CUSTOMER PROFILE

WAKE FOREST BAPTIST MEDICAL CENTER

Wake Forest Baptist Medical Center selects Dell EMC Converged Infrastructure to enhance patient care delivery and advance medical research.

VBLOCK® SYSTEMS IMPROVES END-USER PERFORMANCE, GREATLY SPEEDS UP RESOURCE PROVISIONING, ALLOWS IT TEAM TO FOCUS ON STRATEGIC PRIORITIES.

Wake Forest Baptist Medical Center (WFBMC) is a nationally recognized, fully integrated academic medical center and health system based in Winston-Salem, North Carolina. The institution is comprised of

- Wake Forest School of Medicine
- An integrated clinical system that operates more than 1,000 acute care, rehabilitation, and psychiatric care hospital beds, outpatient services, and community health and information centers
- Wake Forest Innovations, which promotes the commercialization of research discoveries
- Wake Forest Innovation Quarter develops and manages a local research and technology park
- A network of over 18 affiliated community hospitals, more than 100 clinics, physician practices, and outpatient service providers – together serving one million patients annually

INDUSTRY
Healthcare

CHALLENGE
Replace aging IT infrastructure with next-generation Health IT, avoid project delays due to infrastructure and space constraints, use huge untapped capacity, respond promptly to service requests

SOLUTION
Vblock® System 720, Vblock® System 540, and Vblock® System 340 running Epic 2014 EMR, Citrix XenDesktop, and more than 750 enterprise applications

RESULTS
Deliver near 100 percent availability, enhance performance by 30 percent, speed provisioning, and greatly reduce maintenance costs.
THE CHALLENGE
When Chad Eckes, Executive Vice President and Chief Financial Officer, joined Wake Forest Baptist Medical Center in March 2014 as CIO, he found an aging IT infrastructure that was difficult to support, sprawling data centers running out of space, critical projects being delayed due to infrastructure constraints, and an IT team that spent most of its time on routine maintenance and support rather than focusing on IT innovation objectives.

"More than 60 percent of our IT infrastructure was over seven years old and 12 percent was more than 11 years old – and we were seeing less than optimal uptime as a result," Eckes remarked. "Our aging infrastructure was costly. It had large amounts of capacity that were untapped, exposing us to unnecessary risks. Ultimately our legacy infrastructure was not allowing us to focus on our strategic priority which is impacting patient care versus maintenance and support."

Beyond its age, the infrastructure consisted of disparate components from multiple vendors which required having team members with skillsets to support all of the different platforms, making it much more challenging and time-consuming to manage and maintain the infrastructure.

THE SOLUTION
After a review of leading technology solution providers, WFBMC chose AHEAD, a business partner of Dell EMC, to conduct a comprehensive assessment of its IT capabilities and develop a strategic plan for a new infrastructure and application platform. The result of the analysis clearly pointed to Dell EMC and its Vblock Systems.

WFBMC purchased and deployed three Vblock Systems: Vblock 720, Vblock 540, and Vblock 340 to provide the infrastructure for its new software-defined data center, Wake Cloud. The environment has been designed to support not only the medical center's upgrade to Epic 2014 EMR, but also more than 750 other applications – from storing and offering access to the medical center's imaging studies to supporting its Citrix XenDesktop virtual desktop infrastructure.

"Our first Vblock System was launched specifically to manage our very large imaging files. We were able to set up the entire Vblock System environment within two days – a process that had taken six weeks in the past. The implementation proved the financial case, and our board's response was, 'How can we speed up the rest of the deployment?'

- Chad Eckes, Executive Vice President and CFO, Wake Forest Baptist Medical Center

Upgrading Its Epic EMR
The central system for WFBMC is its electronic medical record (EMR) platform, based on industry-leading Epic 2014 software. In 2014, WFBMC needed to upgrade the Epic platform to take advantage of the application's latest features and capabilities. Unfortunately, server utilization was already at 70 percent, with an average CPU load of approximately 75 percent. Excessive latency resulted in slow response times, and provisioning of new storage required a minimum of 24 hours.

To maximize the performance, WFBMC implemented a Vblock 540 and relied on Dell EMC XtremIO all-flash storage arrays to deliver performance in the millions of input/output operations per second (IOPS) with sub-millisecond response times.

"Our IT infrastructure is a core part of the business of healthcare," said Dee Emon, Vice President and Chief Information Officer and formerly Chief Clinical Information Officer at Wake Forest Baptist Medical Center. "It's very important that our physicians and other care providers have information at their fingertips at all points of care – whether that's at the patient's bedside or in the operating room. "With our investment in Citrix XenDesktop, our clinicians and staff now have faster, more secure access to billing records, medical records, diagnostic information, and medical imaging."
Further, there are a host of regulatory and training requirements that must be tracked to ensure the delivery of safe and appropriate care. In addition, as WFBMC is an academic medical center, both its medical students and researchers need ready access to information.

With the implementation of the Dell EMC Vblock System infrastructure, WFBMC has been able to standardize, consolidate, and converge technologies to simplify its IT environment and significantly reduce both its physical and management footprints. It also has successfully moved away from its previous project-based application delivery model – which resulted in an IT stack for each new solution – to a Dell EMC based enterprise hybrid cloud, service-based model.

“For example, when we need to stand up a new environment, we have the option to use the public cloud for that,” noted Eckes. “We do all the testing and modeling in the public cloud. But then for production, we bring the application into our private cloud and launch it there. We dismantle the public environment and eliminate those costs. And from a security standpoint, we have all our core systems running within our private cloud.”

