

Lake County Makes Virtualizing Business Critical Applications a Reality with Nimbus All-Flash Arrays

By Jerome M Wendt, DCIG Lead Analyst

Lake County needed to make the virtualization of its business critical tax system a reality and it could wait no longer for that to happen. Using Nimbus Data all-flash arrays, it successfully virtualized this application, accelerated its performance by six-fold and set the stage for it virtualizing even more of its business critical applications.

COMPANY

Lake County Illinois
18 N. County Street
Waukegan, IL 60085

847.377.2000

www.lakecountyil.gov

CHALLENGES

- I/O wait times over 10 milliseconds and spiking in the 30 – 60 ms range
- Growing VDI environment
- Storage hardware outdated and needing to be upgraded
- Virtualization of business critical tax system creating increased I/O

SOLUTION

- Nimbus Data Gemini All-Flash Array

BENEFITS

- Eliminated I/O wait times
- Laid the foundation for virtualizing more business critical applications
- Non-disruptive availability and reliability
- Multiple storage networking protocols
- Scale-out architecture

“We were looking at very similar costs for either an all-flash or a hybrid storage system so why go hybrid? For our needs, an all-flash array from Nimbus was a no-brainer.”

— John Clark

Lake County, IL, Lead IT Architect



OVERVIEW

Virtualizing business critical applications had become a waiting game for Lake County—literally. A virtualized Informix database with latencies spiking in the 30 – 60 millisecond range coupled with a rapidly growing virtual desktop infrastructure (VDI) necessitated that Lead IT architect, John Clark, implement a storage solution that met Lake County’s availability, performance and reliability needs. By deploying two Nimbus Gemini all-flash storage arrays, he eliminated Lake County users’ wait times while enabling Lake County to make virtualizing its business critical applications a reality.

Lake County, IL, Profile

Lake County, IL, is located on the shores of Lake Michigan between Chicago and Wisconsin. Home to more than 700,000 residents who live in both urban and rural communities, the Lake County government offices include, to name a few, the County Administrator, Coroner, Health Department, Community Health Center, Information Technology, Judicial, Division of Transportation, Public Works, Sheriff and Treasurer. These departments provide services to individuals and businesses residing throughout the county’s 470 square miles.

The Waiting is the Hardest Part

Lake County is a progressive county that had early on discovered the many benefits of virtualization. Already it had come to love the increased data mobility, lower operating costs and better utilization of existing hardware that virtualization provided. These benefits among others had led Lake County and its Lead IT Architect, John Clark, to virtualize 70 percent of Lake County’s IT infrastructure. Now Lake County was ready to move forward with virtualizing more business critical applications such as its county-wide tax system that was based on an Informix database.

But early test results of this tax system in a virtualized environment were less than stellar. Lake County immediately saw I/O latencies of over 10 milliseconds with spikes in the 30 – 60 millisecond range. This was unacceptable. The tax system needed 1 – 5 millisecond response times in order for Lake County to successfully virtualize it in production.

To identify the root cause of these delays, Clark checked out the kernel average latency (KAVG) reporting tool included with VMware vSphere. KAVG indicated that the individual I/Os being generated by the Informix database were waiting inordinate amounts of time to be serviced by the attached storage system.

In an attempt to reduce these wait times and increase throughput, Clark opened up multiple 3Gb SAS channels between the server and its direct attached storage system that offered 15K RPM hard disk drives (HDDs). This resulted in little to no performance gain.

Clark then opened a support ticket with VMware to see if it could help him solve this issue. After evaluating the physical configuration and vSphere statistics, VMware had no practical suggestions as to how to reduce the wait times of this application using the existing hardware.

Though the tax system still ran in a test environment, it was scheduled to go live as a virtualized application in just a few months. Lake County was also looking to expand its VDI deployment at the same time. This put the onus on Clark to quickly identify a storage solution that would meet the performance and scalability demands of these two applications as well as satisfy Lake County’s internal requirements for high availability and reliability.

All-Flash Next Step in Lake County’s Virtualization Journey

Lake County’s Lead IT Architect Clark knew this day of reckoning was coming. As Lake County centralized and virtualized its business critical applications, HDD-based storage systems would at some point fail to deliver required levels of performance. Anticipating this event, he had previously begun searching for a higher performing storage solution that would meet Lake County’s specific needs.

