

Tune Right – Run Fast®

Thomson Financial Website Response Times Cut 67% while Usage Triples

Executive Summary

Thomson Financial is acclaimed for its financial intelligence and its ability to deliver it quickly via the web. So, when Thomson needed to improve response times of their business-critical Thomson ONE Analytics application and prepare for huge growth, they turned to Performance Tuning Corporation (PTC). Through improvements to the application, the databases, and the hardware, PTC was able to reduce response times to a third of the original while supporting a three-fold increase in users and a 150% increase in data.

Customer Profile: Thomson Financial

Thomson Financial, an operating unit of The Thomson Corporation (TSX: TOC, NYSE: TOC), is a \$1.5 billion provider of information and technology solutions to the worldwide financial community. The Thomson Corporation is a leading provider of value-added information, software applications, and tools to over 20 million users in the areas of law, tax, accounting, financial services, higher education, reference information, corporate training and assessment, scientific research, and healthcare.

Thomson ONE Analytics

One of Thomson Financial's most business-critical web applications is Thomson ONE Analytics. This product provides a robust research and analytical workflow solution for institutional investors, delivering content and tools for effectively monitoring, identifying, and analyzing investment opportunities.

Customer Challenges

Thomson Financial faced several existing challenges as well as some changes they were anticipating over the next several months. Their main concern was to improve poor performance with their Thomson ONE Analytics application and to maintain that level of improved performance as the system experienced growth. Specifically, Thomson contacted Performance Tuning to assist with the following business issues:

1. Slow end-user response times – Thomson had promised clients that they would deliver faster performance to the end users – targeting under six second response times for the most commonly hit web pages.
2. Huge growth in research data - The database at that time stored research data for a period of about two years. Thomson needed to load an additional three years of data to provide five years of historical research data to users.
3. Migration of a large number of users to the product – By December 2003, 10,000 more users would be using Thomson ONE Analytics.

Environment Architecture

When Performance Tuning began work at Thomson Financial in April 2003, Thomson ONE Analytics was a multi-tiered web application, with two back-end database servers running Microsoft Windows 2000 Advanced Server and Microsoft SQL Server Enterprise Edition. The total sizes of the databases on each server were approximately 16GB and 211GB, with continuous growth expected. The data consisted of financial information that was used for performing financial research queries, as well as specific user information such as permissions and entitlements.

Performance Metrics

Performance Tuning helped define the metrics needed to get a baseline of current system, database, and application performance and active user counts. Some of these metrics included individual web page response times, number of hits per page during busy time of day, system utilization, I/O activity, number of distinct users, and web sessions active on the system. Thomson captured web page response times and user count data on a daily basis to track changes at each phase of implementation as the system evolved.

Opportunities for Improvement

Performance Tuning determined that a combination of factors in the system caused the slow performance. PTC analyzed the system and pinpointed specific areas for improvement, then recommended and helped implement solutions for each of the following areas:

1. SQL Databases
2. Thomson ONE Analytics Application
3. Hardware

Load-Testing

PTC led an effort to plan, design, create, and run load-testing scripts, using SilkPerformer®, a third party tool by Segue, in order to test the Thomson ONE Analytics application on various web and database server hardware platforms. The load-testing scripts enabled the simulation of large numbers of users on the system under test. PTC analyzed current statistics from the production system and collected data about real user behavior to determine a design that would

About the Company

Performance Tuning Corporation (PTC) is a technology services company that provides database performance tuning, SAN and cluster configuration, data replication, capacity planning, benchmarking and load-testing. In business since 1997, PTC continues to distinguish itself from other database and system consulting companies through its efficient, targeted approach to solving customer problems.

PTC's consultants have extensive experience with major hardware and software technologies (Dell, IBM, Sun, HP, EMC, Oracle, and Microsoft). PTC has led numerous benchmarking efforts on TPC™ and custom benchmarks. Their consultants have published more than eight books on Oracle and Microsoft database technology, as well as numerous technical papers covering database tuning, SAN deployment and clustering.

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accurately reflect the production system. PTC then performed targeted load-testing of several systems to get performance data and determine how many users a given configuration could support, not only on the database server but also on the web servers. With this information, PTC determined the database and web server hardware needed to support the 10,000 new users in December.

The load-test scripts also allowed comparisons between changes in the application and the database. For example, PTC used load-test results to verify that removing linked server calls from the application would improve performance while maintaining functionality.

The following is a description of the three areas that PTC addressed (database, application and hardware) and their suggested solutions for each:

Database

Performance Tuning first looked at the database servers and discovered that tuning SQL code and configuring the database layout differently could accomplish significant gains. The list of issues included blocked processes, long-running SQL queries, recompiles of SQL statements and stored procedures, bad execution plans, and disk I/O bottlenecks. PTC consultants worked with Thomson to resolve these problems.

Thomson had used a significant number of linked server calls in SQL code to perform joins of data across the two database servers. These calls added significant overhead in the form of OLE-DB waits in SQL Server. Performance Tuning helped design, test, and implement a solution to remove linked server calls using SQL Server replication.

Application

PTC also collected specific data for each web page showing the amount of time spent in the database versus time spent in the application. This showed that the application itself required a great amount of tuning. Issues that were affecting performance included returning large amounts of unneeded data from the database to the application, using SQL statements instead of stored procedures, and unnecessarily large web pages returned to the user.

Hardware Upgrade

Performance Tuning assisted Thomson Financial with their decision to purchase new hardware for the database servers. PTC helped develop a plan to separate the 5 years of historical research data onto a separate server using 64-bit technology in order to process larger reporting queries separately from the on-line transaction processing (OLTP) queries. PTC helped determine how much hardware would be needed including disk storage, and made recommendations on how to optimally configure the disks and lay out the SQL Server database files on the new storage.

Results

Over a period of several months, PTC and Thompson together implemented solutions to the above issues. They added five years of historical data to the databases and an additional 10,000 users accessed the application.

By February 2004, the number of active users had tripled. Response times were reduced to one-third of their original values, while the application supported three times the number of users. The team reached beyond the goal of 6 seconds per web page - most pages returned in 1 to 3 seconds.