Lenoir City Utilities Board Upgrades to Nutanix Cloud Platform

Public Utility Achieves Significant Performance Gains for all Virtualized Servers and Production SQL Databases, Simplifies IT Management, and Improves Disaster Recovery

BUSINESS BENEFITS

By moving to Nutanix, LCUB was able to increase the performance of all virtual servers and production SQL databases by 20x, while cutting operational expenses by 2/3. With the Nutanix infrastructure in place, LCUB's IT team was able to easily migrate all data and applications the to the company's new datacenter without taking any systems offline, ensuring business continuity in the event of any disaster.

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>
> – Dr. William Jason Tuttle, Manager of Information Technologies, LCUB

CHALLENGES

The Lenoir City Utilities Board (LCUB) provides water, electrical, wastewater, and gas services to all residents in the rapidly growing Lenoir City, Tennessee region. As the sixth largest municipal utility in the state, LCUB has invested millions of dollars into its infrastructure to continue to provide reliable and affordable utility services to all customers.

INDUSTRY
Municipal Government; Utilities

CHALLENGES

- Running out of storage capacity
- Inadequate application performance
- System management was complex and time consuming
- Needed to improve business continuity and DR

SOLUTION
Nutanix Cloud Platform

- AOS, including built-in hypervisor, AHV

Applications

- Microsoft SQL
- PostgreSQL
- MongoDB

LCUB's IT department was getting ready to refresh its legacy VMware ESXi infrastructure in 2015. The goals for the upgrade included supporting the utility's increasing demands for data, while optimizing performance and redundancy in the LCUB datacenter. "Our IT environment was running very close to full capacity," noted Dr. William Jason Tuttle, Manager of Information Technologies at LCUB. "Our high resource utilization made it difficult to maneuver in the event of peak demand or a failure, or even to make changes without experiencing downtime."

SOLUTION

LCUB purchased two Nutanix clusters in 2015 to increase available storage capacity. They later added 12 additional Nutanix nodes to accommodate all production databases and backup storage. LCUB now has a total of 14 Nutanix systems: eight are being used for the utility's production MS SQL and PostgreSQL workloads; and six are used for disaster recovery.

A Fast Deployment with Nutanix Support
LCUB enlisted the help of Nutanix Support for the initial implementation. "A Nutanix engineer came out and showed us how to install the equipment in the rack," Tuttle said. "He had a lot of good advice on the placement and the way to run wires so we wouldn't have to bring down a cluster to do a replacement if there was a problem moving forward. That was invaluable advice. You don't want to have to shut everything down to replace a mechanical part, like a power supply, that is going to eventually run out."

The Nutanix engineers also helped LCUB configure the storage backplane and switches. "There are some real pros working in Nutanix Support—they put me at ease," Tuttle acknowledged. "The entire implementation went very smoothly. And post deployment, every interaction with Nutanix Support has been excellent."

CUSTOMER OUTCOMES

Reducing Management Time by 5x
"The interface for the old equipment was simply horrible," Tuttle shared. "Anytime we wanted to manage the SAN, we had to use Windows XP with an old version of Java, or it wouldn't work. It was a major headache. It's much easier with Nutanix. The Prism Pro interface is a beautiful masterpiece and makes my job so much easier. By moving from our 3-tier infrastructure to Nutanix, the amount of time we are spending on system management has dropped from ten hours a week to just two."

Capturing Accurate Performance Metrics for Performance Optimization
LCUB created a performance baseline before and after moving its production database from the existing EMC SAN to the Nutanix platform. LCUB is now able to easily capture comparative performance metrics at the hardware, virtual machine, and hypervisor level using the Prism interface. "If we were using conventional methods to improve performance, we would need to decide on a way to split our database so that workloads could be shared among several controllers and disks," explained Tuttle. We'd have to place indexes on file-groups that were on separate disks (in a RAID configuration) with their own controllers. And to further speed things up, we would have to build a non-clustered index on yet another disk."

The Nutanix platform takes care of all that optimization for LCUB without having to reconfigure the company's main production database. "The same results could have been accomplished by having multiple controllers and drives configured in a striped RAID," explained Tuttle. "But it would have taken 6 to 12 months to complete the project. The Nutanix option was much faster. I moved 10TB of servers over to Nutanix in just one day, and that was with doing it all in baby steps. You can deploy Nutanix a lot faster than that, but since it was my first experience with their systems, I was cautious about moving servers over and testing them. The next time it will only take hours instead of a day."

