

To: T10 Technical Committee
From: Rob Elliott, HP (elliott@hp.com)
Date: 19 June 2007
Subject: 07-287r0 SAS-2 SMP function result tweaks

Revision history

Revision 0 (19 June 2007) First revision

Related documents

sas2r10 - Serial Attached SCSI - 2 (SAS-2) revision 10

07-288r0 SAS-2 SMP PHY CONTROL and affiliations (Rob Elliott, HP) - this reorders the priorities of some of the function results

Overview

This proposal makes clarifications, consistency corrections, and minor changes in the area of SMP function results.

1. If a management device server receives an SMP request frame that is too long (e.g., as defined in a future version of SAS), it needs to ignore the excess bytes, not return a function result of INVALID REQUEST FRAME LENGTH. Similarly, if the frame is too short (e.g., as defined in SAS-1.1), it should treat the missing fields as being set to zero; as long as the 4-byte header and CRC are present, the function is viable.
2. PHY TEST FUNCTION should return PHY VACANT if the PHY IDENTIFIER field specifies a vacant phy.
3. CONFIGURE ZONE PHY INFORMATION should return PHY VACANT if any of the zone phy configuration descriptors contains a PHY IDENTIFIER field specifying a vacant phy.
4. Rather than include the sentence "The ADDITIONAL RESPONSE BYTES may be present but shall be ignored" in nearly every function result (all the ones that return more than the standard 4-byte response + CRC), that sentence belongs in the general description of the response frame ADDITIONAL RESPONSE BYTES field.
5. For PHY CONTROL, the REQUESTED LOGICAL LINK RATE field is still not defined (07-091 is struggling to define it), so the LOGICAL LINK RATE NOT SUPPORTED function result should be removed. If it ever is added to the standard, it should have lower priority than UNSUPPORTED PHY OPERTAION, since that is defined as meaning the entire request frame was ignored.
6. Function results that are only currently used and likely to be used by one function should be described in the function section rather than the ever-growing FUNCTION RESULT field table. This avoids some duplicate definitions, places them in better context, and reduces the size of that table.
7. Added function result information for REPORT and SET ZONE MANAGER PASSWORD, which was omitted by 06-373r3.

Suggested changes**10.4.3 SMP functions****10.4.3.1 SMP function request frame format**

An SMP request frame is sent by a management application client via an SMP initiator port to request an SMP function be performed by a management device server. Table 222 defines the SMP request frame format.

Table 222 — SMP request frame format

Byte/Bit	7	6	5	4	3	2	1	0	
0	SMP FRAME TYPE (40h)								
1	FUNCTION								
2	Reserved								
3	REQUEST LENGTH $((n - 7) / 4)$								
4	ADDITIONAL REQUEST BYTES								
m									
	Fill bytes, if needed								
n - 3	(MSB)	CRC							
n								(LSB)	

The SMP FRAME TYPE field is included in each frame format defined in this clause, although that field is parsed by the SMP transport layer (see 9.4). The SMP FRAME TYPE field is set to 40h.

The FUNCTION field specifies which SMP function is being requested and is defined in table 223. If the value in the FUNCTION field is not supported by the management device server, it shall return a function result of UNKNOWN SMP FUNCTION as described in table 225.

Table 223 — SMP functions (FUNCTION field) (part 1 of 3)

Code	SMP function	Description	Reference
00h	REPORT GENERAL	Return general information about the device	10.4.3.3
01h	REPORT MANUFACTURER INFORMATION	Return vendor and product identification	10.4.3.4
02h	READ GPIO REGISTER	See SFF-8485	
03h	REPORT SELF-CONFIGURATION STATUS	Return status of the discover process in a self-configuring expander device	10.4.3.5
04h	REPORT ZONE PERMISSION	Return zone permission table active or shadow values	10.4.3.6
05h	REPORT ZONE MANAGER PASSWORD	Return the zone manager password	10.4.3.7
06h - 0Fh	Reserved for general SMP input functions		
10h	DISCOVER	Return information about the specified phy	10.4.3.8

Table 223 — SMP functions (FUNCTION field) (part 2 of 3)

Code	SMP function	Description	Reference
11h	REPORT PHY ERROR LOG	Return error logging information about the specified phy	10.4.3.9
12h	REPORT PHY SATA	Return information about a phy currently attached to a SATA phy	10.4.3.10
13h	REPORT ROUTE INFORMATION	Return phy-based expander route table information	10.4.3.11
14h	REPORT PHY EVENT INFORMATION	Return phy event information for the specified phy	10.4.3.12
15h	REPORT PHY BROADCAST COUNTS	Return Broadcast counts	10.4.3.13
16h	DISCOVER LIST	Return information about the specified phys	10.4.3.14
17h	REPORT EXPANDER ROUTE TABLE	Return contents of the expander-based expander route table	10.4.3.15
18h - 1Fh	Reserved for phy-based SMP input functions		
20h - 3Fh	Reserved for SMP input functions		
40h - 7Fh	Vendor specific		
80h	CONFIGURE GENERAL	Configure the device	10.4.3.16
81h	ENABLE DISABLE ZONING	Enable or disable zoning	10.4.3.17
82h	WRITE GPIO REGISTER	See SFF-8485	
83h - 84h	Reserved for general SMP output functions		
85h	ZONED BROADCAST	Transmit the specified Broadcast on the expander ports in the specified zone group(s)	10.4.3.18
86h	ZONE LOCK	Lock a zoning expander device	10.4.3.19
87h	ZONE ACTIVATE	Set the zoning expander active values equal to the zoning expander shadow values	10.4.3.20
88h	ZONE UNLOCK	Unlock a zoning expander device	10.4.3.21
89h	CONFIGURE ZONE MANAGER PASSWORD	Configure the zone manager password	10.4.3.22
8Ah	CONFIGURE ZONE PHY INFORMATION	Configure zone phy information	10.4.3.23
8Bh	CONFIGURE ZONE PERMISSION TABLE	Configure the zone permission table	10.4.3.24
8Ch - 8Fh	Reserved for general SMP output functions		
90h	CONFIGURE ROUTE INFORMATION	Change phy-based expander route table information	10.4.3.25
91h	PHY CONTROL	Request actions by the specified phy	10.4.3.26
92h	PHY TEST FUNCTION	Request a test function by the specified phy	10.4.3.27
93h	CONFIGURE PHY EVENT INFORMATION	Configure phy event information for the specified phy	10.4.3.28

Table 223 — SMP functions (FUNCTION field) (part 3 of 3)

Code	SMP function	Description	Reference
94h - 9Fh	Reserved for phy-based SMP output functions		
A0h - BFh	Reserved for SMP output functions		
C0h - FFh	Vendor specific		

The REQUEST LENGTH field specifies the number of dwords that follow, not including the CRC field. For compatibility with previous versions of this standard, a REQUEST LENGTH field set to 00h sometimes specifies a non-zero number of dwords; this is defined in the function description. [If the request frame size including the CRC field is less than 8 bytes, or the REQUEST LENGTH field does not match the request frame size, the management device server shall return a function result of INVALID REQUEST FRAME LENGTH. The management device server shall consider any fields not included in the request frame to be set to zero.](#)

The ADDITIONAL REQUEST BYTES field definition and length are based on the SMP function. The maximum size of the ADDITIONAL REQUEST BYTES field is 1 024 bytes, making the maximum size of the frame 1 032 bytes (i.e., 1 024 bytes of data + 4 bytes of header + 4 bytes of CRC).