**Improving Infrastructure Efficiency**

With the help of the Dell EMC advanced converged infrastructure, WFBMC has achieved important efficiencies.

- Collapsed 45 racks per data center to 15 racks per center and avoided a huge capital outlay that would have been needed to expand existing data centers
- Has substantially reduced 70 percent of the IT team’s time that was devoted to routine break/fix support – allowing more time for creating added value
- Has driven maintenance and support costs down from 44 percent of the IT budget to just 10 percent
- Will reach 96 percent virtualization, up from 22 percent, in just 18 months
- Has simplified and streamlined backup and recovery and reduced storage requirements by increasing deduplication to 30-to-1 from the previous 7-to-1

**Enhancing EMR Performance**

The Vblock System 540 with XtremIO All-Flash Arrays has also delivered exceptional performance running the Epic 2014 platform, which is fundamental to the medical center’s mission of serving its communities. Since the upgrade, WFBMC has enjoyed a number of benefits including

- Increase in server utilization from 35 percent to 70 percent
- Reduced CPU load from 75 percent to 15 percent
- Improved latency from 8 milliseconds to 0.5 milliseconds for better application response times
- Delivering an overall 30 percent performance improvement to end users – enabling busy clinicians to see more patients in a day
- Decreased the time needed for storage provisioning from 24 hours to less than an hour
- Simplified the Extract, Transform, and Load (ETL) process, reducing it by a minimum of one hour daily

“With all the new technologies and new enhancements they’ve done to the Epic 2014 environment, we had to have a more robust solution and that’s why we decided to go with XtremIO,” stated Eric Sato, AVP of IT Infrastructure, Wake Forest Baptist Medical Center.

In addition, with the implementation of Epic 2014, WFBMC has provided both its patients and those who care for them with the ability to access the EMR solution from any desktop, laptop, handheld device, or tablet.
“When we first implemented our EMR it was truly a transformative event,” said Russell Howerton, Chief Medical Officer and VP of Clinical Operations for Wake Forest Baptist Medical Center. “Epic allows us to integrate care – not only in an acute care setting, but also in an ambulatory setting – interact with patients, and perform analytics that would simply not have been possible in a world with separate systems.”

Data Rich, Data Lake
To further enhance their strategy for evidence-based care, WFBMC faced the challenge of how to better utilize the extraordinarily large pools of data it captured to enhance patient care, facilitate groundbreaking research, and support its clinicians, staff members, and medical students in their daily activities.

To address this, WFBMC selected the Dell EMC Greenplum Data Computing appliance to launch Wake Lake, a platform that will integrate with Wake Cloud to enable the health system to start aggregating both structured and unstructured data in a centralized repository. With the help of Pivotal Big Data Suite and the Pivotal Greenplum Database solutions as well as Dell EMC Isilon scale-out network-attached storage, WFBMC can now move enormous volumes of data quickly and efficiently from its diversified source systems into the data lake. The integrated solution will also allow users – from clinicians to researchers – to perform powerful analytics to gain patient data intelligence as needed.

The final aspect of the sweeping deployment is backup and recovery. Again, WFBMC turned to Dell EMC for innovative solutions delivering powerful deduplication and replication of data to a backup site across town – ensuring reliable recovery in the event of a failure. In addition, the Dell EMC solutions enable real-time application mobility and full business continuity to offer additional flexibility to the Medical Center.

Enabling Precision Medicine and Advanced Clinical Research
Announced by President Barack Obama in January 2015, the Precision Medicine Initiative envisions tailoring medical approaches and treatments to account for individual differences in a patient’s genes, environment, and lifestyle. Wake Forest Baptist’s Dell EMC based hybrid cloud and new big data Hadoop-based solution, Wake Lake, will enable clinicians to efficiently draw upon a very large information set and rely on powerful predictive analytics to better identify the most effective care for specific patients.

“Wake Forest Baptist has been a leader in genome sequencing in the treatment of cancer patients,” said Eckes. “The sequencing process generates massive amounts of data. Having a hybrid cloud to store the data and Wake Lake to quickly take the unstructured genomic data and match it with the most promising clinical therapies helps us develop targeted therapies that align with a patient’s unique disease state.” It also allows Wake Forest Baptist to track the effectiveness of the therapies.

The new IT environment also offers important advantages to researchers at WFBMC who are advancing the frontiers of medicine and developing new treatment approaches.

In an academic medical center, researchers are awarded grants that typically include funding for the IT infrastructure and applications they will need. “The Dell EMC environment is very supportive of such an arrangement,” Eckes commented. “Our hybrid cloud enables us to provide a dedicated virtual environment built to a researcher’s precise specifications with the processing horsepower they’ll need under normal circumstances. But we can easily partition additional horsepower when they need more processing support.”

“- Eric Sato, AVP of IT Infrastructure, Wake Forest Baptist Medical Center
Dell EMC and AHEAD Are Ideal Partners

As the project unfolded, it became apparent that Dell EMC, and AHEAD were the right choices to partner with WFBMC. Dell EMC provides a stable, converged IT environment that ensures a fast time to value, is easy and less costly to support and maintain, is highly secure, and lets WFBMC focus on strategic priorities. The team at AHEAD provided the strategy and roadmap services that helped Wake Forest Baptist Medical Center design and plan the converged infrastructure solution.

"To-date, our experience with both Dell EMC and the AHEAD group has been terrific," said Eric Sato. "We had a very aggressive timeline and our teams came together, often meeting on a daily basis. Without that support, we wouldn’t have been able to deliver the project."