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To: T10 Committee (SCSI)

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Subject: Per-Command Priority Tagging

1 Overview

The following proposed wording represents changes to FCP-3, SAS 1.1, and SRP-2 to enable the transmission of priority information on a per-command basis.

This proposal standardizes the interface by which device servers can offer differentiated quality of service to different applications associated with the same initiator. Examples of its use would include offering lower priority on IO associated with background destage writes within a storage controller or on IO associated with background applications, so that response time may be reduced for those IO operations that directly affect the responsiveness offered to the end user.

The method defined in this proposal to accomplish this involves changes to the protocol standards to accommodate an extension to the task attribute field to allow different priorities to be assigned to simple task attributes. There should be no changes required to SAM-3 as a simple task with a priority is still architecturally handled the same as a simple task.

1.1 FCP-3, SAS 1.1, and SRP-2 additions

The changes below will be applied to the FCP-3, SAS 1.1, and SRP-2 standards. Only the section numbers are different.

Table 1 — COMMAND information unit

Byte\Bit	7	6	5	4	3	2	1	0
0	(MSB) _____							
7	LOGICAL UNIT NUMBER							(LSB)
8	Reserved							
9	Reserved	PRIORITY				TASK ATTRIBUTE		
10	Reserved							
11	ADDITIONAL CDB LENGTH (n dwords)						Reserved	
12	CDB _____							
27								
28	ADDITIONAL CDB BYTES _____							
27+n×4								

[The PRIORITY field specifies the relative scheduling of this task in relation to other tasks already in the task set for processing by the device server. The relationship between the PRIORITY field and the TASK ATTRIBUTE field is defined in table 2. A priority of zero indicates the device server schedules the task in a vendor specific manner. Priority 1h is the highest priority, with increasing priority values indicating lower priorities.](#)

NOTE 1 - [A difference in priority between tasks does not necessarily override other task manager scheduling considerations, such as different times to access different logical block addresses. However, processing of a set of tasks with different priorities should cause the subset of tasks with the higher priority to return status sooner in aggregate than the same subset would if the same set of tasks were submitted under the same conditions but with all priorities equal.](#)

The TASK ATTRIBUTE field is defined in table 2.

Table 2 — TASK ATTRIBUTE field

Task Attribute Code	Priority Code	Task attribute	Description
000b	1h-Fh	SIMPLE	Requests that the task be managed according to the rules for a simple task attribute (see SAM-3). The priority code may be used by the task manager to determine an ordering to process simple tasks in addition to it's vendor specific ordering rules.
001b	Reserved	HEAD OF QUEUE	Requests that the task be managed according to the rules for a head of queue task attribute (see SAM-3).
010b	Reserved	ORDERED	Requests that the task be managed according to the rules for an ordered task attribute (see SAM-3).
011b	Reserved	Reserved	
100b	Reserved	ACA	Requests that the task be managed according to the rules for an automatic contingent allegiance task attribute (see SAM-3).
101b-111b	Reserved	Reserved	