ICICI Bank Limited (ICICI Bank) is a trendsetter in the use of banking technology in India. Since 1999, ICICI Bank leverages comprehensive datacenter availability and data protection solutions from Symantec. Using Veritas Storage Foundation and Veritas Cluster Server, the bank is achieving 99.9 percent application availability and 99.99 percent uptime for its server infrastructure. The bank relies on Veritas NetBackup and a full range of agents and options for data protection. The solution is delivering tangible results, including a 50 percent reduction in the time to rebuild corrupted servers and 25 percent annual growth in data volume without any increase in staffing resources. Seeking greater adaptability, the bank recently turned to Symantec for an enterprise licensing agreement that lowered software infrastructure costs by as much as 20 percent.

ICICI Bank Limited

Boosting Datacenter Availability for Largest Private Bank in India with the Help of Symantec

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A leader in banking technology

ICICI Bank seeks to be at the forefront of technology usage in the financial services sector. Information technology is a strategic tool for business operations, providing the bank with a competitive advantage and improved productivity and efficiencies. All the bank’s IT initiatives are aimed at enhancing value, offering customer convenience, and improving service levels.

ICICI Bank (NYSE:IBN) is India's second largest bank and largest private sector bank, with assets of USD 43 billion as of September 30,2005. ICICI Bank offers a wide range of banking products and financial services to corporate and retail customers through a variety of delivery channels and through its specialized subsidiaries and affiliates. Areas include investment banking, life and non-life insurance, venture capital, and asset management. Specifically, ICICI Bank is a leading player in the retail banking market and has over 14 million retail customer accounts. The bank has a network of 600 branches and extension counters and 2,060 ATMs.

ICICI Bank is growing rapidly, in part through its online service offerings, and is considered a technology trendsetter in the Asian banking industry.
It is the first bank to offer Internet banking services in India. It is also extending online banking to rural communities via kiosks.

A loyal Symantec customer for six years and counting

The bank set the stage for its technology ascendancy in 1999 when it consolidated its IT operations to a new data center in Mumbai. Pravir Vohra, Senior General Manager of ICICI Bank’s Technology Management Group, was a key decision maker in the planning for the new data center.

“We took a hard look at the bank’s requirements well into the future,” he says. “High availability for our customer-facing applications was on the top of the list. If my customers cannot transact, nothing else matters. An outage can be highly detrimental to the bank’s reputation.” As a result, the bank’s internal applications needed to meet high availability requirements. And all banking data had to be protected and recovered in case of disaster.

In building the bank’s Mumbai datacenter, Vohra looked first to establish relationships with suppliers that could solve a whole class of problems, not just those suppliers who offered point solutions. “To build a world-class infrastructure, we needed world-class software to manage our applications and storage,” explains Vohra. “We standardized on Symantec products for our data center because they have a well-deserved reputation as being best in class. Also, Symantec supports all major platforms, so we can deploy a single set of tools across the entire infrastructure, simplifying administration and reducing training costs.” An additional decision factor was Symantec’s broad range of services, from consulting to onsite education.

Targeting high availability for the end user

To meet its datacenter availability goals, ICICI Bank runs its customer-facing services and key enterprise applications such as Finacle Core Banking (Infosys), FinnOne Retail Loans System (Nucleus Technologies), CTL Prime Credit Cards Processing System (Card Tech Limited), and SAP on highly available servers. The data center has several Sun Fire 15K, E6900, E2900, and E6500 enterprise-class servers and various Sun Fire mid-range servers—25 in all—running the Solaris 9 Operating System. ICICI Bank deployed Oracle 9i database and Oracle Real Application Clusters (RAC) to provide a robust database component for its enterprise applications, while other applications such as Internet Banking and Customer Relationship Management use Microsoft SQL Server 2000 Enterprise Edition.

The FlashSnap feature of Veritas Storage Foundation allows ICICI Bank to lower its total cost of ownership through more efficient use of its storage infrastructure. “The data for the Finacle application is stored on a new HP Storage Works XP 12000 disk array,” Vohra relates. “We make periodic point-in-time copies of the data so that we can restore the database in case there is a corruption. While the HP StorageWorks XP 12000

“FlashSnap allows us to write copies of the data onto less expensive Hitachi or Sun storage arrays. We avoid buying more hardware and get the most value from our existing assets.”

