



WATERWORKS HEADQUARTERS OF DAEGU METROPOLITAN CITY STABLE SUN PLATFORM DELIVERS

Company/Organization

- Waterworks Headquarters of Daegu Metropolitan City
www.dgwater.go.kr

Vertical Market

- Government

Key Challenges

- Meet government-mandated disaster recovery requirement.
- Migrate computing infrastructure from legacy platform.

Solution

- Stable IT infrastructure and disaster recovery solution.

Business Results

- Currently achieving 99% availability.
- Provides secure, continuous information management system along with reliable disaster recovery capabilities.
- Delivers consistent waterworks management.
- Minimizes expenses that result from loss of digitalized documents.
- Offers improved customer service and support.

In an effort to provide world-class customer service, the Waterworks Headquarters of Daegu Metropolitan City (Daegu Water) has become the first municipal water utility in Korea to implement a remote disaster recovery system to protect the organization's information resources.

Although local government agencies are required by law to have disaster recovery programs in place, most have not yet responded to the mandate. When Daegu Water made the decision to move forward with its disaster recovery initiative, the company turned to Sun for both the construction of its real-time remote backup system as well as for support in migrating from a retired Hewlett Packard (HP) Alpha Server 4100 system to the Sun™ infrastructure.

Customer Service Initiative Drives Disaster Recovery Solution and HP-to-Sun Migration

The Daegu Water disaster recovery project began in June 2004 and was completed in December 2004. Daegu Water's intent was to build a more enhanced and stable water service information management system that could maintain business continuity during disasters and accidents. The new system was also intended to provide a more proactive response to Daegu Water's growing information requirements. The goal was to construct a reliable administrative information system while providing citizens with a stable facility information service.

Sun consultants constructed the new disaster recovery system in Dalseong, which is about 30 kilometers away from Daegu Water's headquarters. The infrastructure foundation is a Sun Fire™ 4800 server loaded with a Sun StorEdge™ D240 Media Tray and connected to a Sun StorEdge 6120 Array through two Brocade SilkWorm 3250 switches. Sun StorEdge Availability Suite software is installed to help with data continuance.



Prior to the construction phase of its remote disaster recovery facility, Daegu Water began a project to migrate from its aging and inefficient existing computer resources to a new platform. At the time, Daegu Water used a Digital Alpha server 4100 as its primary computing platform. As the performance of the Digital Alpha deteriorated, there was growing demand for new equipment. Daegu Water decided to standardize on Sun and chose the Sun Fire 4800 server for its stability, performance and scalability. While constructing Daegu Water's disaster recover system, Sun consultants reconfigured the Sun Fire 4800 server for increased performance by extending CPUs by 4 and memory by 8.

Daegu Water leverages the Sun server and storage platforms to achieve improved system performance and state-of-the-art disaster recovery capabilities for best-in-class customer support.

Job Priorities Help Differentiate Recovery Solutions

The Daegu Water information management system includes two primary systems: an administrative information system and a facilities information system. The Daegu Water disaster recovery system has been implemented with different recovery standards for each of these two components. By doing so, Daegu Water has managed to construct a low-cost and high-efficiency system.

Daegu Water regards its administrative information system as less mission-critical than its facilities information system. The administrative information system consists of a customer information system that tracks administration, facilities and business management, and a management information system that covers budgets, materials management and other financial information. Daegu Water chose the Sun StorEdge Availability Suite with remote mirror and point-in-time copy capability for the administrative information system so that its recovery operations would perform data backup on a real-time basis in order to protect data against disasters. This provides the administrative information system with

complete synchronization and real-time remote site duplication between headquarters and the backup center by using the Metro Ethernet. The administrative information system's Recovery Point Objective (RPO) is set to restore the data from the Oracle8i database that existed as close as possible to the occurrence of the disaster. Its Recovery Time Objective (RTO) is set for four

hours. It is also set to copy the internal data volume periodically between the Sun StorEdge 6120 Array and the Sun StorEdge 3310 SCSI Array using the Sun StorEdge Availability Suite's point-in-time copy solution.

