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, 25 Oct 2000: first revision
Revision 1, 30 Oct 2000: Moved target-specific fields into a mode page and expander-specific fields into an ECP command. The PPR values are useless when retrieved with ECP because they were negotiated away to run ECP itself.

Related documents

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

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

00-396r1 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. A mode page is proposed to return this information.

When expanders are present, there are settings for each bus segment not visible to the host. An ECP command is proposed to return this information.

Target Fields to report include:

- Current settings of all negotiable fields (based on PPR)
  - transfer period factor
  - REQ/ACK offset
  - transfer width exponent
  - protocol options bits QAS, IU, etc. (PCOMP_EN is special)
- Sent precomp request. The value the device requests, indicating whether it wants the initiator or expander to use precomp.
- Received precomp status. The value the device received; indicates whether precomp is enabled by the target.
- Current bus interface state (SE or LVD)

Expander fields to report (for near and active far port) include:

- Sent precomp request. The value the device requests, indicating whether it wanted the other device to use precomp. Some expanders will modify the PCOMP_EN bit during negotiation (e.g. non-AAF expanders will force it to 1, while AAF expanders will force it to 0); others will just pass it through.
- Received precomp status. The value the device received; indicates whether precomp is enabled within the expander's drivers.
- Current bus interface state (SE or LVD)

Proposed changes

[Add the following section to the mode pages chapter of SPI-4, using the conventions established in 00-396.]

18.1.4.x Report Negotiated Settings subpage

The Report Negotiated Settings subpage, shown in Table X.10, is used to report the negotiated settings of a target for the current I_T nexus.

Table X.10 — Report Negotiated Settings subpage (3h)

Bit Offset	7	6	5	4	3	2	1	0
0	CURRENT TRANSFER PERIOD FACTOR							
1	Reserved							
2	CURRENT REQ/ACK OFFSET							
3	CURRENT TRANSFER WIDTH EXPONENT							
4	CURRENT PROTOCOL OPTION BITS							
	RSVD	RTI	RD_STRM	WR_FLOW	RSVD	QAS_REQ	DT_REQ	IU_REQ
5	RSVD	RESERVED			TRANSCEIVER MODE		SENT PCOMP EN	RECEIVED PCOMP EN
6	RESERVED							
7	Reserved							

CURRENT TRANSFER PERIOD FACTOR indicates the negotiated transfer period factor for the current I_T nexus.

CURRENT REQ/ACK OFFSET indicates the negotiated REQ/ACK offset for the current I_T nexus.

CURRENT TRANSFER WIDTH EXPONENT indicates the negotiated transfer width exponent for the current I_T nexus.

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

The RECEIVED PCOMP_EN bits contain the value for PCOMP_EN received by the target for the current I_T nexus. The SENT PCOMP_EN bits contain the value for PCOMP_EN sent by the target for the current I_T nexus.

[The RECEIVED bit indicates if the target is turning on precomp in its drivers when returning read data. The SENT bit indicates if the target is requesting the initiator (or expander) to turn on precomp in its drivers when providing write data.]

The TRANSCEIVER_MODE field defined in table X.11 indicates the current bus mode.

Table X.11 — Transceiver mode

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

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

Table G.2 — Expander functions

EXPANDER FUNCTION CODE	Expander function	Type
80-82h	<already in use>	Inbound multiple function
83h	REPORT CURRENT STATUS	
84h - EFh	Reserved	

Add this section to the inbound multiple section:
G.6.3.x REPORT CURRENT STATUS SEDB

Table X.10 — REPORT CURRENT STATUS SEDB

Bit / Byte	7	6	5	4	3	2	1	0
0	USED	Reserved					D_CLASS	
1	RSVD	RSVD	RSVD	RSVD	NEAR TRANSCEIVER MODE		NEAR SENT PCOMP EN	NEAR RECEIVED PCOMP EN
2	RSVD	RSVD	RSVD	RSVD	FAR TRANSCEIVER MODE		FAR SENT PCOMP EN	FAR RECEIVED PCOMP EN
3	Reserved							
…								
15								

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. The values returned are from the most recent PPR negotiation that resulted in a synchronous or paced data transfer agreement.

[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 the G.6.3.3 REPORT CAPABILITIES SEDB since a “maximum” doesn’t make sense there.]

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

Table X.11 — Transceiver 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.]