To: T10 Technical Committee
From: Rob Elliott, HP (elliott@hp.com)
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Subject: 06-409r0 SAS-2 IDENTIFY address frame REASON field

Revision history
Revision 0 (6 September 2006) First revision, extracted from 05-381r4 SAS-2 Multiplexing

Related documents
sas2r02 - Serial Attached SCSI - 2 (SAS-2) revision 2
05-381r4 and later - SAS-2 Multiplexing (Rob Elliott, HP)

Overview
This adds a REASON field to the identify address frame to indicate the reason the phy chose to run a link reset sequence. This was originally part of the multiplexing proposal, where it was added to indicate that detecting the wrong MUX primitive in a logical link was the cause.

Suggested changes to SAS-2
7.8.2 IDENTIFY address frame
Table 84 defines the IDENTIFY address frame format used for the identification sequence. The IDENTIFY address frame is sent after the phy reset sequence completes if the physical link is a SAS physical link.
The DEVICE TYPE field specifies the type of device containing the phy, and is defined in table 85.

Table 85 — DEVICE TYPE field

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>001b</td>
<td>End device</td>
</tr>
<tr>
<td>010b</td>
<td>Edge expander device</td>
</tr>
<tr>
<td>011b</td>
<td>Fanout expander device</td>
</tr>
<tr>
<td>All others</td>
<td>Reserved</td>
</tr>
</tbody>
</table>

The ADDRESS FRAME TYPE field shall be set to 0h.
The \textit{REASON} field indicates the reason for the link reset sequence and is defined in in table 86.

\begin{table}[h]
\centering
\begin{tabular}{|c|l|}
\hline
\textbf{Code} & \textbf{Description} \\
\hline
0h & Unknown reason \\
1h & Power on \\
2h & Hard reset (e.g., phy received a HARD_RESET primitive)(see 4.4.2), or SMP PHY CONTROL function HARD_RESET phy operation (see 10.4.3.18) \\
3h & SMP PHY CONTROL function LINK_RESET phy operation, or TRANSMIT SATA PORT SELECTION SIGNAL phy operation (see 10.4.3.18) \\
4h & Loss of dword synchronization (see x.x) \\
5h & After the multiplexing sequence completes, MUX (LOGICAL LINK 0) received in logical link 1 or MUX (LOGICAL LINK 1) received in logical link 0 (see 7.xx) \\
6h & I_T nexus loss timer expired in the STP target port of an STP/SATA bridge when the phy was attached to a SATA device (see 4.6) \\
7h & Break Timeout Timer expired (see 7.12.8) \\
8h & Phy test function stopped (see 10.4.3.19) \\
\hline
All others & Reserved \\
\hline
\end{tabular}
\caption{REASON field}
\end{table}

An SSP INITIATOR PORT bit set to one \textit{specifies indicates} that an SSP initiator port is present. An SSP INITIATOR PORT bit set to zero \textit{specifies indicates} that an SSP initiator port is not present. Expander devices shall set the SSP INITIATOR PORT bit to zero.

An STP INITIATOR PORT bit set to one \textit{specifies indicates} that an STP initiator port is present. An STP INITIATOR PORT bit set to zero \textit{specifies indicates} that an STP initiator port is not present. Expander devices shall set the STP INITIATOR PORT bit to zero.

An SMP INITIATOR PORT bit set to one \textit{specifies indicates} that an SMP initiator port is present. An SMP INITIATOR PORT bit set to zero \textit{specifies indicates} that an SMP initiator port is not present. Expander devices may set the SMP INITIATOR PORT bit to one.

An SSP TARGET PORT bit set to one \textit{specifies indicates} that an SSP target port is present. An SSP TARGET PORT bit set to zero \textit{specifies indicates} that an SSP target port is not present. Expander devices shall set the SSP TARGET PORT bit to zero.

An STP TARGET PORT bit set to one \textit{specifies indicates} that an STP target port is present. An STP TARGET PORT bit set to zero \textit{specifies indicates} that an STP target port is not present. Expander devices shall set the STP TARGET PORT bit to zero.

An SMP TARGET PORT bit set to one \textit{specifies indicates} that an SMP target port is present. An SMP TARGET PORT bit set to zero \textit{specifies indicates} that an SMP target port is not present. Expander devices shall set the SMP TARGET PORT bit to one.

For SAS ports, the SAS ADDRESS field \textit{specifies indicates} the port identifier (see 4.2.6) of the SAS port transmitting the IDENTIFY address frame. For expander ports, the SAS ADDRESS field \textit{specifies indicates} the device name (see 4.2.4) of the expander device transmitting the IDENTIFY address frame.

The PHY IDENTIFIER field \textit{specifies indicates} the phy identifier of the phy transmitting the IDENTIFY address frame.

See 4.1.3 for additional requirements concerning the DEVICE TYPE field, SSP INITIATOR PORT bit, STP INITIATOR PORT bit, SMP INITIATOR PORT bit, SSP TARGET PORT bit, STP TARGET PORT bit, SMP TARGET PORT bit, and SAS ADDRESS field.

The CRC field is defined in 7.8.1.