Fill bytes shall be included after the ADDITIONAL REQUEST BYTES field so the CRC field is aligned on a four byte boundary. The contents of the fill bytes are vendor specific.

The CRC field is included in each request frame format defined in this clause, although that field is defined by the SMP transport layer (see 9.4.1) and parsed by the SMP link layer (see 7.18).

10.4.3.2 SMP function response frame format

An SMP response frame is sent by a management device server via an SMP target port in response to an SMP request frame. Table 224 defines the SMP response frame format.

Table 224 — SMP response frame format

Byte\Bit	7	6	5	4	3	2	1	0	
0	SMP FRAME TYPE (41h)								
1	FUNCTION								
2	FUNCTION RESULT								
3	RESPONSE LENGTH ((n - 7) / 4)								
4	ADDITIONAL RESPONSE BYTES								
m									
	Fill bytes, if needed								
n - 3	(MSB)	CRC							
n								(LSB)	

The SMP FRAME TYPE field is included in each frame format defined in this clause, although that field is parsed by the SMP transport layer (see 9.4). The SMP FRAME TYPE field is set to 41h.

The FUNCTION field indicates the SMP function to which this frame is a response, and is defined in table 223 in 10.4.3.1.

Editor's Note 1: With the priority table now in place, the function result table doesn't need to try to express all the conditions on each result (e.g., mentioning that SMP FUNCTION FAILED is only reported if the function is supported).

The FUNCTION RESULT field is defined in table 225.

Table 225 — FUNCTION RESULT field (part 1 of 5)

Code	Name	SMP function(s)	Description
00h	SMP FUNCTION ACCEPTED	All	The management device server supports the SMP function. The ADDITIONAL RESPONSE BYTES field contains the requested information.
01h	UNKNOWN SMP FUNCTION	Unknown	The management device server does not support the requested SMP function. The ADDITIONAL RESPONSE BYTES field may be present but shall be ignored.
02h	SMP FUNCTION FAILED	All	The management device server supports the SMP function, but the requested SMP function failed. The ADDITIONAL RESPONSE BYTES may be present but shall be ignored.
03h	INVALID REQUEST FRAME LENGTH	All	The management device server supports the SMP function, but the SMP request frame length was invalid (i.e., did not match the frame size defined for the function) (see 10.4.3.1). The ADDITIONAL RESPONSE BYTES may be present but shall be ignored.
04h	INVALID EXPANDER CHANGE COUNT	CONFIGURE GENERAL, ENABLE DISABLE ZONING, ZONE LOCK, ZONE ACTIVATE , CONFIGURE ZONE MANAGER PASSWORD , CONFIGURE ZONE PHY INFORMATION, CONFIGURE ZONE PERMISSION TABLE, CONFIGURE ROUTE INFORMATION, PHY CONTROL, PHY TEST FUNCTION, CONFIGURE PHY EVENT INFORMATION	The management device server supports the SMP function, but the EXPECTED EXPANDER CHANGE COUNT field does not match the current expander change count. The ADDITIONAL RESPONSE BYTES may be present but shall be ignored.
05h	BUSY	ZONE UNLOCK	The locked zoning expander device is processing the activate step.

Table 225 — FUNCTION RESULT field (part 2 of 5)

Code	Name	SMP function(s)	Description
06h	INCOMPLETE DESCRIPTOR LIST	ZONED BROADCAST, CONFIGURE ZONE PHY INFORMATION, CONFIGURE ZONE PERMISSION TABLE, CONFIGURE PHY EVENT INFORMATION	The request frame length results in the truncation of a multi-byte field or descriptor list (e.g., in the ZONED BROADCAST request, the request frame is not large enough to contain the number of broadcast source zone groups specified by the NUMBER OF BROADCAST SOURCE ZONE GROUPS field). The ADDITIONAL RESPONSE BYTES may be present but shall be ignored.
10h	PHY DOES NOT EXIST	DISCOVER, DISCOVER LIST , REPORT PHY ERROR LOG, REPORT PHY SATA, REPORT ROUTE INFORMATION, REPORT PHY EVENT INFORMATION, REPORT PHY BROADCAST COUNTS, DISCOVER LIST , CONFIGURE ZONE PHY INFORMATION, CONFIGURE ROUTE INFORMATION, PHY CONTROL, PHY TEST FUNCTION, CONFIGURE PHY EVENT INFORMATION	The phy specified by the PHY IDENTIFIER field or the STARTING PHY IDENTIFIER field in the SMP request frame does not exist (e.g., the value is not within the range of zero to the value of the NUMBER OF PHYs field reported in the SMP REPORT GENERAL response). The ADDITIONAL RESPONSE BYTES field may be present but shall be ignored.
11h	INDEX DOES NOT EXIST	REPORT ROUTE INFORMATION, CONFIGURE ROUTE INFORMATION	The phy specified by the PHY IDENTIFIER field in the SMP request frame does not have the table routing attribute (see 4.6.7.1), or the expander route index specified by the EXPANDER ROUTE INDEX field does not exist (i.e., the value is not in the range of 0000h to the value of the EXPANDER ROUTE INDEXES field in the SMP REPORT GENERAL response).
12h	PHY DOES NOT SUPPORT SATA	REPORT PHY SATA, PHY CONTROL (TRANSMIT SATA PORT SELECTION SIGNAL), PHY CONTROL (SET ATTACHED DEVICE NAME)	The phy specified by the PHY IDENTIFIER field in the SMP request frame is not part of an STP target port. The ADDITIONAL RESPONSE BYTES field may be present but shall be ignored. See 10.4.3.26.

