To: T10 SAS Protocols Working Group
From: Steve Gorshe, PMC-Sierra, Inc. (steve_gorshe@pmc-sierra.com)
Date: Dec. 19, 2005
Subject: Handling Redundant Primitive Sequences with DFE-based Receivers –
Proposed Text for SAS 2.0

Introduction

At the November meeting, contribution 05-422r0 summarized the potential problems when redundant primitive sequences are received by a DFE-based receiver. The current text states: "A receiver shall detect a redundant primitive sequence after the identical primitive is received in three consecutive dwords." The potential error multiplication resulting from the feedback in a DFE receiver could result in an error multiplication affecting the 3rd and 4th of the six dwords. As a result, a single transmission channel error could prevent the receiver from seeing three consecutive primitives with the correct value. Agreement was reached for a solution. Specifically, DFE receivers will detect a redundant primitive sequence when it receives any three out of six dwords with the same primitive value. This contribution provides the associated draft text for the SAS 2.0 specification. Two options for the draft text are provided.

Proposed Text

Option 1:
In section 7.2.4.6, modify the second paragraph as follows:

"A receiver shall detect a redundant primitive sequence after the identical primitive is received in any three ~~consecutive~~ dwords within six consecutive dword locations. After receiving a redundant primitive sequence, a receiver shall not detect a second instance of the same redundant primitive sequence until it has received six consecutive dwords that are not any of the following:"

This text remains compatible with the SAS 1.1 specification, since the 'three-consecutive' criterion is a subset of the 'three-out-of-six' criterion. The text makes no distinction between DFE and non-DFE receivers.

Option 2:
In section 7.2.4.6, modify the second paragraph as follows:

"A receiver shall detect a redundant primitive sequence after the identical primitive is received in three consecutive dwords. A receiver using a decision feedback equalizer (DFE) shall detect a redundant primitive sequence after the identical primitive is received in any three dwords within six consecutive dword locations. After receiving a redundant primitive sequence, a receiver shall not detect a second instance of the same redundant primitive sequence until it has received six consecutive dwords that are not any of the following:"

This text retains the identical specification for non-DFE receivers and specifies the modified requirement for a DFE receiver.