



## Daegu Bank

### Banking on 99.999 Percent Uptime with Symantec Solutions

To provide high availability for its online banking services, Daegu Bank implemented Veritas Storage Foundation for Oracle RAC in 2005. Results include five nines (99.999 percent) uptime; a 30 percent reduction in storage administration time; a 40 percent reduction in cluster administration time; a 67 percent reduction in RTO and RPO; a 40 percent reduction in overall storage costs; and increased data throughput. Daegu Bank also received the highest score for “Speed and Stability of Internet Banking” category from Stockpia, a Korean industry expert in evaluating Internet financial services.

#### ORGANIZATION PROFILE

Founded in 1967, Daegu Bank ([www.daegubank.co.kr](http://www.daegubank.co.kr)) serves 5 million customers via online banking, ATM machines, and 210 regional branches across Daegu, Korea's third-largest city. With approximately 3,000 employees and 23 different business units, Daegu Bank is Korea's largest regional bank.

#### INDUSTRY

Financial Services

#### SOLUTION

Storage Management  
High Availability

#### Competing on Stability

Regional banks and credit unions around the world are facing increasing competitive challenges from global financial institutions. In order to maintain and grow their customer base, local banks need to provide the same level of service as large, multinational banks—or better.

Serving five million customers—more than half the population of Korea's third-largest city—Daegu Bank is Korea's largest regional bank. To compete in tech-savvy Korea, Daegu Bank needed to maximize availability for its banking services, particularly online banking, so it could better compete to build market share. In 2005, the bank began taking steps to improve its storage management strategy and ensure high availability of data.

#### Streamlining Storage Management

In 2005, Daegu Bank was using a variety of vendor-specific storage management tools to manage storage on different platforms, which made storage administration complicated and time consuming. What's more, the bank was using raw disk for its Oracle database, as opposed to file systems, which presented manageability and visibility challenges.

“We realized we needed to use file systems for Oracle RAC, because it was taking too long to make changes with raw disk,” says Sang Keun Lee, IT team manager at Daegu Bank. “We also needed quicker failover for high availability.”

After evaluating storage management tools from Symantec, HP, Sun, and IBM, Daegu Bank engaged Symantec partner 3S Soft Co. to implement Veritas Storage Foundation™ for Oracle RAC.

“Since implementing Storage Foundation for Oracle RAC, we've had no unplanned downtime. It also gives us the ability to update the file system on the fly, without taking systems offline.”

**Sang Keun Lee**  
IT Team Manager  
Daegu Bank

Using Veritas Storage Foundation for Oracle RAC, Daegu Bank was able to achieve a 40% reduction in overall storage costs.

**“3S Soft displayed a very high level of technical knowledge and skill. They have a good deal of experience with clustering solutions and were able to recommend several best practices.”**

**Sang Keun Lee**  
IT Team Manager  
Daegu Bank

Storage Foundation for Oracle RAC includes Storage Foundation Cluster File System, Veritas™ Volume Manager, and Veritas™ Cluster Server to create a heterogeneous cluster file system. The solution reduces the ongoing management costs of an Oracle RAC environment and provides a unified view of cluster and file systems across Daegu Bank’s entire data center environment.

“3S Soft displayed a very high level of technical knowledge and skill,” says Lee. “They have a good deal of experience with clustering solutions and were able to recommend several best practices.”

With Storage Foundation for Oracle RAC, provisioning storage is as simple as creating a new file, as opposed to the complicated process of adding a new raw device—without disruption or sacrificing performance. Because two active database instances can write to the Cluster File System concurrently, the bank now enjoys improved data throughput, enhancing the customer experience.

### Targeting Five Nines Uptime

Daegu Bank is now clustering all its critical applications, including custom applications for CRM and Basel II compliance, as well as various banking applications. System uptime is now 99.999 percent, increased from 90 percent.

“Since implementing Storage Foundation for Oracle RAC, we’ve had no unplanned downtime,” says Lee. “It also gives us the ability to update the file system on the fly, without taking systems offline.”

Storage administration time has been reduced by 30 percent, according to Lee. Also, because IT staff can now monitor the clusters using a single management console from one vendor, cluster administration time has been reduced by 40 percent.

“Because of the reduced administration time, our storage administrators are now free to spend more time on higher value tasks,” says Lee.

## SOLUTION AT A GLANCE

### Business Drivers

- Provide efficient, consolidated storage management tools to IT staff
- Increase system uptime for online banking customers
- Lower overall storage costs

### Technology Challenges

- Reduce storage and cluster administration time
- Minimize planned downtime
- Shrink recovery time objective (RTO)
- Improve efficiency of file system updates
- Maximize data throughput

### Solution

Optimized performance of Oracle 10g RAC and enhanced availability

### Symantec Products

- Veritas Storage Foundation™ for Oracle RAC, including:
- Veritas Storage Foundation™ Cluster File System
- Veritas™ Volume Manager
- Veritas™ Cluster Server

### Symantec Services

- Symantec Education Services

### Symantec Partner

- 3S Soft Co., Ltd. ([www.3ssoftware.co.kr](http://www.3ssoftware.co.kr))

### Technology Environment

- Applications: Custom applications for customer relationship management (CRM) and Basel II compliance; various banking applications
- Database: Oracle 10g with Real Application Clusters (RAC)
- Servers: 2 IBM p595 servers running AIX 5.3
- Storage: Hitachi 9980 storage array
- Tape Libraries: Hitachi VTL, StorageTek L700

## BUSINESS VALUE AND TECHNICAL BENEFITS

### Compliance

- Highest rating for online banking services from independent research group
- 99.999% system uptime (increased from 90%)
- 30% reduction in storage administration time
- 40% reduction in cluster administration time
- 67% reduction in recovery time objective (RTO)
- 40% reduction in overall storage costs
- Faster data throughput from 2 active database instances
- Able to update file system on the fly with no downtime
- Disaster recovery testing does not affect primary environment

### Reducing Recovery Time Objective by 67 Percent

Most of Daegu Bank's 10 local application clusters are arranged in a one-to-one, active-active architecture with automated failover, while three clusters use an active-passive configuration with manual failover.

Before using Veritas Cluster Server, Daegu Bank's recovery time objective (RTO) was 30 minutes. Now, the bank can restore service within 10 minutes in the event of a failure, a 67 percent reduction in downtime. The bank can also test disaster recovery capabilities without affecting its primary environment.

Symantec Education Services provided training for basic storage administration, resulting in less reliance on outside support. "The training was very useful," says Lee. "Our IT staff has taken over all the basic operations like disk allocation, so we don't have to call 3S Soft for routine administration."

### Cutting Overall Storage Costs by 40 Percent

By reassigning applications and improving disk utilization, Daegu Bank has reduced its total storage costs by 40 percent. Through its investments in Veritas solutions, it has improved customer loyalty and gained efficiency by providing reliable, stable banking services, and has been able to maintain an annual customer growth rate of more than 10 percent.

In 2008, Daegu Bank received the highest score in "Speed and Stability of Internet Banking" category from Stockpia eFinance Research Group, a Korean industry expert in evaluating Internet financial services.

"Symantec has the best-in-class solutions for both storage management and clustering," Lee concludes. "We now have better manageability and easier administration, and our systems are much more stable than before. We chose Symantec products with confidence, and would do so again in the future."