To: T10 Technical Committee
From: Rob Elliott, HP (elliott@hp.com)
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Subject: 06-195r0 SPC-4 Persistent Reservation additional sense code changes

Revision history
Revision 0 (11 April 2006) First revision

Related documents
spc4r04 - SCSI Primary Commands - 4 revision 04
06-196 - SPC-4 Persistent Reservation REGISTER AND MOVE from unregistered I_T nexus (Rob Elliott, HP)

Overview
Table 33 footnote b calls out CHECK CONDITION/ILLEGAL REQUEST/INVALID FIELD IN CDB if one of the I_T nexuses in the parameter list is registered. This should be ILLEGAL REQUEST/INVALID FIELD IN PARAMETER LIST so the sense data field pointer can point to the TransportId of the I_T nexus that is registered and causing the problem. None of the CDB fields are invalid.

Table 33 footnote c and table 34 footnote b call out CHECK CONDITION/ILLEGAL REQUEST/INVALID FIELD IN CDB if certain conditions are true and SPEC_I_PT is set to one. This should be ILLEGAL REQUEST/INVALID FIELD IN PARAMETER LIST so the sense data field pointer can point to the SPEC_I_PT bit. None of the CDB fields are invalid.

Table 36 footnote b calls out CHECK CONDITION/ILLEGAL REQUEST/INVALID FIELD IN CDB if certain conditions are true and SERVICE ACTION RESERVATION KEY is set to zero. This should be ILLEGAL REQUEST/INVALID FIELD IN PARAMETER LIST so the sense data field pointer can point to the SERVICE ACTION RESERVATION KEY bit. None of the CDB fields are invalid.

Suggested changes

5.6.6 Registering

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If the I_T nexus has an established registration, the application client may change the reservation key by issuing a PERSISTENT RESERVE OUT command with REGISTER service action as defined in table 33.

Table 33 — Register behaviors for a REGISTER service action

Command I_T nexus status	Parameter list fields			Results
	RESERVATION KEY	SERVICE ACTION RESERVATION KEY	SPEC_I_T	
received on an unregistered I_T nexus	zero	zero	ignore	Do nothing except return GOOD status.
		non-zero	zero	Register the I_T nexus on which the command was received with the value specified in the SERVICE ACTION RESERVATION KEY field.
			one	Register the I_T nexus on which the command was received and each unregistered I_T nexus specified in the parameter list with the value specified in the SERVICE ACTION RESERVATION KEY field. [b]
	non-zero	ignore	ignore	Return RESERVATION CONFLICT status.
received on a registered I_T nexus	Not equal to I_T nexus reservation key	ignore	ignore	Return RESERVATION CONFLICT status.
	Equal to the I_T nexus reservation key	zero	zero	Unregister the I_T nexus on which the command was received (see 5.6.10.3).
			one	Return CHECK CONDITON status. [c]
		non-zero	zero	Change the reservation key of the I_T nexus on which the command was received to the value specified in the SERVICE ACTION RESERVATION KEY field.
			one	Return CHECK CONDITON status. [c]

[a] For requirements regarding the parameter list fields not shown in this table see 6.12.3.

[b] If any I_T nexus specified in the parameter list is registered, the command shall be terminated with CHECK CONDITION status, with the sense key set to ILLEGAL REQUEST, and the additional sense code set to ~~INVALID FIELD IN CDB~~INVALID FIELD IN PARAMETER LIST, and the field pointer (see 4.5.2.4.2) pointing to the first TransportID of a registered I_T nexus in the parameter list. Devices compliant with previous versions of this standard may return an additional sense code set to INVALID FIELD IN CDB.

[c] The sense key shall be set to ILLEGAL REQUEST, ~~and~~ the additional sense code shall be set to ~~INVALID FIELD IN CDB~~INVALID FIELD IN PARAMETER LIST, and the field pointer (see 4.5.2.4.2) shall point to the SPEC_I_PT bit. Devices compliant with previous versions of this standard may return an additional sense code set to INVALID FIELD IN CDB.