Four factors influenced Lake County's selection of a storage solution:

1. **Intelligent flash management.** The array would have to offer flash to meet Lake County's performance requirements. However it also needed to offer flash-specific features that ensured data integrity while preserving performance over time.
2. **High levels of availability and reliability.** Performance was important to Lake County but virtualizing business critical applications meant the storage system had to be highly available and reliable.
3. **Multi-protocol.** Both the Informix-based tax system and VDI deployments had their own storage networking connectivity requirements. These necessitated the storage system support multiple protocols.
4. **Scale-out architecture.** Lake County anticipated virtualizing more business critical applications. However it only wanted to buy as much storage system capacity as was needed at any one time with the flexibility to scale out as needed.

By examining how well storage systems from both well-known and startup storage providers stacked up against them, the Nimbus Data Systems all-flash arrays stood out from the rest. The controllers on the Nimbus system did their own flash management, accelerated flash memory performance, supported all storage protocols, were highly available and shipped in a scale-out configuration.

Compression and deduplication further added to Nimbus' appeal as these features increased the system's logical storage capacity while keeping its cost down. In comparing the Nimbus all-flash arrays to the hybrid storage systems under consideration, Clark observed, *"We were looking at very similar costs for either an all-flash or a hybrid storage system so why go hybrid? For our needs, an all-flash array from Nimbus was a no-brainer."*

Lake County Cuts Over to Nimbus

Its decision made, Lake County brought in a Nimbus Gemini all-flash storage array to initially support only its VDI initiative. Since it only had about 200 desktops virtualized, hosting these desktops on the Nimbus presented a good opportunity to use Nimbus in a production setting.

Nimbus immediately improved the performance of these virtualized desktops. It also gave Clark greater confidence that the Nimbus array offered sufficient performance to host the virtualized tax system when its time to move into production arrived.

That cutover time came more quickly than anticipated. The hardware supporting Lake County's virtualized tax system application had started to fail plus it had to move to a new operating system and upgrade to the latest release of Informix. While Lake County initially tried to run the application on its existing storage hardware, latency issues immediately surfaced.

Confident that the Nimbus array offered ample performance to host both the virtualized desktops and the tax system, Clark made the decision to put the tax system on the Nimbus array. Using the vSphere Storage vMotion feature, he migrated it to Nimbus and brought it up. Clark says, *"Once the virtualized tax system was on the Nimbus array, all of the latency issues went away. The developers were all ranting and raving about how they were getting six times the application performance."*

Nimbus Makes Virtualizing Business Critical Applications a Reality at Lake County

Many organizations are looking forward to the day they can virtualize their business critical applications. In Lake County's case, that day has already arrived. Since making the cutover to the all-flash Nimbus Gemini, Lake County is already exploring how it can use Nimbus to virtualize more business critical applications.

Lake County has already brought in a second Nimbus array that it uses to host its Oracle Enterprise Resource Planning (ERP) software as well as its business intelligence Hyperion software with plans to bring it yet a third array. It is also evaluating all of its database-centric applications to see if and when it makes financial and technical sense to also virtualize them on an all-flash Nimbus array.

Driven by the increased user satisfaction, the elimination of time spent managing application performance and the rock-solid availability and reliability of the Nimbus all-flash arrays, virtualizing business critical applications is no longer the future at Lake County. It has made virtualization a real time event at Lake County. ■

"Once the virtualized tax system was on the Nimbus all-flash array, all of the latency issues went away. The developers were all ranting and raving about how they were getting six times the application performance."

— John Clark
Lake County, IL, Lead IT Architect

About DCIG

DCIG is a group of analysts with IT industry expertise who provide informed, insightful, third party analysis and commentary on IT technology. DCIG independently develops and licenses access to DCIG Buyer's Guides and IBG. DCIG also develops sponsored content in the form of blog entries, case studies, head-to-head product reports, special reports and white papers. More information is available at www.dcig.com.

About Nimbus Data

Nimbus Data Systems, Inc. develops award-winning **Sustainable Storage®** systems, systems, the most intelligent, efficient and fault-tolerant solid state storage platform engineered for server and desktop virtualization, databases, HPC, and next-generation cloud infrastructure. Combining low-latency flash memory hardware, comprehensive data management and protection software, and highly-scalable multiprotocol storage features, Nimbus systems deliver dramatically greater performance at a significantly lower operating cost than conventional disk-based primary storage arrays, all at a comparable acquisition cost. www.nimbusdata.com



DCIG, LLC // 7511 MADISON STREET // OMAHA NE 68127 // 402.884.9594
dcig.com