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To: X3T10 Committee (SCSI)

From: George Penokie (IBM)

Subject: Exception Handling Selection Mode Page

1 Overview

Many of today SCSI devices have asynchronous events that occur. These devices use several different methods for reporting asynchronous events. This proposal allows a method for application clients to select the method it expects the target to use when reporting asynchronous events.

This proposal also define parameters to control reporting of failures that are predicted by a target.

It is recommended that the informational exceptions control page be added to the following command standards:

    SCSI-3 Block Commands Standard [X3T10/996D]
    SCSI-3 Stream Commands Standard [X3T10/997D]
    SCSI-3 Medium Changer Commands Standard [X3T10/999D]
    SCSI-3 Controller Commands [X3T10/1047D]
    SCSI-3 Muiti-Media Commands Standard [X3T10/1048]

It is recommended that the information exceptions control page be added to the following SCSI device types:

    Direct-access device (e.g. magnetic disk)
    Sequential-access device (e.g. magnetic tape)
    Printer device
    Write-once device (e.g. some optical disks)|
    CD-ROM device
    Optical memory device (e.g. some optical disks)
    Medium changer device (e.g. jukeboxes
    Communications device

2 Informational exceptions control page

The informational exceptions control page defines the methods used by the target to control the reporting and the operations of specific informational exception conditions. This page shall only apply to informational exceptions that report an additional sense code of FAILURE PREDICTION THRESHOLD EXCEEDED to the application client.

Informational exception conditions occur as the result of vendor specific events within a target. An informational exception condition may occur asynchronous to any commands issued by an application client.

Table 1 - Informational exceptions control page

Bit Byte	7	6	5	4	3	2	1	0
0	PS	RESERVED	PAGE CODE (1Ch)					
1	PAGE LENGTH (0EH)							
2	PERF	RESERVED			DEXCPT	RESERVED		LOGERR
3	RESERVED				METHOD OF REPORTING INFORMATIONAL EXCEPTIONS			
4	MSB			INTERVAL TIMER				
5								
6								
7								LSB
8	MSB			REPORT COUNT				
9								
10								
11								LSB

The log errors bit (LOGERR) of zero indicates that the logging of informational exception conditions within a target is vendor specific. A LOGERR bit of one indicates the target shall log informational exception conditions.

The METHOD OF REPORTING INFORMATIONAL EXCEPTIONS field (see table 2) indicates the methods that shall be used by the target to report informational exception conditions. The priority of reporting multiple information exceptions is vendor specific.

Table 2 - Format of METHOD OF REPORTING INFORMATIONAL EXCEPTIONS **field**

Code	Description
0h	**No reporting of informational exception condition:** This method instructs the target to not report information exception conditions. The target shall not preserve informational exception(s) information for reporting reasons.
1h	**Asynchronous event reporting:** This method instructs the target to report informational exception conditions by using the rules for asynchronous event reporting as described in the SCSI-3 Architecture Model and the relevant Protocol Standard. The sense key shall be set to RECOVERED ERROR and the additional sense code shall be indicate the cause of the informational exception condition.
2h	**Generate unit attention:** This method instructs the target to report informational exception conditions by issuing a unit attention condition on any command. In response to a REQUEST SENSE command the target shall return sense data. The sense key shall be set to UNIT ATTENTION and the additional sense code shall be indicate the cause of the informational exception condition. The command that has the CHECK CONDITION shall not be executed before the informational exception condition is reported.
3h	**Conditionally generate recovered error:** This method instructs the target to report informational exception conditions, dependent on the value of the PER bit of the error recovery parameters mode page, by returning a sense of CHECK CONDITION on any command. In response to a REQUEST SENSE command the target shall return sense data. The sense key shall be set to RECOVERED ERROR and the additional sense code shall be indicate the cause of the informational exception condition. The command that has the CHECK CONDITION shall complete without error before any informational exception condition may be reported.
4h	**Unconditionally generate recovered error:** This method instructs the target to report informational exception conditions, regardless of the value of the PER bit of the error recovery parameters mode page, by returning a sense of CHECK CONDITION on any command. In response to a REQUEST SENSE command the target shall return sense data. The sense key shall be set to RECOVERED ERROR and the additional sense code shall be indicate the cause of the informational exception condition. The command that has the CHECK CONDITION shall complete without error before any informational exception condition may be reported.
5h	**Generate no sense:** This method instructs the target to report informational exception conditions by returning a sense of CHECK CONDITION on any command. In response to a REQUEST SENSE command the target shall return sense data. The sense key shall be set to NO SENSE and the additional sense code shall be indicate the cause of the informational exception condition. The command that has the CHECK CONDITION shall complete without error before any informational exception condition may be reported.

Table 2 - Format of METHOD OF REPORTING INFORMATIONAL EXCEPTIONS **field**

Code	Description
6h	**Only report informational exception condition on request:** This method instructs the target to preserve the informational exception(s) information. To find out about information exception conditions the Application Client polls the target by issuing a REQUEST SENSE command when the target does not have a pending check condition. In response to a REQUEST SENSE command the target shall return sense data. The sense key shall be set to NO SENSE and the additional sense code shall be indicate the cause of the informational exception condition.
7h-Bh	Reserved
Ch-Fh	Vendor specific

A disable exception control (DEXCPT) bit of zero indicates information exception operations shall be enabled. The reporting of information exception conditions when the DEXCPT bit is set to zero is determined from the METHOD OF REPORTING INFORMATIONAL EXCEPTIONS field. A DEXCPT bit of one indicates the target shall disable all information exception operations. The METHOD OF REPORTING INFORMATIONAL EXCEPTIONS field is ignored when DEXCPT is set to one.

A performance bit (PERF) of zero indicates that informational exception operations that are the cause of delays are acceptable. A PERF bit of one indicates the target shall not cause delays while doing informational exception operations.

> Note 1 A PERF bit set to one may cause the target to disable some or all of the informational exceptions operations, thereby limiting the reporting of informational exception conditions.

The INTERVAL TIMER field indicates the period in 100 millisecond increments for reporting that a informational exception condition has occurred. The target shall report the informational exception condition as soon as possible after the timer interval has elapsed. After the informational exception condition has been reported the interval timer shall be restarted. A value of zero in the INTERVAL TIMER field indicates that the target shall only report the informational exception condition one time. A value of FFFFFFFFh in the INTERVAL TIMER field shall indicate the timer interval is vendor specific.

The REPORT COUNT field indicates the number of times to report an informational exception condition to the application client. A value of zero in the REPORT COUNT field indicates there is no limit on the number of times the target shall report an informational exception condition.

The maintaining of the interval timer and the report count access power cycles and/or resets by the target shall be vendor specific.