

To: T10 Technical Committee  
 From: Rob Elliott, HP (elliott@hp.com)  
 Date: 17 October 2005  
 Subject: 05-368r0 SPC-4 SBC-3 SMC-3 Allow more commands through Write Exclusive reservations

**Revision history**

Revision 0 (17 October 2005) First revision

**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 I\_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.

**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>	Conflict	Allowed	Allowed <sup>b</sup>	Conflict
READ ATTRIBUTE	Conflict Allowed <sup>b</sup>	Conflict	Allowed	Conflict Allowed <sup>b</sup>	Conflict
READ BUFFER	Conflict Allowed <sup>b</sup>	Conflict	Allowed	Conflict Allowed <sup>b</sup>	Conflict
RECEIVE COPY RESULTS	Conflict	Conflict	Allowed	Conflict	Conflict
RECEIVE DIAGNOSTIC RESULTS	Conflict Allowed <sup>b</sup>	Conflict	Allowed	Conflict Allowed <sup>b</sup>	Conflict
REPORT SUPPORTED OPERATION CODES	Conflict Allowed <sup>b</sup>	Conflict	Allowed	Conflict Allowed <sup>b</sup>	Conflict
REPORT SUPPORTED TASK MANAGEMENT FUNCTIONS	Conflict Allowed <sup>b</sup>	Conflict	Allowed	Conflict Allowed <sup>b</sup>	Conflict
TEST UNIT READY	Allowed <sup>b</sup>	Allowed <sup>b</sup>	Allowed	Allowed <sup>b</sup>	Allowed <sup>b</sup>
<sup>a</sup> ... <sup>b</sup> Logical units claiming compliance with previous versions of this standard (e.g., SPC-2, SPC-3) may return RESERVATION CONFLICT in this case.					

**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="#">SPC4</a>	<a href="#">SPC3</a>	Reserved				PTPL_A
4	PERSISTENT RESERVATION TYPE MASK							
5	PERSISTENT RESERVATION TYPE MASK							
6	Reserved							
7	Reserved							

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An SPC3 bit set to one indicates that the device server allows the TEST UNIT READY command (see table 1 in 5.6.1) through write exclusive and exclusive access persistent reservations. An SPC3 bit set to zero indicates nothing.

An SPC4 bit set to one indicates that the device server allows 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), the READ DEFECT DATA command (see SBC-3), and the READ ELEMENT STATUS and READ ELEMENT STATUS ATTACHED commands (see SMC-3) through write exclusive persistent reservations, if it supports those commands. An SPC4 bit set to zero indicates nothing.

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Editor’s Note 1: Need better suggestions for these bit names

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**Suggested changes to SBC-3**

**Table 3 — 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<sup>b</sup></a>	Conflict	Allowed	<del>Conflict</del> <a href="#">Allowed<sup>b</sup></a>	Conflict
<sup>a</sup> ... <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>					

**Suggested changes to SMC-3**

**Table 4 — 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	Conflict	Conflict <u>Allowed</u> <sup>b</sup>	Conflict	Allowed	Conflict <u>Allowed</u> <sup>b</sup>	Conflict
READ ELEMENT STATUS CURDATA=0	Conflict	Conflict <u>Allowed</u> <sup>b</sup>	Conflict	Allowed	Conflict <u>Allowed</u> <sup>b</sup>	Conflict
READ ELEMENT STATUS CURDATA=1	Allowed	Allowed	Conflict	Allowed	Allowed	Conflict
READ ELEMENT STATUS ATTACHED CURDATA=0	Conflict	Conflict <u>Allowed</u> <sup>b</sup>	Conflict	Allowed	Conflict <u>Allowed</u> <sup>b</sup>	Conflict
READ ELEMENT STATUS ATTACHED CURDATA=1	Allowed	Allowed	Allowed	Allowed	Allowed	Conflict
<p><sup>a</sup> ...</p> <p><sup>b</sup> <u>Logical units claiming compliance with previous versions of this standard (e.g., SMC-2) may return RESERVATION CONFLICT in this case.</u></p>						

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Editor’s Note 2: 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 probably not appropriate to include it in the SMC-3 reservation table at all, since duplication leads to inconsistency.

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Editor’s Note 3: Need to define the ELEMENT TYPE CODE field in the READ ATTRIBUTE CDB

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Editor’s Note 4: Should SEND VOLUME TAG and REQUEST VOLUME ELEMENT ADDRESS be allowed too?

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