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To: T10 Committee (SCSI)

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Subject: Message IU Defination

1 Overview

The current definition of packetized in SPI-3 does not have a defined way to allow an initiator to negotiate a change during any initial connection (i.e., before sending any commands to the target). This proposal allows the ATN signal to be asserted while packetized is enabled. If this occurs the current SPI-3 draft requires the target to go to bus free if the ATN signal is asserted.

1.0.0.1 Unexpected bus free

An unexpected bus free occurs when an initiator detects a BUS FREE phase that is not expected. Initiators shall expect a BUS FREE phase to occur after one of the following occurs:

    a) after a hard reset is detected;
    b) after an ABORT TASK message is successfully received by a target;
    c) after an ABORT TASK SET message is successfully received by a target;
    d) after a CLEAR TASK SET message is successfully received by a target;
    e) after a LOGICAL UNIT RESET message is successfully received by a target;
    f) after a TARGET RESET message is successfully received by a target;
    g) after a DISCONNECT message is successfully transmitted from a target;
    h) after a TASK COMPLETE message is successfully transmitted from a target;
    i) after the release of the SEL signal after a SELECTION or RESELECTION phase time-out;
    j) after a transceiver mode change;
    k) after a PPR negotiation in response to an selection with ATN when information unit transfers are enabled.

Initiators may expect a bus free to occur after one of the following:

    a) after the last SPI command information unit is successfully received by a target;
    b) after a SPI data information unit is successfully received by or transmitted from a target;
    c) after a SPI status information unit is successfully transmitted from a target.

The target uses an unexpected bus free to inform the initiator of a protocol error. The target may switch to a BUS FREE phase at any time, except during an ARBITRATION phase, independent of the state of the ATN signal.

The target shall terminate the task that was the current task before the BUS FREE phase by clearing all data and status for that task. The target may optionally prepare sense data that may be retrieved by a REQUEST SENSE command. However, an unexpected bus free shall not create an exception condition.

The initiator shall terminate the task that was the current task before the BUS FREE phase occurred and shall manage this condition as an exception condition.

1.0.1 SELECTION phase

The SELECTION phase allows an initiator to select a target for the purpose of initiating some target function (e.g., READ or WRITE command). During the SELECTION phase the I/O signal is negated to distinguish this phase from the RESELECTION phase.

1.0.1.1 Selection

The SCSI device that won a normal arbitration has both the BSY and SEL signals asserted and has delayed at least a bus clear delay plus a bus settle delay before ending the NORMAL ARBITRATION phase.

The SCSI device that won a quick arbitration has the SEL signal asserted and has delayed at least a QA arbitration delay before ending the QUICK ARBITRATION phase.

The SCSI device that won the arbitration becomes an initiator by not asserting the I/O signal.

1.0.1.1.1 Selection with ATN

The initiator shall set the DATA BUS to a value that is the OR of its SCSI ID bit, the target's SCSI ID bit, and the appropriate parity bit(s) (i.e., P_CRCA, and/or P1). If information unit transfers are disabled the initiator shall assert the ATN signal (indicating that a MESSAGE OUT phase is to follow the SELECTION phase). If information unit transfers are enabled the initiator may assert the ATN signal.

If the arbitration was a normal arbitration then the initiator shall wait at least two system deskew delays and release the BSY signal. The initiator shall then wait at least a bus settle delay before looking for an assertion of the BSY signal from the target.

If the arbitration was a quick arbitration then the initiator shall then wait at least a bus settle delay before looking for an assertion of the BSY signal from the target.

The target shall determine that it is selected when the SEL signal and its SCSI ID bit are true and the BSY and I/O signals are false for at least a bus settle delay. The selected target may examine the DATA BUS in order to determine the SCSI ID of the selecting initiator. The selected target shall then assert the BSY signal within a selection abort time of its most recent detection of being selected; this is required for correct operation of the selection time-out procedure.

The target shall not respond to a selection if bad parity is detected (see 8.3.1). Also, if more than two SCSI ID bits are on the DATA BUS, the target shall not respond to selection.

No less than two system deskew delays after the initiator detects the BSY signal is true, it shall release the SEL signal and may change the DATA BUS. The target shall wait until the SEL signal is false before asserting the REQ signal to enter an information transfer phase.

If information unit transfers are disabled for the connecting initiator the target shall follow the phase sequences defined in clause 11.3.1.

If information unit transfers are enabled for the connecting initiator the target shall proceed to a MESSAGE OUT phase. On detecting the MESSAGE OUT phase the initiator shall begin a PPR negotiation (see xxx). On completion of the PPR negotiate the target shall proceed to a BUS FREE phase. If the first message received by the target during the MESSAGE OUT phase is not a PPR message the target shall discontinue the MESSAGE OUT phase and proceed to a BUS FREE phase.