

To: T10 Technical Committee
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Date: 24 October 2002
Subject: Method to determine Source of Change Primitive

Overview

When a Change Primitive is sent out by an expander, the current SAS architecture requires a SMP request (Discover) be sent to each Phy on each expander to determine if a device has been added or deleted. The amount of time to do this may be significant in a large topology.

Proposal

Require each expander to keep a 16-bit count of the number of times it has initiated a change primitive. Change Primitives that are simply forwarded on are not counted.

This count is obtained via a SMP Report General function.

When a change primitive is detected, a single SMP Report General is sent to each expander in the domain to determine the count value. If the count is unchanged from the previous count, then nothing has changed on that expander and no further SMP requests are needed for that device. If the count is different, then Discover requests to this expander device is needed to determine what device really changed.

Specification Changes

Dependency: SAS Proposal 02-359r3

Change Section 10.3.1.2 Report General response format, bytes 4 & 5 to be EXPANDER CHANGE COUNT

Add following description below Table 98:

The EXPANDER CHANGE COUNT field shall be set to zero at power on. The expander shall increment this field at least once when it transmits a CHANGE for the following reasons:

- a) after an expander phy has lost dword synchronization; and
- b) after the link reset sequence completes.

The expander need not increment this field again unless a REPORT GENERAL response is transmitted. This field shall not be incremented when forwarding a CHANGE from another expander. The EXPANDER CHANGE COUNT field shall wrap to zero after the maximum value has been reached.

NOTE: Devices that use the EXPANDER CHANGE COUNT field should read it often enough to ensure that it does not increment 65 536 times between reading the field.

Other sections that deal with discovery will also need changes. The relevant sections are: 4.6.11.5, 7.8.2, & 7.11.