ENDL
T E X A S

Date: 16 September 2000
To: T10 Technical Committee
From: Ralph O. Weber
Subject: Changes Made During SAM-2 rev 14 Preparation

Several problems were found while incorporating T10 approved proposals in SAM-2 revision 14 and this document reviews the problems and changes made by the editor in a best effort attempt to honor the desires of T10 members with respect to the content of SAM-2 revision 14.

00-309r2 - Bidirectional data transfers in SAM-2

As written, 00-309r2 would have required the data-in and data-out buffers to contain the same number of bytes. This oversight can be traced to there being no SAM-2 revision incorporating 00-213r2 (SAM-2 Byte Count That's Really Buffer Size). Several changes were made by the SAM-2 editor to provide for different sizes of data-in and data-out buffers.

SPI-4, FCP-2 and other protocol editors should be aware that these changes affect your documents in the areas that describe the relationship of your protocol to SAM-2.

In the **Execute Command** function prototype in clause 5, the **Command Byte Count** parameter (changed to **Application Client Buffer Size** by 00-213r2) was removed and two new parameters were introduced in its place, **Data-In Buffer Size** and **Data-Out Buffer Size**. The modified function prototype looks like this:

Service response =Execute Command (Task Address, CDB, [Task Attribute], [Data-In Buffer Size], [Data-Out Buffer], [Data-Out Buffer Size], [Autosense Request] || [Data-In Buffer], [Sense Data], Status)

The descriptions of the two 'new' parameters are as follows:

Data-In Buffer Size: The number of bytes available for data transfers to the Data-In Buffer. See 5.3.1 for more discussion of this parameter.

Data-Out Buffer Size: The number of bytes available for data transfers from the Data-Out Buffer. See 5.3.1 for more discussion of this parameter.

In 5.3, the **Send SCSI Command** protocol service request was similarly modified with the result looking like this:

Send SCSI Command (Task Address, CDB, [Task Attribute], [Data-In Buffer Size], [Data-Out Buffer], [Data-Out Buffer Size], [Autosense Request] ||)

The changes that affect the protocol document end here.

In clause 5, the following sentence was added to the description of the **Data-Out Buffer** parameter:

"This model permits the target to assume that the content of the data-out buffer does not change while the device server is processing the command."

This differs from the 00-309r2 proposal text:

The target may assume the content of the data-out buffer does not change during the lifetime of the task.

The first problem is that the usage of keyword 'may' is questionable in this context. Also, when linked commands are used (I know it's gross), the lifetime of the task includes the lifetimes of all the commands. Thus the proposed text would be inappropriate for linked commands.

The following alternative wording was considered and rejected:

"If the contents of the data-out buffer change processing of the command, the results are unpredictable."

In 5.3.1 the paragraph before figure 29, the following text was inserted:

"The model allows either unidirectional or bidirectional data transfer. That is, the execution of an SCSI command may require the transfer of data from the application client using the data-out buffer, or to the application client using the data-in buffer, or both to and from the application client using both the data-in buffer and the data-out buffer."

The original (SAM-2 rev 13) text was:

"The model requires unidirectional data transfer. That is, the execution of an SCSI command shall not require the transfer of data for that command both to and from the application client."

The the text proposed by 00-309r2 was:

'The model allows bidirectional data transfer. That is, the execution of an SCSI command may require the transfer of data for that command both to and from the application client. For a SCSI command that requires bidirectional data transfer the application client buffer shall consist of a data-in buffer and a data-out buffer."

The editor believes that the inserted text better communicates the committee's intent by more explicitly listing the options available to the target and command set designers.

In 5.3.1 figure 29, 'Command Byte Count' was changed to 'Application Client Buffer Size' as per 00-213r2. In addition, the definitions of Application Client Buffer Size and Application Client Buffer Offset have been modified to show that they apply to either the data-in buffer or the data-out buffer. The result looks like this:

Application Client Buffer Size: The total number of bytes in the application client's buffer (data-in or data-out).

Application Client Buffer Offset: Offset in bytes from the beginning of the application client's buffer (data-in or data-out) to the first byte of transferred data.