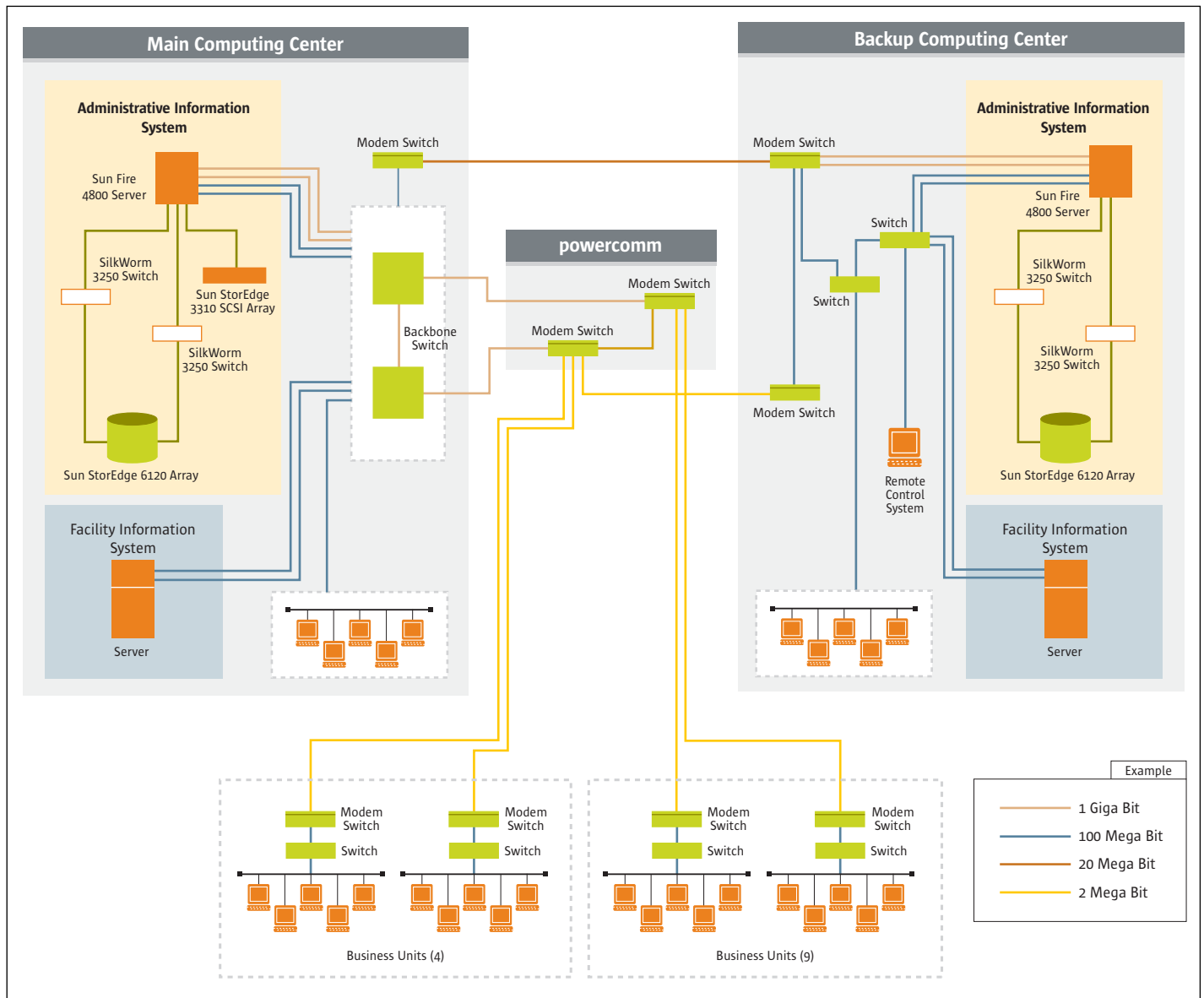
The facilities information system, which provides data on water leaks, water facilities, and infrastructure and construction drawings, also has a backup system. It is set to recover data with a one-day RTO by sending the main center's data to the backup center periodically. The backup system for the facilities information system is one step behind

that of the administrative information system, which means it could lose data. This is why different RPOs are assigned to the administrative information system and the facilities information system respectively. For the purpose of building an efficient and affordable capability, this backup facility has leveraged the servers used for the facilities information systems and made full use of existing technology and network equipment.

