



Pee Dee Electric Cooperative

Electric Cooperative Reduces Costs and Keeps Essential Meter Data Management Systems Running Non-stop with Software-defined Storage from DataCore

About Pee Dee Electric Cooperative

Pee Dee Electric supplies electricity and other services to more than 30,000 consumers in Darlington, Florence, Marion, Chesterfield, Dillon, and Lee Counties in northwestern South Carolina. With a core competency of selling and distributing power, the cooperative serves residential communities, commercial establishments, and industries across the Pee Dee region of South Carolina – encompassing six counties in total.

<http://peedeelectric.com/>

Pee Dee Electric Cooperative (“Pee Dee Electric”) is a non-profit, electric cooperative located in Darlington, South Carolina that supplies electricity and other services to more than 30,000 consumers. With a core competency of selling and transmitting power, one of the overriding missions of the cooperative is to provide excellent customer service. Essential to doing so lies in having a cutting-edge, reliable IT infrastructure.

Robbie Howle, IT Manager at Pee Dee Electric Cooperative, can now extol the virtues and the sheer power of embracing software-defined storage with DataCore Software, “First, the virtualized storage infrastructure has drastically reduced costs by enabling the IT team to virtualize storage devices we already had. Moreover, DataCore has empowered us – as far as having ‘leverage’ when it comes to what devices we use for the backend storage. The fact is that we can go with whatever flavor of hardware we want and are not locked-into a specific vendor.”

It was not always like this at Pee Dee Electric. Howle has been with the company fifteen years and in his current position for ten. Prior to deploying DataCore, Howle explains that the organization had an older SAN from EMC (specifically, an EMC CX3) that was under-performing. Whereas the SAN originally did what IT needed it to do – serving as a local file storage system and archive – as time passed, the slowness of the storage being served from the SAN manifested itself again and again.

The Power of being Software-defined: Faster Performance, Hardware Independence and High Availability

Adding to the bottlenecks they were experiencing, was the fact that the IT department at Pee Dee Electric had embraced a server virtualization initiative wherein many Tier-1, mission-critical databases and applications were virtualized. The disk drives that made up the SAN enclosure just could not keep up with the demands of the virtualized servers. In particular, an Oracle database and Microsoft Exchange (responsible for the entire email system) were both negatively affected. “What we had storage-wise could not perform at a fast enough speed for our business-critical databases,”

Tech Snapshot

With SANsymphony-V, DataCore partner HillSouth has increased Pee Dee Electric's spindle speed from 7.2 k to 15 k. The network fabric has gone from 4GB FC to 8GB.

In addition, the customer has realized the added the benefits of DataCore's caching (using system RAM) as an exponential performance multiplier. With DataCore, the customer experiences no more performance problems and the available IOPS for the virtualized environment far exceeds the requirement.

notes Howle. "We kept encountering delays as far as processing times – particularly for the Oracle database."

Increasing the need for more high performance, shared and centralized storage was the desire by the IT department to move users to virtualized desktops. "Without lightning-fast performance on the storage side, we knew end users would suffer," explains Howle. "After looking at a couple of other vendors, we went with DataCore due to its features and functionality, but also because as portable software it was so easy to deploy – particularly on off-the-shelf hardware as opposed to proprietary equipment. It was pretty intuitive that becoming software-defined on the storage side made just as much sense as it did for servers and desktops."

In terms of some of the mission-critical applications that are fully virtualized now on both the server and storage side, Howle cites Oracle Database as the most business critical. Oracle is the foundation of the organization's meter data management (MDM) solution. Pee Dee Electric stores every consumer's meter data, every hour per day, in the MDM database. This is displayed to the customer (member) via the web so that any household served by Pee Dee Electric can track daily electricity usage. The system also "forecasts" usage – based on past behaviors. Over 30,000 meters are managed by the MDM database, which runs on DataCore's virtualization platform.

Moreover, rather than just "serving" virtualized storage to Oracle, Oracle itself is virtualized as a virtual machine (VM) – albeit on its own server and not one running multiple VMs. Another

VM is attached to this database and runs the algorithms needed to conduct electricity usage "queries" against the Oracle database.

