Case Study

PC-Doctor Hard Drive Testing

White Paper

Introduction

In today's highly competitive OEM market, driving down support costs while raising customer satisfaction is crucial to gaining a competitive edge and increasing revenue. PC-Doctor is dedicated to supplying our customers with world-class diagnostics and services. We work closely with our customers to evaluate and improve our diagnostics. As a part of the effort to continuously improve our diagnostics, we periodically perform analysis on Hard Disk Drives (HDDs) that have been returned to the OEMs from end users. This case study highlights our recent analysis in relation to the effectiveness of PC-Doctor hard drive diagnostics.

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Case Study Background

One problem with diagnosing HDDs is that as their storage capacity continues to grow, the time it takes to perform comprehensive testing is greatly extended. A full suite of tests can take many hours on a large drive making that level of testing impractical for both end users and service/repair technicians. For example, a full HDD surface scan can take up to a day or more to complete on extremely large drives. Traditional HDD random seek tests are simply insufficient to accurately determine faults on large drives.

One of the goals of PC-Doctor is to provide a set of short HDD tests that can be completed in ~5-10 minutes and still reliably determine if an HDD needs to be replaced. To achieve this objective, an effective HDD diagnostic script needs to determine which areas of the HDD are potentially defective and focus testing on those areas.

An appropriately configured PC-Doctor HDD diagnostic script which includes our innovative Targeted Read Test will specifically meet the need to accurately determine HDD faults in a minimum amount of time.

The Targeted Read Test in particular was developed to identify specific areas of an HDD that have potential issues and test these areas first thereby decreasing the time-to-failure (TTF) determination. This is especially effective on drives with multiple errors where this test can fail within seconds making it a highly efficient HDD diagnostic.

The PC-Doctor HDD script utilized in this study was designed to include those tests – including the aforementioned Targeted Read Test - which can most effectively determine HDD faults within a minimum amount of time.

Background and Methodology

Hard Drive errors can be divided into three major areas:

1. Drive not recognized
2. Physical noises
3. Sector errors

This study focuses on sector errors and their detection.

Sector errors can cause read errors from the drive in the form of CRC errors. Additionally, they may cause the drive to retry reading many times causing the operating system to timeout or appear to hang. Sector errors can also corrupt files such as text documents and spreadsheets.

«With the 97.3% First time Detection Rate (FDR) demonstrated in this study, a PC-Doctor hard drive diagnostic script is a highly effective method to determine if HDD replacement is required. »

To determine the effectiveness of the PC-Doctor HDD script used in this study, we performed analysis on 176 drives that had been returned by end users to the OEM as suspected faulty drives. End user problems are commonly misdiagnosed as faulty hard drives.

To ensure that the returned drives used in the study were actually faulty, a comprehensive set of PC-Doctor and vendor-specific hard drive tests were performed on all drives that were bootable prior to subjecting the drives to the specially configured HDD script.

Only those drives which were conclusively determined to be faulty were subjected to this study. **See Table 1 below.**

Drives unable to boot	20
Drives with no fault found	42
Drives failing extended testing	114
Total number of drives	176

Table 1 – Returned Drive Breakdown

Results

Of the 114 confirmed defective drives tested, 111 failed during the first pass of the PC-Doctor HDD diagnostic script. This results in a First-time Detection Rate (FDR) of 97.3%.

With the 97.3% FDR demonstrated in this study, an appropriately configured PC-Doctor hard drive diagnostic script is a highly effective method to determine if HDD replacement is required. This can be applied as a cost-savings process in two major OEM support areas – call-center support for end users and repair/service centers.

A call-center agent can have end users perform this testing prior to issuing an HDD RMA; thereby reducing or eliminating unnecessary returns. Repair/service technicians can quickly determine the status of a suspected hard drive saving costly repair time and increasing technician throughput. Both cases increase customer satisfaction by reducing time to resolution and driving confidence in the OEM brand.

Contact

PC-Doctor welcomes the opportunity to discuss how we can work with your brand to reduce costs and increase your customer satisfaction.

Please contact us at sales@pc-doctor.com or by calling 775.336.4000.

PC-Doctor, Inc.
The global leader in system health

10345 Professional Circle
Reno, Nevada 89521

775-336-4000
http://www.pc-doctor.com