Table 225 — FUNCTION RESULT field (part 3 of 5)

Code	Name	SMP function(s)	Description
13h	UNKNOWN PHY OPERATION	PHY CONTROL	The operation specified by the PHY OPERATION field in the SMP request frame is unknown. The SMP function had no affect. The ADDITIONAL RESPONSE BYTES field may be present but shall be ignored. See 10.4.3.26.
14h	UNKNOWN PHY TEST FUNCTION	PHY TEST FUNCTION	The operation specified by the PHY TEST FUNCTION field in the SMP request frame is unknown. The ADDITIONAL RESPONSE BYTES field may be present but shall be ignored. See 10.4.3.27.
15h	PHY TEST FUNCTION IN PROGRESS	PHY TEST FUNCTION	The specified phy is already performing a phy test function. The ADDITIONAL RESPONSE BYTES field may be present but shall be ignored. See 10.4.3.27.
16h	PHY VACANT	DISCOVER, REPORT PHY ERROR LOG, REPORT PHY SATA, REPORT ROUTE INFORMATION, REPORT PHY EVENT INFORMATION, CONFIGURE ZONE PHY INFORMATION , CONFIGURE ROUTE INFORMATION , PHY CONTROL, PHY TEST FUNCTION , CONFIGURE PHY EVENT INFORMATION	The management device server processing the SMP request frame does not have access to the a specified phy (e.g., because of zoning or vendor-specific reasons), although the value is within the range of zero to the value of the NUMBER OF PHYS field reported in the SMP REPORT GENERAL response. The ADDITIONAL RESPONSE BYTES field may be present but shall be ignored.
17h	UNKNOWN PHY EVENT INFORMATION SOURCE	CONFIGURE PHY EVENT INFORMATION	The phy event information source specified by a PHY EVENT INFORMATION SOURCE field is not supported. The ADDITIONAL RESPONSE BYTES may be present but shall be ignored. See 10.4.3.28.3.
18h	UNKNOWN DESCRIPTOR TYPE	DISCOVER LIST	The descriptor type specified by the DESCRIPTOR TYPE field is not supported. The ADDITIONAL RESPONSE BYTES may be present but shall be ignored.
19h	UNKNOWN PHY FILTER	DISCOVER LIST	The phy filter specified by the PHY FILTER field is not supported. The ADDITIONAL RESPONSE BYTES may be present but shall be ignored.
1Ah	LOGICAL LINK RATE NOT SUPPORTED	PHY CONTROL	The logical link rate specified by the REQUESTED LOGICAL LINK RATE field is not supported.

Table 225 — FUNCTION RESULT field (part 4 of 5)

Code	Name	SMP function(s)	Description
20h	SMP ZONE VIOLATION	CONFIGURE GENERAL, ZONED BROADCAST, PHY CONTROL, PHY TEST FUNCTION, CONFIGURE PHY EVENT INFORMATION	The management device server supports the function, but z zoning is enabled and the SMP initiator port does not have access to a necessary zone group according to the zone permission table (see 4.9.3.2). The ADDITIONAL RESPONSE BYTES may be present but shall be ignored.
21h	NO MANAGEMENT ACCESS RIGHTS	<u>REPORT ZONE MANAGER PASSWORD, ZONE LOCK, CONFIGURE ZONE MANAGER PASSWORD</u>	<p><u>For ZONE LOCK, any</u> Any of the following are true:</p> <p>a) zoning is enabled, the ZONE LOCK bit is set to zero, the PHYSICAL PRESENCE bit is set to zero, the ZONE MANAGER PASSWORD field is not set to the current zone manager password, and the zone manager does not have access to zone group 2;</p> <p>b) zoning is enabled, the ZONE LOCK bit is set to one, and the request did not originate from the active zone manager; or</p> <p>c) zoning is disabled, the PHYSICAL PRESENCE bit is set to zero, the ZONE MANAGER PASSWORD field is not set to the current zone manager password.</p> <p>The ADDITIONAL RESPONSE BYTES field may be present but shall be ignored.</p>
22h	UNKNOWN ENABLE DISABLE ZONING VALUE	ENABLE DISABLE ZONING	The ENABLE DISABLE ZONING field is set to 11b (i.e., Reserved). The ADDITIONAL RESPONSE BYTES field may be present but shall be ignored. See 10.4.3.17.
23h	ZONE LOCK VIOLATION	ENABLE DISABLE ZONING, ZONE LOCK, ZONE ACTIVATE, ZONE UNLOCK, CONFIGURE ZONE PHY INFORMATION, CONFIGURE ZONE PERMISSION TABLE	<p>Zoning is enabled and:</p> <p>a) an unlocked zoning expander device receives an SMP zone configuration function request, a ZONE ACTIVATE request, or a ZONE UNLOCK request from an SMP initiator port that is not the active zone manager; or</p> <p>b) a locked zoning expander device receives an SMP ZONE LOCK request, an SMP zone configuration function request, a ZONE ACTIVATE request, or a ZONE UNLOCK request from an SMP initiator port that is not the active zone manager.</p>
24h	NOT ACTIVATED	ZONE UNLOCK	The ACTIVATE REQUIRED bit in the request is set to one but the locked zoning expander device has not processed the activate step.

Table 225 — FUNCTION RESULT field (part 5 of 5)

Code	Name	SMP function(s)	Description
25h	ZONE GROUP OUT OF RANGE	CONFIGURE ZONE PHY INFORMATION, CONFIGURE ZONE PERMISSION TABLE	The ZONE GROUP field or NUMBER OF ZONE GROUPS field contains a value that is not supported. The ADDITIONAL RESPONSE BYTES field may be present but shall be ignored.
26h	NO PHYSICAL PRESENCE	CONFIGURE ZONE MANAGER PASSWORD	The new ZONE MANAGER PASSWORD field is set to DISABLED (see table 26 in 4.9.1) but physical presence is not asserted. The ADDITIONAL RESPONSE BYTES field may be present but shall be ignored.
All others	Reserved		

Table 226 defines the priority of the SMP function results defined in table 225.

