September 23, 2002

To: T10 Technical Committee
From: Timothy Hoglund (LSI Logic)
Subject: SAS Programmable PPTOV

This proposal defines the methodology for reporting and configuring the partial pathway timeout value (PPTOV) which is used by SAS expanders to recover from potential deadlock conditions. PPTOV establishes the time interval between detection of partial pathway blockage and the invocation of pathway recovery methods. This proposal specifies that PPTOV shall be reported via the DISCOVER SMP function and configured via the PHY CONTROL SMP function. Modifications to the PHY CONTROL and DISCOVER functions are as follows:

1. Modify Table 102 PHY CONTROL request as shown below:

Table 102. PHY CONTROL request

Byte	7	6	5	4	3	2	1	0
0	SMP FRAME TYPE (40h)							
1	FUNCTION (90h)							
2	Reserved							
3								
4	Ignored							
7								
8	Reserved							
9	PHY IDENTIFIER							
10	PHY OPERATION							
11	Reserved							
12	Ignored							
31								
32	PROGRAMMED MINIMUM PHYSICAL LINK RATE				Ignored			
33	PROGRAMMED MAXIMUM PHYSICAL LINK RATE				Ignored			
~~34~~	~~Ignored~~							
34	Ignored				PPTOV			
35	Ignored							
36	Reserved							
39								
40	(MSB)				CRC			
43								(LSB)

2. Modify Table 88 DISCOVER response as shown below:

Table 88. DISCOVER response

Byte	7	6	5	4	3	2	1	0
0	SMP FRAME TYPE (41h)							
1	FUNCTION (10h)							
2	FUNCTION RESULT							
3	Reserved							
4–7	Ignored							
8	Reserved							
9	PHY IDENTIFIER							
10	Ignored							
11	Reserved							
12	ROUTE ENTRY DISABLED	DEVICE TYPE			ADDRESS DECODE			
13	Reserved				ATTACHED SSP INITIATOR	ATTACHED STP INITIATOR	ATTACHED SMP INITIATOR	Reserved
14	Reserved				ATTACHED SSP TARGET	ATTACHED STP TARGET	ATTACHED SMP TARGET	Reserved
15	Reserved							
16–23	ATTACHED SAS ADDRESS							
24–31	SAS ADDRESS							
32	PROGRAMMED MINIMUM PHYSICAL LINK RATE				HARDWARE MINIMUM PHYSICAL LINK RATE			
33	PROGRAMMED MAXIMUM PHYSICAL LINK RATE				HARDWARE MAXIMUM PHYSICAL LINK RATE			
~~34~~	~~Ignored~~							
34	Ignored				PPTOV			
35	Ignored							
36–39	Reserved							
40–43	(MSB)				CRC			(LSB)

3. Add the PPTOV field description to 9.4.4.10 PHY CONTROL and 9.4.4.6 DISCOVER as follows:

The PPTOV field specifies the amount of time in microseconds an expander link shall wait after receiving Arbitrating(Blocked On Partial) confirmation from the expander connection manager before requesting that the expander connection manager resolve pathway blockage (see 7.13.3.4.1).

The default value for PPTOV shall be 7 microseconds. A PPTOV value of zero microseconds indicates that partial pathway resolution shall be requested by the expander link immediately upon reception of Arbitrating(Blocked On Partial) confirmation from the expander connection manager.