EMC VNX and Microsoft help electronics retailer tune into the private cloud

When it comes to consumer electronics gear, audio and video enthusiasts rely on Crutchfield Corporation for excellent customer care and comprehensive product know-how. Crutchfield enables its information-based service with a wide range of powerful tools available to its website visitors, customers and internal customer service advisors.

To keep improving the customer experience, the Charlottesville, Virginia, retailer develops most of its line-of-business applications internally. In recent years, an expanding set of applications led to rampant server growth in the data center.

“The recession hit and we had an aging infrastructure that was getting more costly to maintain as it grew,” says Craig VanHuss, Crutchfield’s Enterprise Systems Group team leader. “We had some older servers putting out 150,000 BTUs of heat on the hour, and we were running out of capacity to cool them.

“We needed to decide: do we replace our aging HVAC (heating, air conditioning, and ventilation) system or do we embrace server virtualization? Since budgets were tight and virtualization would provide better flexibility and reliability for a much lower cost than the HVAC replacement, the choice was obvious.”

Crutchfield’s rapid data growth also was straining system performance, according to VanHuss. “Our websites handle about 75 percent of our sales. Our SQL database driving these sites was going to run out of steam if we didn’t pursue a major upgrade.”

CRUTCHFIELD VIRTUALIZES WITH EMC AND MICROSOFT

A steady user of Microsoft products, Crutchfield has depended on Microsoft Windows Server 2008 R2 Hyper-V to virtualize 75 percent of its EMC® unified storage infrastructure.

EMC VNX® unified storage hosts Crutchfield’s U.S. and Canadian websites and comprises EMC Flash drives and SAS drives for its Microsoft Server 2008 R2 web servers and Microsoft SQL Server 2008 transactional databases. Crutchfield also uses EMC FAST Suite to optimize storage performance and intelligently move data between the Flash and SAS drives.

VanHuss recalls his decision to choose the VNX system. “We originally thought we’d run the website on an EqualLogic array since we had been using a Dell/EMC CX300. Instead, we got a VNX with EMC’s FAST Suite, Flash drives, plenty of storage space and performance, along with EMC’s superior service for a very competitive price.”

Crutchfield also uses EMC unified storage comprising Fibre Channel disk supported by Microsoft Hyper-V for applications such as test and development, Visual Studio Team Foundation Services, and contact center management. Low-impact file shares are served by EMC unified storage with lower-cost SATA drives.

EMC Unisphere™ software is used to centrally manage all of Crutchfield’s EMC unified storage. EMC PowerPath® software performs load balancing and connects the EMC unified storage to...
Hyper-V host servers in a failover cluster that eliminates any single point of failure. EMC SAN Copy® software is used for creating copies of production data for data backup and server upgrades.

“We’re looking at putting EMC’s VNXe® storage systems in some of our retail stores to virtualize the entire retail backend. VNXe also has Hyper-V wizards that will make it easier for me to manage the virtual machines. With EMC products like VNX and VNXe making sophisticated storage so affordable and manageable, we’re able to accelerate our virtualization strategy.”

CRAIG VANHUS
CRUTCHFIELD’S ENTERPRISE SYSTEMS GROUP TEAM LEADER

“EMC’s support and knowledge of Hyper-V have been great,” says VanHuss. “With EMC’s support, we’ve been able to optimize the technologies so we get the best performance possible.”

AVOIDING UPGRADE, GAINING HIGH AVAILABILITY
Virtualization has generated dramatic savings for Crutchfield. After converting 60 physical servers to virtual servers, cooling needs were slashed by half and server hardware costs were reduced by some $245,000. Leveraging Hyper-V consolidation, Crutchfield directly avoided a $70,000 HVAC replacement.

Crutchfield conservatively estimates total savings of $500,000 from virtualization. VanHuss also noticed significant improvements in server and application availability.

