To: T10 Technical Committee
From: Rob Elliott, Compaq Computer Corporation (Robert.Elliott@compaq.com)
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Subject: Reporting AAF values with ECP

Revision 0: first revision

SPI-4 devices may include adjustable active filter (AAF) logic in their receivers that determines parameters like amplifier boost values during the training sequence for use during data transfers. The filtered signals always include all the high speed signals - REQ or ACK, DB[15:0]. P1, P_CRCA, and possibly the low speed signals. There may be one setting per bit, or one setting per group of bits – this is vendor-specific. Settings are maintained separately for each I_T nexus. This might be useful in judging how much margin a system has left – if the boost values are all being pushed to their maximum values, the system has less margin than one where boost values are all near nominal. A REPORT AAF VALUES function using ECP is proposed.

We have no need yet to change the values with a standard command. If wanted, a SET AAF VALUES outbound single function paralleling this function would work.

The meanings of the values are vendor-specific. This proposal provides a standard way to read them, but not a standard way to interpret them. Diagnostic software may display the values on-screen or log them to a file, but cannot interpret the values without knowing the device manufacturer and type.

The width of each AAF value is 8 bits. If a vendor implements more precision, some other vendor-specific means is needed to obtain that additional information. If a vendor implements less precision, either a subset of the bits may be used or values may be rounded. Again, this is a vendor-specific choice.

Editor's note: the field could be made larger if anyone feels that is appropriate. The data structure has room.

Due to the large amount of data, an inbound single function is used rather than an inbound multiple function. Multiple function commands expect 16 bytes of data per device.

Add AAF to the definitions and acronyms:
3.1.x adjustable active filter – optional receiver design component that boosts signals around 80 MHz and attenuates higher frequency signal content.

3.2 Symbols and abbreviations
AAF – Adjustable Active Filter

Change Table G.2 to add a new function code:

Table G.2 — Expander functions

EXPANDER FUNCTION CODE	Expander function	Type
C1h	<see proposal 00-392>	Inbound
C2h	REPORT AAF VALUES	single
C3h - EFh	Reserved	function

Add this section:

G.6.x REPORT AAF VALUES

The REPORT AAF VALUES function is used to report the device's paced data transfer AAF values. These values are part of the saved training configuration values maintained by the device (see 18.8.4.2.1), representing vendor-specific values.

Editor's note: we could call this "REPORT VENDOR-SPECIFIC TRAINING CONFIGURATION VALUES" to avoid using the term AAF.

For expanders implementing this function, both near port and far port (i.e. the target port, the far port active for the current connection) values shall be included. For initiators implementing this function, only the far port values shall be included. For targets implementing this function, only the near port values shall be included.

Only values for the I_T connection in progress are reported.

The meaning of the fields is vendor-specific.

The data structure for this function shall include function specific fields described in table G.12x.

Table G.12x — REPORT AAF VALUES data structure

Bit Byte	7	6	5	4	3	2	1	0
0	(MSB)							
1								
2								
3				EXPANDER FUNCTION SIGNATURE				
4				(B73384B8508F27h)				
5								
6								(LSB)
7	INITIATOR SCSI ADDRESS							
8	RESERVED							
9	RESERVED							
10	RESERVED							
11	RESERVED							
12	NEAR PORT DB[0] AAF VALUE							
…	…							
27	NEAR PORT DB[15] AAF VALUE							
28	NEAR PORT P1 AAF VALUE							
29	NEAR PORT P_CRCA AAF VALUE							
30	NEAR PORT BSY AAF VALUE							
31	NEAR PORT SEL AAF VALUE							
32	NEAR PORT RST AAF VALUE							
33	NEAR PORT REQ AAF VALUE							
34	NEAR PORT ACK AAF VALUE							
35	NEAR PORT ATN AAF VALUE							
36	NEAR PORT CD AAF VALUE							
37	NEAR PORT IO AAF VALUE							
38	NEAR PORT MSG AAF VALUE							
39	RESERVED							
40	FAR PORT DB[0] AAF VALUE							
…	…							
55	FAR PORT DB[15] AAF VALUE							
56	FAR PORT P1 AAF VALUE							
57	FAR PORT P_CRCA AAF VALUE							
58	FAR PORT BSY AAF VALUE							
59	FAR PORT SEL AAF VALUE							
60	FAR PORT RST AAF VALUE							
61	FAR PORT REQ AAF VALUE							
62	FAR PORT ACK AAF VALUE							
63	FAR PORT ATN AAF VALUE							
64	FAR PORT CD AAF VALUE							
65	FAR PORT IO AAF VALUE							
66	FAR PORT MSG AAF VALUE							
67	RESERVED							