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Senior General Manager
Technology Management Group
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disk array permits such internally via its native asynchronous data replication software, the FlashSnap option allows us to write copies of the data onto less expensive disk arrays from Hitachi or Sun. We avoid buying more storage hardware and get the most from our existing assets.”

**Reliable data protection**

While those Symantec products ensure datacenter availability, Veritas NetBackup Enterprise Server provides protection for vital enterprise data. “We chose NetBackup when we first opened the datacenter, and we have never had any reason to reconsider,” Vohra relates. “It backs up 15 terabytes of data every day from more than 700 Microsoft Windows- and UNIX-based servers. It is reliable and easy to administer. And Symantec continues to innovate, so we continue to stay at the edge of data protection technology without having to work at it.”

As data volumes grow at a rapid rate for ICICI Bank—currently 300 gigabytes a month—the bank is challenged to backup increased data volumes without extending its backup window. “With round-the-clock operations, we only have a few hours during the night to complete our backups,” he says. “Fortunately, we’ve been able to accommodate a 25 percent annual growth in data volume with no additions to our staff, thanks to the scalability of NetBackup.”

ICICI Bank has supplemented its

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**ICICI Bank Architecture**

- SAP, Infosys Finacle, and other banking applications running on Oracle Real Clusters (RAC), Oracle9i database, Microsoft SQL Server 2000
- HP StorageWorks Virtual Array 7410, HP StorageWorks XP502, HP StorageWorks XP1024, HP StorageWorks XP12000 Disk Array, Hitachi Thunder V9580 system, NetApp FAS 940c Storage System
- HP StorageWorks tape library, EMC CLARiiON virtual tape drive
- Veritas NetBackup Bare Metal Restore Option dramatically reduces the time needed to rebuild a corrupted server.
- Veritas NetBackup Shared Storage Option creates a virtual pool of tape resources to improve efficiency and reduce backup windows.
- Veritas NetBackup Enterprise Server provides reliable data protection and centralizes management of backup infrastructure.
- Veritas Volume Replicator maintains a copy of vital enterprise data at remote site for disaster recovery.
- Mumbai Main Data Center
- Hyderabad Disaster Recovery site
- 800 km
NetBackup installation with database agents for Oracle, Microsoft SQL Server, and SAP. These backup agents take advantage of the unique features and structure of each database to minimize disruptions to the applications that use each database while ensuring complete protection of the information.

Shared Storage Option leverages tape library

In 2003, lengthening backup operations began to encroach on production time, affecting application performance. The NetBackup Shared Storage Option came to the rescue. It allows ICICI Bank to gain more efficiency from its HP StorageWorks ESL 712E robotic tape library by virtualizing the tape drives into a common resource pool that can be shared by multiple backup jobs.

Even with the efficient usage of the tape drive infrastructure, it can still take a long time to recover a file from tape just due to the inherent nature of tape drives and tape retrieval speeds. To address that problem, Vohra ordered an EMC CLARiiON 720 virtual
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disk library, a disk-based backup system that significantly reduces the time needed to restore a file and enhances backup speeds by a factor of four times.

Will the VTL force ICICI Bank to change its backup software? “Not at all,” Vohra responds. “Once again, Symantec’s heterogeneous platform support gives us the flexibility to adapt the IT infrastructure to our evolving needs without changing our software tools. NetBackup has built-in support for disk-based backups, so we don’t have to buy anything else.”

Bare Metal Restore speeds server rebuilds

The NetBackup Bare Metal Restore Option helps ICICI Bank address another concern, rebuilding servers. “NetBackup Bare Metal Restore Option automates the many manual steps needed to recover a corrupted server image,” relates Dr. Atul Ramani, Chief Manager of the Technology Management Group at ICICI Bank. “We have achieved a 50 percent reduction in time on each server rebuild.”

