ENDL
TEXAS

Date: 18 April 2000
To: T10 Technical Committee
From: Ralph O. Weber
Subject: SAM-2 Byte Count That's Really Buffer Size

During the letter ballot review of FCP-2 Crossroads comment #5 (see 1.5 in 00-150r1) requested that the FCP-2 definition of 'command byte count' match the SAM-2 definition, which it referenced. For the reader's convenience the two definitions are as follows:

FCP-2

command byte count: Upper limit on the extent of the data to be transferred by the SCSI command.

SAM-2

command byte count: The maximum number of bytes to be transferred by the command.

FCP-2 editor Bob Snively rejected this comment saying that the SAM-2 definition restricted the target's option to retry transferring some or all of the data in response to appropriate error conditions detected in the service delivery subsystem (okay, Bob said that Fibre Channel detected the error, and I'm writing in SAMtalk). None the less, Bob's observation is correct. The SAM-2 (and SAM) definition shown above limits the target to transferring each byte in the application client's data buffer exactly once.

During the working group review of this issue, the following SAM-2 (and SAM) figure was discovered on SAM-2 rev 13 pdf page 70.

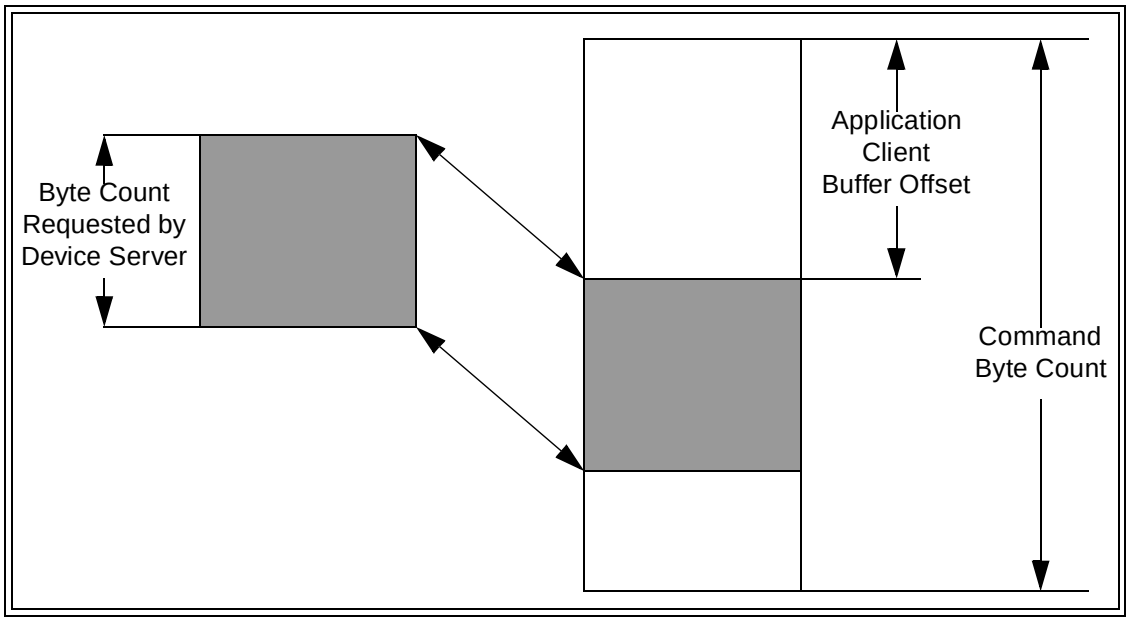

Figure 29 — Model for buffered data transfers

Clearly, this usage of 'command byte count' is the application client data buffer size and exactly the entity that FCP-2 wants to reference.

The working group agreed that SAM-2 should be changed to use the 'command byte count' concept shown in the figure, as opposed to the written definition. This proposal contains a collection of specific SAM-2 changes to meet the working group request.

This proposal replaces the 'command byte count' term with 'application client buffer size' and gives the new term a definition that matches the figure and the needs of FCP-2. The term 'command byte count' is not retrained because its connotations are not compatible with the intent of the change.

Each occurrence of 'command byte count' in SAM-2 is discussed in this proposal. Only one occurrence (change 6) offers any difficulties for replacing 'command byte count' with 'application client buffer size'.

Change 1: In the Execute Command remote procedure call prototype at the beginning of clause 5 (SAM-2 rev 13 pdf page 64)

Replace '[Command Byte Count]' with '[Application Client Buffer Size]'

Change 2: In the clause 5 definitions for the input arguments to the Execute Command remote procedure call (SAM-2 rev 13 pdf page 64)

Replace:

Command Byte Count: The maximum number of bytes to be transferred by the command.

with:

Application Client Buffer Size: The number of bytes available for data transfers to the Data-In Buffer or from the Data-Out Buffer. Also the maximum byte count that a device server can request be transferred by any one data transfer protocol service request (see 5.3.1).

Change 3: In the Send SCSI Command protocol service request prototype near the beginning of 5.3 (SAM-2 rev 13 pdf page 69)

Replace '[Command Byte Count]' with '[Application Client Buffer Size]'

Change 4: In figure 29 (the figure reproduced above) after the second paragraph of 5.3.1 (SAM-2 rev 13 pdf page 70)

Replace 'Command Byte Count' with 'Application Client Buffer Size'

Change 5: In the descriptions of the *objects* shown in figure 29, after the second paragraph following figure 29 in 5.3.1 (SAM-2 rev 13 pdf page 71)

Replace:

Command Byte Count: Upper limit on the extent of the data to be transferred by the SCSI command.

with:

Application Client Buffer Size: The absolute maximum byte count that a device server can request be transferred by any one data transfer protocol service request. For any specific data transfer protocol service request, the maximum is Application Client Buffer Size minus Application Client Buffer Offset.

Change 6: Regarding the paragraph that specifies the 'do not give broad meaning to the number bytes transferred' rule, the first paragraph following the list described in change 5 in 5.3.1 (SAM-2 rev 13 pdf page 71)

Replace:

> If an SCSI protocol supports random buffer access, as described below, the offset and byte count specified for each data segment to be transferred may overlap. In this case the total number of bytes moved for a command is not a reliable indicator of transfer extent and shall not be used by an initiator or target implementation to determine the command byte count.

with (changes marked with underlines and strikeouts):

> If an SCSI protocol supports random buffer access, as described below, the offset and byte count specified for each data segment to be transferred may overlap. In this case the total number of bytes moved for a command is not a reliable indicator of transfer extent and shall not be used by an initiator or target implementation to determine the largest byte offset to which or from which data was transferred ~~command byte count~~.

Related Changes

The following change (noted while preparing this proposal) is suggested to improve the readability of SAM-2.

Change 7: In the paragraph that introduces the descriptions of the *objects* shown in figure 29, the second paragraph following figure 29 in 5.3.1 (SAM-2 rev 13 pdf page 71)

Change:

> The movement of data between the application client and device server is controlled by the following parameters:

to:

> The movement of data between the application client and device server is controlled by the following parameters (also depicted in figure 29):