




Leading Engineering and Architecture Firm Empowers Innovative Thinkers

Mead & Hunt replaces aging SAN with DataON CiB-9112 and Windows Server 2016 running ReFS and Hyper-V

Company Overview

For over a century, Mead & Hunt has built a reputation as an engineering and architectural firm powered by innovative thinkers and steadfast experts. From bridges and highways to airports and factories, Mead & Hunt offers design services in the fields of planning, design, architecture and engineering. Named one of the fastest growing firms in its sector, Mead & Hunt is committed to customer service and their “go-the-extra-mile” philosophy encompasses all aspects of its business. Now, the firm’s rapid growth (thirty offices nationwide with over five hundred employees) has increased the need for more efficient and higher performing data centers to meet the company’s current and future data demands.

IT Challenge: Upgrade to Windows Server 2016 in Resilient File System (ReFS) and Reduce Infrastructure Complexity, Storage and Software Costs

Mead & Hunt faced many challenges with its traditional storage area network (SAN). IT managers found themselves dealing with disk failures at least once a month from an aging EMC 4Gb Fibre Channel (4GFC) SAN. With increased maintenance costs, space-confinement challenges, costly software licensing fees, poor performance and an unsatisfactory eco-footprint, the company needed to make a change in its data center.

Mead & Hunt had to make a decision as to whether it would continue with a traditional SAN architecture or move to a Windows Server 2016 software-defined storage (SDS) Hyper-V cluster solution in an ReFS environment.

For Mead & Hunt, it was also important that the pre-existing four Cisco B200 M3 and four M2 blade servers housed in two Cisco UCS 5108 chassis (for production and disaster recovery respectively at different sites) would be fully compatible.

Mead & Hunt’s goals in updating to a more efficient IT infrastructure, included:

- Eliminating increasing SAN maintenance costs
- Finding a simpler, consolidated enterprise-level and resilient solution optimized for Microsoft Windows Server 2016 and Hyper-V in an ReFS environment (that is not compatible in a traditional SAN)
- Reducing the eco-footprint and hardware size to stay within its data center’s current physical space, including the amount of physical disks
- Capitalizing on features in Windows Server 2016 like re-balancing Storage Space Pool, which can’t be done in Windows Server 2012 R2
- Saving OPEX costs on management, maintenance and additional licensing fees
- Integrating with the existing Cisco UCS 5108-housed B200 M2 and M3 blade server Hyper-V clusters

After analyzing its objectives, Mead & Hunt decided to deploy a Windows Server 2016 SDS Hyper-V cluster hardware solution that could meet all of its storage needs, achieve enterprise reliability and resiliency, while saving both CAPEX and OPEX by replacing the existing Fibre Channel SAN. In addition, managing Windows SDS (Storage Spaces) compared to a traditional SAN is much more efficient without all the management hassles and extra root level commands. It takes up less rack space, which would meet Mead & Hunt’s desire for a smaller eco-footprint, and is Microsoft friendly. For Mead & Hunt, SDS was a win-win.

The Challenge



Mead & Hunt needed an enterprise class highly available and scalable software-defined storage for its production and disaster recover data centers that would:

- Simplify enterprise storage management
- Reduce capital and operational costs
- Increase workload performance with Hyper-V

The Solution



- Windows Server 2016 Software-Defined Storage
- All-in-one DataON Cluster-in-a-Box (CiB) appliance
- Cluster storage that is simple to manage, highly available (HA) and flexible configuration (tiered storage)

The Result



- Simplified Windows SDS management compared to traditional SANs
- Fully compatible, end-to-end Hyper-V cluster solution in a Microsoft Windows Server 2016 ReFS environment
- Reduced eco-footprint and rack space
- 70x better IOPS performance up to 700K IOPS
- Saved \$50K in licensing fees

DataON CiB-9112

Benefits:

- **Simplicity** – Easy management, installation, & maintenance; out-of-the-box experience (OOBE)
- **Availability** – Dual node clustered, dual controller, dual path, heartbeat and redundant power
- **Flexibility** – All-flash storage 12x SSD, tiered storage SSD + HDD, or capacity storage 12x HDD
- **Expandability** – Capacity expansion through external storage enclosure (JBOD)
- **Management** – DataON MUST visibility and management tool



What Were the Key Determining Factors That Drove Mead & Hunt to Choose a DataON Solution?

With the numerous Windows SDS hardware vendors, it was hard to choose the right one. Mead & Hunt needed a vendor with a strong reputation, staying power, full service support and guaranteed end-to-end Windows Server 2016 and ReFS compatibility. It turned to Ned Pyle, Principal Program Manager in Microsoft's Windows Server High Availability and Storage Group, for a recommendation.