Table 226 — Function result priority (part 1 of 4)

SMP function	SMP function result priority
REPORT GENERAL (see 10.4.3.3)	1) INVALID REQUEST FRAME LENGTH; 2) SMP FUNCTION FAILED; and 3) SMP FUNCTION ACCEPTED
REPORT MANUFACTURER INFORMATION (see 10.4.3.4)	1) INVALID REQUEST FRAME LENGTH; 2) SMP FUNCTION FAILED; and 3) SMP FUNCTION ACCEPTED
READ GPIO REGISTER (see SFF-8485)	1) INVALID REQUEST FRAME LENGTH; 2) SMP FUNCTION FAILED; and 3) SMP FUNCTION ACCEPTED
REPORT SELF-CONFIGURATION STATUS (see 10.4.3.5)	1) INVALID REQUEST FRAME LENGTH; 2) SMP FUNCTION FAILED; and 3) SMP FUNCTION ACCEPTED
REPORT ZONE PERMISSION TABLE (see 10.4.3.6)	1) INVALID REQUEST FRAME LENGTH; 2) SMP FUNCTION FAILED; and 3) SMP FUNCTION ACCEPTED
<u>REPORT ZONE MANAGER PASSWORD</u> (see 10.4.3.7)	<u>1) INVALID REQUEST FRAME LENGTH;</u> <u>2) NO MANAGEMENT ACCESS RIGHTS;</u> <u>3) SMP FUNCTION FAILED; and</u> <u>4) SMP FUNCTION ACCEPTED</u>
DISCOVER (see 10.4.3.8)	1) INVALID REQUEST FRAME LENGTH; 2) PHY DOES NOT EXIST; 3) PHY VACANT; 4) SMP FUNCTION FAILED; and 5) SMP FUNCTION ACCEPTED
REPORT PHY ERROR LOG (see 10.4.3.9)	1) INVALID REQUEST FRAME LENGTH; 2) PHY DOES NOT EXIST; 3) PHY VACANT; 4) SMP FUNCTION FAILED; and 5) SMP FUNCTION ACCEPTED

Table 226 — Function result priority (part 2 of 4)

SMP function	SMP function result priority
REPORT PHY SATA (see 10.4.3.10)	1) INVALID REQUEST FRAME LENGTH; 2) PHY DOES NOT EXIST; 3) PHY VACANT; 4) PHY DOES NOT SUPPORT SATA; 5) SMP FUNCTION FAILED; and 6) SMP FUNCTION ACCEPTED
REPORT ROUTE INFORMATION (see 10.4.3.11)	1) INVALID REQUEST FRAME LENGTH; 2) PHY DOES NOT EXIST; 3) PHY VACANT; 4) INDEX DOES NOT EXIST; 5) SMP FUNCTION FAILED; and 6) SMP FUNCTION ACCEPTED
REPORT PHY EVENT INFORMATION (see 10.4.3.12)	1) INVALID REQUEST FRAME LENGTH; 2) PHY DOES NOT EXIST; 3) PHY VACANT; 4) SMP FUNCTION FAILED; and 5) SMP FUNCTION ACCEPTED
REPORT PHY BROADCAST COUNTS (see 10.4.3.13)	1) INVALID REQUEST FRAME LENGTH; 2) PHY DOES NOT EXIST; 3) SMP FUNCTION FAILED; and 4) SMP FUNCTION ACCEPTED
DISCOVER LIST (see 10.4.3.14)	1) INVALID REQUEST FRAME LENGTH; 2) PHY DOES NOT EXIST; 3) UNKNOWN DESCRIPTOR TYPE; 4) UNKNOWN PHY FILTER; 5) SMP FUNCTION FAILED; and 6) SMP FUNCTION ACCEPTED
REPORT EXPANDER ROUTE TABLE (see 10.4.3.15)	1) INVALID REQUEST FRAME LENGTH; 2) SMP FUNCTION FAILED; and 3) SMP FUNCTION ACCEPTED
CONFIGURE GENERAL (see 10.4.3.16)	1) INVALID REQUEST FRAME LENGTH; 2) SMP ZONE VIOLATION; 3) INVALID EXPANDER CHANGE COUNT; 4) SMP FUNCTION FAILED; and 5) SMP FUNCTION ACCEPTED
WRITE GPIO REGISTER (see SFF-8485)	1) INVALID REQUEST FRAME LENGTH; 2) SMP FUNCTION FAILED; and 3) SMP FUNCTION ACCEPTED
ENABLE DISABLE ZONING (see 10.4.3.17)	1) INVALID REQUEST FRAME LENGTH; 2) ZONE LOCK VIOLATION; 3) UNKNOWN ENABLE DISABLE ZONING VALUE; 4) INVALID EXPANDER CHANGE COUNT; 5) SMP FUNCTION FAILED; and 6) SMP FUNCTION ACCEPTED

Table 226 — Function result priority (part 3 of 4)

SMP function	SMP function result priority
ZONED BROADCAST (see 10.4.3.18)	1) INVALID REQUEST FRAME LENGTH; 2) INCOMPLETE DESCRIPTOR LIST; 3) SMP ZONE VIOLATION; 4) SMP FUNCTION FAILED; and 5) SMP FUNCTION ACCEPTED
ZONE LOCK (see 10.4.3.19)	1) INVALID REQUEST FRAME LENGTH; 2) ZONE LOCK VIOLATION; 3) NO MANAGEMENT ACCESS RIGHTS; 4) INVALID EXPANDER CHANGE COUNT; 5) SMP FUNCTION FAILED; and 6) SMP FUNCTION ACCEPTED
ZONE ACTIVATE (see 10.4.3.20)	1) INVALID REQUEST FRAME LENGTH; 2) ZONE LOCK VIOLATION; 3) INVALID EXPANDER CHANGE COUNT; 4) SMP FUNCTION FAILED; and 5) SMP FUNCTION ACCEPTED
ZONE UNLOCK (see 10.4.3.21)	1) INVALID REQUEST FRAME LENGTH; 2) ZONE LOCK VIOLATION; 3) NOT ACTIVATED; 4) BUSY; 5) SMP FUNCTION FAILED; and 6) SMP FUNCTION ACCEPTED
<u>CONFIGURE ZONE MANAGER PASSWORD</u> (see 10.4.3.22)	<u>1) INVALID REQUEST FRAME LENGTH;</u> <u>2) INVALID EXPANDER CHANGE COUNT;</u> <u>3) NO MANAGEMENT ACCESS RIGHTS;</u> <u>4) NO PHYSICAL PRESENCE;</u> <u>5) SMP FUNCTION FAILED; and</u> <u>6) SMP FUNCTION ACCEPTED</u>
CONFIGURE ZONE PHY INFORMATION (see 10.4.3.23)	1) INVALID REQUEST FRAME LENGTH; 2) INCOMPLETE DESCRIPTOR LIST; 3) PHY DOES NOT EXIST; <u>4) PHY VACANT;</u> 5) ZONE LOCK VIOLATION; 6) INVALID EXPANDER CHANGE COUNT; 7) ZONE GROUP OUT OF RANGE; 8) SMP FUNCTION FAILED; and 9) SMP FUNCTION ACCEPTED
CONFIGURE ZONE PERMISSION TABLE (see 10.4.3.24)	1) INVALID REQUEST FRAME LENGTH; 2) INCOMPLETE DESCRIPTOR LIST; 3) ZONE LOCK VIOLATION; 4) INVALID EXPANDER CHANGE COUNT; 5) ZONE GROUP OUT OF RANGE; 6) SMP FUNCTION FAILED; and 7) SMP FUNCTION ACCEPTED

