

TELUS Mobility Taps Hitachi Data Systems to Help Manage Vigorous Ongoing Growth

Toronto, Ontario-based TELUS Mobility, a business unit of TELUS Corporation (TSX: T, T.A; NYSE: TU), is one of Canada's largest telecommunications companies, with revenues of over \$2 billion (Canadian) annually. TELUS Mobility is a national wireless telecommunications provider—offering digital wireless voice, data, and Internet services to business and consumer clients across the dominion. The company has two state-of-the-art digital wireless networks: TELUS Mobility PCS and Mike.

When TELUS acquired several smaller telecommunications companies to form TELUS Mobility, it found itself faced with multiple storage platforms, customer care and billing systems, and data centers. The infrastructure was responsible for tracking more than 2.5 billion phone calls daily, and with business growing at rates between 20 percent and 30 percent annually, it was imperative to consolidate systems to a single system architecture that could handle the growing workload reliably and cost-efficiently.

“We had multiple storage vendors after merging the acquisitions—virtually every major vendor was installed somewhere—and so we decided to standardize with a common storage platform,” says Chris Renter, manager of infrastructure deployment at TELUS Mobility. “We conducted an exhaustive competition among the vendors, and selected Hitachi Data Systems as our storage platform.”

The selection was made in the first quarter of 2001, and the new storage network went live in the third quarter of that year.

“Though we haven't done a full ROI study, the results-to-date have supported the decision we made,” continues Renter. He cites two primary areas—cost and reliability—as having already shown the wisdom of going with Hitachi Data Systems (HDS).

“I would say that our cost savings *vis-à-vis* the other storage platforms are on the order of 20 percent to 30 percent, and the reliability has been impeccable,” Renter says. According to Renter, TELUS Mobility has had 100% service dispatch since switching to HDS as its single storage platform; with previous storage suppliers, the company had experienced at least one major failure a year.

Pumping up the storage volume

To achieve the initial consolidation of the storage platform on Hitachi, TELUS purchased two Hitachi Freedom Storage™ Lightning 9900™ Series Model 9960 systems for its two data centers, one located in Calgary, Alberta and the other in Toronto. Each of these systems provided TELUS approximately 6 terrabytes of storage capacity.

The Lightning 9960 systems provided the foundation for TELUS' initial Storage Area Network (SAN), which also consists of two Brocade® SilkWorm® fabric switches, a Sun Fire™ 15K server, six Sun Fire 6800 servers, and an array of other Sun hardware including R420s, R280s, Ultra™ workstations, and a SPARC™ system. All Sun servers are connected to the SAN via JNI® FCE-6410 or FC64-1063 host bus adapters (HBAs), depending on the server. The two Lightning 9960 systems and the HBAs are attached to the fiber patch panels and fabric switches. An Oracle database provides the framework for the VLDB.

The Hitachi Data Systems team then installed Hitachi Shadowimage™, Hitachi SANTinel™, Hitachi Resource Manager™, and Hitachi CruiseControl™ to optimize the configuration of the Lightning systems. Hitachi TrueCopy™ was installed to safeguard critical data.

“The Hitachi software has been a critical contributor to the storage solution,” says Renter. “Shadowimage has given us the ability to perform timely data conversions for billing integrations and data center relocations. CruiseControl has strongly supported the system's high availability and performance, allowing us to move databases around within the storage frame while the business is operating.”

Renter notes that TELUS Mobility relocated a data center in the spring of 2002, completed two major data conversions that year, and completed yet another in September 2003. All of these system upgrades have been accomplished easily and without disruption to ongoing operations. According to Robert Lennie, a systems engineer at Hitachi Data Systems directly involved in the project, CruiseControl has enabled TELUS Mobility to reduce service times for migrating highly utilized logical disks from RAID-5 to RAID-0+1 groups by 96 percent. (RAID stands for Redundant

Array of Inexpensive Disks.)

With this concrete SAN in place, TELUS Mobility moved to install a new American Document Management (AMDOC) billing system to support the increasing regulatory demands of its growing customer base. This new system, along with consolidation of data from new TELUS acquisitions, required an additional 21 terrabytes of capacity.

To implement the desired change, the TELUS/HDS project team determined it was necessary to consolidate data and migrate operations from TELUS' Calgary HP-UX-based environment to Toronto's Solaris-based environment—and have both run the AMDOC billing system.

The Solaris environment running a single-threaded AMDOC billing system for 2.8 million customers is the largest of its kind in the world. “We began innocuously enough, but now we have more storage than any competitor in the telecommunications industry,” say Renter.

Lennie confirms this: “We began to upgrade the initial pair of Lightning 9960 systems, and as TELUS witnessed how much capacity the systems could manage, they became increasingly ‘storage hungry.’ The more they used, the more they wanted. It was just a matter of time before they wanted another system.”

HDS worked out a deal with TELUS to loan them a third Lightning 9960 to help migrate the data from Calgary in exchange for the purchase of additional hardware and software to support their burgeoning needs. (Since the implementation, TELUS has purchased an additional Lightning 9980 to further support the cross-country SAN.)

The upgraded SAN solution included:

Calgary data center

- Lightning 9960 with 34 terrabytes of capacity
- 73 GB drives
- RAID-5 and RAID-0+1 arrays
- 32 GB cache
- 28 FC interfaces
- Hitachi Resource Manager, SANTinel, Shadowimage
- One Brocade SilkWorm 6400 fabric switch

Toronto data centers

- Two Lightning 9960 systems with 37.5 terrabytes of capacity
- 73 GB drives
- RAID-5 and RAID-0+1 arrays
- 2 x 32 GB cache
- 2 x 32 FC-2 interfaces
- Hitachi Resource Manager, SANtinel, CruiseControl Shadowimage
- Two Brocade SilkWorm 6400 fabric switches
- 40 JNI FCE-6410 and FC64-1063 Host Bus Adapters with 1GB
- 20 JNI FCE-6460-N.P Host Bus Adapters with 2 GB

The Daily Workhorse

Renter says the SAN is critical to supporting TELUS Mobility's day-to-day operations, and it has performed to the critical acclaim of all involved. "The system primarily supports billing—the AMDOC system—and cell phone activations," he says. "When a customer goes into a store and buys a phone, he or she wants service right away. Before having the HDS solution in place, we had significant reliability problems, as well as problems during heavy load time. Since the system has been in place, these problems have essentially disappeared."

What does this mean to TELUS Mobility? In a word, revenue.

If the company is unable to generate a customer bill, they lose money. But since they've fortified their storage environment with HDS technology, this is less of a worry. In fact, according to Lennie, "their only concern now appears to be determining which component of the SAN needs upgrading next."

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