"There aren't very many SDS vendors, other than DataON, who fully support [Windows Server 2016 and ReFS]." – Ned Pyle, Principle Program Manager in Microsoft's Windows Server High Availability and Storage Group

Ned has worked extensively with DataON for several years and knows its products well. "DataON is a solid company with a phenomenal product line," he said. "Mead & Hunt was looking for a certified Windows SDS hardware vendor that could support Windows Server 2016 Storage Spaces and ReFS. There aren't very many SDS vendors, other than DataON, who fully support it. And DataON runs ReFS well. There was no question in my mind—DataON was the right choice for Mead & Hunt."

Mead & Hunt System Administrators Joseph Anich and Gavin Quamme said, "not only were the people at DataON easy to work with, but early on, they were the first SDS vendor to embrace and offer full functionality with Windows Server 2012 R2 and Windows Server 2016."

"Just like that, DataON saved Mead & Hunt fifty thousand dollars." – Howard Lo, VP Sales and Marketing, DataON

Cost and performance were also crucial to Mead & Hunt's choice. Howard Lo, VP of Sales and Marketing, DataON, said, "I knew our DataON CiB-9112 solution wouldn't have a problem outperforming any other similar storage in its class, but we also could provide Mead & Hunt substantial cost savings not only in hardware, but in licensing. With our DataON solution and Windows Server 2016 Datacenter's cluster-to-cluster replication, they withdrew from their second ongoing proof of concept (PoC). Just like that, DataON saved Mead & Hunt fifty thousand dollars."

The Solution – Hardware Configuration

Mead & Hunt purchased one DataON CiB-9112 for each of its two data centers—one production data center in Madison, WI and a similarly configured offsite disaster recovery (DR) in Green Bay, WI—and replaced the four FC switches with four new Cisco-branded 10GbE switches.

Production – Madison, WI

The newly configured DataON production data center compute consisted of a Cisco 5108 chassis containing four Cisco B200 M3 server blades running Hyper-V clusters in a Windows Server 2016 ReFS environment.

The network switches included two Cisco 6248UP Fabric Interconnects between server and storage (Hyper-V networking configured per Cisco UCS best practices) and two Cisco 4500X core switches (upstream) that connected to clients and the Green Bay DR data center.

Storage consisted of a DataON CiB-9112 with two-node storage cluster system scale-out file servers (SoFSs) used for server messaging block (SMB) share applications, each running in a Windows Server 2016 Datacenter Edition ReFS environment. Two shares were presented to the Hyper-V cluster via Microsoft System Center Virtual Machine Manager (SCVMM).



“The reliability and resiliency of the DataON CiB-9112 has been outstanding. After extensively stress testing the unit in a three-way mirror configuration, we have absolute confidence in our storage integrity.”

- Gavin Quamme,
Systems Administrator,
Mead & Hunt

For the DR backup, Windows Server 2016 Datacenter’s cluster-to-cluster replication application (with asynchronous replication enabled) allowed seamless block cluster replication from the production server in Madison to the offsite DR in Green Bay (see Figure 1).

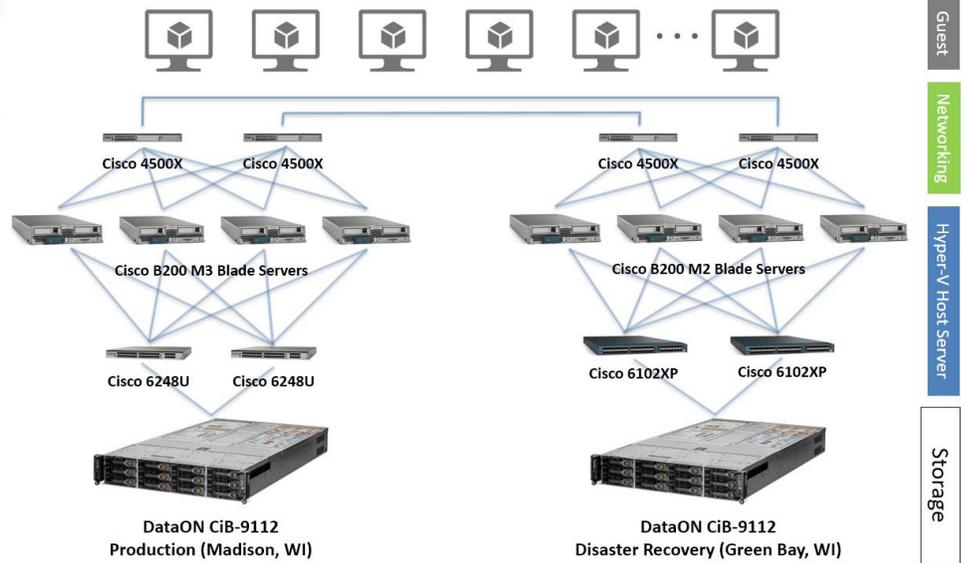


Figure 1. Block cluster replication from the production server in Madison to the disaster recovery server in Green Bay.

