Community Health Centers Improve Patient Care with Microsoft Azure Stack HCI Deployment

Healthcare organization replaces SAN with all-NVMe flash DataON HCI solution for on-premises electronic health record (EHR) systems

The Challenge

- Eliminate traditional SAN infrastructure for scalable industry standard hardware solution aligned with Microsoft Windows Server road map

- Provide doctors best QoS for on-premises EHR and improve performance for staff managing large Microsoft Excel workloads

- Purchase from a vendor that offers an integrative Microsoft Windows Server and hardware infrastructure solution with the support to go with it

- Eliminate OEM hardware taxes and get access to the latest drivers without OEM delay times

The Solution

- Microsoft Azure Stack HCI with Windows Server 2019 and Storage Spaces Direct

- DataON HCI-224 solution with all-NVMe flash, optimized for IOPS and performance

- DataON MUST monitoring and management software tool

Organization Overview

This healthcare organization serves as the largest provider of primary medical, dental, and behavioral health services for both the insured and uninsured in a large metropolitan US city. With eleven health centers throughout the community, this nonprofit serves over 107,000 people and has over 2600 employees.

IT Challenge: Improve QoS and patient care experience, reduce management complexity with an industry-standard hardware solution

Their current SAN, consisting of Cisco UCS servers and Hitachi, Fujitsu and Kaminario storage arrays, had reached end-of-life. Its data center, built on a Microsoft Windows Server Hyper-V infrastructure, had faced many challenges with managing its on-premises NextGen® electronic health record (EHR) software on hardware sourced from multiple OEMs. Driver updates lagged behind Microsoft Windows Server releases and made overall data center management more difficult than it needed to be.

The institution wanted to streamline updates and management, reduce the extra administrative load that its Cisco UCS infrastructure had been creating within its Windows Server environment, and ultimately transition to an industry standard hardware solution from one provider.

Running multiple on-premises EHR applications created heavy terminal server workloads, requiring multiple APIs and communication services. The organization needed to ensure that its healthcare providers could quickly access patients' electronic health records without perceived latency. Its administrative and billing teams also manage large Excel workloads that would require the same quality of service (QoS).

The healthcare organization's goals in updating its infrastructure included:

- Eliminating its traditional SAN infrastructure for a highly scalable industry standard-based hardware solution aligned with Microsoft Windows Server road map for better infrastructure lifecycle

- Providing doctors the best QoS for on-premises EHR and improve performance for staff managing large Excel workloads

- Finding a vendor that offers an integrative Microsoft Windows Server and hardware infrastructure solution with the support to go with it

- Eliminating OEM hardware taxes and get access to the latest drivers without OEM delay times

The Result

- Simplified deployment—able to get up and running withing two days compared to a three to four week setup for the previous SAN

- Significant increase in QoS for NextGen® EHR and Excel workloads

- 2.7x IOPS and throughput perfomance increase (measured in VDbench)

- Increased resliency and fault tolerance with cluster sets

- Simplifed single-pane-of-glass cluster management and monitoring with Windows Admin Center and DataON MUST

- Industry standard hardware solution enables immediate access to latest drivers without OEM taxes

- Collaboration with DataON gave them the insight, service and support to have a better, more resilient deployment

The Solution: DataON solution for Azure Stack HCI, optimized for IOPS and performance with all-NVMe flash

The healthcare organization's director of infrastructure and cybersecurity was impressed with Azure Stack HCI and Storage Spaces Direct. For most of his career he had predominantly worked with Microsoft Windows Server and Hyper-V infrastructures. After dealing with the complexities of previous SAN infrastructure, he couldn't wait to get back to basics and go with a simple streamlined solution.

"DataON caught my eye because of its MUST management tool and integration within Windows Admin Center," he said. "There weren't any proprietary gotchas, all of their hardware was industry-standard hardware, and they were aligned with Microsoft, which meant they would be able to support Microsoft features and extend the hardware lifecycle."

The healthcare organization purchased a ten-node DataON HCI-224, optimized for IOPS and performance with all-NVMe flash. During the planning phase, the director chose a three-way mirror storage configuration for increased resiliency, but asked DataON if there were any other ways to increase fault tolerance. DataON suggested that by using cluster sets, a new feature in Windows Server 2019. It enables virtual machine fluidity across member clusters within a cluster set and a unified storage namespace, the healthcare center could build two five-node clusters instead of one ten-node cluster, and greater increase fault tolerance. Meaning that, in his case, up to four nodes could fail without data loss, as opposed to two in a typically configured three-way mirror cluster.

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Director of Infrastructure and Cybersecurity

The Results

The DataON deployment went smoothly for the healthcare organization. Using the failover clustering feature in Windows Sever 2019 and implementing cluster sets were a breeze. The infrastructure director said, "Whether using Windows Admin Center's new GUI or PowerShell, scripting and networking was trouble-free within the new infrastructure. From not knowing anything, it took less than a few days to learn. This was a much different deployment experience than we had with our Cisco SAN, which took between three to four weeks."

When it came to management, he said, "I really like the ability to be able to see the status of a cluster and manage it in a single pane of glass with Windows Admin Center and DataON MUST. MUST will automatically send alerts to our team if there are any issues with the clusters or drives, which is a plus."

The healthcare organization exceeded its performance goals with its new Microsoft and DataON HCI. They used VDbench to compare IOPS and throughput performance between their old and new infrastructure. The previous Hitachi storage array took four minutes complete the test, while the DataON HCI took only one and a half minutes. In real world performance, Excel and NextGen® EHR workloads performed significantly faster, providing the QoS it intended to improve doctor/patient care and productivity among administrative and accounting staff.