Table 226 — Function result priority (part 4 of 4)

SMP function	SMP function result priority
CONFIGURE ROUTE INFORMATION (see 10.4.3.25)	1) INVALID REQUEST FRAME LENGTH; 2) PHY DOES NOT EXIST; 3) PHY VACANT; 4) INDEX DOES NOT EXIST; 5) INVALID EXPANDER CHANGE COUNT; 6) SMP FUNCTION FAILED; and 7) SMP FUNCTION ACCEPTED
PHY CONTROL (see 10.4.3.26)	1) INVALID REQUEST FRAME LENGTH; 2) PHY DOES NOT EXIST; 3) PHY VACANT; 4) SMP ZONE VIOLATION; 5) LOGICAL LINK RATE NOT SUPPORTED; 6) UNKNOWN PHY OPERATION; 7) PHY DOES NOT SUPPORT SATA; 8) INVALID EXPANDER CHANGE COUNT; 9) SMP FUNCTION FAILED; and 10) SMP FUNCTION ACCEPTED
PHY TEST FUNCTION (see 10.4.3.27)	1) INVALID REQUEST FRAME LENGTH; 2) PHY DOES NOT EXIST; 3) PHY VACANT; 4) SMP ZONE VIOLATION; 5) UNKNOWN PHY TEST FUNCTION; 6) PHY TEST FUNCTION IN PROGRESS; 7) INVALID EXPANDER CHANGE COUNT; 8) SMP FUNCTION FAILED; and 9) SMP FUNCTION ACCEPTED
CONFIGURE PHY EVENT INFORMATION (see 10.4.3.28)	1) INVALID REQUEST FRAME LENGTH; 2) INCOMPLETE DESCRIPTOR LIST; 3) PHY DOES NOT EXIST; 4) PHY VACANT; 5) SMP ZONE VIOLATION; 6) UNKNOWN PHY EVENT INFORMATION SOURCE; 7) INVALID EXPANDER CHANGE COUNT; 8) SMP FUNCTION FAILED; and 9) SMP FUNCTION ACCEPTED

The RESPONSE LENGTH field indicates the number of dwords that follow, not including the CRC field. For compatibility with previous versions of this standard, a RESPONSE LENGTH field set to 00h sometimes indicates a non-zero number of dwords; this is defined in the function description.

If the FUNCTION RESULT field is set to 00h, then the ~~The~~ ADDITIONAL RESPONSE BYTES field definition depends on the SMP function requested. If the FUNCTION RESULT field is set to a value other than 00h, then the ADDITIONAL RESPONSE BYTES field may be present but shall be ignored. The maximum size of the ADDITIONAL RESPONSE BYTES field is 1 024 bytes, making the maximum size of the frame 1 032 bytes (i.e., 1 024 bytes of data + 4 bytes of header + 4 bytes of CRC).

Fill bytes shall be included after the ADDITIONAL RESPONSE BYTES field so the CRC field is aligned on a four byte boundary. The contents of the fill bytes are vendor specific.

The CRC field is included in each response frame format defined in this clause, although that field is defined by the SMP transport layer (see 9.4.1) and parsed by the SMP link layer (see 7.18).

10.4.3.17 ENABLE DISABLE ZONING function

The ENABLE DISABLE ZONING function enables or disables zoning. This SMP function shall be supported by SMP target ports in zoning expander devices (see 4.9). Other SMP target ports shall not support this SMP function.

This function is an SMP zone configuration function (see 4.9.6.3).

Table 277 defines the request format.

Table 277 — ENABLE DISABLE ZONING request

Byte\Bit	7	6	5	4	3	2	1	0
0	SMP FRAME TYPE (40h)							
1	FUNCTION (81h)							
2	Reserved							
3	REQUEST LENGTH (02h)							
4	(MSB)	EXPECTED EXPANDER CHANGE COUNT						(LSB)
5	Reserved							
6	Reserved							
7	Reserved							
8	Reserved						ENABLE DISABLE ZONING	
9	Reserved							
11	Reserved							
12	(MSB)	CRC						(LSB)
15	Reserved							

The SMP FRAME TYPE field shall be set to 40h.

The FUNCTION field shall be set to 81h.

The REQUEST LENGTH field shall be set to 02h.

The EXPECTED EXPANDER CHANGE COUNT field is defined in the CONFIGURE GENERAL request (see 10.4.3.16).

The ENABLE DISABLE ZONING field is defined in table 278.

Table 278 — ENABLE DISABLE ZONING field

Code	Description
00b	No change
01b	Enable zoning
10b	Disable zoning
11b	Reserved

[If the ENABLE DISABLE ZONING field is set to 11b \(i.e., reserved\), the management device server shall return a function result of UNKNOWN ENABLE DISABLE ZONING VALUE in the response frame.](#)

The CRC field is defined in 10.4.3.1.

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10.4.3.23 CONFIGURE ZONE PHY INFORMATION function

10.4.3.23.1 CONFIGURE ZONE PHY INFORMATION function overview

The CONFIGURE ZONE PHY INFORMATION function configures zone phy information for one or more phys in a locked zoning expander device. This function shall be supported by all zoning expander devices. This function is an SMP zone configuration function (see 4.9.6.3).

SMP zone configuration functions change the zoning expander shadow values. These do not become zoning expander active values until the activate step (see 4.9.6.4).

10.4.3.23.2 CONFIGURE ZONE PHY INFORMATION request

Table 291 defines the request format.

Table 291 — CONFIGURE ZONE PHY INFORMATION request

Byte\Bit	7	6	5	4	3	2	1	0
0	SMP FRAME TYPE (40h)							
1	FUNCTION (8Ah)							
2	Reserved							
3	REQUEST LENGTH ((n - 7) / 4)							
4	(MSB)	EXPECTED EXPANDER CHANGE COUNT						(LSB)
5								
6	Reserved							
7	NUMBER OF ZONE PHY CONFIGURATION DESCRIPTORS							
Zone phy configuration descriptor list								
8	Zone phy configuration descriptor (first)(see table 302 in 10.4.3.23.26)							
11								
...	...							
n - 7	Zone phy configuration descriptor (last)(see table 302 in 10.4.3.23.26)							
n - 4								
n - 3	(MSB)	CRC						(LSB)
n								

The SMP FRAME TYPE field shall be set to 40h.

The FUNCTION field shall be set to 8Ah.

The REQUEST LENGTH field specifies the number of dwords that follow, not including the CRC field.

The EXPECTED EXPANDER CHANGE COUNT field is defined in the SMP CONFIGURE GENERAL request (see 10.4.3.16).

