Accredited Standards Committee
X3, Information Processing Systems

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Reply to: John Scheible

To: X3T10.1 Membership
From: John Scheible

Subject: Extend Buffer Full condition to BUSY

BACKGROUND

The SMS Buffer Full condition protects the ordering of in-flight commands when a QUEUE FULL condition causes the rejection of a command. Without SMS Buffer Full, subsequent in-flight commands could be queued if space became available prior to processing.

This same condition exists for when BUSY status is reported. This proposal extends QUEUE FULL to cover this case.

This proposal does not cover the RESERVATION CONFLICT status, since it is an exception case and can occur as commands are removed from the queue. The SMS Buffer Full condition was meant to hide the in-flight nature of a serial interface that does not occur in a parallel interface, rather than handling a queuing problem which exists in parallel SCSI today.

PROPOSAL

1) Replace sub-clause 7.3 with the sub-clause shown on the next page.
2) Replace paragraph 9 in 7.6 with:
The RESUME bit controls the processing of QUEUE FULL and BUSY conditions within the target protocol layer. The initiator normally clears the RESUME bit when processing SCSI COMMAND SMSs. After receiving an SCSI STATUS SMS from a destination node indicating QUEUE FULL or BUSY status, the initiator protocol layer shall set the RESUME bit for the next SCSI COMMAND SMS issued to the destination node in an attempt to resume SCSI COMMAND SMS processing. Receiving an SCSI COMMAND SMS with the RESUME bit set informs the destination node to stop discarding SCSI COMMAND SMSs (see 7.3).
3) Remove C.1.4 as it is defined under deadlock avoidance (C.1.5).
4) Replace bullet b) of C.1.5 with:
The SCSI COMMAND SMS resource limitations are controlled by the use of Queue Full and the protocol layer's Outstanding Commands Table. When the initiator S3P protocol layer receives an SCSI STATUS SMS with STATUS field of either QUEUE FULL or BUSY, it generates a Command Complete Received protocol service response with the same status for all commands in its Outstanding Commands Table that were issued after the command responding with QUEUE FULL or BUSY status. Since the initiator generates the QUEUE FULL or BUSY status for those commands, the target shall discard all SCSI Commands with the RESUME bit cleared, without issuing a SCSI STATUS SMSs or generating a Command Complete Received protocol service indication. The next SCSI Command to be sent has the RESUME bit set, causing the QUEUE FULL flag in the device to be cleared and the resumption of SCSI command processing.

7.3 SMS Buffer Full condition

The S3P protocol layer of the destination node shall enter an SMS Buffer Full condition for a given initiator when an SCSI COMMAND SMS is received from that initiator and the command cannot be accepted due to a QUEUE FULL or BUSY. Upon entering an SMS Buffer Full condition, the destination node shall complete the SCSI COMMAND SMS and generate an SCSI STATUS SMS indicating a QUEUE FULL status. When in an SMS Buffer Full condition, the destination node shall discard SCSI COMMAND SMSs with a RESUME bit cleared from the same Initiator even if the condition which caused the SMS Buffer Full condition no longer exists.

The destination node shall exit the SMS Buffer Full condition after receiving an SCSI COMMAND SMS with a RESUME bit set from the Initiator with the SMS Buffer Full condition. If the destination node still cannot accept the command due to a QUEUE FULL or BUSY, the destination node shall once again enter the SMS Buffer Full condition.

When an Initiator S3P protocol layer receives an SCSI STATUS SMS indicating QUEUE FULL or BUSY status, the Initiator shall mark the command identified by the SMS and any subsequent commands already issued to the destination node as having completed with a QUEUE FULL or BUSY status. The S3P protocol layer then has the option of reporting the QUEUE FULL or BUSY status to the Application client or can reissue the commands itself after a delay. The Initiator S3P protocol layer shall send the next SCSI COMMAND SMS with the RESUME bit set.

Sincerely,

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