Their infrastructure has been simplified with industry standard hardware. The IT team can now work natively within Windows Server without extra OEM management tools. Driver updates are much easier, and they can implement them faster without the problems they faced with previous OEM hardware. They are also happy to know that they will be able to install the latest drivers when they are released without the long OEM wait times.

One of the healthcare organization's next steps is to explore its hybrid cloud options with Microsoft Azure. Because all DataON solutions are validated Azure Stack HCI solutions, the director and his team will be able to employ features like Azure Site Recovery, Azure Backup, Azure Monitor and cloud witness seamlessly. He believes this will be able to help reduce geo-redundancy as the IT team also helps small community hospitals throughout the region with their IT needs. There are also plans to build an off-premises disaster recovery center with another DataON solution for Azure Stack HCI soon.

Deployment Tips

1. Avoid lengthy OEM driver build delays and choose a vendor who sells industry standard hardware.

2. Find a knowledgeable vendor like DataON that will collaboratively plan and help realize your IT infrastructure goals, and provide the software and hardware support to ensure a simplified deployment.

"I like the ability to see the status of a cluster and manage it in a single pane of glass with Windows Admin Center and DataON MUST."

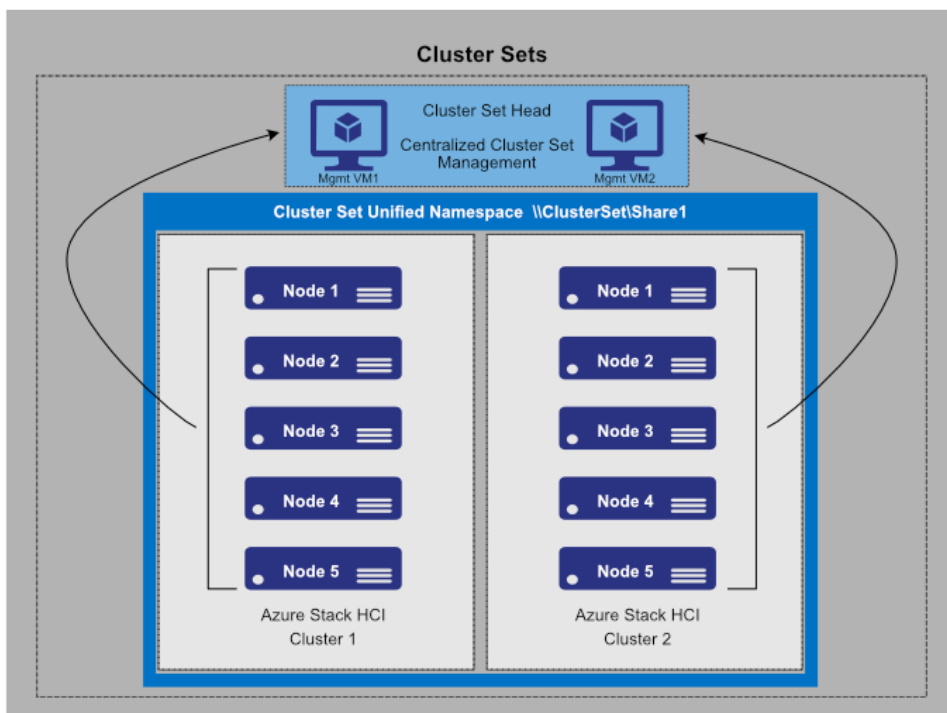*Director of Infrastructure & Cybersecurity*

Deployment Tips

After a successful deployment, the director of infrastructure and cybersecurity offered a few words to organizations seeking a Azure Stack HCI infrastructure. "First," he said, "choose a vendor who sells hardware that can utilize native drivers; otherwise, you may have to wait up to year for them to be developed by the vendor, which makes it difficult to update the hypervisor, OS or other software."

"Second," he continued. "Choose a vendor that's not going to just deliver the hardware on your doorstep and say good luck! DataON worked with us collaboratively throughout the planning phase to help realize our goals. They gave us insight into how we could optimize our infrastructure, for example, by using cluster sets to gain additional resiliency and better fault tolerance. That kind of help is essential, and it's not something we could have gotten with another vendor."

"DataON worked with us collaboratively throughout the planning phase to help realize our goals. They gave us insight into how we could optimize our infrastructure."

Director of Infrastructure and Cybersecurity

Cluster Sets

Cluster Set Head
Centralized Cluster Set Management
Mgmt VM1 — Mgmt VM2

Cluster Set Unified Namespace \\ClusterSet\Share1

Node 1, Node 2, Node 3, Node 4, Node 5 — Azure Stack HCI Cluster 1
Node 1, Node 2, Node 3, Node 4, Node 5 — Azure Stack HCI Cluster 2

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About DataON

DataON is a hybrid cloud computing company focused on delivering Microsoft Azure Stack HCI solutions, on-premises storage systems, intelligent edge appliances, and cloud-based Microsoft Azure Services. Our company is helping enterprises and customers who have made the "Microsoft choice" to modernize their IT with Microsoft applications, virtualization, and data protection through a complete and turnkey experience. With over 650 HCI clusters and 150PB of storage deployed, DataON enterprise-level solutions are designed to provide the highest level of performance, manageability, and security offered. DataON is a Microsoft Gold Partner, Microsoft Cloud Service Provider (CSP), and an Intel Platinum Partner.

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