

To: T10 Technical Committee

From: Rob Elliott, HP (elliott@hp.com)

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Subject: 05-368r1 SPC-4 SBC-3 SMC-3 Allow more commands through Write Exclusive reservations

### **Revision history**

Revision 0 (17 October 2005) First revision

Revision 1 (11 November 2005) Incorporated comments from November CAP WG - merged the bits in PR IN REPORT CAPABILITIES into a single ALLOW COMMANDS field

### **Related documents**

spc4r02 - SCSI Primary Commands - 4 revision 2

sbc2r16 - SCSI Block Commands - 2 revision 16

smc3r00 - SCSI Media Changer Commands - 3 revision 0

05-331r1 Allow Mode Sense Through Read Only Persistent Reservation (incorporated in spc4r02) (George Penokie, IBM)

### **Overview**

05-331 allows MODE SENSE, a read command that does not have any side-effects, to be processed on any L\_T nexus if there is a Write Exclusive (i.e. read-only) persistent reservation in effect.

There are several other harmless read commands that should also be allowed in SPC-4, SBC-3, and SMC-3:

- a) READ ATTRIBUTE (if the media can be read, the attributes containing media metadata should be allowed to be read)
- b) READ BUFFER (sometimes used for vendor-specific data)
- c) RECEIVE DIAGNOSTIC RESULT (to allow diagnostic page access, particularly for SES)
- d) REPORT SUPPORTED OPERATION CODES and REPORT SUPPORTED TASK MANAGEMENT FUNCTIONS (used to test if commands are supported without triggering an error)
- e) READ DEFECT DATA (no side effects)
- f) READ ELEMENT STATUS (if media can be read, then the status of an element should be allowed too)

### **Suggested changes to SPC-4**

#### **5.6.1 Persistent Reservations overview**

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Table 1 — SPC commands that are allowed in the presence of various reservations

Command	Write Excl	Excl Access	From registered I_T nexus (RR all types)	Write Excl RR	Excl Access RR
MODE SENSE(6) / MODE SENSE(10)	Allowed <sup>b</sup> <sub>c</sub>	Conflict	Allowed	Allowed <sup>b</sup> <sub>c</sub>	Conflict
READ ATTRIBUTE	<del>Conflict</del> Allowed <sub>c</sub>	Conflict	Allowed	<del>Conflict</del> Allowed <sub>c</sub>	Conflict
READ BUFFER	<del>Conflict</del> Allowed <sub>c</sub>	Conflict	Allowed	<del>Conflict</del> Allowed <sub>c</sub>	Conflict
RECEIVE COPY RESULTS	Conflict	Conflict	Allowed	Conflict	Conflict
RECEIVE DIAGNOSTIC RESULTS	<del>Conflict</del> Allowed <sub>c</sub>	Conflict	Allowed	<del>Conflict</del> Allowed <sub>c</sub>	Conflict
REPORT SUPPORTED OPERATION CODES	<del>Conflict</del> Allowed <sub>c</sub>	Conflict	Allowed	<del>Conflict</del> Allowed <sub>c</sub>	Conflict
REPORT SUPPORTED TASK MANAGEMENT FUNCTIONS	<del>Conflict</del> Allowed <sub>c</sub>	Conflict	Allowed	<del>Conflict</del> Allowed <sub>c</sub>	Conflict
TEST UNIT READY	Allowed <sup>b</sup>	Allowed <sup>b</sup>	Allowed	Allowed <sup>b</sup>	Allowed <sup>b</sup>
<p><sup>a</sup> ...</p> <p><sup>b</sup> Logical units claiming compliance with previous versions of this standard (e.g., SPC-2, <del>SPC-3</del>) may return RESERVATION CONFLICT in this case.<sub>d</sub></p> <p><sup>c</sup> <a href="#">Logical units claiming compliance with previous versions of this standard (e.g., SPC-3) may return RESERVATION CONFLICT in this case.</a><sub>d</sub></p> <p><sup>d</sup> <a href="#">Logical units may report whether certain commands are allowed in the PERSISTENT RESERVE IN command REPORT CAPABILITIES service action ALLOW COMMANDS field (see 6.11.4).</a></p>					

6.11.4 REPORT CAPABILITIES service action

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Table 2 — PERSISTENT RESERVE IN parameter data for REPORT CAPABILITIES

Byte\Bit	7	6	5	4	3	2	1	0
0	LENGTH (0008h)							
1	LENGTH (0008h)							
2	Reserved			CRH	SIP_C	ATP_C	Reserved	PTPL_C
3	TMV	<a href="#">ALLOW COMMANDS</a>			Reserved			PTPL_A
4	PERSISTENT RESERVATION TYPE MASK							
5	PERSISTENT RESERVATION TYPE MASK							
6	Reserved							
7	Reserved							

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The ALLOW\_COMMANDS field indicates whether certain commands allowed through certain types of persistent reservations and is defined in table 3.

