POINTER bit set to one.

If the WRITE data frame verification is successful and the Data-Out Arrived message is not discarded, then this state shall:

- a) set the Write Data Received variable to the current Write Data Received variable plus the number of bytes received in the DATA field of the write Data information unit; and
- b) process the write data as indicated in the Data-Out state machine arguments using the Device Server Buffer (e.g., logical block address) to which the write data is to be transferred.

If the WRITE data frame verification is successful and the CHANGING DATA POINTER bit set to one, then this state shall:

- a) set the Write Data Received variable to the Requested Write Data Offset state machine variable; and
- b) process the write data as indicated in the Data-Out state machine arguments using the Device Server Buffer (e.g., logical block address) to which the write data is to be transferred.

If data received in the write DATA frame overlaps data previously received and verified successfully, this state may either discard the overlapping data, or replace the previously received data with the new data.

If the Initiator Response Timeout timer is implemented, then this state shall initialize and start the Initiator Response Timeout timer:

- a) upon entry into this state; and
- b) when this state receives and verifies the write DATA frame received with the Data-Out Arrived values (i.e., Data-Out data was received and processed).

If the Initiator Response Timeout timer is running, then this state shall stop the timer before transitioning from this state.

If the Initiator Response Timeout timer expires, then this state shall send a Reception Complete (Initiator Response Timeout) message to the ST_TFR state machine.

If the Write Data Received variable equals the Request Byte Count Data-Out state machine argument, then this state shall send a Reception Complete (Data-Out Received) message to the ST_TFR state machine after a Reception Complete (ACK Transmitted) confirmation is received for each write DATA frame previously received.

If this state receives a Cancel message, then this state shall send a Reception Complete (Data Transfer Terminated) message to the ST_TFR state machine.

If this state receives Transmission Status (Break Received) confirmation, then this state shall send a Reception Complete (Data Transfer Terminated) to the ST_TFR state machine.

The Reception Complete message, if any, shall include the tag as an argument.