DATACORE™

ABOUT THE CUSTOMER

Located in Medford, Oregon, Emergency Communications of Southern Oregon (ECSO) is a combined emergency dispatch facility and Public Safety Answering Point (PSAP) for the 911 lines in Jackson County, Oregon.

CHALLENGES

The ECSO dispatch application based on Microsoft SQL Server, was experiencing latencies of 200 milliseconds at multiple times throughout the day, impacting how fast the fire and police departments could respond to an emergency. The ECSO also needed better real-time mirroring, replication plus an overall more robust storage infrastructure than its existing NetApp solution.

SOLUTION

The DataCore solution is deployed as hyperconverged infrastructure using DAS or internal storage on a cluster of hosts. DataCore™ Hyperconverged Virtual SAN enables users to put the internal storage capacity of their servers to work as a shared resource while also serving as integrated storage architecture. Hyperconverged systems by definition combine compute, storage networking tiers into a single unified system. From a performance standpoint, much of the traffic that goes over the storage network is eliminated and with the compute and storage co-located faster response times were possible.

RESULTS

ECSO is a firm believer in the power of a hyperconverged solution now that it has implemented DataCore Hyperconverged Virtual SAN. Importantly, this single decision has enabled ECSO to keep using a traditional storage array by making virtual storage part of the hyperconverged infrastructure, as well as significantly increasing application performance speed by 20X and reducing storage-related downtime.

DataCore™ Hyperconverged Virtual SAN

Improving 911 Emergency Response Times

Located in Medford, Oregon, Emergency Communications of Southern Oregon (ECSO) is a combined emergency dispatch facility and Public Safety Answering Point (PSAP) for the 911 lines in Jackson County, Oregon.

ECSO first needed to look for a better storage solution because its dispatch application, based on Microsoft SQL Server, was experiencing latencies of 200 milliseconds at multiple times throughout the day. When this application runs slow, it impacts how fast fire and police can respond to an emergency. In addition, ECSO wanted a solution to meet its key "must haves" including better real-time mirroring, replication, and an overall more robust storage infrastructure – and the organization was dedicated to finding a better alternative than its existing NetApp solution.

Fortunately, the ECSO IT manager, Corey Nelson, attended VMworld and found the DataCore team.

"At the time I had my first conversation with one of DataCore's system engineers, I was not thinking about a hyperconverged solution," explained **Nelson.** *"Rather, I was thinking about a traditional storage solution whereby I had a separate array that handles storage and separate hosts that would rely on that backend storage."*

Once DataCore came onsite to ECSO and drew up various potential solution scenarios that would meet the organization's infrastructure needs–focusing specifically on a budget-friendly, hassle-free installation of a hyperconverged solution, according to **Nelson** *"a lightbulb went off"* in his head. With a sizable investment in NetApp, Nelson knew that he wanted to use NetApp in some capacity. DataCore enabled him to do that and extend the DAS capacity from each server.

> *This product makes you think differently about storage and ultimately is the next step in virtualization. DataCore Hyperconverged Virtual SAN gives us the flexibility, reliability and performance to keep our systems running non-stop. No other products I looked at were even close to accomplishing this.*
>
> - Corey Nelson, IT Manager, Emergency Communications of Southern Oregon

CUSTOMER SNAPSHOT:
REAL-WORLD HYPERCONVERGED SCENARIO AT ECSO

DataCore Hyperconverged Virtual SAN is perfect for environments that require high availability in a low-cost, small footprint, as well as latency-sensitive environments where the organization wants to move data close to database applications, but needs to share it across a cluster of servers.

In one instance, the entire ECSO building went offline because its Uninterruptible Power Supply (UPS) was being replaced, which means downtime. However, downtime is unacceptable for a 911 call center.

Because a back-up disaster recovery data center with DataCore had been set up, everything failed over and continued to run as it was supposed to, with zero issues from the technology side, despite the power outage at the primary site.