Enterprise licensing agreement saves time and money

Since the original data center deployment, the relationship between ICICI Bank and Symantec has continued to strengthen. In early 2004, Vohra met with his Symantec sales representative to explore ways to streamline the process of acquiring new Symantec software. “It no longer made sense to go through the procurement process and evaluate competitive bids,” explains Vohra. “Time and again, we wound up buying Symantec. So we decided to formalize the relationship with an enterprise site licensing agreement (ESLA).”

Symantec designed a custom ESLA for ICICI Bank that included Storage Foundation, Cluster Server, and NetBackup, and associated options and agents. The ESLA also provides ICICI Bank with the option to use other Symantec software products that the bank wants to evaluate and test for future needs, including Veritas Volume Replicator and Veritas i3 software.

“The Symantec ESLA removes a layer of administrative overhead from my team,” relates Vohra. “Getting the software needed to deploy a new server used to take weeks through the traditional purchasing process. Now we simply download the latest versions of Symantec availability products and keep going. The ESLA shortens our time to deployment by an average of 10 days.”

Besides saving time, the Symantec ESLA also saves ICICI Bank money through discounts. While the full amount will not be known until the end of the two-year agreement, Vohra estimates that it could be as high as 20 percent. “The ESLA has also made cash flows much easier to predict,” he adds.
Enhancing datacenter availability with disaster recovery solution

As soon as the ESLA was in place, Vohra’s group began to tackle other problems, starting with disaster recovery. “We keep a copy of our important information at our disaster recovery site,” Vohra explains. “We had been replicating the data using HP StorageWorks asynchronous data replication product called Continuous Access. It works fine but confines us into using only similar HP StorageWorks disk arrays at both sites. Since we would prefer to remain vendor neutral, we switched to Veritas Volume Replicator. Its performance is on a par with HP’s proprietary data replication solution, and now we can replicate data across heterogeneous storage arrays.”

Symantec services contribute to efficient administration

ICICI Bank’s smooth relationship with Symantec extends beyond products to include technical support. “For our round-the-clock operations, we chose Veritas Extended Support,” says Vohra. “There’s always a knowledgeable support technician on the phone when we need help.”

“To get the most from our Symantec-powered environment, we leverage Symantec Education Services,” he says. When ICICI Bank installed a new version of NetBackup in 2004, the bank contracted with Symantec Education Services for two days of onsite training for 12 system administrators. The customized instruction tailored to ICICI Bank’s needs shortened the learning curve.

Vohra has a fixed number of consulting hours as part of the ESLA and he already knows how he plans to use them. “Veritas consultants will advise us on how to set up Symantec products for the first time,” he explains. “They understand best practices and can help us validate our installation.”

Looking to future solutions based on Symantec

With no shortage of infrastructure projects on his plate, Vohra has the tools his group needs, thanks to the Symantec ESLA. “We have several planned enhancements to our backup system, all based on NetBackup options covered by the ESLA,” he relates. “To extend backup coverage to the data on user machines, our IT staff is testing the Desktop and Laptop Option.”

ICICI Bank is also evaluating the NetBackup Encryption Option. “The NetBackup Encryption Option will give us an additional level of security for our backup tapes, always welcome in this age of stolen identities,” says Vohra. With this option, NetBackup encrypts data before it is passed over the network and stores it on tape in an encrypted format. It reverses the process on restores, so that the data is always encrypted while traversing the network.

The bank is considering Veritas i³ software, another product covered under the ESLA, as a potentially useful tool. Vohra explains: “Real-time online transaction processing applications demand high performance.

“We value our relationship with Symantec. ICICI Bank looks forward to working with Symantec to help drive their product roadmap so they can continue to accommodate the special needs of banks like ours.”

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Senior General Manager
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ICICI Bank

When they start to slow down, it’s not easy to discover why. In preliminary tests, Veritas i³ software has pinpointed in just a few minutes problems that used to take hours or even days to resolve.”

Vohra expects the close collaboration between ICICI Bank and Symantec to continue. “We value our relationship with Symantec,” he says. “ICICI Bank looks forward to working with Symantec to help drive their product roadmap so they can continue to accommodate the special needs of banks like ours.”