Alternatively, an application client may establish a reservation key for an I_T nexus without regard for whether one has previously been established by issuing a PERSISTENT RESERVE OUT command with REGISTER AND IGNORE EXISTING KEY service action as defined in table 34.

Table 34 — Register behaviors for a REGISTER AND IGNORE EXISTING KEY service action

Command I_T nexus status	Parameter list fields		Results
	SERVICE ACTION RESERVATION KEY	SPEC_I_T	
received on an unregistered I_T nexus	zero	ignore	Do nothing except return GOOD status.
	non-zero	zero	Register the I_T nexus on which the command was received with the value specified in the SERVICE ACTION RESERVATION KEY field.
		one	Return CHECK CONDITON status. [b]
received on a registered I_T nexus	non-zero	zero	Unregister the I_T nexus on which the command was received (see 5.6.10.3).
		one	Return CHECK CONDITON status. [b]
	non-zero	zero	Change the reservation key of the I_T nexus on which the command was received to the value specified in the SERVICE ACTION RESERVATION KEY field.
		one	Return CHECK CONDITON status. [b]

[a] The RESERVATION KEY field is ignored when processing a REGISTER AND IGNORE EXISTING KEY service action. For requirements regarding other parameter list fields not shown in this table see 6.12.3.

[b] The sense key shall be set to ILLEGAL REQUEST, ~~and~~ the additional sense code shall be set to ~~INVALID FIELD IN CDB~~INVALID FIELD IN PARAMETER LIST, and the field pointer (see 4.5.2.4.2) shall point to the SPEC_I_PT bit. Devices compliant with previous versions of this standard may return an additional sense code set to INVALID FIELD IN CDB.

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5.6.7 Registering and moving the reservation

The PERSISTENT RESERVE OUT command REGISTER AND MOVE service action is used to register a specified I_T nexus (see table 36) and move the reservation to that I_T nexus.

Table 36 — Register behaviors for a REGISTER AND MOVE service action

Command I_T nexus status	Parameter list fields [a]			Results
	RESERVATION KEY	SERVICE ACTION RESERVATION KEY	SPEC_I_T	
received on an unregistered I_T nexus	ignore	ignore	ignore	If there is an existing persistent reservation, return RESERVATION CONFLICT status. If there is not an existing persistent reservation, return CHECK CONDITION status. [b] [06-196 removes this reference to footnote b, so it is ignored by this proposal. If 06-196 is not accepted, this footnote would have to remain unchanged, so the field pointer can point to the SERVICE ACTION field in the CDB.]
received on the registered I_T nexus of reservation holder	Not equal to I_T nexus reservation key	ignore	ignore	Return RESERVATION CONFLICT status.
	Equal to the I_T nexus reservation key	zero	ignore	Return CHECK CONDITON status. [b]
		non-zero [c]	zero	The I_T nexus on which PERSISTENT RESERVE OUT command was received shall remain registered. See this subclause for the registration and the move specifications.
			one	The I_T nexus on which PERSISTENT RESERVE OUT command was received shall be unregistered (see 5.6.10.3) upon completion of command processing. See this subclause for the registration and the move specifications.
received on a registered I_T nexus that is not the reservation holder	ignore	ignore	ignore	Return RESERVATION CONFLICT status.

[a] For requirements regarding the parameter list fields not shown in this table see 6.12.3.
[b] The sense key shall be set to ILLEGAL REQUEST, ~~and~~ the additional sense code shall be set to ~~INVALID FIELD IN CDB~~INVALID FIELD IN PARAMETER LIST, and the field pointer (see 4.5.2.4.2) shall point to the SERVICE ACTION RESERVATON KEY field. Devices compliant with previous versions of this standard may return an additional sense code set to INVALID FIELD IN CDB.
[c] The application client and backup application should use the same reservation key.