Microsoft Business Solutions

Scalability White Paper
Microsoft® Business Solutions–Great Plains®

Benchmark Performance
1,000 Concurrent Users

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Microsoft

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Introduction

Growth is the goal of every business. Without growing in every aspect – from sales to knowledge, from profit to culture – a company will eventually lose customers and market share to their competitors, wither and die. A business' growth must be managed, however - targeted in the right areas, throttled up and down – as circumstances warrant. That management comes not only from a company's people, but also from its business systems.

As you will see from this white paper, Microsoft Business Solutions - Great Plains has the capacity to scale with growing businesses, successfully handling massive amounts of transactions and data. Whether it's sheer transaction volume in a particular business function, size of your database or number of users and machines, Microsoft Great Plains can handle the peaks and valleys that come with regular business cycles as well as the long-term, ever upward path that comes with a growing business. Now you can focus on growing, and not worry about whether or not your existing business system can keep pace with your success.

This whitepaper documents the successful performance benchmark testing of Microsoft Great Plains version 8.0 running with 1,000 concurrent users in heavy transaction processing activity across various functional areas of the solution. This performance benchmark demonstrates a sample customer environment demonstrating processing of more than 1.6 million transactions in an 8 hour work day. In addition sample customer transaction processing throughput is included from some of our customers. The combination of this information should help you assess the ability of Microsoft Great Plains to scale to meet your organizations needs. Should you require additional diligence regarding scalability, please contact Microsoft or your Microsoft Business Solutions Partner.

Summary Results

Transaction processing speed and system scalability are important criteria when researching financial and business management applications. You need to know your new system will be able to easily handle existing transaction loads, with the ability to manage significant increases should your business experience exponential growth.

The foundation for any business management application is the operating environment products it is designed to use. Microsoft Great Plains is designed for Microsoft Windows and SQL Server. These two widely used products hold the top spots on the industry-standard benchmarks that count with customers: Transaction Processing Performance Council's TPC-C and TPC-W benchmarks. These results are proof that businesses that rely on scalable operating environments can achieve better results with business management applications based on Microsoft Windows and SQL Server like Microsoft Great Plains. And they can do so at a fraction of the price of comparable systems. For more information on Microsoft SQL Server Benchmark results visit www.microsoft.com/sql/evaluation/compare/benchmarks.asp

Microsoft Great Plains is tightly integrated with Microsoft SQL Server, Windows 2000 and Microsoft .NET Enterprise 2003 Servers. This configuration creates a business system environment that is easy to use, lowers the overall cost of distributed computing and enables businesses to harness the power, flexibility and award-winning functionality of Microsoft Great Plains. Businesses can now improve their decision making, streamline business processes and strategically manage their growth because they can have confidence that their business system will grow with them.

The following test results demonstrate that Microsoft Great Plains can handle substantial transaction volumes for large customers. The test consisted of1,000 physical Microsoft Great Plains users entering transactions and processing transactions continuously while other activities such as Payables Management Checks being printed and Receivables Management Month End Process of Aging, Statements, and Paid Transaction Removal were done simultaneously.

Transaction Type	Transactions Per Hour
Sales Orders Entered	>31,000
Sales Orders Transferred	>27,000
Sales Orders Posted	>28,000
Receivables Management Receipts Posted	>12,000
General Ledger Transactions	>9.000
Payables Management Vouchers Posted	>38,000
Payables Management Vouchers Entered	>21,000
Receivables Management Receipts Entered	>37,000

Test Definition

To put perspective on the test itself, it is helpful to understand the following items.

- The users in these tests were not simulated users but actual Microsoft Great Plains clients.
- This test consisted of 1,000 physical Microsoft Great Plains users entering transactions and processing transactions continuously.
- Other activities were done simultaneously, such as Payables Management Checks being printed and Receivables Management Month End Process of Aging, Statements, and Paid Transaction Removal.
- Most clients had a type delay which represented clients entering information in at 90 words a minute.
- In the scenarios, all clients were continuously processing for 6 hours straight.
    - Sales Order Entry - 60 transactions an hour
    - Receivables Management Cash Entry - 352 transactions an hour
    - Payables Management Entry - 212 transactions an hour
    - General Ledger Entry - 80 transactions and hour

The table below shows the definition of the test.

Module	Transaction Line Count	Number of Clients Running Test
General Ledger Entry	10	115
Payables Management Entry		100
Receivables Management Cash Entry		106
Sales Order Entry	5	500
Sales Order Transfer	5	75
Sales order Post	5	75
Receivables Management Cash Post		20
Payables Management Post		5
Payables Management Trial Balance		1
Receivables Management Trial Balance		1
Payables Management (Checks)		1
Receivables Management Aging		1

For example: There were 115 Microsoft Great Plains clients entering journal entries with 10 lines.