**Table 3 — ALLOW\_COMMANDS field**

Code	Description
<a href="#">000b</a>	<a href="#">No information is provided about whether certain commands are allowed through certain types of persistent reservations.</a>
<a href="#">001b</a>	<p>The device server allows the TEST UNIT READY command (see table 1 in 5.6.1) through Write Exclusive and Exclusive Access persistent reservations and does not allow the following commands through Write Exclusive persistent reservations (i.e., as defined in a previous version of this standard):</p> <ul style="list-style-type: none"> <li>a) <a href="#">the MODE SENSE, READ ATTRIBUTE, READ BUFFER, RECEIVE DIAGNOSTIC RESULTS, REPORT SUPPORTED OPERATION CODES, and REPORT SUPPORTED TASK MANAGEMENT FUNCTION commands (see table 1 in 5.6.1);</a></li> <li>b) <a href="#">the READ DEFECT DATA command (see SBC-3); and</a></li> <li>c) <a href="#">the READ ELEMENT STATUS and READ ELEMENT STATUS ATTACHED commands (see SMC-3).</a></li> </ul>
<a href="#">010b</a>	<p>The device server allows the TEST UNIT READY command (see table 1 in 5.6.1) through Write Exclusive and Exclusive Access persistent reservations and allows the following commands through Write Exclusive persistent reservations:</p> <ul style="list-style-type: none"> <li>a) <a href="#">the MODE SENSE, READ ATTRIBUTE, READ BUFFER, RECEIVE DIAGNOSTIC RESULTS, REPORT SUPPORTED OPERATION CODES, and REPORT SUPPORTED TASK MANAGEMENT FUNCTION commands (see table 1 in 5.6.1);</a></li> <li>b) <a href="#">the READ DEFECT DATA command (see SBC-3); and</a></li> <li>c) <a href="#">the READ ELEMENT STATUS command (see SMC-3).</a></li> </ul>
<a href="#">All others</a>	<a href="#">Reserved</a>

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**Suggested changes to SBC-3**

**Table 4 — SBC-~~2~~3 commands that are allowed in the presence of various reservations**

Command	Write Excl	Excl Access	From registered I_T nexus (RR all types)	Write Excl RR	Excl Access RR
READ DEFECT DATA	<del>Conflict</del> <a href="#">Allowed</a> <sup>b</sup>	Conflict	Allowed	<del>Conflict</del> <a href="#">Allowed</a> <sup>b</sup>	Conflict
<p><sup>a</sup> ...</p> <p><sup>b</sup> <a href="#">Logical units claiming compliance with previous versions of this standard (e.g., SBC-2) may return RESERVATION CONFLICT in this case.</a></p>					

**Suggested changes to SMC-3**

**Table 5 — SMC commands that are allowed in the presence of various reservations**

Command	Addressed LU is reserved by another initiator	Write Excl	Excl Access	From registered I_T nexus (RR all types)	Write Excl RR	Excl Access RR
READ ATTRIBUTE	<a href="#">See SPC-4</a> <sup>b</sup> <del>Conflict Conflict Conflict Allowed Conflict Conflict</del>					
READ ELEMENT STATUS CURDATA=0	Conflict	<del>Conflict</del> <a href="#">Allowed</a> <sup>b</sup>	Conflict	Allowed	<del>Conflict</del> <a href="#">Allowed</a> <sup>b</sup>	Conflict
READ ELEMENT STATUS CURDATA=1	Allowed	Allowed	Conflict	Allowed	Allowed	Conflict
<sup>a</sup> ... <sup>b</sup> <a href="#">Logical units claiming compliance with previous versions of this standard (e.g., SMC-2) may return RESERVATION CONFLICT in this case.</a>						

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Editor’s Note 1: READ ATTRIBUTE is owned by SPC-3. SMC-3 is just defining 3 of the bytes in the CDB marked “Restricted for SMC-3”. It is not prudent to include it in the SMC-3 reservation table, since duplication leads to inconsistency. Replacing the row with “See SPC-4” solves the problem.

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Editor’s Note 2: READ ELEMENT STATUS ATTACHED would also have been affected but is being made obsolete by 05-317.

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