To: T10 Technical Committee
From: Rob Elliott, Compaq Computer Corporation (Robert.Elliott@compaq.com)
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Subject: Reporting currently negotiated settings

Revision 0: first revision

Related documents
98-215r0 (John Lohmeyer, Symbios) tried to put bits in INQUIRY indicating if a device was in SE or LVD mode.

00-257r3 (by John Lohmeyer, LSI Logic), the Expander Communication Protocol (ECP) proposal accepted by T10 in September 2000, includes ECP-based MARGIN CONTROL and MARGIN REPORT commands for communicating with expanders and initiators.

00-378r0 (by George Penokie, Tivoli) is the proposed text for SPI-4 revision 1, which incorporates ECP.

00-391r0 proposes letting targets understand ECP commands themselves, allowing margin control and margin reporting to be implemented via the same mechanism used for expanders.

00-396r0 Mode page equivalents for ECP commands

Overview
Presently, it can be difficult to determine if devices are running Ultra 2 or Ultra 3 modes. Although host drivers know this information, they are not very good at reporting it to higher-level software for presentation to the user. Ultra 320 just exacerbates the problem.

If there were a standard way to query the current negotiated settings from each parallel SCSI target, this would be easily accessible to higher level software that can run SCSI commands. This is admittedly redundant information.

Fields to report include:
* current settings of all negotiable fields
    * transfer period factor
    * REQ/ACK offset
    * transfer width exponent
    * protocol options bits QAS, IU, etc (includes the precomp value the device requests)
    * based on the PPR data structure

* received precomp status (the value the device received; indicates whether precomp is enabled)

* current bus interface state (SE or LVD)

* (maybe) record the cause of the last reset
    * TARGET RESET, LUN RESET (one bit per LUN?), bus reset, or power on
(since this only applies to targets, it is not included in this proposal).

This command would be useful in expanders along with targets, so it is proposed as an ECP function. A mode page equivalent could be used for targets if 00-391 is rejected, also supporting a “cause of last reset” field.

X.5.3.3 REPORT NEGOTIATION STATUS

The REPORT NEGOTIATION STATUS function is used to determine domain topology and report expander characteristics. The REPORT NEGOTIATION STATUS SEDB is shown in table X.10.

Table X.10 — REPORT NEGOTIATION STATUS SEDB

Bit / Byte	7	6	5	4	3	2	1	0
0	USED	Reserved					D_CLASS	
1	CURRENT TRANSFER PERIOD FACTOR							
2	Reserved							
3	CURRENT REQ/ACK OFFSET							
4	CURRENT TRANSFER WIDTH EXPONENT							
5	CURRENT PROTOCOL OPTION BITS							
	RESERVED	RTI	RD_STRM	WR_FLOW	RESERVED	QAS_REQ	DT_REQ	IU_REQ
6	RSVD	RSVD	RSVD	RSVD	NEAR TRANSCEIVER MODE		NEAR SENT PCOMP EN	NEAR RECEIVED PCOMP EN
7	RSVD	RSVD	RSVD	RSVD	FAR TRANSCEIVER MODE		FAR SENT PCOMP EN	FAR RECEIVED PCOMP EN
10	Reserved							
11								
12								
13								
14								
15								

CURRENT TRANSFER PERIOD FACTOR indicates the current negotiated transfer period factor for the current I/O connection.

CURRENT REQ/ACK OFFSET indicates the current negotiated REQ/ACK offset for the current I/O connection.

CURRENT TRANSFER WIDTH EXPONENT indicates the current negotiated transfer width exponent for the current I/O connection.

CURRENT PROTOCOL OPTIONS BITS contain the current negotiated protocol options for the current I/O connection. Bit 7, which corresponds to PCOMP_EN In the PPR message, is reserved in this data structure.

The RECEIVED PCOMP_EN bits contain the last received value for PCOMP_EN on the corresponding ports. The SENT PCOMP_EN bits contain the last sent values for PCOMP_EN on the corresponding ports. For initiators, only the far port values are defined. For targets, only the near port values are defined.

[The SENT values are needed because some expanders will change the PCOMP_EN bit as it flows through, and others will not.]

[Remove PCOMP_EN from REPORT CAPABILITIES SEDB since a “maximum” doesn’t make sense there.]

The TRANSCEIVER_MODE fields specify the current bus mode for the port as defined in table X.11.

Table X.11 — Port bus mode

TRANSCEIVER_MODE	Bus mode
00b	Unknown (expander not capable of reporting bus mode)
01b	Single ended
10b	Low Voltage Differential
11b	High Voltage Differential

[Remove the TARG_MODE field from the REPORT CAPABILITIES SEDB. It fits better here, indicating a current value rather than a maximum supported value like the other fields in that SEDB. Both near and far ports can be supported at the same time.]