Case Study: Western Digital

Leading Manufacturer Consolidates Storage and Accelerates Global Engineering Projects with Nasuni

Transition to cloud-native file system cuts global file transfer latency from hours to minutes

Renowned data storage infrastructure leader Western Digital is made up of multiple technology brands, including the company that invented the first hard drive some sixty-seven years ago. But Western Digital has been particularly busy in the past three years. The company recently completed mergers with two separate $7B companies—storage giant SanDisk and the hard drive manufacturer HGST.

Merging two large companies is a challenge, so integrating three should have been an administrative disaster. Yet Western Digital's Information Technology leadership saw this unique scenario as an opportunity. When two large companies merge, IT has to combine two ecosystems of technology solutions. Typically, the companies will battle it out over whose preferred solution will be best for the newly merged company. This was different.

"When you have three big companies coming together, you have a three-way tie as to whose capability is better," explains Todd Stewart, Vice President, Global Infrastructure and IT Operations. "So that allowed us to go out to the market for technical solutions, application, and infrastructure and choose the best in class."

Western Digital.

Executive Summary

Industry: Manufacturing
Global File System: Nasuni
Object Storage: Private Cloud

Use Cases: Multi-Site File Collaboration; M&A Integration; NAS Consolidation; Digital Transformation; Data Center Consolidation; Cloud Backup

Benefits: Follow-the-sun collaboration; file transfer times cut from 12 hours to 8 minutes; 100 storage devices retired

Sharing Manufacturing & Engineering Files Globally

The company overhauled and unified multiple Active Directories and invested in a global infrastructure network with high-bandwidth pipes at all of its major sites around the world. But Western Digital still had a file storage infrastructure problem on its hands.

Across industries, file data is growing at unprecedented rates. But storage capacity isn't the only problem. Manufacturing and engineering files are becoming larger and more complex, and large companies like Western Digital aren't housed under one wired roof. Design, engineering, testing, and manufacturing are often located in different parts of the world. Sharing, protecting, and managing manufacturing project data has become a massive challenge—one that strains traditional infrastructure and often forces companies to rely on a complex web of often incompatible solutions.

After the mergers, Western Digital was left with a complex global storage infrastructure:

- 3 major companies

- 10,000 engineers

- 40 major sites, including multiple headquarters, factories, and testing, development, and engineering centers

- 50+ storage devices from 7 different OEMs

- 100 additional remote and branch locations

- True geographic distribution, including major sites in the U.S., India, Israel, Asia, and Europe

The merger of three similar companies meant that project groups concentrated in one region were now spread across multiple sites around the world. As an example, firmware engineers are now based in Minnesota, Poland, Japan, and California. And it was up to IT to find a way to help these groups operate efficiently.

Latency, Transfer Failures, and Frustrated Engineers

Unfortunately, Western Digital's engineers just weren't able to access the files they needed fast enough. Windows® File Copy, Linux® File Copy, and Robocopy® aren't built to work over long-distance networks. The company tested other products that worked well as point-to-point file sharing solutions but failed at the scale required. Western Digital couldn't settle for linking two or three sites. The storage giant needed all 40 of its major sites to be able to operate as one connected company.

"We needed something much more mature than the old distributed file systems people were used to from ten years ago," says Stewart. "We finally realized that what we needed was a globally distributed file system."

Prior to its merger with Western Digital, SanDisk had multiple remote and branch offices struggling to access files stored at its major data centers. A competitive solution failed to deliver the necessary performance at scale, so SanDisk turned to Nasuni. The Nasuni platform solved SanDisk's remote latency issues, delivered unlimited scale, and gave the company a simple, drop-in solution whenever SanDisk stood up a new office. Instead of investing in legacy hardware, the company could deploy a physical or virtual Nasuni edge appliance at that location and give end users fast access to the files they needed.

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Western Digital's New Global File System

The IT group soon determined that a Nasuni deployment backed by Western Digital's private cloud would be an ideal solution on multiple levels.

The Nasuni UniFS® global file system stores all files and related metadata in private, public, or hybrid cloud object storage as the authoritative "gold copies." Actively used files are cached locally on Nasuni Edge Appliances to ensure the same high-performance file access as traditional NAS devices or file servers. When files become inactive, they automatically leave the edge appliances, existing only in the cloud. This eradicates the need for full-sized file servers or NAS arrays in all offices and reduces traditional file storage footprint by up to 80%.

Nasuni also eliminates the need for additional backup or Disaster Recovery solutions by maintaining a complete, versioned history of every file in the object store. High-speed file synchronization and global collaboration technologies allow a large distributed enterprise to function as a single, unified organization. Finally, by collapsing multiple solutions and storage systems into a single, easy-to-manage platform, Nasuni massively simplifies global file infrastructure.

Today, Western Digital has deployed 92 virtual appliances. "Data can be available anywhere it's needed," says Stewart. "We've now been rapidly deploying this globally. We have Nasuni in every significant location now."

Results: Backed by the Cloud, Powered by Nasuni

High-Speed Synchronization of Engineering Data

The IT team wanted to implement a follow-the-sun collaboration and development model so that when work ended in one region, it could pick right up in another. Prior to Nasuni, this wasn't happening. After engineers in Minnesota finished a build, the associated files wouldn't be available to their colleagues in Fujisawa, Japan for another 12 to 18 hours.