The NUMBER OF ZONE PHY CONFIGURATION DESCRIPTORS field specifies the number of zone phy configuration descriptors in the request. ~~If the number of zone phy configuration descriptors exceeds the number of phys of the zoning expander device then the function shall report INVALID REQUEST FRAME LENGTH in the response FUNCTION RESULT field.~~

The zone phy configuration descriptor list contains zone phy configuration descriptors as defined in 10.4.3.23.26.

10.4.3.23.26 Zone phy configuration descriptor

Table 302 defines the zone phy configuration descriptor.

Table 302 — Zone phy configuration descriptor

Byte\Bit	7	6	5	4	3	2	1	0
0	PHY IDENTIFIER							
1	Reserved		INSIDE ZPSDS PERSISTENT	REQUESTED INSIDE ZPSDS	Reserved	ZONE GROUP PERSISTENT		Reserved
2	Reserved							
3	ZONE GROUP							

The PHY IDENTIFIER field specifies the phy to which the zone phy configuration descriptor information shall be applied. ~~If the PHY IDENTIFIER field specifies a phy that does not exist then the management device server shall report PHY DOES NOT EXIST in the response FUNCTION RESULT field.~~

The INSIDE ZPSDS PERSISTENT bit specifies the value of the INSIDE ZPSDS PERSISTENT bit in the zone phy information (see 4.9.3.1).

The REQUESTED INSIDE ZPSDS bit specifies the value of the REQUESTED INSIDE ZPSDS bit in the zone phy information (see 4.9.3.1).

The ZONE GROUP PERSISTENT bit specifies the value of the ZONE GROUP PERSISTENT bit in the zone phy information (see 4.9.3.1).

The ZONE GROUP field specifies the value of the ZONE GROUP field in the zone phy information (see 4.9.3.1). Zone group values between 128 and 255, inclusive, are reserved.

10.4.3.26 PHY CONTROL function

The PHY CONTROL function requests actions by the specified phy. This SMP function may be implemented by any management device server. In zoning expander devices, if zoning is enabled then this function shall only be processed from SMP initiator ports that have access to zone group 2 or the zone group of the specified phy (see 4.9.3.2).

Table 303 defines the request format.

Table 303 — PHY CONTROL request

Byte\Bit	7	6	5	4	3	2	1	0
0	SMP FRAME TYPE (40h)							
1	FUNCTION (91h)							
2	Reserved							
3	REQUEST LENGTH (09h)							
4	(MSB)	EXPECTED EXPANDER CHANGE COUNT						(LSB)
5	Reserved							
6	Reserved							
8	Reserved							
9	PHY IDENTIFIER							
10	PHY OPERATION							
11	Reserved							UPDATE PARTIAL PATHWAY TIMEOUT VALUE
12	Reserved							
23	Reserved							
24	ATTACHED DEVICE NAME							
31	Reserved							
32	PROGRAMMED MINIMUM PHYSICAL LINK RATE				Reserved			
33	PROGRAMMED MAXIMUM PHYSICAL LINK RATE				Reserved			
34	Reserved							
35	Reserved							
36	Reserved				PARTIAL PATHWAY TIMEOUT VALUE			
37	Reserved							
39	Reserved							
40	(MSB)	CRC						(LSB)
43	Reserved							

The SMP FRAME TYPE field shall be set to 40h.

The FUNCTION field shall be set to 91h.

The REQUEST LENGTH field shall be set to 09h. For compatibility with previous versions of this standard, a REQUEST LENGTH field set to 00h specifies that there are 9 dwords before the CRC field.

The EXPECTED EXPANDER CHANGE COUNT field is defined in the SMP CONFIGURE GENERAL request (see 10.4.3.16).

The PHY IDENTIFIER field specifies the phy (see 4.2.8) to which the SMP PHY CONTROL request applies.

Table 304 defines the PHY OPERATION field.

Table 304 — PHY OPERATION field (part 1 of 2)

Code	Operation	Description
00h	NOP	No operation.
01h	LINK RESET	<p>If the specified phy is not a virtual phy, perform a link reset sequence (see 4.4) on the specified phy and enable the specified phy. If the specified phy is a virtual phy, perform an internal reset and enable the specified phy. See 7.11 for Broadcast (Change) requirements related to this phy operation in an expander device.</p> <p>Any affiliation (see 7.17.4) shall continue to be present. The phy shall bypass the SATA spinup hold state, if implemented (see 6.8.3.9).</p> <p>The management device server shall return the PHY CONTROL response without waiting for the LINK RESET phy operation to complete.</p> <p>While the LINK RESET phy operation is in progress, the management device server sets the NEGOTIATED PHYSICAL LINK RATE field and the NEGOTIATED PHYSICAL LINK RATE field to RESET_IN_PROGRESS in the SMP DISCOVER response (see 10.4.3.8).</p>
02h	HARD RESET	<p>If the specified phy is not a virtual phy, perform a link reset sequence (see 4.4) on the specified phy and enable the specified phy. If the attached phy is a SAS phy or an expander phy, the link reset sequence shall include a hard reset sequence (see 4.4.2). If the attached phy is a SATA phy, the phy shall bypass the SATA spinup hold state. See 7.11 for Broadcast (Change) requirements related to this phy operation in an expander device.</p> <p>If the specified phy is a virtual phy, perform an internal reset and enable the specified phy.</p> <p>Any affiliation (see 7.17.4) shall be cleared.</p> <p>The management device server shall return the PHY CONTROL response without waiting for the HARD RESET phy operation to complete.</p> <p>While the HARD RESET phy operation is in progress, the management device server sets the NEGOTIATED PHYSICAL LINK RATE field and the NEGOTIATED PHYSICAL LINK RATE field to RESET_IN_PROGRESS in the SMP DISCOVER response (see 10.4.3.8).</p>
03h	DISABLE	Disable the specified phy (i.e., stop transmitting valid dwords and receiving dwords on the specified phy). The LINK RESET and HARD RESET operations may be used to enable the phy. See 7.11 for Broadcast (Change) requirements related to this phy operation in an expander device.
04h	Reserved	
05h	CLEAR ERROR LOG	Clear the error log counters reported in the REPORT PHY ERROR LOG function (see 10.4.3.9) for the specified phy.

