



Mobile Database Improves Usability, Facilitates Offline Access for Hosted E- Payables Solution

Overview

Country or Region: United States
Industry: Oil and Gas

Customer Profile

Based in Denver, Colorado, Transzap provides a comprehensive suite of digital data exchange, workflow, and business intelligence solutions for the global oil and gas industries.

Business Situation

Transzap needed a proven mobile database for its new smart client solution, but the company's first choice for a database exhibited stability and performance issues.

Solution

The company's switch to Microsoft® SQL Server™ 2005 Compact Edition enabled Transzap to meet customer needs for a fast and reliable solution that can be used when offline.

Benefits

- Proven reliability
- Improved performance
- Enhanced developer productivity
- More efficient management
- Lower costs and increased sales

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Transzap, a provider of hosted e-payables solutions for the energy industry, is turning to smart client user interfaces to improve the usefulness and performance of its products. However, the desktop database Transzap originally chose to store data on user PCs exhibited stability and performance problems, thereby resulting in a suboptimal customer experience. By switching to Microsoft® SQL Server™ 2005 Compact Edition, Transzap eliminated its database stability issues, increased solution performance by a factor of ten or more, and reduced its overall costs. Part of an ongoing trend to expand its use of SQL Server 2005, the company's decision to use SQL Server 2005 Compact Edition also has improved developer productivity and is enabling the company to manage information on user PCs as well as in its data center with less effort.

Situation

Founded in 1999, Transzap provides digital data exchange and workflow solutions for the global oil and gas industries, helping buyers and suppliers in those industries to do business in a paper-free environment. The company is known for its Oildex data exchange, through which more than 1,000 oil and gas companies exchange tens of billions of dollars in transaction detail each year.

In 2002, Transzap developed Spendworks, a Web-based “e-payables” solution that extends the company’s Oildex service to let buyers receive and process invoices electronically. Initially, the only way for users to access the solution was through its Web-based UI. In 2004, in response to customer demand for a solution that could be used offline, Transzap began working on a smart client version—called Spendworks Unplugged—that took advantage of the computing resources on a user’s PC to allow those users to remain productive when not connected to the Internet.

To build its new smart client solution, Transzap needed a local data store that ran on user PCs, into which transaction data stored in the company’s data center could be downloaded and cached for offline access. The company originally chose a third-party, desktop relational database that promised to deliver the necessary performance, a small footprint on user’s PC, and compatibility with the Microsoft® .NET Framework and the Microsoft Visual Studio® .NET development system, Transzap’s chosen platform for developing smart client solutions.

The company’s original choice of a database was problematic from the outset, with one major issue being poor performance. Although the database promised compatibility with ADO.NET, the classes for data access in the Microsoft .NET Framework, Transzap found performance under that

mode to be unacceptable. To obtain better query response times, the company’s developers had been forced to write extra code to access the database through its proprietary API. Even then, a single SELECT statement against a database table with 50,000 rows could take more than 20 seconds to complete.

“Performance was terrible, especially on string-based indices” says Peter Flanagan, President of Transzap. “A smart client is supposed to deliver a superior user experience, but the performance issues we faced with our original desktop database made the Spendworks Unplugged smart client more sluggish than its Web-based counterpart.”

An even larger issue was poor database reliability. “We suffered through one stability issue after another, during which time developers were prevented from working on new product features,” says Flanagan. “Even more damaging, we lost some customer credibility. When we found that the data on PCs was being corrupted and couldn’t get the support we needed to fix the problem, we started looking for a new database. Luckily, customers liked the smart client model and were tenacious about wanting us to fix the problems.”

Solution

Transzap eliminated its database stability and performance issues—and is delivering a solution now that fully meets customer expectations—by switching to Microsoft SQL Server™ 2005 Compact Edition. “We had been contemplating using Firebird, an open source database, but its lack of official support for an ADO.NET driver made us nervous,” says Flanagan. “We also considered SQL Server 2005 Express Edition, but it’s really a server product and was more than we needed in many ways. SQL Server 2005 Compact Edition gave us just what we

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needed: a time-tested, compact, and full-featured relational database with proven stability and performance.”

