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T10: T10 Technical Committee (SCSI)

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Subject: Report LUNS Clarification

Revision History

Revision 0 (October 31, 2003), first revision
Revision 1 (January, 2004)

Related Documents

SPC-3r15 – SCSI Primary Commands – 3, revision 15

SAM3r10 – SCSI Architectural Model – 3, revision 10

Overview

We find the current wording of the Report LUNS command ambiguous for some scenarios. Consider a multi-LUN device that supports the industry common practice of LUN mapping and masking. A particular host may not be allowed to access LUN 0 for Read/Write but does have access to other LUNS. The question is, does LUN 0 appear in the Report LUNS inventory list?

Problem Description

Reference:

Under the Inquiry command we have:

Table 75 — Peripheral qualifier

Qualifier	Description
000b	The specified peripheral device type is currently connected to this logical unit. If the device server is unable to determine whether or not a physical device is currently connected, it also shall use this peripheral qualifier when returning the INQUIRY data. This peripheral qualifier does not mean that the device is ready for access by the initiator.
001b	The device server is capable of supporting the specified peripheral device type on this logical unit. However, the physical device is not currently connected to this logical unit.
010b	Reserved
011b	The device server is not capable of supporting a physical device on this logical unit. For this peripheral qualifier the peripheral device type shall be set to 1Fh to provide compatibility with previous versions of SCSI. All other peripheral device type values are reserved for this peripheral qualifier.
1xxb	Vendor specific

Pertinent paragraphs from Report LUNS:

Paragraph 1

> "The REPORT LUNS command (see table 139) requests that the peripheral device logical unit inventory accessible to the initiator via the addressed target port be sent to the application client. The logical unit inventory is a list that **shall include the logical unit numbers of all logical units having a PERIPHERAL QUALIFIER value of 000b** (see 6.4.2). Logical unit numbers for **logical units with PERIPHERAL QUALIFIER values of 100b, 101b, 110b, or 111b may optionally be included** in the logical unit inventory.

Paragraph 2

> "**A SCSI device shall support a REPORT LUNS command that is addressed to logical unit zero.** Support of the REPORT LUNS command by logical units other than logical unit zero is optional. Support of the REPORT LUNS command on devices having only a single logical unit with the logical unit number of zero is optional."
>
> .....

Paragraph 3

> "The REPORT LUNS data should be returned even though the device server is not ready for other commands. The default report of the logical unit inventory should be available without incurring any media access delays. **The default report of the logical unit inventory shall contain at least LUN 0**."

Text from SAM-3

4.9.2 LUN 0 address

> **All SCSI devices shall accept LUN 0 as a valid address**. For SCSI devices that support the hierarchical addressing model the LUN 0 shall be the logical unit that an application client addresses to determine information about the SCSI target device and the logical units contained within the SCSI target device.
>
> To address the LUN 0 of a SCSI device the peripheral device address method shall be used.

Ambiguity

Does LUN 0 always exist? I believe it does (see Paragraph 2), but it may have a PQ of 001 (not attached). Unfortunately Paragraph 1 above does not specify how PQ's of 001 and 011 are treated by Report LUNS.

Paragraph 3 makes it clear that if the device server has not yet acquired it's LUN configuration and mapping information, it should answer a Report LUNS request with a "**default**" inventory. Further, that default inventory shall contain at least LUN 0. **BUT,** what happens when the default inventory list is replaced with the real inventory list when the device server completes its configuration initialization phase? I believe arguments can be made both ways:

- LUN 0 should **always** be present in the inventory list, even if not mapped (i.e. PQ of 001)
- LUN 0 may be left out of the inventory if it has a PQ of 001 and other LUNS with a PQ of 000 exist for the requesting initiator.

This ambiguity needs to be fixed.

Proposed SPC Change

Change the first paragraph of **6.21 Report LUNS Command** to the following;

> "The REPORT LUNS command (see table 139) requests that the peripheral device logical unit inventory accessible to the initiator via the addressed target port be sent to the application client. The logical unit inventory is a list that shall include the logical unit numbers of all logical units having a PERIPHERAL QUALIFIER value of 000b (see 6.4.2). Logical unit numbers for logical units with PERIPHERAL QUALIFIER values of 100b, 101b, 110b, or 111b may optionally be included in the logical unit inventory. Logical unit numbers for logical units with a PERIPHERAL QUALIFIER value of 001b, or 011b **should** not be included in the logical unit inventory.

Change the second paragraph from the top of page 193 (rev 15) and insert a new paragraph as follows;

> The REPORT LUNS data should be returned even though the device server is not ready for other commands. The default report of the logical unit inventory should be available without incurring any media access delays.
>
> The report of the logical unit inventory shall always contain LUN 0 or the Report Luns well know logical unit.

Note – I split the last sentence off into a new paragraph. My intent is this rule **always** applies, not just while the device server is not ready for "other commands."