The IT environment consists of two, synchronously mirrored SANsymphony-V storage servers plus a third, replicated node for disaster recovery (DR) offsite. The third storage server has various LUNs running off of the "node" at the DR site. Ten terabytes of storage space is replicated across the mirrored sites. Eight gigabit Fibre Channel connectivity runs on the backend (from the storage to the DataCore host). Six VM hosts run on a mix of Gen6 and Gen7 HP ProLiant DL308 servers that are attached to the storage. Three of these support the core environment. The additional three support the VDI (virtual desktop infrastructure) environment. The three copies of DataCore SANsymphony-V software each run on HP ProLiant DL380 Gen8 servers. Running on the backend of each of these virtualized storage servers are HP storage arrays.

The systems that have been virtualized include a maps database, all of the organization's document imaging, file storage, and two web servers handling customer traffic. SQL is virtualized and runs the outage management system – an automated system that provides alerts and updates and manages the information of members who are coping with power outages. In addition, once the current billing system is upgraded, Pee Dee Electric's entire billing system (another Oracle-based database) will also run on the DataCore virtualized platform. Performance-wise, Howle notes that the virtualized servers run "far better" than they did previously in a physical environment.

IT Environment At-a-Glance

DataCore Managed Capacity:

» 20 TBs

Number of Users:

» 80 employees and 30,000 members (customers)

Total Number of Physical Servers within the IT Infrastructure:

» 9

Number of Virtual Servers:

» 23

Number of Virtual Desktops:

» 181

Primary Server Vendor:

» HP

Storage Vendor:

» HP

Server Virtualization Platform:

» VMware

Desktop Virtualization Platform:

» VMware

Primary Business Applications:

» Exchange, Oracle, SQL, SAP

Storage Management and Virtualization Platform

» DataCore Software

Storage Today with DataCore: Lightning-fast, Non-stop & Waste-free

The team at DataCore reseller partner HillSouth, located in Florence, South Carolina, has served as a trusted IT advisor to Pee Dee Electric for more than a decade – building and deploying IT infrastructure as well as applications for this client company. It was the HillSouth team including Chief Technology Officer Andy Patel and Lead Engineer Stephen Balogh that brought the idea of virtualized storage to Pee Dee Electric when the cooperative was trying to effectively deploy virtualization for servers and for desktops and needed a SAN that could better meet the performance and capacity requirements brought on by these storage hungry virtual computers.

Benchmarks and testing confirmed that the virtualized infrastructure that HillSouth specified for Pee Dee Electric was able to achieve better IOPs and more throughput than EMC ever claimed it could deliver with a comparable system. The system as originally “spec’d” was designed to support between 50-65 VDI sessions, plus existing servers at the start of this storage virtualization initiative, which totaled around 20. The system now stands at over 200 virtualized servers and desktops as a combined total – and is not encountering any performance or latency issues, even though the scope has grown far beyond what HillSouth originally envisioned.

“The original decision to go with DataCore boiled down to numbers – particularly the fact that Pee Dee

Electric could get twice as much storage and better performance in going with DataCore,” explains Patel. “For the cost of one EMC SAN, we were able to deploy synchronously mirrored, DataCore-powered virtualized storage servers and achieve everything Pee Dee Electric wanted as far as high availability. We were able to give them more storage, better performance, as well as fault tolerance. They would not have had this had they stuck with the single EMC SAN.”

DataCore fulfilled the long-term disaster recovery and business continuity (BC) strategy that Pee Dee Electric had in mind. One year after the initial deployment, the IT team added a third DataCore storage server to the virtualized IT infrastructure that is located thirty miles away and utilizes asynchronous replication. By addressing the core business objective of business continuity through redundancy and fault tolerance, Pee Dee Electric has now realized the overall high availability it sought from its IT infrastructure.

Moreover, beyond high availability the benefits of the DataCore virtualized storage infrastructure, according to Howle, continue to manifest themselves perpetually. On the one hand, performance has increased – leading to productivity improvement across the board. And second, DataCore’s software-based approach to storage virtualization has drastically reduced costs by enabling the IT team to virtualize storage devices it already had, which first and foremost obviated the need to pay upwards of \$500,000 for a traditional, hardware-based SAN to support its Oracle-powered MDM solution.