“Building a failover cluster with Hyper-V was another opportunity to virtualize some physical boxes that weren’t highly available. To get the redundancy, we needed back-end storage that’s addressable by both server nodes in the cluster. EMC’s unified storage and its five-9s data protection were a perfect fit.”

Now Crutchfield’s critical test and development environment is highly available. “We perform maintenance on production server nodes without affecting our developers’ efficiency or delaying any projects. Before we had to plan for downtime,” says VanHuss.

DEPLOYING APPLICATIONS IN HOURS INSTEAD OF WEEKS
“We give top priority to any IT request with an impact on sales,” says VanHuss. “Traditionally, we needed to architect the system, acquire hardware, wait for delivery, build, and implement. Now, we provision virtual machines in under an hour, shaving two weeks or more off the process. We’re driving applications to market 20 percent faster, which is a huge competitive advantage.”

Crutchfield also found that the virtualized infrastructure streamlined recent upgrades from Microsoft SQL Server 2005 to SQL Server 2008; Exchange 2003 to 2010; and SharePoint 2007 to 2010. “With Hyper-V and EMC, we were able spool up more efficiently for upgrades than before, while minimizing any planned downtime,” notes VanHuss.

VanHuss estimates IT administration is far more efficient than before. “Since moving to Hyper-V and EMC storage, we’ve grown from 200 to 350 servers and 25 to 120 terabytes of storage. Yet, we didn’t need to expand our staffing resources to support the greater needs of our business.”

UNIFIED STORAGE DRIVES UP PERFORMANCE
Crutchfield moved all of its web servers and SQL Server transactional databases to EMC VNX storage and virtualized most of the infrastructure with Microsoft Hyper-V. Performance gains were noticed immediately.

VanHuss comments, “VNX is architected for much faster throughput. We’re also using EMC FAST Cache so we’re serving our SQL transactions from 250 gigs of cache when before we had only one gig of cache available. Our disk read times and disk latency fell from 5-10 milliseconds to under a millisecond. It’s very impressive.”
“We’re looking forward to fully leveraging the horsepower of the VNX when this year’s holiday season hits and traffic spikes dramatically. We’re anticipating a major uptick in response time.”

As Crutchfield continues to virtualize additional applications, the IT team is confident that EMC unified storage will provide the I/Os per second (IOPS) required.

“We know what the EMC array can deliver,” VanHuss reflects. “The beauty is that EMC just works—no matter what we throw it at.”

MANAGING CHANGE—EFFICIENTLY

To manage its infrastructure more efficiently, Crutchfield is using EMC VNX Virtual Provisioning™ and EMC Unisphere management software.

“Now, we provision everything as thin LUNs so we’re using our storage space much more efficiently,” says Van Huss. “We’re not allocating storage based on a bunch of what we might need over 12 months. Since moving to EMC’s Virtual Provisioning, we’ve increased our overall storage utilization from 40 to 80 percent and avoided $100,000 in storage expenditures.”

“With EMC’s Unisphere, it’s easier to manage storage day to day,” he continued. “Even people on our team who don’t regularly manage storage picked up Unisphere quickly. As a big Microsoft shop, we also appreciate that Unisphere’s management packs let us integrate easily with Microsoft Operations Manager.”

HEADING TO PRIVATE CLOUD

Crutchfield has accelerated toward private cloud as Hyper-V has developed. When upgrading to Microsoft Windows Server R2 Hyper-V, Crutchfield gained access to live migration, which enables virtual machines to move between physical hosts without discernable downtime.

“With live migrations, we’ll be getting even closer to private cloud,” explains VanHuss. “The live migrations are amazing because they’re so fast and easy to manage. With EMC tools like Unisphere, we’re able to optimize performance of the virtual machines across shared clusters of storage volumes.”

Crutchfield expects it will have attained a 95 percent virtualized infrastructure in the next 12 months.

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VanHuss concludes, “EMC’s technology is always right on par with what we need today and where we’re headed with initiatives like private cloud. Instead of being consumed with day-to-day tasks that just turn the wheel, we get to spend more time innovating for the business.”