

Reduced Latency Data Access in Hard-drives, Solid-State Arrays, and Networked Storage Devices

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TECHNOLOGY DESCRIPTION

Given here is a novel method to reduce the time-cost of accessing data stored in a computer file system, particularly on a very fast solid-state disk. Normally, to access data in a file system, an application makes a call to the operating system, which invokes the file system to determine where the data resides in the storage device and whether the application has permission to access it. On next generation solid-state drives (SSDs), this is projected to create approximately 7.8 microseconds of latency for each access of the storage device. The approach taken here eliminates nearly all the overhead related to accessing the device aside from the raw hardware cost, reducing latency by 64 percent for 512-byte operations without compromise to system security and access protocols.

ADVANTAGES

Solid-state drives are becoming very common in computer systems and are, in many cases, replacing hard drives in storage applications. Though hard drives were sufficiently slow that operating-system and file-system commands did not create a bottleneck, solid state drives are fast enough that operating system and file system overheads can significantly impact performance. The present technique removes these overheads and could enable improved performance of almost any SSD.

APPLICATIONS

Currently, SSDs are among the fastest memory devices in the world, and several manufacturers have devices that compete for top honors. However, operating system and file system overheads are detrimental to performance, reducing it by up to six times. As the file system is a critically important to organizing data in the SSD, the present invention is the only method found for providing the benefits of the file system while incurring almost zero overhead. As a result, using the present invention can boost SSD performance by up to 6 times, with early measured results of 1.8 million 512-byte IO operations per second.

INTELLECTUAL PROPERTY INFO

This invention is fully prototyped with commercial rights under U.S. and foreign patent jurisdictions available to license.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,868,867	10/21/2014	2011-187

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OTHER INFORMATION

CATEGORIZED AS

- ▶ Computer
- ▶ Hardware
- ▶ Software

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