Obtaining 20x Faster Performance

After migrating its primary database to the Nutanix environment, LCUB saw an immediate increase of 652 million disk bytes/sec, which equates to a 20x improvement in system performance. "We now have blisteringly fast speeds at the data level by utilizing the Nutanix architecture," noted Tuttle. "Several of our power users informed us that they noticed a significant performance improvement in their daily tasks of running reports and navigating large datasets, and there have been zero complaints of performance issues from any other staff after the migration. The combination of results from the performance baseline and direct feedback from end users confirms that we have significantly improved the daily working environment, based on Nutanix's performance alone."

Reducing OpEx by 2/3

LCUB also obtained a huge reduction in operational costs by moving to the Nutanix hyperconverged platform. "With traditional 3-tier systems, you're juggling a lot of pieces and parts," noted Tuttle. "You also have to work with several different admins and teams to perform any maintenance tasks. I could cover the server side by myself, but I needed at least two more people for deploying and managing the network, storage, and the SAN. Nutanix removes the need for 'drawing lines in the sand' between infrastructure teams. This is a tremendous benefit of Nutanix's hyperconverged approach—it eliminates the 'political minefield' you must navigate when working between departments. As a result, we have significantly streamlined our IT management tasks and obtained a 66% reduction in operational expenses."

Enabling Non-Disruptive Upgrades

"We are a public utility company, so any downtime is simply not an option—our systems have to be up and running 24x7," noted Tuttle. "We now have hundreds of virtual machines. It would take several hours just to shut everything down properly, and then there are a lot of processes that are involved with restoring all those servers. Without Nutanix, it took a week or two to do an upgrade, assuming everything went smoothly. With Nutanix, we can perform upgrades on-the-fly without taking any of our systems offline."

Improving Disaster Recovery

One disaster scenario that LCUB must plan for involves a direct hit on its datacenter by a tornado. Tennessee has experienced over one thousand tornados since 1950, several of which have been near LCUB's datacenter. "If we are to remain operational in the event of a major catastrophe, we must have at least one secondary site that can be turned up quickly to take over production workloads," Tuttle stated. "As our workflows become more dependent on technology, we must plan for the worst, so we can restore power and other lifesaving services in a timely manner after any catastrophic event that impacts our primary datacenter."

LCUB recently finished building a new datacenter for disaster recovery. They migrated all data to the new site using the recently completed 80-mile fiber optics line that connects all LCUB's offices and substations. "Before Nutanix, we would've had to take our systems off-line until everything was physically moved to the new data center," noted Tuttle. "Nutanix enabled us to stay up and running through-out the move. Now that we have Nutanix replication in place, we can run off that replicated data and rebuild it again. We were able to relocate to our new data center and never missed a beat. That's a huge benefit of the Nutanix approach."

Reducing Licensing Costs with Move from vSphere to AHV

LCUB recently migrated from VMware's vSphere hypervisor to Nutanix AHV. "By moving to AHV, we get all of the hypervisor functionality we need, while saving hundreds of thousands of dollars each year on VMware licensing. That frees up a large part of our IT budget, enabling us to innovate and deploy new services to our end users."

Minimizing the Risk of Ransomware

Dr. Tuttle is well-aware of the risks of ransomware to public utilities and other organizations, having recently completed his PhD thesis on that topic. In his research paper, 'Effective Strategies Small Business Leaders Use to Address Ransomware', Dr. Tuttle explored some of the most effective ways that small business leaders could use to minimize the risk and impact of ransomware. "Nutanix is the perfect platform for recovering from ransomware because you can restore an entire server within seconds," Tuttle stated. "We

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take snapshots of our production environment several times per day. If there ever is a ransomware attack, we have a quick way to go back in time without having to lose 24 hours-worth of data. We are subject to audits on a regular basis where we must restore a server. Since we've moved to Nutanix, we've never failed a recovery test."

NEXT STEPS

Dr. Tuttle is now considering the use of other Nutanix technologies in the future, including Calm, Nutanix's multi-cloud application management framework, as well as creating self-service catalogs so LCUB's developers can create and deploy their own VMs. "We are responsible for keeping all electricity, gas, water, and wastewater services running efficiently for the citizens of Lenoir City and surrounding counties. It's critical infrastructure for us, and Nutanix is enabling us to easily meet our technology and service and goals. Nutanix is simply 'knocking it out of the park' with their hyperconverged arrays," concluded Tuttle.

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