To: T10 Technical Committee
From: Rob Elliott, HP (elliott@hp.com)
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Subject: T10/03-343r0 SPC-3 Report supported asymmetric access states

Revision History
Revision 0 (3 October 2003) first revision

Related Documents
spc3r15 - SCSI Primary Commands - 3 revision 15

Overview
It is up to the target device vendor which asymmetric logical unit access states (active/optimized, active/non-optimized, standby, or unavailable) are implemented. However, there is no way for an application to determine which states are implemented other than to try to set a target port group into each state (and look for failures).

A bit mask is proposed for the REPORT TARGET PORT GROUPS parameter data indicating which of the currently defined states are supported.

Also, the response if an unsupported state is requested is clarified (ILLEGAL REQUEST/INVALID FIELD IN PARAMETER DATA, not HARDWARE ERROR/SET TARGET PORT GROUPS COMMAND FAILED).

Suggested Changes
5.8.3 Discovery of asymmetric logical unit access behavior
SCSI logical units with asymmetric logical unit access may be identified using the INQUIRY command. The value in the asymmetric logical units access (ALUA) field (see 6.4.2) indicates whether or not the logical unit supports asymmetric logical unit access and if so whether implicit or explicit management is supported. The asymmetric access states supported may be determined by the REPORT TARGET PORT GROUPS command parameter data.

5.8.5 Transitions between target port asymmetric access states
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If the transition was explicit to a supported asymmetric access state and it failed, then the device server shall return CHECK CONDITION status with the sense key set to HARDWARE ERROR and an additional sense code of SET TARGET PORT GROUPS COMMAND FAILED. The target port group that encountered the error should complete a transition to the unavailable target port asymmetric access state. If a target port group asymmetric access state change occurred as a result of the failed transition the device server shall establish a unit attention condition for all initiators other than the one that sent the SET TARGET PORT GROUPS command with an additional sense code of ASYMMETRIC ACCESS STATE CHANGED.
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6.24 REPORT TARGET PORT GROUPS command
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There shall be one target port group descriptor (see table 152) for each target port group.

Table 152 - Target port group descriptor parameter data

	7	6	5	4	3	2	1	0
0	Reserved				ASYMMETRIC ACCESS STATE			
1	Reserved			U_SUP	S_SUP	AN_SUP	AO_SUP	sup_sup
2	(MSB)							
3			TARGET PORT GROUP					(LSB)
4	Reserved							
5	STATUS CODE							
6	Vendor unique							
7	TARGET PORT COUNT (X)							
8	Relative target port(s)							
9	RELATIVE TARGET PORT 1							
				....				
n								

A SUP_SUP bit of one means the U_SUP, S_SUP, AN_SUP, AND AO_SUP BITS are valid and indicate which asymmetric access states the target port group supports as defined in Table xxx. A SUP_SUP bit of zero means the U_SUP, S_SUP, AN_SUP, and AO_SUP bits are undefined.

Table xxx — Asymmetric access state supported bits

Bit	Value	Description
U_SUP	0	Unavailable asymmetric access state is not supported
	1	Unavailable asymmetric access state is supported
S_SUP	0	Standby asymmetric access state is not supported
	1	Standby asymmetric access state is supported
AN_SUP	0	Active/non-optimized asymmetric access state is not supported
	1	Active/non-optimized asymmetric access state is supported
AO_SUP	0	Active/optimized asymmetric access state is not supported
	1	Active/optimized asymmetric access state is supported

The ASYMMETRIC ACCESS STATE field (see table 153) contains the target port group's current asymmetric access state (see 5.8.4).

Table 153 — Asymmetric access state

Value	State
0h	Active/optimized
1h	Active/non-optimized
2h	Standby
3h	Unavailable
4h-Eh	Reserved
Fh	Transitioning between states

6.28 SET TARGET PORT GROUPS command

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The allowable values to which target port asymmetric access states may be set is vendor specific and should be reported in the REPORT TARGET PORT GROUP parameter data.

[new para] Target port groups that are not specified in a parameter list may change asymmetric access states as a result of the SET TARGET PORT GROUPS command. This shall not be considered an implicit target port group asymmetric access state change.

If the SET TARGET PORT GROUPS attempts to establish an invalid combination of target port asymmetric access states or attempts to select an unsupported asymmetric access state, the device server shall return CHECK CONDITION status with the sense key set to ILLEGAL REQUEST and an additional sense code of INVALID FIELD IN PARAMETER LIST.