DATABASE EXCELLERATION SYSTEMS™

Customer Application

DES and Natural Gas Pipeline Company of America

After 18 months of planning, Natural Gas Pipeline Company of America conducted a stress test on its client/server system and determined that performance levels were not being met. Severe I/O bottlenecks were occurring within tempdb and two primary tables of their Sybase database. Thorough investigation into possible solutions for improving their database performance concluded with the installation of a DES Database Excellerator™ for storing tempdb and two key tables.

Natural Gas Pipeline Company of America, headquartered in Lombard, Illinois, owns and operates approximately 13,000 miles of interstate pipelines that extend from the Gulf Coast and Southwest gas producing regions to markets in the UpperMidwest. Natural, an operating unit of MidCon Corporation companies, provides a complete range of natural gas transmission, storage and marketing services to gas marketers and large-volume gas users, including utility companies, power plants and industrial complexes.

Database Excellerators Triple Performance

"In our extensive stress test prior to deployment of our client/server system, we knew that the performance we needed was just not there," said David J. Ply, Natural's Manager of Technology Development and Database Support. "At one point, we had more than 150 people throughout our organization as well as some of our sister companies stressing the system. It was clear that we weren't even close to meeting our performance objectives.

Industry: Petroleum

RDBMS: Sybase 10.2.3.

Application: OLTP, batch processing

Hardware: HP9000 T500

DES Products: DES Database Excellerator, Model 1000, Model 800M, Model 800T

"We made several attempts to gain acceptable performance levels," Ply said. "We added additional processors, we brought in a Sybase consultant for a period of time, and we worked extensively at tuning the application. But, we had an I/O bottleneck that was severely affecting performance. More specifically, Sybase tempdb and two primary Sybase tables totaling nearly one Gigabyte of crucial customer transaction data were causing most of the problems."

Natural started investigating potential solutions for its I/O contention and identified Database Excellerators™ from Database Excelleration Systems (DES) as a solution. "We did some due diligence and found that DES had considerable experience solving similar problems for other Hewlett-Packard installations running Sybase. Their positive working relationship with H-P was also an important factor."

Natural installed the DES Database Excellerator, loaded tempdb and the two large Sybase tables onto it, and according to Ply, the performance gains were immediate and substantial. "We saw a three-fold performance improvement with respect to the customer information system. Our batch jobs ran much faster as well," said Ply. "Adding the DES Database Excellerator gave us the performance boost we needed. Without the DES system, we could not have deployed this application. We would have been unable to fulfill our customer orders, and thus, unable to meet our business objectives."

Improved Client/Server System Performance

Natural's improved client/server system, based on a five-processor Hewlett-Packard 9000 T500 hardware running Sybase 10.2.3, was developed to meet growing customer needs for sophisticated electronic transactions and communications. The new system enables some 325 shippers to contract for service, order gas deliveries by pipeline and storage, monitor the flows, and modify their daily delivery patterns. Recent federal regulations resulted in gas sales being unbundled from transportation and storage services, which increased customer options, thus making a competitive industry even more so.

"This system was crucial to the success of the company," said Ply. "It would provide our customers with a powerful and interactive customer service and support system that would allow them to make more timely, and thus better business decisions.

The Sybase database, Ply explained, consists of customer contractual data that is accessible by both customers and internal staff. The database references the various points on the system where customers can receive and/or deliver gas. "We have literally thousands of points up and down our pipeline–points representing connections to other pipes, another utility company, or another entry or exit point on our pipeline.

"This is where the workload becomes extremely heavy because it becomes sort of a parts explosion. One transaction could wind up becoming 100,000 in order to separate all of the components and aspects of that particular transaction. At the database level, each transaction is an insert, an update, or a delete. At the business level, a transaction might consist of a 100,000 updates."

> ***"Without the DES system, we could not have deployed this application. We would have been unable to fulfill our customer orders, and thus, unable to meet our business objectives."***
>
> ***– David J. Ply, Manager of Technology Development and Database Support***

Natural's cutoff for receiving customers transactions is 11:00 a.m. All of its gas must be scheduled and ready to roll by noon. During that one-hour window, Natural processes up to 1,300 customer orders, verifies the orders against the customer's contract, compares the ordered amount against available quantities that can be processed through the pipeline, as well as schedules and plans the delivery.

"All of the required information is then dumped into a work-in-process queue so that our customer can verify their order," Ply said. "As you might imagine, we have this huge crunch during that time frame with all of the orders that are coming in. The DES system helps us handle the load."

"Using tempdb as a working storage memory area turned out to be a major, major bottleneck," Ply said. "We decided to rethink our code, and use tempdb where it makes sense.

"In addition, the size of the databases got to be extremely large, and as the user population continued to grow, performance became a major issue," Ply said. "We were bumping into all the problems that very large databases cause," said Ply, noting that re-indexing, loading, and backing up are key offenders. "The DES system has dramatically improved our performance in these areas.

"For example," Ply continued, "it takes six and one-half hours to load our database onto our test machine that does not utilize the DES system. Whereas on the production system with the DES system it now takes two hours. In addition, by moving those two huge customer tables and some other highly accessed tables onto a 1.2 Gigabyte DES system, the performance improvement was at least three-fold."

These numbers are even more impressive when you realize the system supports up to 1,500 users, with more than 200 concurrent on the system issuing requests. In 1995, more than 30 million electronic transactions flowed through the system.

New Competitive Advantage

"As our customers learn the system, they're realizing that we've given them the ability to wait until the last minute to place or adjust orders based upon current market conditions," Ply continued, "The gas market is very competitive, so a time advantage can be very crucial."

Data availability is crucial in a customer-driven application such as this. "The DES system has been very reliable," Ply said. "We have not had any problems, concerns, issues, outages or anything. In addition, the DES support staff has been excellent. They clearly understand the issues relating to delivering performance to RDBMS client/server applications."

"We had a very rapid development time frame to get the new system in and working, and we met our delivery date. With the new system, we are now able to get business done, and provide a unique level of customer service that will gain us a competitive advantage, and DES has played a significant role

© 1995 Database Excelleration Systems, Inc. DES is a registered trademark of Database Excelleration Systems, Inc. All other company and product names may be trademarks of the respective company with which they are associated. Any information contained herein may not be reproduced without written consent of DES, Inc.

Printed in U.S.A.
CA NATURAL GAS PIPELINE COMPANY OF AMERICA 2.96

DATABASE EXCELLERATION SYSTEMS™

3080 Oakmead Village Drive • Santa Clara, California 95051 • 408 727 5497 • E-Mail: info@desdbx.com, http://www.desdbx.com