Transzap became aware of SQL Server 2005 Compact Edition in July 2006, when Flanagan read a news article on Microsoft’s plans to extend its existing SQL Server 2005 Mobile Edition product for use on PCs as well as mobile devices. Two days after downloading a prerelease version of the new product, Transzap developers had successfully prototyped a working solution.

Two developers began working on formal replacement of the old database with SQL Server 2005 Compact Edition in mid-August and, using the Visual Studio 2005 development system for all aspects of software development, finished one month later. The company now is testing its new solution with a select group of users and plans to upgrade all users by December 2006.

Transzap’s use of SQL Server 2005 Compact Edition for its smart client solution came shortly after the company’s initial deployment of SQL Server 2005 in its data center, as part of a new business intelligence offering that allows users to analyze expenses for the invoices they receive and process in Spendworks. Called TrendX, that offering uses SQL Server 2005 Integration Services to move data from the Oracle database that supports the Oildex service into SQL Server 2005 relational database tables. SQL Server 2005 Analysis Services are then used build to Online Analytical Processing (OLAP) cubes, which users access over the Web using a Transzap-developed TrendX smart client.

Key Capabilities

Some key capabilities of SQL Server 2005 Compact Edition that Transzap used in building its new smart client solution include:

- **Flexible data access.** Built-in support for merge replication in SQL Server 2005 Compact Edition provided an efficient way to synchronize the databases running on user PCs with servers in the Transzap data center. Previously, Transzap developers had written their own code to synchronize the old database running on user PCs with the company’s main Oracle database. Today, SQL Server 2005 Integration Services are used to extract data from Oracle into the same SQL Server 2005 database supporting the TrendX solution, upon which merge replication is used to synchronize selected database tables in SQL Server 2005 with the local database running on the smart client.
- **Strong data security.** Support for 128-bit encryption during merge replication provided an efficient way to help secure data passing between the Transzap data center and user PCs. SQL Server 2005 Compact Edition also enabled Transzap to easily help secure the PC databases themselves using the same 128-bit RSA algorithm.
- **Efficient deployment.** Using Visual Studio 2005, Transzap developers were able to easily integrate SQL Server 2005 Compact Edition into the same ClickOnce deployment process that supports the rest of the smart client, in which program files are downloaded and installed when a user clicks a link on a Web site. After initial installation, the smart client checks the Web site for newer versions and, if found, automatically updates itself.

Architecture and Database Metrics

The Spendworks Unplugged smart client is a Windows® Forms application, and is based on the Microsoft .NET Framework version 2.0. Built to support offline workflows, the solution uses SQL Server 2005 Compact Edition to do aggressive offline caching of key database

tables (such as those containing a chart of accounts) that are extracted from customers' accounting systems and stored in the database servers at the Transzap data center.

Using merge replication, the smart client initially pulls down about 10 tables from the servers at the data center, and then polls for updates whenever the user reconnects. Most local database tables are small and contain only a few thousand rows, although one local table may have up to 50,000 rows. Typical database size on the user's PC is 10 to 30 megabytes.

Users do lookups against the local copies of the database tables, using the smart client to match invoices and delivery receipts to purchase orders and accounts. As the user works, Web services are used to push changes back to the Transzap data center. If the user is working offline, those messages are queued by the smart client until the next time the user connects.

Benefits

By switching from its previous desktop database to SQL Server 2005 Compact Edition, Transzap eliminated the performance and stability issues plaguing its smart client application and can provide customers with a solution that works as expected. The company's move to SQL Server 2005 Compact Edition also has enhanced developer productivity, reduced database management costs, and decreased customer support costs. In turn, those improvements are leading to a lower overall total cost of ownership and the potential for increased product sales.

"As a provider of corporate workflow solutions and services, we realized early on the limitations of pure browser-based applications, and have moved aggressively toward distributed applications that utilize a

smart client to deliver improved usability and user productivity," says Flanagan. "SQL Server 2005 Compact Edition is the client-side database that we've been looking for, and will serve as a cornerstone of our strategy to transition to a smart client model."

Proven Reliability

Originally built on SQL Server Mobile technology, SQL Server 2005 Compact Edition delivers the stability and reliability that Transzap customers expect from the company's hosted solutions. "SQL Server 2005 Compact Edition is remarkably stable, which isn't surprising considering that the product has been around for several years," says Flanagan. "From what we've seen so far, we won't need to address any major bugs and are in good shape to meet our aggressive deployment schedule."