Real Life Results

Customers

Nothing is more frustrating than asking a customer to wait because the "system is slow." That customer can very easily go elsewhere with their business. Arguably, the most important function any business performs is that of efficiently processing customer sales. Not only is sales one of the most important barometers of how a company is performing, but a business' ability to quickly fulfill a customer's request allows them to improve customer loyalty and retention and grow by gaining market share over their competitors. Microsoft Great Plains has proven itself in both real life and computer lab tests to not only handle large sales order transaction volumes but to also handle the load comfortably when those volumes grow in a successful business.

- *A leader in the computer and technology industry meets their customer demands by successfully transacting over 4,000 sales orders a day in Microsoft Great Plains.*
- *A large telecommunications company profitably manages over 500,000 customers and imports over 1,000,000 receivables transactions a month in its Microsoft Great Plains system.*
- *A successful company in the printer parts business uses Microsoft Great Plains to fulfill 24,000 customer sales orders each month.*

Suppliers

Businesses have to rely on their suppliers. Without a dependable supply of goods and services into your business, the trickle down result is an inability to adequately satisfy your customers' demands. It only makes sense that your most loyal vendors – the ones that bend over backwards for you in a pinch AND the ones that will negotiate terms and rates with you in good faith – are the ones that have been treated fairly along the way. Easy to handle, accurate purchase orders and timely, fair payments from you create those type of relationships. Microsoft Great Plains gives you that kind of leverage and can do it with thousands of suppliers and transactions.

- *A printing industry company efficiently manages over 5,000 purchase order transactions each month in Microsoft Great Plains.*
- *An innovator in the financial sector uses Microsoft Great Plains to import and processes over 100,000 payables transactions per day.*

Employees

At the end of the day it's your people who make up your business. Your ability to meet their needs from a pay and benefits perspective will ultimately affect how well they treat your business partners – customers, vendors, investors and the like. The Microsoft Great Plains solutions productively manage a company's most valuable asset from one to 1,000 and much more.

- *Microsoft Great Plains helps a high volume restaurant franchisee keep their 4,000 employees satisfied handling benefits and managing over 20,000 payroll transactions per pay period.*

Inventory

Your inventory gets hit from all sides. Too much on-hand can rob your profitability, and too little can send your customers into the arms of your competition. Not to mention the fact that transaction volumes in inventory can swell easily because they are affected by both sales and purchases. Combine those two elements and you have a business function that can be horribly costly if not handled correctly, or one that gives you THE competitive edge if handled well. Microsoft Great Plains' has proven its ability to manage huge inventory transaction volumes fast and accurately.

- *A large wholesale distributor in the industrial supply industry keeps control of over 200,000 inventory items using Microsoft Great Plains.*

General Ledger

The final test of a business management application is the ability for decision makers to keep their fingers on the pulse of their business. Profit & Loss Statements, Balance Sheets, Statements of Cash Flow and other financial statements are the crucial reports that allow executives to do just that. Your ability to "fly over" at a high level and see the landscape, as well as "dive down" into increasing levels of detail is paramount if you are going to be able to identify and act on issues. A business owner can't get from that summary and then slice the details in different ways if his business system can't handle massive amounts of transactions posted to volumes of account numbers. Microsoft Great Plains allows decision makers to continue to be confident in their GL data even when hundreds of thousands of accounts and transactions are involved.

- *A large not-for-profit uses Microsoft Great Plains to navigate 500,000 GL account numbers and stay in front of business issues.*

System

Using a business system for any length of time can accumulate massive amounts of data in a database. And that data can grow exponentially as a business grows. It's that very data that is critical to making timely, accurate decisions whether it's 8 minutes old, 8 months old or 8 years old. Adding all that data, or for that matter, adding additional users can't bog down your ability to process current daily transactions. Microsoft Great Plains efficiently scales with a successful business to handle the additional system loads put on it by growth.

- *Microsoft Great Plains helps a jewelry industry company handle a growing user base of more than 350 concurrent users.*
- *A music and video products company successfully mine a valuable database of over 150 gigabytes worth of business transactions with Microsoft Great Plains.*

Detailed Results

The information below outlines the benchmark tests that were performed using Microsoft Great Plains 8.0. This test was performed to simulate 1,000 users and various conditions experienced in typical Microsoft Great Plains implementations.