Table 304 — PHY OPERATION field (part 2 of 2)

Code	Operation	Description
06h	CLEAR AFFILIATION	Clear an affiliation (see 7.17.4) from the STP initiator port with the same SAS address as the SMP initiator port that opened this SMP connection. If there is no such affiliation, the management device server shall return a function result of SMP FUNCTION FAILED in the response frame.
07h	TRANSMIT SATA PORT SELECTION SIGNAL	<p>This function shall only be supported by phys in an expander device.</p> <p>If the expander phy incorporates an STP/SATA bridge and supports SATA port selectors, the phy shall transmit the SATA port selection signal (see 6.6) which causes the SATA port selector to select the attached phy as the active host phy and make its other host phy inactive. See 7.11 for Broadcast (Change) requirements related to this phy operation in an expander device.</p> <p>Any affiliation (see 7.17.4) shall be cleared.</p> <p>If the expander phy does not support SATA port selectors, then the management device server shall return a function result of PHY DOES NOT SUPPORT SATA.</p> <p>If the expander phy supports SATA port selectors but is attached to a SAS phy or an expander phy, the management device server shall return a function result of SMP FUNCTION FAILED.</p>
08h	CLEAR STP I_T NEXUS LOSS	The STP I_T NEXUS LOSS OCCURRED bit in the REPORT PHY SATA function (see 10.4.3.10) shall be set to zero.
09h	SET ATTACHED DEVICE NAME	<p>If the expander phy is attached to a SATA phy, set the ATTACHED DEVICE NAME field reported in the DISCOVER response (see 10.4.3.8) to the value of the ATTACHED DEVICE NAME field in the PHY CONTROL request.</p> <p>If the expander phy is not attached to a SATA phy, then the management device server shall return a function result of PHY DOES NOT SUPPORT SATA.</p>
All others	Reserved	

[If the operation specified by the PHY OPERATION field is unknown, the management device sever shall return a function result of SMP FUNCTION FAILED and not process any other fields in the request.](#)

If the PHY IDENTIFIER field specifies the phy which is being used for the SMP connection and a phy operation of LINK RESET, HARD RESET, or DISABLE is requested, the management device server shall not perform the requested operation and shall return a function result of SMP FUNCTION FAILED in the response frame.

An UPDATE PARTIAL PATHWAY TIMEOUT VALUE bit set to one specifies that the PARTIAL PATHWAY TIMEOUT VALUE field shall be honored. An UPDATE PARTIAL PATHWAY TIMEOUT VALUE bit set to zero specifies that the PARTIAL PATHWAY TIMEOUT VALUE field shall be ignored.

The ATTACHED DEVICE NAME field is used by the SET ATTACHED DEVICE NAME phy operation and is reserved for all other phy operations. If a management application client detects the ATTACHED DEVICE NAME field set to zero in the DISCOVER response when a SATA device is attached, it shall set the ATTACHED DEVICE NAME field based on the IDENTIFY (PACKET) DEVICE data retrieved by an ATA application client in the same SAS initiator device as follows:

- a) if IDENTIFY (PACKET) DEVICE data word 255 (i.e., the Integrity word) is correct and words 108-111 (i.e., the World Wide Name field) are not set to zero, set this field to the world wide name indicated by words 108-111 according to table 12 in 4.2.5;

- b) if IDENTIFY (PACKET) DEVICE data word 255 (i.e., the Integrity word) is correct and words 108-111 (i.e., the World Wide Name) are set to zero, set this field to 00000000 00000000h; and
- c) if IDENTIFY (PACKET) DEVICE data word 255 (i.e., the Integrity word) is not correct, set this field to 00000000 00000000h.

The PROGRAMMED MINIMUM PHYSICAL LINK RATE field specifies the minimum physical link rate the phy shall support during a link reset sequence (see 4.4.1). Table 305 defines the values for this field. If this field is changed along with a phy operation of LINK RESET or HARD RESET, that phy operation shall utilize the new value for this field. This value is reported in the DISCOVER response (see 10.4.3.8).

The PROGRAMMED MAXIMUM PHYSICAL LINK RATE field specifies the maximum physical link rates the phy shall support during a link reset sequence (see 4.4.1). Table 305 defines the values for this field. If this field is changed along with a phy operation of LINK RESET or HARD RESET, that phy operation shall utilize the new value for this field. This value is reported in the DISCOVER response (see 10.4.3.8).

Table 305 — PROGRAMMED MINIMUM PHYSICAL LINK RATE **and** PROGRAMMED MAXIMUM PHYSICAL LINK RATE **fields**

Code	Description
0h	Do not change current value
1h - 7h	Reserved
8h	1,5 Gbps
9h	3 Gbps
Ah	6 Gbps
Bh - Fh	Reserved for future physical link rates

If the PROGRAMMED MINIMUM PHYSICAL LINK RATE field or the PROGRAMMED MAXIMUM PHYSICAL LINK RATE field is set to an unsupported or reserved value, or the PROGRAMMED MINIMUM PHYSICAL LINK RATE field and PROGRAMMED MAXIMUM PHYSICAL LINK RATE field are set to an invalid combination of values (e.g., the minimum is greater than the maximum), the management device server shall not change either of their values and may return a function result of SMP FUNCTION FAILED in the response frame. If it returns a function result of SMP FUNCTION FAILED, it shall not perform the requested phy operation.

The PARTIAL PATHWAY TIMEOUT VALUE field specifies the amount of time in microseconds the expander phy shall wait after receiving an Arbitrating (Blocked On Partial) confirmation from the ECM before requesting that the ECM resolve pathway blockage (see 7.12.4.5). A PARTIAL PATHWAY TIMEOUT VALUE field value of zero (i.e., 0 μ s) specifies that partial pathway resolution shall be requested by the expander phy immediately upon reception of an Arbitrating (Blocked On Partial) confirmation from the ECM. The PARTIAL PATHWAY TIMEOUT VALUE field is only honored when the UPDATE PARTIAL PATHWAY TIMEOUT VALUE bit is set to one. This value is reported in the DISCOVER response (see 10.4.3.8).

The CRC field is defined in 10.4.3.1.

10.4.3.27 PHY TEST FUNCTION function

The PHY TEST FUNCTION function requests actions by the specified phy. This SMP function may be implemented by any management device server. In zoning expander devices, if zoning is enabled then this function shall only be processed from SMP initiator ports that have access to zone group 2 or the zone group of the specified phy (see 4.9.3.2).

Table 306 defines the request format.

Table 306 — PHY TEST FUNCTION request

Byte\Bit	7	6	5	4	3	2	1	0
0	SMP FRAME TYPE (40h)							
1	FUNCTION (92h)							
2	Reserved							
3	REQUEST LENGTH (09h)							
4	(MSB)	EXPECTED EXPANDER CHANGE COUNT						(LSB)
5								
6	Reserved							
8								
9	PHY IDENTIFIER							
10	PHY TEST FUNCTION							
11	PHY TEST PATTERN							
12	Reserved							
14								
15	Reserved				PHY TEST PATTERN PHYSICAL LINK RATE			
16	Reserved							
18								
19	PHY TEST PATTERN DWORDS CONTROL							
20	PHY TEST PATTERN DWORDS							
27								
28	Reserved							
39								
40	(MSB)	CRC						(LSB)
43								

The SMP FRAME TYPE field shall be set to 40h.

