

To: T10 Technical Committee  
From: Rob Elliott, HP (elliott@hp.com)  
Date: 18 December 2002  
Subject: T10/03-032r0 SAM-3 Single level LUN formats

### **Revision History**

Revision 0 (18 December 2002) first revision

### **Related Documents**

02-155r5 Responses to SAM-2 letter ballot comments (Compaq #18)  
sam3r04 - SCSI Architecture Model - 3 revision 4

### **Overview**

SAM-2 originally defined a single-level LUN format for LUNs 256 and below. In letter ballot, SAM-2 added the option to use the new flat-space address method for 257 to 16,384 logical units.

Should the flat space address method be allowed for access to LUNs 256 and below as well? If not, software would have to change methods based on the LUN number; this seems burdensome.

Should a device with 256 or fewer LUNs be allowed to use the flat space address method? If it is dynamically creating and deleting LUNs, it would have to change formats each time it passes the 256 LUN boundary - this doesn't seem like a good idea. Plus, if some LUs have already been assigned numbers greater than 256, the device would have to renumber them to fit the smaller format.

To resolve this, either format should be allowed at any time.

### **Suggested Changes**

Discuss the two formats first, then the rules for using them...

## **4.9 Logical unit numbers**

### **4.9.1 Logical unit numbers overview**

All logical unit number formats described in this standard are hierarchical in structure even when only a single level in that hierarchy is used. The HiSUP bit shall be set to one in the standard INQUIRY data (see SPC-2) when any logical unit number format described in this standard is used. Non-hierarchical formats are outside the scope of this standard.

### **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.

### **4.9.3 Single level logical unit number structure**

When the single level subset format is used, the HiSUP bit shall be set to one in the standard INQUIRY data (see SPC-2) returned by the logical unit with the logical unit number zero.

~~If a SCSI target device contains 256 or fewer logical units, none of which are dependent logical units (see 4.13) or extended addressing logical units (see 4.9.8), then its logical unit numbers shall have the format shown in table 1, that is a single level subset of the format described in 4.13.~~

Table 1 describes a single level subset of the format described in 4.13 for logical unit numbers 255 and below.

**Table 1 — Single level logical unit number structure for ~~256 or fewer~~ logical unit numbers 255 and below**

[includes SINGLE LEVEL LUN (00h to FFh, inclusive)]

All logical unit number structure fields shall be zero except the SINGLE LEVEL LUN field (see table 1). The value in the SINGLE LEVEL LUN field shall be between 0 and 255 (inclusive). The 00b in the ADDRESS METHOD field (see 4.9.4) and the 00h in the BUS IDENTIFIER field (see 4.9.6) specify peripheral device addressing for a logical unit at the current level (~~see 4.9.4~~).

~~If a SCSI target device contains more than 256 and less than 16 385 logical units, none of which are dependent logical units (see 4.13) or extended addressing logical units (see 4.9.8), then its logical unit numbers that are greater than 255 shall have the format shown in table 2, that is a single level subset of the format described in 4.13.~~

~~Logical unit numbers between 0 and 255 should have the format shown in table 1 but may have the format shown in table 2.~~

~~Table 2 describes a single level subset of the format described in 4.13 for logical unit numbers 16 383 and below.~~

**Table 2 — Single level logical unit number structure for ~~257 to 16 384~~ logical unit numbers 16 383 and below**

[includes SINGLE LEVEL LUN (~~0400h-0000h~~ to 3FFFh, inclusive)]

All logical unit number structure fields shall be zero except the SINGLE LEVEL LUN field (see table 2). The value in the SINGLE LEVEL LUN field shall be between ~~256-0~~ and 16 383 (inclusive). The 01b in the ADDRESS METHOD field (see 4.9.4) and the 00h in the BUS IDENTIFIER field (see 4.9.7) specifies flat ~~address~~-space addressing for a logical unit at the current level (~~see 4.9.7~~).

If a SCSI target device contains 256 or fewer logical units, none of which are dependent logical units (see 4.13) or extended addressing logical units (see 4.9.8), then its logical units should be numbered 255 and below.

If a SCSI target device contains 16 384 or fewer logical units, none of which are dependent logical units (see 4.13) or extended addressing logical units (see 4.9.8), then its logical units should be numbered 16 383 and below.

Logical unit numbers that are greater than 255 shall have the format shown in table 2. Logical unit numbers that are less than 256 should have the format shown in table 1 but may have the format shown in table 2.