Overall, Microsoft Great Plains used 90+% of the available server CPU capacity, indicating that additional hardware would be optimal for Corporate Account customers running these scenarios.

Sales Order Processing Transaction Throughput Test

This test measured the rate at which Microsoft Great Plains can accept transactions being entered via Sales Order Processing order entry, while simultaneously transferring orders to invoices, and posting invoices to Microsoft Great Plains Sales Order Processing, Receivables, Inventory and General Ledger applications.

Sales Order Processing	Transactions Per Hour	Sales Items Per Hour (1)
Orders Entered	31,042	155,210
Orders Transferred	27,299	136,495
Invoices Posted	28,701	143,505

(1) - Sales Items per Hour is calculated using five line items per order

Receivables Cash Receipts

This test measured the rate at which Microsoft Great Plains handles cash receipt transactions being posted via Receivables Management during a one hour period.

Receivables Management	Transactions Per Hour
Receipts Entered	37,335
Receipts Posted	12,540

General Ledger Accounts

This test measured the rate at which Microsoft Great Plains handles journal entries being posted via General Ledger during a one hour period.

General Ledger	Accounts Per Hour
Posting	9,248

Payables Vouchers

This test measured the rate at which Microsoft Great Plains handles vouchers being posted via Payables Management during a one hour period.

Payables Management	Transactions Per Hour
Vouchers Entered	21,245
Vouchers Posted	38,797

Test Methodology

Microsoft Business Solutions uses an internal testing lab to conduct software performance reviews, as well as to perform automated testing routines. This testing lab is isolated from other network traffic during the tests. Note that the client/server configurations are running the automated testing system only and do not have any other network traffic during the benchmark process. Although this would not likely be the case in an actual site, as most clients will also be running e-mail or other workplace specific applications, this kind of testing does allow for the isolation and testing of critical system components – the database server in this case. From a system perspective, this kind of testing is more stressful than would be encountered in a real customer environment.

Comparison to previous Microsoft Business Solutions performance reports

Microsoft Business Solutions has published several performance reports in the past, and while we can confidently state that we have made performance advances in specific areas of the product from release to release, it must also be noted that the testing environment continuously evolves, negating any “apples to apples” comparisons. More powerful hardware, better configurations, new versions of operating system and database management software, adjustments to the starting data set and enhancements to our solutions all contribute to overall performance.

Test Lab Configurations

This report presents the results of internal testing as performed by Microsoft Business Solutions’ Corporate Testing Lab with the following applications:

- Microsoft Great Plains Release 8.0
- Microsoft SQL Server 2000 Enterprise Edition SP3
- Microsoft Windows 2003 Enterprise Server (Server)
- Microsoft Windows XP SP2 (Client)

Testing Hardware

Server Definition – Dell PowerEdge 6650
- 4 - 3.0 GHz Xeon / 4MB Cache
- 4 GB RAM
- 1 10/100/1000 NIC
- 4 Internal drives (18.2 GIG 15K U320) Raid 10 on a PERC4/DC
- 4 - Emulex LP9002 HBA's

External Storage:
- Dell | EMC CX600 SAN
- 6 - Raid Groups consisting of 1 LUN each
  - Each Raid group consists of 14 - 36.4 GIG 15K / 2Gb Fibre Channel Drives
  - RAID level for all 6 is RAID 10
  - DATA 1, DATA2, DATA3, DATA4, LOGS, TEMPDB
- 1 - Raid Group consisting of 1 LUN
  - Raid group consists of 16 - 73 GIG 10K / 2Gb Fibre Channel
  - RAID level is RAID 5
  - ALL BACKUPS

Operating System
- Windows 2003 Server Enterprise
  - 3GB switch enabled

Testing Data

The Microsoft Great Plains data sets used in testing are configured to allow comparisons across different levels of transactions. In addition, prior to each test, after the data is restored statistics are updated in order to synchronize data distribution, index distribution and table statistics. This process is similar to the process that Microsoft SQL Server uses to maintain dynamic statistics on data in a production environment. The information supplied below represents key tables within the 240 GIG database.

General Ledger Accounts	164,000
Receivables Customers	153,106
Payables Vendors	153,000
Inventory Items	59,992
Inventory Sites	3
General Ledger Year to Date Transaction	51,541,034
Receivables Open Transactions	683,209
Payable Open Transactions	33,433
GL History	6,081,487
Receivables Transaction History	3,770,887
Payables Paid Transaction History	782,889
Sales History	
Sales History	6,667,953
Sales Line History	32,550,654
Inventory Transaction History	528,979

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