SAN Environment Provides High Performance and Stability

Daegu Water's increasing workload and demand for new services made it necessary to offer both large-scale data transmission and fast response time. As a result, Daegu Water installed a storage area network (SAN) connected to Brocade SilkWorm 3250 switches to achieve uninterrupted automatic recovery and interchannel load balancing. The Sun StorEdge 3310 SCSI Array that Daegu Water's main computing center was using had no performance problems. However, it was necessary to have mid-range SAN storage to help ensure high performance and stability, which is why the Sun StorEdge 6120 Array was added. The Sun StorEdge 3310 SCSI Array was also refurbished, and then dedicated to the Sun StorEdge 6120 Array for data backup as well as development and testing purposes.

The Daegu Water computer center currently has a relatively low rate of storage use, below 50 percent. Through the duplexing of remote sites, the backup capability would help minimize a data loss in the event of disaster at the main center. By implementing the SAN-based redundant storage, Daegu Water has enhanced the stability of its information management system and has a platform for future growth.



System configuration for Daegu Water IT infrastructure.

This project enhanced not only system stability but also the scalability of Daegu Water’s main computer and backup centers. Sun solutions were chosen for the main center after taking into consideration the required doubling of storage capacity and the network environment. The local area network (LAN) within the main computer center and backup

center uses 100Mb Ethernet, while the wide area network (WAN) between the main computer center and the backup center uses 20Mb Ethernet. Daegu Water’s Web server, currently managed by the staff in the computer room at Daegu City Hall, is scheduled to be upgraded and built in the spring of 2005 in preparation for new Web services in 2006.

Robust Disaster Recovery Solution Constructed

Daegu Water now has established guidelines not only for building a disaster recovery system but also for taking prompt measures when actual disasters occur. Both computer facilities managers and operators participated in disaster-preparedness tests and mock

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Park Ju-heum

Project Chief, Waterworks Headquarters of Daegu Metropolitan City

training sessions during the disaster recovery project’s construction. As a result of the success of the initial mock training sessions, Daegu Water plans to hold two mock training sessions every year. Such training is intended to allow Daegu Water’s staff to accomplish disaster recovery within three hours in the event that a disaster or problem occurs.

In addition, Daegu Water has a set of standard operating procedures for use in day-to-day activities as well as during disasters, and has a formal change management process in place for improving operational processes. Daegu Water utilizes an integrated remote management system for comprehensive and accurate analysis of performance and failure information for each situation. The system is also equipped with a monitoring system that can query various situation screens such as

performance viewer, event viewer and map viewer. Sun provided Daegu Water with real-world assistance in the form of a written operations procedure manual on Sun products and technology in use.

Daegu Water First Korean Municipal Agency to Build Disaster Recovery Center

This project has allowed Daegu Water to have a secure, continuous information system, which helps Daegu Water headquarters as well as its seven regional offices and five water-purifying offices deliver consistent waterworks management. It also helps minimize the expense caused by the loss of digitalized documents and redundant staffing that would otherwise be required to prevent information loss and data maintenance. In addition, it delivers improved customer service through stable operation of the waterworks information management system.

As the first municipal agency in Korea to build a disaster recovery facility, Daegu Water has provided leadership to other government agencies nationwide. For example, Seoul City has now opened a disaster recovery center while other local waterworks agencies have also shown interest. Sun is expected to be involved with other governmental agencies that need a disaster recovery solution. In the words of Park Ju-heum, Project Chief for Daegu Water’s remote site disaster recovery system, “We are very pleased to have developed a stable disaster recovery center with the Sun StorEdge Availability Suite solution. As a result of this implementation, it is our hope that other municipal water utilities in Korea will also build disaster recovery centers to provide their customers with better service.”

Learn More

For more information on Waterworks Headquarters of Daegu Metropolitan City, visit dgwater.go.kr. And for more information on Sun, please visit sun.com.

Sun Technology

- Sun Fire™ 4800 Server
- Sun StorEdge™ 3310 SCSI Array
- Sun StorEdge 6120 Array
- Solaris™ 8 Operating System
- Sun StorEdge Availability Suite software

Sun Services

- Sun consultants for business continuity and migration services.

Third-Party Products

- Brocade SilkWorm 3250 Switches
- Oracle8i database