ATA-3 Proposal
Informational Exception Condition Reporting

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Introduction

ATA-2 does not provide a mechanism to report an informational
exception condition. The IEC condition, also referred to as
PFA, indicates that the data on the drive should be backed up to
another storage device and that the drive should be serviced. This
proposal is a method for reporting an informational exception condition
on ATA drives.

Proposal Features

- An Identify Data bit indicates support for IEC (word 49 bit 14)
- IEC mode is enabled by a Set Features command (84h On, 04h Off)
- Status bit 2 (CORR/IEC) indicates an IEC   •
- Drives in IEC mode and asserting an IEC shall fail Execute Device
  Diagnostic Commands.

Sequence of operation

1. System reads the Identify information to determine if the drive is
   IEC capable.

2. System issues Enable IEC Set Features command (Function 84h)

   If IEC is not supported by the drive the Set Features command is
   aborted. This checks the Identify data obtained in step 1.

3. The drive asserts status register bit 2 (CORR/IEC) when the
   drive detects an IEC. Data transfers are not terminated.

4. The IEC may be verified with an Execute Device Diagnostics command.

Proposed Changes (Reference ATA-2 rev 2j)

Section 3.1.9 (new)

IEC (Informational Exception Condition)

An informational exception condition is a request for device data back
up and maintenance. The maintenance procedure is vendor specific.

Section 6.2.1

CORR becomes CORR/IEC

Section 6.2.12

CORR becomes CORR/IEC

replace -CORR definition with

- CORR/IEC (Corrected Data/IEC) A drive which has been set IEC enabled

asserts CORR/IEC when an IEC has been detected. The definition of what constitutes a IEC is vendor specific. IEC is cleared by power on reset, hard reset, or execution of the set features IEC disable command.

Drives that do not support IEC and drives that are IEC disabled assert CORR/IEC to indicate a correctable data error. The definition of what constitutes a correctable error is vendor specific. A CORR or IEC condition does not terminate a data transfer.

Section 8.8

add: A drive with IEC enabled and asserting a IEC status (CORR/IEC bit) shall fail Execute Device Diagnostics.

Section 8.10

Word 47 bit 14, 1=IEC may be supported

Section 8.24

in table 14

04h Disable IEC
84h Enable IEC   •

Implementation Considerations

This proposal for an IEC indication reuses the CORR bit as the IEC bit. Most BIOS's and device drivers ignore the CORR status, or pass back a code which is ignored by the operating system.

The status register CORR bit indicates that data read from the drive was corrected using ECC. The data is correct. IEC is similar in that an IEC is a state, not an error. Data read from the drive while IEC is asserted is correct.

In this proposal IEC may be asserted at any time and must remain asserted until POR, hard reset, or IEC is turned off with set features. The assertion of IEC is not dependant on command execution. Host software may check for IEC when a command is executed or between commands. This accommodates hosts which check for IEC at each command and those which check for IEC as separate maintenance task.

A single bit for IEC assertion does not provide a way to determine the reason for a IEC state. Drives should provide a vendor specific method of determining the reason for IEC state assertion.

Because the drive must have IEC enabled to set an IEC state, failing diagnostics in IEC mode should not interfere with systems that run diagnostics at power on.

Although Diagnostics error codes are vendor specific, code 6 is preferred for IEC errors, as it was not defined in previous specifications.

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