

# memorandum



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T10/04-285r0

To INCITS T10 Committee      From Michael Banther, HP      Subject Resolution of ADC letter ballot comment HP-225

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## Revision History

Revision 0 – Initial proposal.

## Background

ADC letter ballot comment HP-225 points out that the description of the LOGICAL UNIT NUMBER field in the RMC Logical Unit descriptor (ADCr06b, 6.2.2.3.1 RMC Logical Unit descriptor parameters) conflicts with the association of logical unit numbers to logical units by the access controls coordinator (SPC3r20a, 8.3.1 Access controls model).

In sub-clause 4.8, SAM-2 (r24) states the existence of a logical unit number per logical unit – SCSI initiator port combination if access controls are in effect. SAM-2 references SPC-3 regarding the association of logical unit numbers to logical units. SPC-3 contains the normative text that defines the access controls feature (SPC3r20a, 8.3 ACCESS CONTROLS well known logical unit). Since ADC uses SAM-2 as its architectural base and since SAM-2 both discusses the per-initiator aspect of a LUN when access controls are in effect and also references SPC-3, HP believes that ADC must allow for use of a target device with access controls enabled.

SPC-3 defines the concept of a default LUN. Default LUN values, 'shall be the LUN values that would be reported by the REPORT LUNS command if access controls were disabled' (SPC3r20a, 8.3.1.4.3). In the last paragraph of 8.3.1.4.3, SPC-3 also points out that:

The association between default LUN values and logical units is managed by the access controls coordinator and may change due to circumstances that are beyond the scope of this standard. To track such changes, the access controls coordinator shall maintain a generation counter value called DLgeneration as described in 8.3.1.4.4.

## Proposed changes to ADCr06c

### 6.2.2.4.2 RMC logical unit descriptor format

The LOGICAL UNIT NUMBER field specifies, for the RMC logical unit when accessed through the DT device primary port(s):

- a) The LUN if access controls are not in effect; or
- b) The default LUN if access controls are in effect (see SPC-3).

The LOGICAL UNIT NUMBER field contains the first two bytes (i.e., bytes 0 and 1) of a single level logical unit number structure or the contents of a two byte extended logical unit address (see SAM-2). The ADC device server shall return a CHECK CONDITION to a MODE SELECT command when multiple descriptors with the ENABLE bit set to one have the same value in the LOGICAL UNIT NUMBER field. The sense key shall be set to ILLEGAL REQUEST and the additional sense code shall be set to INVALID FIELD IN PARAMETER LIST.



#### 6.2.2.4.3 SMC logical unit descriptor format

The LOGICAL UNIT NUMBER field specifies, for the SMC logical unit when accessed through the DT device primary port(s):

- a) The LUN if access controls are not in effect; or
- b) The default LUN if access controls are in effect (see SPC-3).

The LOGICAL UNIT NUMBER field contains the first two bytes (i.e., bytes 0 and 1) of a single level logical unit number structure or the contents of a two byte extended logical unit address (see SAM-2). The ADC device server shall return a CHECK CONDITION to a MODE SELECT command when multiple descriptors with the ENABLE bit set to one have the same value in the LOGICAL UNIT NUMBER field. The sense key shall be set to ILLEGAL REQUEST and the additional sense code shall be set to INVALID FIELD IN PARAMETER LIST.

#### 6.2.2.4.4 ADC logical unit descriptor format

The LOGICAL UNIT NUMBER field specifies, for the ADC logical unit when accessed through the DT device primary port(s):

- a) The LUN if access controls are not in effect; or
- b) The default LUN if access controls are in effect (see SPC-3).

The LOGICAL UNIT NUMBER field contains the first two bytes (i.e., bytes 0 and 1) of a single level logical unit number structure or the contents of a two byte extended logical unit address (see SAM-2). The ADC device server shall return a CHECK CONDITION to a MODE SELECT command when multiple descriptors with the ENABLE bit set to one have the same value in the LOGICAL UNIT NUMBER field. The sense key shall be set to ILLEGAL REQUEST and the additional sense code shall be set to INVALID FIELD IN PARAMETER LIST.

#### Questions for the group

ADCr06b used the text, 'The LOGICAL UNIT NUMBER field is the logical unit number of the device server presented through the DTD primary port(s).' In ADCr06c, this text reads, 'The LOGICAL UNIT NUMBER field is the logical unit number ... of the RMC logical unit that contains the RMC device server and associated DT device primary port(s).' I've made several changes in this sentence:

- a) I've replaced 'is' with 'specifies' because 'is' often signals a definition or implication;
- b) I've removed 'that contains the RMC device server' since the SCSI architecture demands that the RMC logical unit contain one; and
- c) I've changed the text regarding primary port access back to using 'through' because SAM-2 doesn't include ports within logical units.

Does the group agree with these changes?

Given that the LOGICAL UNIT NUMBER field doesn't contain the entire LUN, should it have a different name (e.g., LOGICAL UNIT ADDRESS)?

The first changed sentence in each sub-clause states that the logical unit number field specifies a LUN. SAM-2 defines a LUN as a 64-bit number. The claim that the 16 bits can specify the entire 64 bits lies in the fact that SAM-2 defines the remaining 48 bits as zero. Does the text need an additional statement to clarify the implied mapping?

The text in ADCr06c associates the logical unit number field to the first two bytes of a single level logical unit number structure. It's not clear whether the text allows the use of the two byte extended address method in this field. I've proposed allowing it. The reasons for inclusion seem to balance the reasons for exclusion. Adding it caters for the possibility that T10 may add new extended address methods; however it increases the likelihood of a reader misunderstanding that a LOGICAL UNIT NUMBER field can associate an RMC/SMC/ADC logical unit with a well known LUN. What's the group's preference?