

Document: T10/02-318r1
To: T10 Committee Membership
From: Edward A. Gardner, Basil Networks
Subject: SAS Data Transfer Rules

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SAS-r01 places very few constraints on how data transfers are performed. For example, SAS-r01 allows a data transfer to be performed as a series of DATA information units containing only a single byte of data, or any other arbitrary combination of data lengths. This flexibility is of negligible utility to ports that send DATA information units and complicates the design of ports that receive DATA information units.

Revision 0, discussed at the August 21-23 SAS working group meeting, proposed to require that all DATA information units for a command be the maximum length (1024 bytes), except the final DATA information unit for a command (in either direction) may be any length. The people at that working group thought that would be too restrictive, suggesting an alternate requirement that all DATA information units except the last be a multiple of four bytes. Subsequent discussion on the T10 reflector has shown support for the working group suggestion.

Revision 1 of this proposal follows the working group suggestion, requiring four-byte alignment for all DATA information units except the last. Basil Networks still feels that it would be beneficial to the industry for SAS to require or recommend greater alignment (e.g. eight-byte or larger).

References are to SAS-r01b.

Clause 9.2.1, page 189, paragraph beginning "The NUMBER OF FILL BYTES field...". Add the sentence:

The NUMBER OF FILL BYTES field shall contain zero and fill bytes shall not be present in all information unit types except DATA information units.

Clause 9.2.2.3, page 193, XFER_RDY information unit. Add the following:

If a target sends a XFER_RDY information unit containing a WRITE DATA LENGTH field that is not divisible by 4, the target shall not send any subsequent XFER_RDY information units for that command.

Clause 9.2.2.4, page 193, DATA information unit. Add the following:

If a target sends a DATA information unit containing a non-zero value in the NUMBER OF FILL BYTES field, the target shall not send any subsequent DATA information units for that command.

An initiator may set the NUMBER OF FILL BYTES field to a non-zero value in the last DATA information unit that it sends in response to a XFER_RDY. An initiator shall set the NUMBER OF FILL BYTES field to zero in all other DATA information units that it sends.