Each of the CiBs was equipped with Storage Spaces and tiered HDD/SDD storage for the best performance and resiliency (six 1.6 TB SSDs and six 10TB HDDs) and Hyper-V cluster integration. The physical disks were arranged in two columns with three-way mirroring and optimized using the Windows Server 2016 Storage Pool tool (see Figure 2). In addition, Mead & Hunt created Hyper-V virtual hard disks (VHDx) to optimize performance and maximize disk space.

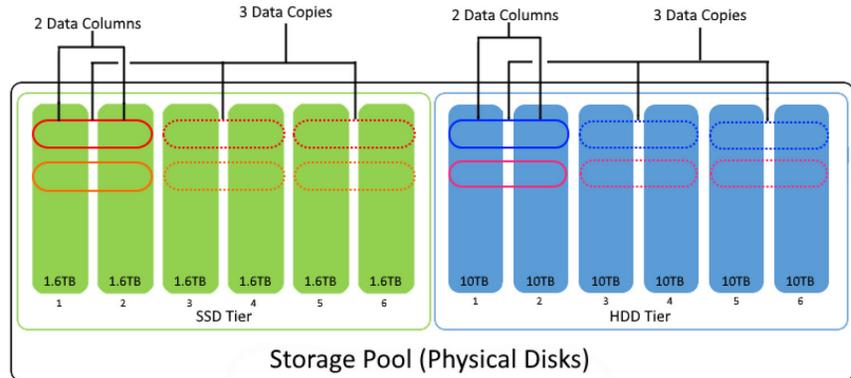


Figure 2. DataON CiB disks arranged in two columns with three-way mirroring.

Disaster Recovery – Green Bay, WI

The DR data center was configured nearly the exact same way, but consisted of four slower Cisco B200 M2 server blades instead of the M3s. The network consists of two 6120XP Fabric Interconnects (Hyper-V networking configured per Cisco UCS best practices) and two Cisco 4500X core switches (upstream) that connected to the Green Bay DR data center (see Figure 1).



“Customer growth and increased demand in hardware performance prompted an evaluation of our storage needs. We needed to maintain our high level of customer service while improving storage performance and headroom for the future. The transition to DataON Storage CiB and JBODs helped us accomplish those goals.”

–Joseph Anich,
Systems Administrator,
Mead & Hunt

Deployment

Setting up the CiB-9112 running Storage Spaces and SoFS in a Windows 2016 ReFS was easy using DataON’s intuitive MUST (Management Utility Storage Tool) visibility and management software. Mead & Hunt upgraded each blade server from Windows 2012 R2 to 2016 and rebuilt the Hyper-V clusters. Then, using SCVMM following Microsoft best practices, Mead & Hunt reconfigured the clusters to utilize SoFS.

Results

After setup and migration, Mead & Hunt saw a marked performance improvement. “The performance bump was significant,” Anich remarked, “with the EMC 4GFC SAN, we were barely getting nine to ten thousand IOPS. Now, on average, we run at six hundred to seven hundred thousand.”

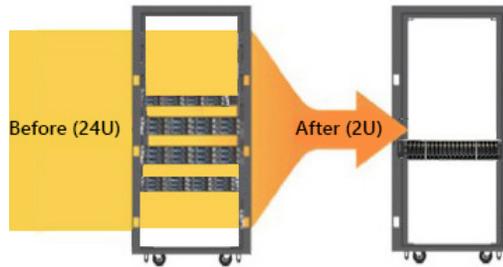


Figure 3. Consolidating storage rack size from 24U to 2U.

“Storage Spaces, ReFS and VHD to VHDX conversion helped us reclaim twelve terabytes of disk space!” – Joseph Anich, Systems Administrator, Mead & Hunt

When it came to storage consolidation, Anich went on to say, “Storage Spaces, ReFS and VHD to VHDX conversion helped us reclaim twelve terabytes of disk space and reduced the amount of disk drives from one hundred five to twenty four. Ultimately, we consolidated storage rack size from 24U down to 2U” (see Figure 3).

Rebalancing storage pool, a new tool only available in Windows Server 2016, allows IT administrators to automatically redistribute the storage pool to new drives, instead of having to manually remove and copy data. The rebalancing tool has saved Mead & Hunt countless hours during hot swaps and storage optimization.

Mead & Hunt is extremely happy with its new storage solution. After deploying the DataON CiB with Windows Server 2016 Storage Spaces, Mead and Hunt achieved enterprise level reliability and resiliency, reduced OPEX and CAPEX costs, hassle-free integration with Hyper-V and lightning fast performance. When asked, would you deploy a DataON and Windows Storage Spaces solution again? Anich replied, “Yes, in a heartbeat.”



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About DataON™

DataON is the industry leading provider of hyper-converged cluster appliances (HCCA) and storage systems optimized for Microsoft® Windows Server environments. Our solutions are built with the single purpose of rapidly and seamlessly deploying Microsoft applications, virtualization, data protection, and hybrid cloud services. Our company is exclusively focused on customers who have made the “Microsoft choice” and we provide the ultimate platform for the Microsoft software-defined data center (SDDC). DataON is a division of Area Electronics Systems, Inc.

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