Computer Storage Device Providing Implicit Detection of Block Liveness

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a controller within a storage device that enables the secure shredding of deleted computer files.

Overview

A computer operating system is connected to its hard drive(s) by an interface that controls recording and viewing of data to and from storage blocks on the drive. To increase efficiency, the operating system registers deleted files but never overwrites the data on the storage device until the space is needed for other use. Business or government organizations that handle confidential information would benefit from a reliable method for securely shredding deleted files.

The Invention

UW-Madison researchers have developed a controller within a storage device that can determine liveness of a block without input from the operating system. Each block includes stored data and metadata, which describes whether the block is active (live) or inactive (dead). A controller situated between the disk/operating system interface and the read and write circuits reads the metadata for each block and digitally shreds the data on dead blocks. A smart controller, harnessing this liveness detection technology, can detect when a file has been deleted and then overwrite the data with special patterns to ensure such data cannot be recovered.

Applications

- Securely shredding deleted files on a computer hard drive or other storage device

Key Benefits

- Uses liveness information to optimize performance, correctness and functionality of storage devices
- Allows faster caching of data by eliminating dead blocks from lower-level storage caches
- Reduces the time to recover from disk failure by recovering only live blocks
- Increases efficiency of shredding by tracking liveness from within the storage device
- Requires only block-specific read and write instructions to pass between operating system and storage device
- Works with both single and multiple disk drives
- Can be used on a variety of common file system types
- Determines liveness of a block data based solely on observation of traffic stream to disk
- Includes buffer time before shredding to avoid accidental deletes by user

Additional Information

For More Information About the Inventors

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Tech Fields

- Information Technology : Computing methods, software & machine learning

For current licensing status, please contact Emily Bauer at emily@warf.org or 608-960-9842