

To: T10 Technical Committee
 From: Rob Elliott, HP (elliott@hp.com)
 Date: 4 March 2006
 Subject: 06-134r0 SAS-2 Renumber phy event information codes

Revision history

Revision 0 (4 March 2006) First revision

Related documents

sas2r02 - Serial Attached SCSI - 2 (SAS-2) revision 02
 06-055r0 (aka 04-172r4) SAS-2 More counters (Rob Elliott, HP) (incorporated in sas2r02)

Overview

Several phy event information codes like 42h and 43h don't follow the general convention of the other pairs of codes that the code for transmission has a lower value than the code for reception. The codes should be swapped to maintain transmit/receive order. (noticed by Hugh Curley)

Suggested changes

4.9 Phy event information

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Table 22 — PHY EVENT INFORMATION SOURCE field (part 1 of 4)

Code	Name	Type ^a	Description
00h	No event	N/A	No event. The PHY EVENT INFORMATION field is not valid.
01h	Invalid dword count	WC	Number of invalid dwords (see 3.1.101) that have been received outside of phy reset sequences (i.e., between when the SP state machine (see 6.8) sends a Phy Layer Ready (SAS) confirmation or Phy Layer Ready (SATA) confirmation and when it sends a Phy Layer Not Ready confirmation to the link layer)
02h	Running disparity error count	WC	Number of dwords containing running disparity errors (see 6.2) that have been received outside of phy reset sequences
03h	Loss of dword synchronization count	WC	Number of times the phy has restarted the link reset sequence because it lost dword synchronization (i.e., the SP state machine transitioned from SP15:SAS_PHY_Ready or SP22:SATA_PHY_Ready to SP0:OOB_COMINIT (see 6.8))
04h	Phy reset problem count	WC	Number of times the phy did not obtain dword synchronization during the final SAS speed negotiation window (see 6.7.4.2)
05h	Elasticity buffer overflow count	WC	Number of times the phy's receive elasticity buffer (see 7.3) has overflowed (e.g., because it did receive a sufficient number of ALIGNs and/or NOTIFYs)
06h	Received ERROR count	WC	Number of times the phy received an ERROR primitive
07h - 1Fh	Reserved for phy layer-based phy event information		
^a The Type column indicates the source type: a) WC = wrapping counter b) PVD = peak value detector c) N/A = not applicable			

Table 22 — PHY EVENT INFORMATION SOURCE field (part 2 of 4)

Code	Name	Type ^a	Description
20h	Received address frame error count	WC	Number of times the phy detected an invalid address frame (see 7.8) (e.g., because of a CRC error)
23h 21h	Transmitted OPEN_REJECT abandon count	WC	Number of times the phy received an OPEN address frame and transmitted an abandon-class OPEN_REJECT (see 7.2.5.11). In expander devices, forwarded OPEN_REJECTs shall not be counted.
24h 22h	Received OPEN_REJECT abandon count	WC	Number of times the phy transmitted an OPEN address frame and received an abandon-class OPEN_REJECT (see 7.2.5.11). In expander devices, forwarded OPEN_REJECTs shall not be counted.
24h 23h	Transmitted OPEN_REJECT retry count	WC	Number of times the phy received an OPEN address frame and transmitted a retry-class OPEN_REJECT (see 7.2.5.11). In expander devices, forwarded OPEN_REJECTs shall not be counted.
22h 24h	Received OPEN_REJECT retry count	WC	Number of times the phy transmitted an OPEN address frame and received a retry-class OPEN_REJECT (see 7.2.5.11). In expander devices, forwarded OPEN_REJECTs shall not be counted.
25h	Received AIP (WAITING ON PARTIAL) count	WC	Number of times the phy received an AIP (WAITING ON PARTIAL) or AIP (RESERVED WAITING ON PARTIAL). In expander devices, forwarded AIPs shall be counted.
26h	Received AIP (WAITING ON CONNECTION) count	WC	Number of times the phy received an AIP (WAITING ON CONNECTION). In expander devices, forwarded AIPs shall be counted.
28h 28h 27h	Transmitted BREAK count	WC	Number of times the phy transmitted a BREAK that was not a response to a BREAK it received (e.g., a Close Timeout was detected by the SL state machine interfacing to the SMP target port).
27h 27h 28h	Received BREAK count	WC	Number of times the phy received a BREAK that was not a response to a BREAK that it transmitted
29h	Break Timeout count	WC	Number of times the phy transmitted a BREAK and did not receive a BREAK in response (e.g., as detected by the XL state machine and/or the SL state machine interfacing to the SMP target port).
2Ah	Connection count	WC	Number of connections in which the phy was involved
2Bh	Peak transmitted pathway blocked count	PVD	Peak value of a PATHWAY BLOCKED field in an OPEN address frame transmitted by the phy. Since the maximum value of the PATHWAY BLOCKED field is FFh, only byte 3 of the PHY EVENT INFORMATION field is used.
^a The Type column indicates the source type: <ul style="list-style-type: none"> a) WC = wrapping counter b) PVD = peak value detector c) N/A = not applicable 			

