



## Solution Brief



### Partner Profile: Temenos

Founded in 1993 and listed on the Swiss Stock Exchange (SIX: TEMN), Temenos Group AG is the market-leading provider of banking software systems to retail, corporate, universal, private, Islamic, and microfinance and community banks.

Headquartered in Geneva with more than 60 offices worldwide, Temenos serves over 1,500 customers in more than 125 countries across the world. Temenos' software products provide advanced technology and rich functionality, incorporating best practice processes that take advantage of Temenos' experience in over 700 implementations around the globe.

### Partner Application: TEMENOS T24

TEMENOS T24 is a fully integrated, modular core banking solution that covers a broad spectrum of functional requirements for the retail, private, corporate, universal, and Islamic banking and microfinance sectors.

T24 consists of a core system for the common operations between the various banking activities and a series of modules that address the operational requirements of different users. T24 is built on an open architecture and uses established standards such as HTTP and XML.

For more information, please visit: [www.temenos.com](http://www.temenos.com).

## Benchmark Results: TEMENOS T24 Running on Microsoft SQL Server 2012

As part of their strategic alliance, Temenos Group AG and Microsoft Corporation tested the performance and scalability of TEMENOS T24 R12 running on Microsoft SQL Server 2012 and Windows Server 2008 R2 Enterprise. The high-water benchmark testing was conducted at the Microsoft Platform Adoption Center in Redmond, Washington, in August and September of 2011. The testing included a mix of standard, real-world banking transactions that were defined by Temenos to represent typical transactions for a large tier-1 retail bank with an extensive customer base.

The results of the benchmark testing were extremely impressive.

**At peak performance, the system processed 11,500 transactions per second in online business testing and averaged more than 10,000 interest accrual and capitalizations per second during close-of-business testing, processing 25 million capitalizations and account accruals in less than 42 minutes.** The testing showed a near linear scalability of 95% as the number of agents was increased.

These record-breaking benchmark performance results, together with the massive scalability of SQL Server 2012, make the combination of T24 and Microsoft technologies a viable solution for even the world's largest banks.

### Benefits of SQL Server 2012

SQL Server 2012 provides a reliable, cost-effective, low-maintenance database framework for T24, with the ability to support the largest and most process-intensive deployments. SQL Server is a comprehensive, integrated, and enterprise-ready data

management software solution. Hundreds of enterprises are currently running 10-terabyte and larger transactional databases on SQL Server.<sup>1</sup>

- *Scalability and performance*  
SQL Server includes many features that help Temenos customers scale up and scale out as their businesses grow.<sup>2</sup>
- *Lower hardware costs*  
SQL Server runs on standard commodity server hardware, providing dramatically lower total cost of ownership (TCO) compared to mainframe computers.
- *Lower software costs*  
With SQL Server, customers can typically enjoy a 3:1 reduction over the largest competitor in licensing costs.<sup>3</sup>
- *Simpler systems management and lower staffing costs*<sup>4</sup>  
SQL Server database administrators (DBAs) can typically manage three times as many physical databases as competitors' DBAs.<sup>5</sup>
- *Lower maintenance costs*<sup>6</sup>  
SQL Server first-year maintenance costs are up to 77% less than those of the largest competitor solutions.
- *Fewer security vulnerabilities*  
SQL Server has consistently had fewer security vulnerabilities than the largest competitor solutions.<sup>7</sup>

With SQL Server, T24 customers can save with reduced licensing, hardware, administration, and support fees, which translate into substantially lower costs over the life of the system.

<sup>2</sup> <http://www.microsoft.com/sqlserver/2008/en/us/performance-scale.aspx>

<sup>3</sup> <http://www.microsoft.com/sqlserver/2008/en/us/value-calc.aspx>

<sup>4</sup> <http://www.microsoft.com/sqlserver/2008/en/us/compare-oracle.aspx>

<sup>5</sup> [http://www.alinean.com/PDFs/Microsoft\\_SQL\\_Server\\_and\\_Oracle-Alinean\\_TCA\\_Study\\_2010.pdf](http://www.alinean.com/PDFs/Microsoft_SQL_Server_and_Oracle-Alinean_TCA_Study_2010.pdf)

<sup>6</sup> <http://www.microsoft.com/sqlserver/2008/en/us/compare-oracle-calc.aspx>

