To: T10 Technical Committee
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Date: 8 May 2006
Subject: 06-212r1 SAS-2 Zone Group of an Expander's SMP

Revision history

Revision 0 (27 April 2006) First revision (by Ed D'Avignon)

Revision 1 (8 May 2006) Incorporated comments from 8 May 2006 T10 SAS Protocol meeting. Require the SMP initiator and target of a zoning expander device be in group 1. Re-write the overview to match the new wording.

Related documents

sas2r03a - Serial Attached SCSI - 2 (SAS-2) revision 3a

Overview

In the original SAS-2 Zoning discussions, it was intended that the SMP target of all Zoning Expanders would be accessible to any device in the domain. This was to be accomplished by placing the SMP target in Group 1. The language in subsequent proposals and SAS-2 revision 3a did not make this intent clear nor provide rules to ensure the SMP target device in a zoning expander device could always be reached.

This proposal attempts to correct these omissions by requiring that:

a) all phys with the PARTICIPATING bit set to one are in group one;
b) The SMP of the zoning expander device shall be set to one.

By requringing phys with the PARTICIPATING bit set to one be in group one ensures all traffic routed through a participating phy will be permitted. Without this requirement, there are some cases where a frame that is routed through a participating phy will be rejected incorrectly.

Since the SMP of all zoning expander devices must be reachable by every device in the domain, it must be in group one. In addition, the SMP of all zoning expander devices must be able to communicate with all end devices in the domain regardless of the group of the end device. By placing the SMP of the zoning expander device in group 1, it will have access to all end devices.

Suggested changes

4.8.3 Zone operation

4.8.3.1 Zone phy information

Each phy of a zoning expander device shall support the following zone phy information fields:

a) ZONE PARTICIPATING bit;
b) ZONE ADDRESS RESOLVED bit;
c) ZONE GROUP PERSISTENT bit; and
d) ZONE GROUP field.

The ZONE PARTICIPATING bit indicates a boundary of the ZPSDS. The ZONE PARTICIPATING bit shall be set to zero when the phy is attached to an end device or an expander device that does not support zoning. The ZONE PARTICIPATING bit shall be set to one when the phy is attached to a zoning expander device.

The ZONE ADDRESS RESOLVED bit specifies the method used to determine the source zone group for a connection request received by a phy at the boundary of the ZPSDS as specified in table 24 (see 4.8.3.5).

The ZONE ADDRESS RESOLVED bit may be set to one when:

a) the phy is contained within a zoning expander device; and
b) the ZONE PARTICIPATING bit for the phy is set to zero.

The ZONE ADDRESS RESOLVED bit shall be set to zero when:

a) the phy is contained within a non-zoning expander device; or
b) the phy is contained within a zoning expander device and the ZONE PARTICIPATING bit for the phy is set to one.

The ZONE GROUP field has a value in the range 0 to 127 that indicates the zone group to which the phy belongs.

If the ZONE PARTICIPATING bit of the phy is set to one, the ZONE GROUP field shall be set to 1.

The ZONE GROUP PERSISTENT bit specifies the method of determining the zone group value of the phy after a link reset sequence (see 4.8.4). If the ZONE PARTICIPATING bit is set to one, the ZONE GROUP PERSISTENT bit shall be set to one.

All phys in an expander port shall have the same zone phy information (see 4.6.2). The default (e.g., power on) values for the zone phy information fields are vendor-specific.

4.8.3.3 Zone permission table

The zone permission table specifies access permission between zone groups. If a bit in the zone permission table is set to one then connection requests shall be permitted between phys in the zone groups. If a bit in the zone permission table is set to zero then connection requests between phys in the zone groups shall be rejected with OPEN_REJECT (ZONE VIOLATION) as described in 4.8.3.5.

The zone permission table structure is shown in table 1.

Table 1 — Zone permission table

Destination zone group d	Source zone group s				
	0	**1**	**2 to 3**	**4 to 7**	**8 to 127**
0	0	1	0	0	0
1	1	1	1	1	1
2 to 3	0	1	ZP[s = 2 to 3, d = 2 to 3]	Reserved	ZP[s = 8 to 127, d = 2 to 3]
4 to 7	0	1	Reserved	Reserved	Reserved
8 to 127	0	1	ZP[s = 2, d = 8 to 127]	Reserved	ZP[s = 8 to 127, d = 8 to 127]
Note: Shading identifies configurable zone groups.					

A ZP[s, d] bit set to one specifies that zone group s has permission to access zone group d. A ZP[s, d] bit set to zero specifies that zone group s does not have permission to access zone group d.

If ZP[s, d] is set to a value, ZP[d,s] shall be set to the same value.

Zone group 0 shall not have access asdf to any other group except zone group 1 (e.g., bits ZP[0, 0] and bits ZP[2 to 127, 0] are set to zero).

Zone group 1 shall have access to all other zone groups (e.g., bits ZP[0 to 127, 1] are set to one).

The ZONE GROUP of the SMP initiator and target ports of a zoning expander device shall be set to one.

~~Regardless of the zoning expander phy attributes, OPEN address frames addressed to a zoning expander device shall be processed as if the destination is zone group 1.~~

Zone groups 4 through 7 are reserved zone groups. All reserved ZP bits shall be set to zero (e.g., bits ZP[4 to 7, 4 to 127] are set to zero).