



# Regional Medical Facility Deploys Electronic Health Records Management and PACS Imaging Software on HCI

Reagan Medical Center avoids hefty software subscription fees by deploying an on-premise Storage Spaces Direct solution

## The Challenge



- Replacing existing VMware platform and SAN with a hyper-converged solution that could support their clinical management software and improve QoS for its patients and medical professionals
- Increasing performance with all-NVMe flash storage

## The Solution



- Windows Server 2016 Storage Spaces Direct
- DataON K2N-108 two-node all-NVMe hyper-converged appliance
- DataON MUST visibility, monitoring, and management tool

## Company Overview

Reagan Medical Center is a full service medical practice that includes primary and urgent care, wellness visits, occupational medicine and an imaging center. It is a completely paper-free office that utilizes electronic medical records, so patients can visit any of its locations and access their medical records anywhere, anytime. It employs approximately one hundred-fifty employees in six locations in the greater Atlanta area.

## IT Challenge: Replace outdated SAN with hyper-converged infrastructure solution to power its on-premise electronic health record (EHR) management and PACS imaging software

Reagan Medical Center had several aging Dell SANs running VMware vSphere 5.0 and its EHR clinical management software, eClinicalWorks, no longer supported Reagan's older VMware software release and SAN hardware specs. Kylentus Clark, Network Administrator, Reagan Medical Center, and Dr. Satish Poddar, founder and Medical Director, Reagan Medical Center, calculated the costs of switching from an on-premise to cloud subscription-based eClinicalWorks solution. The two found that it was more affordable to keep an on-premise deployment.

Reagan Medical Center's goals in updating its infrastructure included:

- Replacing existing VMware platform and SAN with a hyper-converged solution that could support their clinical management and PACS (picture archiving and communications system) imaging software, and improve quality of service (QoS) for its patients and medical professionals
- Increasing performance with all-NVMe flash storage

## The Solution: All-NVMe DataON Kepler K2N-108 hyper-converged appliance with Windows Server 2016 Storage Spaces Direct

Watching trends in storage, Clark and Dr. Poddar had thoroughly researched hyper-converged infrastructure. With its promise of lower costs, better performance and affordable all-NVMe flash storage compared to a traditional SAN, the team felt HCI was a superior solution and would best fit their needs.

After making the decision, Clark and Dr. Poddar looked at HCI solutions from Microsoft and VMware. "The VMware software costs for HCI were unreasonably high," Clark said. "With Windows Server 2016 and Storage Spaces Direct, the costs were much lower and were consolidated in the Windows Server 2016 Datacenter edition. In addition, I was already familiar with Windows Server platforms and its easy-to-use interface, so I was very comfortable with choosing Microsoft."

Clark came across DataON on the web while researching Storage Spaces Direct and reached out to the DataON sales team. Clark and Dr. Poddar were originally interested in DataON's S2D series, but DataON assessed Reagan Medical Center's needs and introduced Clark and Dr. Poddar to the DataON Kepler 2-node (K2N) hyper-converged appliance designed for small-to-medium sized businesses and branch office/remote office (ROBO) deployments.

Unlike most Storage Spaces Direct deployments, which are three nodes or more, the K2N appliance's two nodes are directly connected to each other, eliminating the need for an Ethernet switch. This simplifies deployment and reduces costs, making it perfect for small data centers.

## The Result



- Replaced SAN with a DataON & Microsoft hyper-converged infrastructure with all-NVMe storage
- Increased eClinical Works and PACS performance and QoS
- Improved upload and access times to large files like diagnostic imaging
- Saved money with Windows Server 2016 Storage Spaces Direct solution
- Purchased a true turnkey solution – deployed within thirty minutes
- Received comprehensive customer support from DataON

*"You can look on YouTube for how-to videos, but you need expertise. And I don't think there is anyone offers DataON's kind of support."*

*Kylentus Clark, Network Administrator, Reagan Medical Center*

Clark was impressed by the large number of published DataON customer stories, but he wanted to speak with customers first hand. DataON encouraged him and set up the introductions. Hearing nothing but good things from DataON customers about Storage Spaces Direct and DataON's hardware quality and customer support, Dr. Poddar and Clark chose DataON as their solution provider.

After designing an initial all-NVMe flash, DataON K2N series Storage Spaces Direct solution, Reagan needed assurance that it would be compatible with its EHR software. DataON contacted and worked with the eClinical Works support team to ensure the software was compatible with Storage Spaces Direct and Reagan's K2N series hardware configurations.