With Nasuni this now takes only minutes.

This dramatic reduction in synchronization time not only accelerates workflows and improves productivity. It also allows the engineering teams an additional luxury. Since the synchronization is so fast, the group in Minnesota—or whichever global site happens to be making its work available—can actually monitor the process and ensure that it's complete before leaving the office.

"Before the guys even wake up on the other end, the data is already there, and they know it's there," explains Stewart. "We've been able to achieve near real-time synching of the work product between these groups so they're able to function globally and not have all that friction that was there before."

Respecting the Speed of Light with Dedupe & Compression

UniFS® doesn't break the speed of light—or not in the current release, anyway. Western Digital's sites in Bangalore and California are still 8,000 miles apart, and it takes time to move a large manufacturing data set that far.

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UniFS delivers high-speed synchronization because it isn't moving the whole data set on a daily basis. With deduplication and compression, UniFS minimizes the data that actually has to propagate. "Many of these data sets are very large but don't change much day to day," notes Stewart. "With Nasuni, we can accomplish today's big file copy but in reality, very little actually moves. If we weren't using this dedupe and compression solution that would have to be recopied every time."

Increasing Productivity Across Engineering Teams

The impact on the engineering, development, testing, and manufacturing groups has been tremendous. Western Digital doesn't have to babysit file transfers, sit through extremely long copy times, or figure out what to do when the transfer fails, which happened often. Instead, the engineers interact with the global file system as if it were any other traditional file system and focus on doing what they do best. "Among our engineering community, it has become absolutely life changing," Stewart says. "The performance we're getting is just radically different from what we were seeing before. It just absolutely changes the way they work and it has significantly improved their productivity."

Cleaning Up and Simplifying Global Storage Infrastructure

As the combined product of three billion-dollar-plus companies, Western Digital was saddled with an unnecessarily complex global IT infrastructure. Storage products from six or seven different companies, all at various stages of their lifecycle, were trying to carry out scripts written by employees who didn't even work for Western Digital anymore.

By deploying a Nasuni virtual appliance on site, all of these incompatible islands of storage became part of one global file system. "The cleanliness in the system is huge, and it lends itself to success rather than chaos and failure," says Stewart.

Dramatically Reducing Storage Hardware & Costs

Now that file storage scales in Western Digital's private cloud, the company needs less traditional storage infrastructure at each location. Fewer devices means less hardware to support, and lower overall costs. "We've probably turned off 100 storage devices in the last year and a half, and we have 100 more to go," Stewart adds.

Consolidating and Decommissioning Data Centers

The company's private cloud, combined with Nasuni, makes Western Digital less reliant on traditional data centers and all the costs associated with maintaining these facilities. As Western Digital looks to consolidate its data center footprint, Nasuni is uniquely equipped to facilitate that mission. File data and metadata is migrated out of the data center and into a secure, cost-effective private cloud storage volume, where it instantly becomes available to any location with the proper permissions.

Strengthening Data Protection at Every Global Location

With Western Digital's private cloud, data exists on and is automatically updated across systems in three geographically distant locations. This way, if one cluster fails, or a local disaster strikes, the file data is still available from two other locations. The approach delivers nineteen 9s of data durability, surpassing traditional tape.

Nasuni only strengthens this use case. With Nasuni's Continuous File Versioning®, the gold copy of each file is continuously updated in the cloud as changes are made. A complete, immutable, versioned history of every file in UniFS® is maintained in the cloud.

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So, in the event of a local or regional disaster, Western Digital can quickly restore access to the global file system, delivering breakthrough recovery points and recovery times and 15-minute disaster recovery.

Reducing Support Calls & Freeing Up IT Time

Prior to Nasuni, Stewart says his phone was ringing off the hook every single day. "It was a daily fire drill," he recalls. "Now there's less babysitting of data, and certainly it's easier to take care of one global ecosystem than 150 NAS devices from 7 OEMs in 40 different locations, of various ages and firmware releases, probably none of which you yourself deployed." Today, all of that has been replaced by one cloud-backed global file system. Western Digital's IT team can remotely manage storage and permissions, restore deleted files, and more, across all its global offices, through the Nasuni Management Console.

What's Next for Western Digital and Nasuni

Western Digital is now focusing on moving large data sets off legacy hardware and out of data centers, and into the more cost-effective, flexible global file system. But in developing and pushing out this new Western Digital Global File System, powered by Nasuni, the group has also created a different kind of problem for itself. A good one, in this case. "My phone doesn't ring off the hook anymore," Stewart says. "When it does ring, it's a new engineering group saying we need to get on the global file system, and I say, let's get you on the list."

About Nasuni

Nasuni enables organizations to store, protect, synchronize and collaborate on files across all locations at scale. Powered by the Nasuni UniFS® global file system, Nasuni leverages cloud storage to modernize NAS, while offering transformational new capabilities for multi-site file sharing. By combining the low cost, unlimited capacity, and durability of object storage from leading cloud vendors with the high performance, security, and broad application compatibility of traditional file storage, the Nasuni subscription service improves workforce productivity, simplifies IT operations, and reduces IT costs. Nasuni is based in Boston, Mass. USA.

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