PERFORMANCE SURGES WITH DATACORE

Prior to DataCore, performance and specifically latency was a huge problem at ECSO, in part due to the NetApp array which delivered latency of 200 milliseconds on average throughout the day. The DataCore solution has solved the performance issues and fixed the real-time replication issues Nelson was previously encountering. This is because DataCore Hyperconverged Virtual SAN speeds response and throughput with its innovative Parallel I/O technology in combination with high-speed caching (using low-latency server RAM) to keep the data close to the applications.

The critical 911 dispatch application must interact nearly instantly with the SQL server-based database. As a result, understanding response and latency times during the evaluation and testing period were vital criteria. To test this, Nelson ran a SQL Server benchmark against his current environment as well as the DataCore hyperconverged solution. The benchmark used a variety of block sizes as well as a mix of random/sequential and read/write patterns to measure the performance. The results were nothing short of amazing. The DataCore Hyperconverged Virtual SAN solution was 20X faster than the current environment, despite the fact that the same nodes that generated the I/O load had to a fulfill the requests (compared to the current environment where separate servers generated the I/O load and all the NetApp storage had to do was to meet the load, which it did poorly).

"Response times are much faster. The 200 millisecond latency has gone away now with DataCore running," stated **Nelson.** *"In fact, we are down to under five milliseconds as far as application response times at peak load. Under normal load, the response times are currently under one millisecond."*

UNSURPASSED STORAGE PERFORMANCE AND SIMPLIFIED MANAGEMENT USING DATACORE HYPERCONVERGED VIRTUAL SAN

Before DataCore, every storage-related task was labor intensive at ECSO. Nelson was accessing and reviewing documentation continuously to ensure that any essential step concerning storage administration was not overlooked. What became clear was that if he went down the path of purchasing a traditional storage SAN, it would be yet another "point" to manage.

"I wanted as few 'panes of glass' to manage as possible," commented **Nelson.** *"Adding yet another storage management solution to manage would just add unnecessary complexity."*

The DataCore hyperconverged solution was exactly what **Nelson** was looking for. DataCore has streamlined the storage management process by automating it and enabling IT to gain visibility to overall health and behavior of storage infrastructure from a central console. DataCore Hyperconverged Virtual SAN frees **Nelson** from the pain of labor-intensive storage management and provides true hardware independence.

"DataCore has radically improved the efficiency, performance and availability of our storage infrastructure," he said. *"I was in the process of purchasing new hosts, and DataCore Hyperconverged Virtual SAN fit perfectly into the budget and plan. This is a very unique product that can be tested in anyone's environment without purchasing additional hardware."*

The DataCore Hyperconverged Virtual SAN lets Nelson now rely on a single console to manage the storage residing on NetApp, which he serves up to the DataCore servers as an extension to their local disk space. NetApp is now used for storage archiving applications that do not require a lot of throughput or performance.

The "hierarchy" of storage now at ECSO is as follows:

- **DataCore-managed flash storage comprises Tier 1 storage**
- **Tier 2 storage consists of the DataCore-managed SAS drives**
- **Tier 3 storage is represented by the NetApp external storage array**

With DataCore auto-tiering, all this storage is utilized holistically to meet the performance and capacity needs of the workloads. "Hot" data will typically reside on tier 1, "warm" data on tier 2 and "cold" data residing on tier 3. By automatically moving data on a sub-LUN level basis to the tier that best matches its performance characteristics, DataCore ensures that each tier is used efficiently and optimally from a performance and capacity perspective.

DELIVERING REAL-TIME DATA REDUNDANCY

According to **Nelson,** *"Now we are synchronously mirroring to the other site. There certainly was no mirroring going on before and latency was deplorable. Moreover, the old solution would not allow us to failover to the backup site without migrating the systems, therefore taking them offline during that time. I knew that a special product was needed to keep the systems running all of the time. If our systems fail, it puts not only citizens but first responders at risk."*

Two DataCore nodes reside at the primary site and one DataCore node resides at the disaster recovery site, which is two miles away. The (DR) site is connected by dark fiber – specifically a 10-gig low-latency latency link. Both primary site nodes mirror to the third node at the DR site. The infrastructure consists of 60 TBs of storage, including 5 TBs of SSD or flash storage.