The FUNCTION field shall be set to 92h.

The REQUEST LENGTH field shall be set to 09h. For compatibility with previous versions of this standard, a REQUEST LENGTH field set to 00h specifies that there are 9 dwords before the CRC field.

The EXPECTED EXPANDER CHANGE COUNT field is defined in the SMP CONFIGURE GENERAL request (see 10.4.3.16).

The PHY IDENTIFIER field specifies the phy (see 4.2.8) to which the SMP PHY TEST PATTERN request applies.

If the PHY IDENTIFIER field specifies the phy which is being used for the SMP connection, the management device server shall not perform the requested operation and shall return a function result of SMP FUNCTION FAILED in the response frame.

The PHY TEST FUNCTION field specifies the phy test function to be performed, and is defined in table 307. If the PHY TEST FUNCTION field specifies a phy test function that is not supported by the phy, the management device server shall return a function result of UNKNOWN PHY TEST FUNCTION in the response frame.

Table 307 — PHY TEST FUNCTION field

Code	Name	Description
00h	STOP	<p>If the selected phy is performing a phy test function, then the selected phy shall stop performing the phy test function and originate a link reset sequence.</p> <p>If the selected phy is not performing a phy test function, then this function has no effect on the selected phy.</p>
01h	TRANSMIT_PATTERN	<p>If the selected phy is not performing a phy test function, the selected phy shall be set to transmit the phy test pattern specified by the PHY TEST PATTERN field at the physical link rate specified by the PHY TEST PATTERN PHYSICAL LINK RATE field and set to ignore its receiver. If the selected phy receives data while transmitting the pattern, then the selected phy shall ignore the received data.</p> <p>If the selected phy is performing a phy test function, the management device server shall return a function result of PHY TEST FUNCTION IN PROGRESS in the response frame.</p>
02h - EFh	Reserved	
F0h - FFh	Vendor specific	

If the PHY TEST FUNCTION field is set to 01h, the PHY TEST PATTERN field specifies the phy test pattern to be performed, and is the same as that defined in table 215 for the Protocol-Specific diagnostic page (see 10.2.9.1). The phy test pattern shall be sent at the physical link rate specified by the PHY TEST PATTERN PHYSICAL LINK RATE field.

The PHY TEST PATTERN PHYSICAL LINK RATE field specifies the physical link rate at which the phy test function, if any, shall be performed. Table 308 defines the values for this field.

Table 308 — PHY TEST PATTERN PHYSICAL LINK RATE field

Code	Description
0h - 7h	Reserved
8h	1,5 Gbps
9h	3 Gbps
Ah	6 Gbps
Bh - Fh	Reserved for future physical link rates

The PHY TEST PATTERN DWORDS CONTROL field and the PHY TEST PATTERN DWORDS field are as defined in table 215 for the Protocol-Specific diagnostic page (see 10.2.9.1).

The CRC field is defined in 10.4.3.1.

10.4.3.28 CONFIGURE PHY EVENT INFORMATION function

10.4.3.28.1 CONFIGURE PHY EVENT INFORMATION function overview

The CONFIGURE PHY EVENT INFORMATION function configures phy event information (see 4.11) about the specified phy. This SMP function may be implemented by any management device server. In zoning expander devices, if zoning is enabled then this function shall only be processed from SMP initiator ports that have access to zone group 2 or the zone group of the specified phy (see 4.9.3.2).

10.4.3.28.2 CONFIGURE PHY EVENT INFORMATION request

Table 309 defines the request format.

Table 309 — CONFIGURE PHY EVENT INFORMATION request

Byte\Bit	7	6	5	4	3	2	1	0
0	SMP FRAME TYPE (40h)							
1	FUNCTION (93h)							
2	Reserved							
3	REQUEST LENGTH ((n - 7) / 4)							
4	(MSB)	EXPECTED EXPANDER CHANGE COUNT						(LSB)
5								
6	Reserved							CLEAR PEAKS
7	Reserved							
8								
9	PHY IDENTIFIER							
10	Reserved							
11	NUMBER OF PHY EVENT CONFIGURATION DESCRIPTORS							
Phy event configuration descriptor list								
12	Phy event configuration descriptor (first)(see table 310 in 10.4.3.28.3)							
	...							
	Phy event configuration descriptor (last)(see table 310 in 10.4.3.28.3)							
n - 4								
n - 3	(MSB)	CRC						(LSB)
n								

The SMP FRAME TYPE field shall be set to 40h.

The FUNCTION field shall be set to 93h.

The REQUEST LENGTH field specifies the number of dwords that follow, not including the CRC field.

The EXPECTED EXPANDER CHANGE COUNT field is defined in the SMP CONFIGURE GENERAL request (see 10.4.3.16).

A CLEAR PEAKS field set to one specifies that all phy event information peak value detectors shall be set to zero. A CLEAR PEAKS field set to zero specifies no change to the phy event information peak value detectors.

The PHY IDENTIFIER field specifies the phy (see 4.2.7) for which information shall be reported.

The NUMBER OF PHY EVENT CONFIGURATION DESCRIPTORS field specifies the number of phy event configuration descriptors, and shall be set to the same value as the NUMBER OF PHY EVENT DESCRIPTORS field in the SMP REPORT PHY EVENT INFORMATION function (see 10.4.3.12).

The CRC field is defined in 10.4.3.1.

10.4.3.28.3 CONFIGURE PHY EVENT INFORMATION request phy event configuration descriptor

Table 310 defines the phy event configuration descriptor.

Table 310 — Phy event configuration descriptor

Byte\Bit	7	6	5	4	3	2	1	0	
0	Reserved								
2	Reserved								
3	PHY EVENT INFORMATION SOURCE								
4	(MSB)	PEAK VALUE DETECTOR THRESHOLD							
7								(LSB)	

The PHY EVENT INFORMATION SOURCE field, defined in table 35 in 4.11, specifies the type of event that shall be recorded by the corresponding phy event information monitor.

If the phy event information source is a peak value detector, the PEAK VALUE DETECTOR THRESHOLD field specifies the value of the peak value detector that causes the expander device to originate a Broadcast (Expander)(see 7.2.5.5). If the phy event information source is not a peak value detector, the PEAK VALUE DETECTOR THRESHOLD field is reserved.

[If the PHY EVENT INFORMATION SOURCE field contains a value that is not supported, the management device server shall return a function result of UNKNOWN PHY EVENT INFORMATION SOURCE in the response frame.](#)