Genesis Hard Drive Solutions

'Processing Second-User Hard Drives & SSD'

White Paper

INTRODUCTION / BACKGROUND

The aim of this document is to de-mystify the processes and technologies behind processing second user Hard Drives and SSD to promote product re-use and increase sustainability, while maximising remarketing revenues and keeping operational costs under control.

Millions of Data Storage devices, including Hard Drives (HDD) and Solid-State Drives (SSD) are manufactured & distributed every year. The big four HDD manufacturers are Seagate, Western Digital (WD), Toshiba & HGST. There is an even larger number of SSD vendors in this growing market, including companies such as Intel, Kingston, Samsung, SanDisk & Seagate.

The second user market is as equally buoyant, with 1000's of companies across the globe buying and selling HDD's and SSDs as a commodity. However, within this industry sector there are several challenges, which we will endeavour to discuss within this document.   When buying second user devices, there are two main considerations taken on board; firstly, has the device been fully sanitised/erased prior to sale/purchase and the second is the overall level of product quality. So, how can you be 100% sure that device will function correctly and is going to be reliable for years to come?

The second-user Hard Drive industry does lack methods of standardisation, whereby drives can be graded or health-scored accurately to a common standard. The EU has desires to create a similar type of programs, where a device serial number can be checked and certified in terms of its service life and journey.

At present many Hard Drive suppliers/traders use the number of G-List Defects as the primary or only health scoring mechanism. This has its pros and cons. Defects are viewed negatively, however Hard Drives are designed with the fact that, by nature, magnetic media will have defects and hence, appropriate management processes are built into the device. Defects will be found on media at the point of manufacture. The number of defects alone is a too simple way of calculating drive health. Advanced techniques can be used to safely move defects and reallocate good blocks to be used as means as replacement.

ABSTRACT / BUSINESS CASE

Daily, thousands of perfectly serviceable hard drives are scrapped/shredded & physically destroyed. This is a waste financially, but also has a huge negative impact on the environment. Hard drives contain a number of precious metals, including gold, silver, platinum and palladium.

There are two major reasons for this occurring. Users are not fully aware of their data-erasure compliancy regulations and take what they deem as a 'risk-free/safe' approach of 'shred-everything', rather than using a data erasure product or subcontracting to a professional ITAD (IT Asset Disposal/Disposition) organisation who fully understand the techniques and legislation (such as GDPR) to safely erase all user-data from devices.

The other issue, which is potentially the bigger problem, is that most IT recycling companies and ITAD's use data wiping software are their sole or primary form of test and erasure method for Hard Drives and SSDs. Depending on how the software is configured, it is possible for a drive to 'fail' with just one single defect, which as previously stated, does not make it a bad or unreliable device.

By using a solution to recover drives that are being scrapped, with the additional functionality to be able to properly test and refurbish drives will offset any additional costs incurred by using more advanced test & erasure techniques.

PROBLEM STATEMENT

We have already highlighted a number of the issues, for convenience, we will summarise below.

- Drives are prematurely scrapped due to lack of technology to process/test fully. Erasure software can fail a device with grown defects, even if the drive is perfectly fit for purpose but needs the defects to be re-assigned to the P-List.
- Traders/re-marketers of Hard Drives are losing revenue by selling Grade B & C product that could be refurbished to a Grade A status.
- Drives are being sold that have been 'erased' but not 'tested'. A drives that may pass an Erasure, does not necessarily equate to a good fully functioning device.
- Fake drives have been found on the market, where the SMART data has been reset, but no reassignment of defects (to the P-List) has taken place.
- SSD drives need to be graded accurately to ensure they are fit for re-use.

PROPOSED SOLUTION

Genesis is a culmination of many years of development and engineering that has been developed into a plug and-play solution that is highly sophisticated in its technology but packaged in a way that is easy to use at an operator level. The overall aim of the solution is to promote product re-use and contribute to sustainability, while refurbishing the device to increase health and ensuring devices are fully tested as 'fit for use' with any user data full erased to industry standards.

INTRODUCTION OF SOLUTION

The solution is a combination of hardware and software. The fully automated system enables companies to process storage devices (SAS/SATA, 2.5 or 3.5", HDD/SSD). Genesis is deployed at customers' site(s) where required, this provides additional security benefits of minimising transportation of data bearing devices. The solution is controlled via the Genesis web portal, providing full management with live statistics and reporting. At an operator level, the solution is easy to use with cable-less hot-swap drive ports, with a choice of 8, 16, 32, 64 & 96-Port systems.

APPLICATION OF SOLUTION

Drives of unknown state/quality can be inserted into the test bays, the software will sense the drive being inserted an automatically commence the chosen test routine. The system can be configured to use standard test routines, or bespoke test schedules can be created on a customer-by-customer basis. The scripts are deployed using 'Dynamic Schedules', these are fully automated and intelligent deployment methods that will only use the applicable functions based on the capability and compatibility of the device being processed. The solution has also been certified by ADISA under their Product Assurance scheme, to confirm the system's ability to ensure all user data is erased & verified.

The advanced 'repair' schedule runs a suite of tests and routines to check & confirm the integrity of the device and scans the entire media searching any defects. Once defects are verified, they are allocated to the prime defect list and new space is made available to retain full capacity. Once this technique is completed the SMART counters are reset to reflect the new status of the device.

Genesis also provides a health score, called Guardian, for ease of drive grading. The Guardian score is compatible with Sentinel and uses a number of key drive attributes to provide an accurate health score out of 100.

FUTURE DIRECTION / LONG-TERM FOCUS

The Genesis solutions and technology is in continual development. There are two main focuses; firstly, drive vendors are continuously developing new technologies & methodologies, so there is always a necessity to ensure the solution is always compatible with the most modern of devices.

Secondly, the goal is to build more intelligence & sophistication into the solution. This can be achieved in multiple ways. Processing efficiency is a key driver, so as an example; having the ability to predict failures before they happen. The main cause of failure of Hard Drives (during long duration tests) is sub-standard magnetic media quality. This can either be diagnosed by the sheer number of defects, but also the type of and placement of specific defects. By assessing the positions of the defects, it is possible to discover a linear defect of scratch. This type of physical defect could/would be a sign of a head crash, of which would be a reason for failing a device. Additional EFD (Early Failure Detection) can be diagnosed by evaluating at the numbers of defects found within a set period. This will enable customers to decide priority of either high yield versus of efficient processing times.

RESULTS / CONCLUSIONS

A vast number of companies that currently process second-user hard drives use wiping software, are missing a big opportunity to dramatically increase revenues & profit, while aiding sustainability through promoting the reuse of products.

An erased drive is not a tested drive. With Genesis drives are fully tested and refurbished using similar techniques deployed by the drive manufacturers themselves within their own in-house refurbishment programs.

Genesis is easy to install and use and can be located wherever needed on a site-by-site basis. Management of multiple locations is easy to achieve through the Genesis web-portal.

The team at Ultratest Solutions are always on-hand to provide help and guidance on best practices and ensuring that customers gain maximum return on investment from the technology.

For further information, please contact…

Ultratest Solutions Limited
1 Eastman Way
Stevenage
Hertfordshire SG1 4SZ
United Kingdom
Email: info@ultratestsolutions.com