<sup>7</sup> NIST National Vulnerability Database, <http://nvd.nist.gov/>

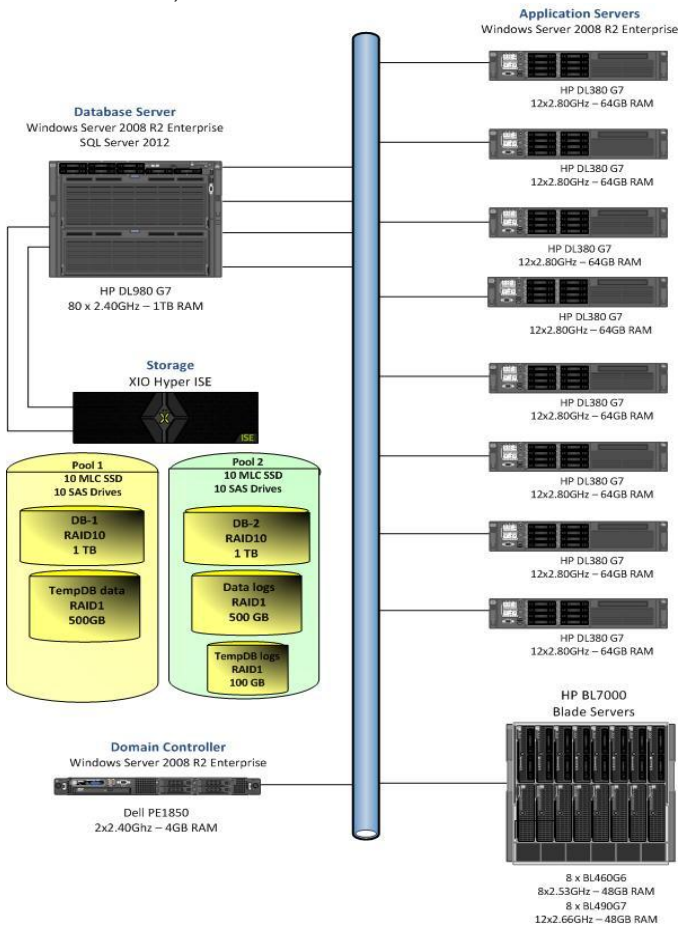
<sup>1</sup> <http://www.microsoft.com/presspass/itanalyst/docs/06-30-09EnterpriseDatabaseManagementSystems.pdf>

## Benchmark Testing Overview

The objective of the high-water benchmark testing was to measure the online business and close of business (COB) transaction scalability and throughput capacity of a T24 R12 retail Model Bank. Test cases and mix percentage were compiled from existing and prospective T24 customers to simulate the real-world banking scenarios.

## Testing Environment

The benchmark testing environment was designed to emulate that of a typical large-scale retail bank. The tests used hardware from Hewlett-Packard (HP) for the application servers and the database server. The tests were run on 25 application servers that were connected to a central, single instance of SQL Server 2012 and Windows Server 2008 R2 Enterprise. (Note that not all servers were used for all tests.)



High-water benchmark testing infrastructure

## Data Set

The data set used in the benchmarking test reflects real-world banking activity volumes.

### Data set used in benchmark testing

Number of accounts	25 million
Number of customers	15 million
Number of branches	2,000
Direct channel peak-hour load	4 million accounts
Number of transactions/day	50.4 million (50% during single peak hour)
Peak online business load	50.4 million (50% during single peak hour)

## Online Test Results

The online business test was designed to simulate concentrated daily use of T24 by injecting a high volume of nine different online transactions, including withdrawals, ATM transactions, and deposits, to the T24 application. For an online business transaction load of approximately 50 million transactions per eight-hour day, while accommodating a peak-hour load of 50% of all daily transactions, a T24 business scenario online test must meet a minimum throughput target of approximately 7,000 transactions per second.

The system exceeded the target, processing the equivalent of more than 83.4 million transactions for an eight-hour day.

### Online business test results

Metric	
Average transactions/second	11,592
Test duration	75 minutes

For the online test, 55.3% of the available 280 application server cores were used.

## Close-of-Business Test Results

The COB test was designed to simulate close-of-business batch processing and to measure the speed at which account capitalizations could be processed for a database of 25 million accounts. The COB accrual and capitalization target was set to 7,000 transactions per second. Again, the target goal was exceeded.

### Close-of-business test results

Metric	
Average transactions/second	10,008
Average database requests/second	260,500
Time to complete	41 minutes, 38 seconds

Note that peak results were even higher. For the COB test, 73.8% of the available 256 application server cores were used.

## Scalability

The scalability of T24 was demonstrated during the benchmark testing in several ways. At the peak levels of transaction throughput, CPU utilization across the available server capacity remained below 75%, providing considerable additional capacity for further increases in transactions. Additionally, multiple application servers were used, showing that customers can use existing and new hardware simultaneously to develop a resilient and scalable architecture.

## Summary: Record-Breaking Performance

Temenos and Microsoft work together to provide banking solutions that address today's industry challenges and demands in the most cost-effective way, while offering the agility to respond to the business and technology opportunities of tomorrow.

The Temenos and Microsoft high-water benchmark proves that SQL Server 2012 can provide record-breaking performance for T24.

These results make the combination of T24 and Microsoft technologies an increasingly compelling proposition for even the largest banks.

## More information



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