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# Security through Motion: Protecting Data-at-Rest with Dispersive™ Software Defined Storage

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**Divide and conquer.**

**It's more than a military strategy. It's how Dispersive Technologies strengthens networks.**

**Our software-defined solutions virtualize routing and data storage for IP-based networks. These solutions increase routing speeds, bolster security and improve reliability. They uniquely protect data-in-motion and data-at-rest in ways that help organizations reduce costs, streamline and secure operations, and perform more efficiently.**

**Delivering real solutions to real problems.**

**That's Dispersive Technologies.**

## Introduction

Stored data is where the money is. It's where hackers find credit card and Social Security numbers, sensitive medical and financial information, intellectual property and email addresses.

It's where one breach can cost a retailer, insurance company or investment firm billions of dollars in lost revenue and stock value—not to mention lost consumer confidence and embarrassment when stolen data is leaked.

Recent data breaches illustrate how encryption fails to adequately secure data-at-rest. These violations will certainly increase in frequency as hackers become more sophisticated and parallel processing capabilities continue to advance.

Dispersive™ Software Defined Storage (Dispersive™ SDS) is a platform designed to overcome the current limitations on protecting stored data. Dispersive™ SDS virtualizes data storage for IP-based networks and then protects the stored data by shuffling it across storage devices. This paper describes this solution and the benefits it provides.

## Solution Overview and Component Definition

Dispersive™ SDS comprises a number of components that collaborate to forward, store and shuffle data in ways that provide security, reliability and improved network performance. This platform utilizes:

- Standards-based IP connections
- Off-the-shelf data storage devices that leverage network block devices
- Computing devices that support the interface to a network drive, and
- A Dispersive™ Shuffling Server, server-based software which divides and forwards data across a virtualized storage pool of network block devices.

In managing data storage and retrieval across these components, Dispersive™ software performs several key functions that combine to increase network speed, improve data security, and enhanced stored data reliability. Dispersive™ SDS software:

1. Divides data into blocks as small as one kilobyte
2. Sends each block to a different device selected from a virtualized pool of storage devices in different geographical locations
3. Shuffles the locations of these blocks dynamically based on:
  - a. Access frequency
  - b. Bandwidth availability
  - c. I/O performance
  - d. Time stored on a device
  - e. Other factors important to the customer
4. Reassembles the data at the Dispersive™ Shuffling Server when queried or recalled by the client

Dispersive Technologies' approach to data storage differs fundamentally from the way data is stored on traditional networks, where encrypted data at-rest typically stays at-rest until it is recalled or queried.

**Shuffle your data.  
Stack the deck against cybercrime.**

## Delivering Real Advantages

By dividing data blocks across multiple storage locations, and shuffling these blocks, Dispersive Technologies conquers traditional problems with securing data-at-rest. Specifically, Dispersive™ SDS provides:

**Tighter security:** Data blocks shuffle across multiple drives which can be in different geographical locations. Consequently, the technology thwarts hackers more effectively than mere encryption. Capturing usable information becomes a costly, time-consuming guessing game for a hacker, with little

chance of success. Discouraged, the hacker moves to easier targets.

**Greater reliability:** Dispersive™ SDS deploys data across various physical devices located in geographically disparate areas. This built-in resiliency leads to greater reliability.

**Higher speeds:** The Dispersive™ storage solution monitors network performance for bandwidth availability, I/O performance and myriad other factors. It then shuffles data blocks to locations where access is optimized. This dramatically speeds access to information and allows interactive access to big data without having to upgrade or alter routers.

**More flexibility:** Dispersive™ SDS moves stored data automatically to underutilized areas of the network. This prevents overburdening any one resource at any time. And since any pooled storage device can be employed, e.g., flash drives, flash memory, hard disk drives, etc., a multi-vendor, heterogeneous data storage strategy can be implemented.

**Reduced costs:** Dispersive™ SDS customers typically slash data costs by reducing or eliminating the need for data duplication and the requirement to over-provision fast drives.

**Dispersive™ Software Defined Storage transforms data security. Not only does it make it more difficult for hackers to steal complete data records, it also enables integrity checking—a new tool to identify the presence of a stealthy hacker.**

Within a Dispersive™ SDS platform, software resides only on the Shuffling Server; the virtualized storage

pool of network block devices presents as a network interface drive to edge client devices. With the client communicating directly with the Shuffling Server and the Shuffling Server communicating directly with the storage devices, network components collaborate to store and shuffle data in ways that meet established criteria. These criteria include bandwidth availability, I/O performance, time stored on device and others important to the customer.

Packets flow through the driver in response to requests and commands from user-facing applications (e.g., Microsoft Office, mobile device apps, etc.) without any perceptible latency. The Shuffling Server takes pre-defined byte-sized chunks (as small as one kilobyte) and stores them across the available storage devices using a Dispersive™ concatenating algorithm. This means all available storage space can be used, with the size of the store determined by dividing the amount of data to be stored by the size of the chunk. Shuffling data in this way secures it, and also makes the overall network more efficient. Data is pushed to the fastest and least congested areas of the network.

Software semaphores, a hysteresis of persistence and an independent pass insure data integrity. The Shuffling Server also orchestrates shuffling of stored data to continuously improve network communications and create a “security through motion” paradigm.

## Conclusion

Dispersive™ SDS virtualizes data storage for IP-based networks in a way that conquers weaknesses with at-rest data protection. Its innovative approach simultaneously renders existing hacking tools obsolete. Dispersive™ SDS improves the ways organizations guard their most important secrets and protects employees, customers and shareholders—all while enhancing network performance and reducing costs.

*Dispersive Technologies:  
Transforming the Internet and  
the way organizations use it.*

**“We’ve seen time and time again that merely encrypting stored data inadequately protects it against hacking. Our approach to securing at-rest data introduces a whole new complexity axis to the hacker’s collection problem, one that means even if a hacker breaches your first level of defense, the compromised data is only a piece of the puzzle. Without the other pieces, the data is useless.”**

**—Robert W. Twitchell, Jr., President and CEO, Dispersive Technologies**



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