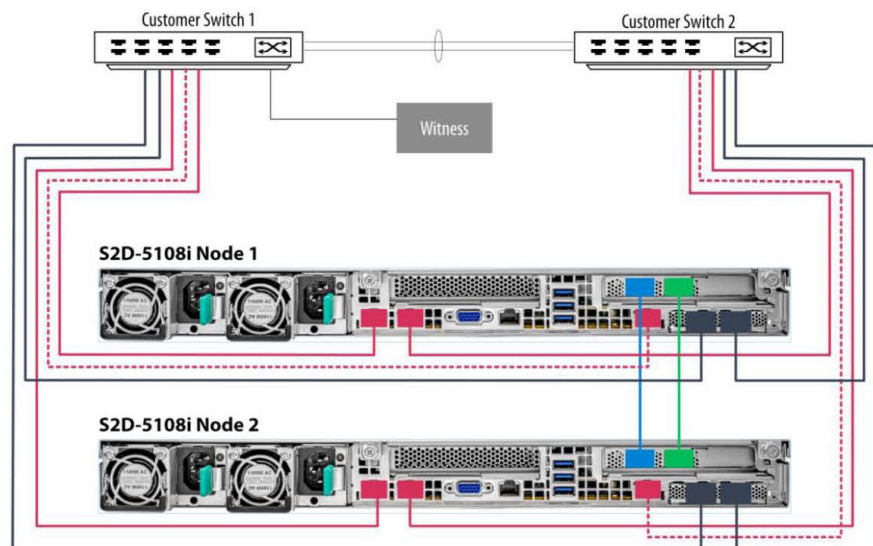
For Reagan Medical Center, the DataON K2N series was ideal for their complete medical management solution, using it as an FTP server, managing radiology imaging, running their EHR software with eClinical Works, generating reports, and tunneling radiological imaging to an offsite, third-party group of radiologists for review. The K2N solution was configured with terminal servers, enabling Reagan's staff to remotely login to the applications server using virtual desktop infrastructure (VDI).

Reagan's K2N complete medical management solution was configured into thirteen virtual machines (VMs):

- (4) eClinical Works application servers
- (2) MySQL servers for eClinical Works
- (1) MySQL job scheduling for MySQL servers
- (1) EVO HTML to .pdf server to create additional custom reports
- (1) FTP server
- (1) PACS radiological image and machine management
- (1) Tunneling route to third party radiology group
- (2) Terminal servers allowing medical professionals to remote into K2N applications via VDI

## The Results

When Reagan Medical Center's K2N hyper-converged appliance arrived, the clusters were pre-configured and ready to go with customized deployment scripts. Clark said, "I called DataON support and they were able to see remotely that the nodes were connected correctly. Within thirty minutes of booting up for the first time, I was up and running. It was that simple. I also needed help creating a VM in the new hyper-converged environment, and DataON showed me how I could use Cluster Manager to do it and save time, which helped tremendously."



## Deployment Tips from Kylentus Clark

1. Choose DataON if you're a novice with Storage Spaces Direct. DataON's Microsoft expertise, hands on support, and customized deployment scripts will save you a lot of time and effort.
2. Do your research on Storage Spaces Direct. Microsoft has a lot of helpful technical articles.
3. Choose NVMe drives. They cost a little more but are worthwhile for the performance.

*"Within thirty minutes of booting up for the first time, it was up and running. It was that simple."*

*Kylentus Clark, Network Administrator, Reagan Medical Center*

Reagan Medical Center saw substantial performance gains with its K2N hyper-converged appliance. "Hyper-converged infrastructure is much more affordable and faster than a SAN," Clark said. "Configured with NVMe SSDs, it's exceptionally fast."

"We saw an increase in our eClinical Management software performance and overall quality of service," Clark continued. "Medical staff mentioned to me how much faster it was to access and update medical records and diagnostic imaging."

"DataON has a unique offering," Clark continued. "With their high level of support that comes with their solutions, I don't think there is anyone out there that offers DataON's kind of support and you want DataON's Microsoft expertise."

"DataON's K2N and Storage Spaces Direct solution enables us to cost-effectively host our electronic health records management software, radiological imaging, FTP servers, etc. on-premise," Clark said. "If we would have chosen an eClinical Works cloud-based subscription solution, within a year and a half, we would have spent more than it would have cost to purchase a DataON K2N, including on-premise software with far slower performance. We made the right choice."