Table 22 — PHY EVENT INFORMATION SOURCE field (part 3 of 4)

Code	Name	Type ^a	Description
2Ch	Peak transmitted arbitration wait time	PVD	Peak value of an ARBITRATION WAIT TIME field in an OPEN address frame transmitted by the phy. Since the maximum value of the PATHWAY BLOCKED field is FFFFh, only bytes 2 and 3 of the PHY EVENT INFORMATION field are used.
2Dh	Peak arbitration time	PVD	Peak time in microseconds after transmitting an OPEN address frame that the phy has waited for connection response (e.g., OPEN_ACCEPT or OPEN_REJECT).
2Eh	Peak connection time	PVD	The peak duration, in microseconds, of any connection in which the phy was involved.
2Fh - 3Fh	Reserved for SAS arbitration-related phy information		
40h	Transmitted SSP frame count	WC	Number of SSP frames transmitted
41h	Received SSP frame count	WC	Number of SSP frames received
43h 42h	Transmitted SSP frame error count	WC	Number of times the phy was used in a connection involving the SSP target port, transmitted a frame, and received a NAK or an ACK/NAK timeout
42h 43h	Received SSP frame error count	WC	Number of times the phy was used in a connection involving the SSP target port, detected an invalid frame, and transmitted a NAK (CRC ERROR) (e.g., because of a CRC error)
44h	Transmitted CREDIT_BLOCKED count	WC	Number of times the phy transmitted a CREDIT_BLOCKED
45h	Received CREDIT_BLOCKED count	WC	Number of times the phy received a CREDIT_BLOCKED
46h - 4Fh	Reserved for SSP-related phy event information		
50h	Transmitted SATA frame count	WC	Number of STP or SATA frames transmitted
51h	Received SATA frame count	WC	Number of STP or SATA frames received
52h	SATA flow control buffer overflow count	WC	Number of times the phy's STP flow control buffer (see 7.17.3) has overflowed (e.g., because it received more data dwords than allowed after transmitting HOLD during an STP connection). This count should be maintained in the phy transmitting the HOLD and receiving the data dwords, but may be maintained in the phy receiving the HOLD and transmitting the data dwords.
^a The Type column indicates the source type: <ul style="list-style-type: none"> a) WC = wrapping counter b) PVD = peak value detector c) N/A = not applicable 			

Table 22 — PHY EVENT INFORMATION SOURCE field (part 4 of 4)

Code	Name	Type ^a	Description
53h - 5Fh	Reserved for STP and SATA-related phy event information		
60h	Transmitted SMP frame count	WC	Number of SMP frames transmitted
61h	Received SMP frame count	WC	Number of SMP frames received
62h	Received SMP frame error count	WC	Number of times the phy was used for to access the SMP target port and the SMP target port detected an invalid frame and transmitted a BREAK (e.g., because of a CRC error).
63h - 6Fh	Reserved for STP-related phy event information		
70h - CFh	Reserved		
D0h - FFh	Vendor specific		
^a The Type column indicates the source type: a) WC = wrapping counter b) PVD = peak value detector c) N/A = not applicable			