Key applications are all based on SQL Server, Exchange and Active Directory. One ECSO application is very unique and that is a computer- aided dispatch application for fire and police. All of the data is stored in SQL Server, but runs in a private cloud at ECSO's data center.

"That is really our critical application where all information is broadcast over the network," stated **Nelson.** *This gets all the Tier 1 support and it is what everything revolves around at our site. It must always be up-and-running."*

BETTER STORAGE ECONOMICS THROUGH FLEXIBILITY

One of the things that most appealed to Nelson about DataCore was that if he wanted to add another server (as has already been the case), then he could just buy a server and turn it on – because he had already bought enough licenses to cover a new server under DataCore's license terms.

"Originally I had two DataCore-powered servers deployed and that was working just fine – and then I added a third at a DR site just for some additional redundancy and because I needed some more CPU cycles," explained **Nelson.** *"At some point I might add a fourth to our DR site."*

SUMMARY

For ECSO, a hyperconverged solution from DataCore accelerated their mission-critical applications while providing huge cost-savings. With DataCore, the tremendous performance seen during the proof of concept was matched by real-world performance in production with peak latencies below five milliseconds, whereas the application was regularly seeing latencies of 200 milliseconds previously.

During an introductory meeting with DataCore that Nelson began to understand all of the inherent benefits of embracing a hyperconverged infrastructure. When the lightbulb "went off," Nelson realized that hyperconverged was a strategy that could be embraced immediately by a solution readily available from DataCore – where the host and the storage were all in one box.

"It fits our price range and gives us a way to use our existing storage," said **Nelson.** *"It was a sheer breath of relief once I found the solution in DataCore Hyperconverged Virtual SAN that I had been struggling for months to find. By implementing DataCore we would be solving multiple issues with one purchase."*

THE IT LANDSCAPE AT EMERGENCY COMMUNICATIONS OF SOUTHERN OREGON

Today the IT environment at ECSO consists of the following:

- Each host is a Dell PowerEdge R730 XD, with 6 Mirrored SSD disks and 18 SAS drives
- Each site also has a NetApp FAS-2240 attached to two servers at the primary and one at the DR site
- Each VM is mirrored to the ECSO offsite DR site. The site is connected via 10GB dark fiber connection

In this current configuration, 50 VMs are running, including:

- Exchange
- SQL
- Active Directory
- The fire/police dispatching application (of most importance), which tracks all emergency service resources in the county and makes recommendations on who to send where.

IT ENVIRONMENT AT-A-GLANCE

- **DataCore Managed Capacity**
  60 TBs
- **Are you using the auto-tiering feature?**
  Yes
- **Number of Users**
  50 internal; 250 external
- **Number of Virtual Servers and Number of Hosts**
  3 hosts; 45 VMs
- **Primary Server Vendor**
  Dell
- **Storage Vendor(s)**
  Dell; NetApp
- **Server Virtualization Platform**
  VMware ESXi 6
- **Desktop Virtualization Platform**
  NA
- **Hyperconverged Software**
  DataCore Hyperconverged Virtual SAN

ABOUT EMERGENCY COMMUNICATIONS OF SOUTHERN OREGON

Beyond serving as a combined emergency dispatch facility and Public Safety Answering Point (PSAP) for the Jackson County Oregon 911 lines, ECSO is also a regional "drop point" for emergency information that needs to be given to Jackson and Josephine counties. This may include severe storm warnings or notice of a foreign enemy attack. This information is received through the National Air Warning Alert System (NAWAS) radio channel that covers the entire United States.

www.ecso911.com

For additional information, please visit **datacore.com** or email **info@datacore.com**

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