Clark is using DataON's MUST tool with the DataON K2N and Storage Spaces Direct cluster. MUST provides infrastructure visibility, monitoring, and management for Microsoft's suite of software-defined technologies, including Hyper-V, Storage Spaces Direct, Storage Replica, and Storage Quality-of-Service. From a central console, Clark can quickly and easily view the health of Reagan Medical Center's cluster, with data such as storage I/O and CPU memory performance. If any problems arise, Clark can get alerts from MUST so he can take appropriate action.

MUST is also available as a plug-in for Microsoft's Windows Admin Center, a new modernized management tool for Windows Server environments. Locally deployed with a browser-based interface, Windows Admin Center consolidates various tools like Remote Desktop, Power Shell, Windows Services, Event Viewer, and Failover Cluster Manager. MUST adds to the Windows Admin Center experience by provided expanded functionality such as historic data reporting, disk mapping, system alerts and SAN-like call home service.

**DataON MUST** for Windows Admin Center www.dataonstorage.com

Drive Map | HCI Reports | **Alert Services** | Call Home Service | About DataON

0  
Critical Alerts

0  
Warnings

0  
Status Update

Setting

**Alert by Category**

Enclosures 0	Network Adapters / Interfaces 0	Volume Capacity 0	Storage QoS 0
Pool Capacity 0	Physical Disks 0	Servers 0	Firmware Updates 0
Clusters 0	Virtual Disks 0	Other 0	

**Active Alerts** Delete Selected Alert | Remove All Alerts

Severity	Category	Description	Time	Location	Recommended Action
Critical	Cluster	The cluster S224P0cluster4	8/24/2018 6:22:34 AM	Not available	Consider moving virtual machi...
Critical	Server	**Test** Server 'king-n4', DataON...	9/11/2018 2:46:19 PM	**Test** Server 'king-n4', DataON...	**Test** Start or replace server.



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Kylentus Clark  
Network Administrator  
Reagan Medical Center

IT administrators who are considering deploying a Storage Spaces Direct HCI, Clark offered some advice. "If you're a novice with Storage Spaces Direct, you should strongly consider a DataON solution. They're experts with Storage Spaces Direct and they provide hands-on support and customized deployment scripts that will save you a lot of time and effort with your deployment." Clark also suggested learning as much as you can before choosing Storage Spaces Direct. "There are a lot of technical articles available from Microsoft." And lastly, Clark advises, "Choose NVMe drives. They cost a little more but worthwhile for the performance."

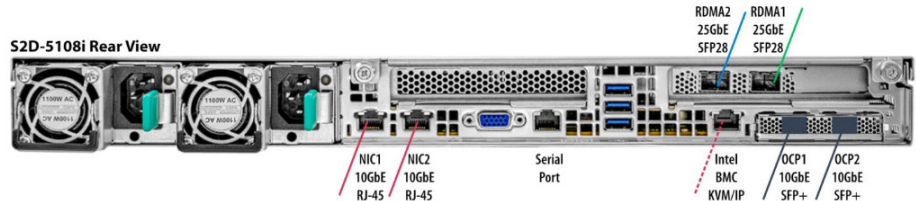
## DataON K2N-108

K2N-108 consists of (2) S2D-5108i server nodes direct-attached

S2D-5108i Front View



S2D-5108i Rear View



10GbE - RJ-45	On-board NIC 1 & 2 - North-South Client/Management Traffic (option 1)	<p><b>Note on SFP+ and SFP28</b></p> <p>Our dual-port 25GbE RDMA adapters have ports in the form factor of SFP+. To achieve the following speeds, please select the appropriate cables:</p> <ul style="list-style-type: none"> <li>- For 25Gb/s, select SFP28 cables</li> <li>- For 10Gb/s, select SFP+ cables</li> </ul>
10GbE - SFP+	OCP 1 & 2 - North-South Client/Management Traffic (option 2)	
25GbE - SFP28	RDMA 1 - East-West Cluster and Storage Traffic	
25GbE - SFP28	RDMA 2 - East-West Cluster and Storage Traffic	
RJ-45	Intel BMC/IPMI RJ-45 for KVM/IP	



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## About DataON

DataON is the industry-leading provider of hyper-converged infrastructure and storage systems optimized for Microsoft Windows Server environments. It has been named to CIO Review's '20 Most Promising Microsoft Solution Providers 2018.' Our company is focused on customers who have made the "Microsoft choice" to deploy Microsoft applications, virtualization, data protection, and hybrid cloud services. Our enterprise-level solutions, delivered as a complete, turnkey experience, are designed to provide the highest level of performance, manageability, and security offered.