Telecom Giant Accelerates Growth with Violin Flash Memory Arrays

After deploying Violin 6000 Series flash Memory Arrays to accelerate system monitoring and reporting, a large cellular phone service provider in the Americas was able to identify and repair problems before customers even experienced them.

The Customer

The customer is one the largest "No Contract" Cellular Mobile Virtual Network Operators (MVNO) in the United States, with nearly 20 million subscribers. This MVNO represents multiple brands and products and is the leading provider of telecommunication services in Latin America, with more wireless customers throughout the Americas than AT&T and Verizon combined. Its business model is based on offering prepaid services that enable the least expensive way to own and use a cell phone in America, offering phones that are easy to use, reliable, and inexpensive, with Airtime options to fit any budget without contracts or bills.

The Challenge

This MVNO has experienced several years of high growth as cellular customers move more and more into utilizing prepaid cell phones. The company's success and customer growth has led to an explosion in customer data processing and in the amounts of data required to support business reporting and analytics. The basic IT infrastructure consists of a 32 processor HP Itanium Superdome server hosting an Oracle database that accesses 8 terabytes (TB) of customer data. Replication of the production database is accomplished via IBM DataStage to a second Oracle database hosted on a separate high-end server.

Case Study

Due to company growth, the IT organization faced multiple challenges, including tracking retail and online sales, monitoring business transactions such as activations and redemptions, and supporting the business units with accurate and timely data to make real-time decisions. Given the growing number of IT projects and resulting hardware and software changes, the CIO realized it was no longer feasible to say, "Let's bring in a consultant to do some more performance tuning."

The company's growth also drove the need to improve the efficiency of its customer service. The CIO explains, "We wanted to utilize our monitoring tools to detect and fix customer phone issues even before customers actually experienced them and called a service agent." If the team could process data integrity corrections on a real-time basis, an opportunity existed to reduce service call volumes and associated costs.

The Solution

The Violin Sales Manager and local partner visited the customer's IT team on several occasions. The company agreed to test a Violin flash Memory Array against one of its most intractable challenges. The initial goal was to utilize the Violin demo unit on the reporting database. Due to the heavy monthly processing volume, the current real-time production system reporting could not be run off the replicated database and the monitoring queries could not effectively execute on the production database without impacting the company's real-time mission critical Point-of-Sale applications.

A Violin 3210 flash Memory Array demo unit was configured into the MVNO's storage area network. The initial Proof-of-Concept testing yielded impressive results. The CIO and his IT team became enthusiastic about the potential for Violin flash Memory Arrays to solve their system performance problems. They moved ahead with deploying three of the new Violin 6000 Series flash Memory Arrays with 16TB of data storage each. In fact, the team significantly changed their processing and storage architectures and procedures just to better accommodate and leverage the capabilities of the Violin arrays.

Violin 6000 Series flash Memory Arrays are all-silicon systems with the reliability, performance, and economics to be deployed as mission critical primary storage. Violin Memory Arrays are tightly integrated systems based on Violin Intelligent Memory Module (VIMM) technology. VIMMs work in conjunction with Violin's patented vRAID, a hardware-based RAID algorithm specifically designed to support flash and reduce latency. A single 6616 unit fits in 3U of rack space and can deliver one million inputs/outputs per second (IOPS) with 4 GB/sec of bandwidth. The 6000 Series features fully redundant components, no Single Point of Failure, active-active vRAID controllers, and spare VIMMs for fail-in-place protection.

The Results

According to the CIO, "Violin was able to quickly install a 6616 for the replicated database, move our data over in under 24 hours, and had our system back up and running. With no code changes or anything else, we were able to keep the replication current during our peak processing time and keep our real-time reporting and monitoring functioning. We were also able to trap all production errors and issue customer fixes on a real-time basis, something we had a desire to do but had never had a practical solution until now."

In fact, database replication times had significantly reduced from more than 12 hours behind the production database to only one second. Thanks to the Violin 6616 Memory Array deployment, the IT team was able to run their data integrity reports 300 percent faster. The company's real-time reports Web page was finally able to pull data without failing, very unusual for the previously heavily taxed system. The Query for Redemption reports, which had never run effectively before, was now routinely completed in 20 minutes. Additionally, the company fed 3.9 million safe link inserts into the production database in only one hour, an effort that previously required six hours.

Because of these results, the customer invested in four additional Violin 6616 flash Memory Arrays. The CIO states, "Due to the success of our Violin deployments, the ease of migrating the database over, and the performance results we saw, we looked at several other applications that were experiencing heavy wait IO or that we felt were unduly expensive because of disk partitioning – over 196 of our spindles were consumed by one database for optimized performance via spreading IO across multiple drives."

He continued, "We added additional Violin flash units that allowed us to reduce data center energy requirements and floor space at both our data center and collocation data center. In different environments, without any tuning, we noticed improvements ranging from 300 percent to 800 percent for query performance and 200 percent to 400 percent for batch type processing. And this was all done without having to invest in tuning, code rewrites, expensive consultants, or new implementations."