



## Case Study

# GreenBytes

## Rewriting the Rules for Storage Performance and Efficiency With GB-X Series Appliances and Seagate® Constellation® Hard Drives

As the challenging economy forces businesses to cut IT costs wherever possible, demand for more efficient storage solutions is booming. Boasting far lower power consumption and smaller physical footprints than conventional storage systems utilizing 3.5-inch hard disk drives (HDDs), a new generation of small form factor (SFF) 2.5-inch HDD-based systems seems to epitomize the word *efficiency*.

GreenBytes, Inc., an innovative new manufacturer of storage appliances, takes the concept of efficiency far beyond many of its competitors. According to GreenBytes, a truly efficient storage solution must deliver superior capacity, reliability and economy of acquisition, in addition to the accepted criteria of reduced power usage and space savings.

### Company

GreenBytes, Inc.

### Location

Ashaway, Rhode Island

### Contact

[www.getgreenbytes.com](http://www.getgreenbytes.com)

### Primary Focus

Provider of high-performance, energy-efficient, inline deduplication storage appliances that combine highly innovative software technology and advanced power management design with a world-class server platform to address the storage and energy-efficiency crises facing today's IT operations

At the heart of GreenBytes' broader, more holistic paradigm of efficiency is the ability to perform inline data deduplication, not only for backup operations *but for primary storage as well*. Achieving the extraordinary performance this approach demands requires a variety of unique technologies, including a hybrid storage architecture that blends solid state drives (SSDs) with Seagate® Constellation® 2.5-inch high-capacity hard drives.

### Deduplication Comes of Age

The benefits of deduplication are compelling. For example, a mail server storing 100 emails with the same PowerPoint file attached to each one wastes drive capacity and system bandwidth. But traditional deduplication has a crucial limitation: only after redundant data is written does the process of deduplication begin. This is not only time-consuming, it also wastes storage capacity due to the additional scratch disk space required by post-storage deduplication technologies.

Based on their experience in storing medical images, GreenBytes founders have proven technical expertise and know that inline (real-time, on-the-fly) deduplication is the answer. Notes Michael Robinson, director of marketing and communications at GreenBytes, "You need to have an absolutely brilliant process for ingesting the data, processing the data, deduplicating it and then writing it to drives. That is our secret sauce."

Equally impressive is GreenBytes' hardware solution, which pairs high-speed SSDs for data caching with multiple Seagate Constellation 2.5-inch drives for mass data storage duties. Choosing these drives made sense for several reasons: "From a reliability and reputation standpoint, Seagate enterprise drives stand out from the crowd. We know they're designed with the robustness required in 24x7 data center environments, so everybody at GreenBytes was very excited to have Seagate drives in our boxes," Robinson recalls.

### Efficiency at Every Level

In addition to delivering the enterprise-class reliability that GreenBytes GB-X Series storage appliances demand, Seagate Constellation drives are extremely cost-efficient, enabling GreenBytes to boost system performance with high IOPS-capable SSDs while still keeping the overall cost of their appliances remarkably low. Ask Robinson how low, and he proudly states, "Our pricing is one half, one third, in some cases even one quarter that of competing boxes."

Of course, reduced power consumption and its space-saving form factor were also key attributes of Constellation drives. Boasting the lowest operating power use of any enterprise HDD, Constellation drives also feature enhanced, host-selectable PowerChoice™ power options to achieve unprecedented power savings (up to 54 percent—as low as 1.1W power usage) during slow or idle periods. Combined with its compact 2.5-inch size, the Constellation drive delivers significant savings.

Robinson continues, "The Constellation drive's efficiency lets us require significantly less power to both operate the appliance and cool it. The drives are smaller, so the chassis can be smaller (which is easier to cool) and take up less room. You save money on operating costs, as well as on space needed to house the appliances. And the Constellation drive's best-in-class rotational vibration tolerance ensures GB-X Series appliances can be densely packed with drives without performance degradation."

### Flexible Performance

In concert with the high throughput and tunable I/O performance made possible by its hybrid SSD architecture, the GB-X Series utilizes the rich features of the GreenBytes file operating system (GBFS) to meet the real-time performance challenges of primary storage while delivering the data ingest, restore and remote replication rates required for effective backup and data protection.

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And this performance doesn't come at the cost of forcing users to choose between block or file storage: GBFS is equally capable of ingesting data backup streams and acting as primary storage in a NAS and/or SAN environment. Indeed, GB-X appliances simultaneously permit virtual provisioned storage pools with NAS (CIFS and NFS) and iSCSI SAN identities, all within a single GreenBytes storage namespace.

With their ability to scale up to petabyte-size storage architectures utilizing the Constellation 500GB drives—without sacrificing inline storage performance—the GB-X Series appliances have the flexibility to meet both the primary and backup/recovery storage needs of a broad spectrum of businesses.

Boasting powerful, efficient storage in a 1U form factor under US\$10,000, the 4TB GB-1000 delivers the same features as larger GB-X Series appliances but at an unprecedented performance/price ratio. The midrange GB-2000 (2U, 12TB, up to 60TB total with optional expansion shelves) offers even higher performance and scalability, while the flagship GB-4000 (4U, 24TB, up to 216TB total) employs two high-performance Intel Xeon processors and 48 Constellation drives to keep pace in even the most punishing high-traffic network environments.

When planning the roadmap for its storage appliances, GreenBytes knew that it needed a hard drive partner with a clear vision of the future. As Robinson puts it, "As drive capacities increase, we'll be able to dramatically boost the capacity, scalability and value of our appliances. From the outset we could see that Seagate has a strong, aggressive roadmap for drive growth, and that was just one more reason we chose to go with Seagate."

### Unprecedented Value

Robinson summarizes GreenBytes' value proposition: "We believe we have an appliance that, in many respects, nobody else has: in its energy savings, in its performance and certainly in its price. Plus, we include so many features that other companies aren't offering. We didn't want a product that was *just* faster than the competition, or *just* less expensive, or *just* more scalable. We wanted to do ALL of those things, deliver unprecedented value...and we think we have."

### To Learn More:

#### Seagate® Constellation® Hard Drives

For more information on utilizing Constellation drives, visit [www.seagate.com](http://www.seagate.com).

AMERICAS Seagate Technology LLC 920 Disc Drive, Scotts Valley, California 95066, United States, 831-438-6550  
ASIA/PACIFIC Seagate Technology International Ltd. 7000 Ang Mo Kio Avenue 5, Singapore 569877, 65-6485-3888  
EUROPE, MIDDLE EAST AND AFRICA Seagate Technology SAS 16-18 rue du Dôme, 92100 Boulogne-Billancourt, France, 33 1-4186 10 00

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