Improved Performance

Transzap's new smart client solution based on SQL Server 2005 Compact Edition is far faster than the previous version based on the old database, both in terms of synchronization times and core application performance. "Our move to SQL Server 2005 Compact Edition has improved application responsiveness by an order of magnitude or more," says Flanagan. "One query that used to take 23 seconds now runs in less than a second."

Synchronization of the smart client with the Transzap data center also is much faster. It took 30 to 60 seconds for Transzap's internally developed synchronization code to synchronize the previous database with servers at the company's data center, whereas SQL Server 2005 merge replication accomplishes that same task in just a few seconds.

Enhanced Developer Productivity

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eliminating the need to continually troubleshoot database stability issues. “SQL Server 2005 Compact Edition has eliminated stability issues that we faced with our previous database,” says Flanagan. “Our developers now can focus on delivering new product features. In the past, they had to devote a significant portion of their time to addressing stability issues or creating workarounds for those problems, such as rebuilding a binary image of each customer’s local database on our servers on a nightly basis in case of a database corruption.”

In addition, developer productivity is enhanced because SQL Server 2005 Compact Edition allows developers to utilize the same Visual Studio 2005 development system that they use for all other Windows-based software development. “One reason we went from a Web-based user interface to a smart client model was to increase the rate at which we can deliver new features,” says Flanagan. “Our developers now have three years experience with SQL Server in the data center, and SQL Server 2005 Compact Edition will allow them to apply those same skills to the development of smart client solutions, without having to learn any new tools or APIs.”

Built-in SQL Server 2005 Compact Edition features also will enhance productivity by reducing the number of lines of code that Transzap must support. For example, with merge replication, the company will no longer need to maintain its own synchronization engine. Similarly, with the native support for ADO.NET in SQL Server 2005 Compact Edition, Transzap developers can remove the extra code they wrote to access the previous database through its proprietary API.

Consistent Management and Tool-Set
SQL Server 2005 Compact Edition improves productivity for Transzap’s system administrators by enabling them to manage

local databases on user desktops with the same tools they use to manage SQL Server in the data center. For example, when setting up merge replication for a new customer, which is done using SQL Server 2005 Enterprise Manager, system administrators can complete the task in only 20 minutes. With the previous database, the same process of setting up synchronization for a new customer took all day.

“SQL Server 2005 Compact Edition lets us use the same management tools we already use to manage SQL Server in our data center,” says Flanagan. “We anticipate this will take a full day’s work off the time it takes to set up each new customer.”

Based on Transzap’s experience administering SQL Server in its data center over the past three years, the company now is rethinking its database strategy for its core OLTP systems.

Lower TCO and Higher Revenues
Transzap’s move to SQL Server 2005 Compact Edition is leading to a lower total cost of ownership for its flagship Spendworks solution and, by improving product performance and quality, opening the door for greater potential sales. “SQL Server 2005 Compact Edition will reduce our TCO in several ways, including improved developer productivity and a reduced customer support burden,” says Flanagan. “More important, it will make our own product more successful by dramatically improving database stability and performance. It’s nice to finally be moving forward and delivering on the smart client vision we’ve sold to our customers.”

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Microsoft Server Product Portfolio

For more information about the Microsoft server product portfolio, go to: www.microsoft.com/servers/default.mspix

Microsoft SQL Server 2005

Microsoft SQL Server 2005 is comprehensive, integrated data management and analysis software that enables organizations to reliably manage mission-critical information and confidently run today's increasingly complex business applications. By providing high availability, security enhancements, and embedded reporting and data analysis tools, SQL Server 2005 helps companies gain greater insight from their business information and achieve faster results for a competitive advantage. And, because it's part of Windows Server System, SQL Server 2005 is designed to integrate seamlessly with your other server infrastructure investments.

For more information about SQL Server 2005, go to: www.microsoft.com/sqlserver

Software and Services

- Microsoft Servers
 - Microsoft Windows Server 2003 Enterprise Edition
 - Microsoft SQL Server 2005 Standard Edition
 - Microsoft SQL Server 2005 Compact Edition
- Microsoft Visual Studio 2005

Hardware

- Dell PowerEdge 2650 two-processor server

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