

INTEGRATE

Microsoft® **SQL Server™** 2005

Microsoft Dynamics™ NAV*

Improving Microsoft Dynamics NAV 4.0 Scalability and Performance by Using SQL Server 2005

White Paper

This paper documents benchmark results that demonstrate the superior performance and scalability of Microsoft Dynamics NAV 4.0 with SQL Server 2005 when compared to Microsoft SQL Server 2000 and the Microsoft Dynamics NAV C/SIDE database.

Date: July 2006

* Microsoft Dynamics NAV, formerly Microsoft® Business Solutions–Navision®

www.microsoft.com/dynamics/nav



Table of Contents

| | |
|---|----------|
| Introduction..... | 3 |
| Summary Results..... | 3 |
| Test Definition..... | 4 |
| Detailed Results..... | 4 |
| Test Methodology..... | 6 |
| Test Starting Data | 6 |
| Test Lab Hardware and Configurations..... | 6 |
| Comparison to Previous Performance Reports | 7 |
| Detailed Results by Task | 8 |
| About Microsoft Dynamics | 9 |

Introduction

Microsoft Dynamics™ NAV is a complete business solution that helps small and midsized companies integrate financial, manufacturing, distribution, customer relationship management, and e-commerce processes and data. This fully customizable enterprise resource planning (ERP) product is ideal for growing businesses with specialized needs.

Microsoft Dynamics NAV is designed for a global market of midmarket-segment companies with typically between 5 and 500 employees, and between 2 and 100 users, with revenues between \$1 million and \$500 million USD. Microsoft Dynamics NAV is ideal for companies with complex business processes and a strong need for a vertical focus. Industries are wholesale, manufacturing, and business services, in that order, with IT resources that range from superuser to one-person IT staff.

In February 2006, Microsoft Dynamics NAV surpassed 1 million users. This is a significant milestone and further proof that Microsoft Dynamics NAV provides real business value to small and medium-sized businesses and divisions of larger enterprises around the globe while offering a powerful business value proposition to partners.

Microsoft Dynamics NAV is easy to adapt to changing business requirements, enabling companies to grow within the solution. This means that some customers will have more users than the typical customer in the midmarket.

Microsoft has progressively optimized Microsoft Dynamics NAV to help businesses enjoy the benefits of Microsoft SQL Server™, and Microsoft SQL Server 2005 in particular. With the Microsoft SQL Server option, Microsoft Dynamics NAV offers businesses a secure, reliable, and productive platform for storing, extracting, and analyzing business data to help improve business decisions.

This paper documents test results that demonstrate that Microsoft Dynamics NAV 4.0 performs at equal or superior levels with SQL Server 2005 when compared to Microsoft SQL Server 2000 and the Microsoft Dynamics NAV C/SIDE database. This means that Microsoft Dynamics NAV customers can fully enjoy the benefits of SQL Server 2005 while improving the performance and scalability of Microsoft Dynamics NAV.

Summary Results

In December of 2005, Microsoft ran tests to compare the performance of Microsoft Dynamics NAV 4.0 Service Pack 1 on SQL Server 2005, SQL Server 2000, and the Microsoft Dynamics NAV C/SIDE database.

The tests ran on a basic, uncustomized installation of Microsoft Dynamics NAV paired with basic installations of the Microsoft Dynamics NAV C/SIDE database, SQL Server 2000 Service Pack 3, and SQL Server 2005. All tests ran with the same data set: a real-life 39-gigabyte (GB) database that contained financial, sales, and purchase data. The tests ran with these particular modules because they are the most commonly used; they are present in the majority of Microsoft Dynamics NAV installs worldwide, and usually require the least amount of customization. The tests did not include warehouse management systems and manufacturing modules, as they tend to be heavily customized and therefore difficult to test in a way that is comparable to real-world installations.

Microsoft designed the tests to reflect realistic use of Microsoft Dynamics NAV, with numbers of concurrent Microsoft Dynamics NAV sessions that simulated businesses of varying sizes. The tests ran with 43, 128, and 215 concurrent sessions divided into specific user roles (salesperson, purchaser, accountant, sales lookup, and purchase lookup), which focused only on tasks relevant to those roles. Each session processed a constant number of documents. The roles, although not exact reproductions of the extremely individualized users of Microsoft Dynamics NAV, represented basic types of roles and tasks. The tests also included large reports running in the background as other sessions ran their tasks.

Microsoft measured the number of each type of document processed per user per hour, which gives a realistic comparison for businesses of all sizes. Concurrent client sessions processed all document types simultaneously in every test. As the tests increased the number of concurrent users, the gap in the number of documents processed per user per hour between the different servers increased in favor of SQL Server 2005. By 215 users, SQL Server 2005 was allowing Microsoft Dynamics NAV to process 15.75 total documents per user per hour, compared to 10.11 on SQL Server 2000 and 11.63 on the Microsoft Dynamics NAV C/SIDE database. SQL Server 2005 also reduced blocking problems.

For more detailed information about this and other Microsoft Dynamics NAV benchmark tests, visit the Microsoft Dynamics NAV on SQL Server landing page on Partnersource:
https://mbs.microsoft.com/partnersource/sales/salestools/productfactsheets/NAV_SQLSvrOption

Test Definition

The following information may help clarify the test results:

- **The tests ran through the Navision Application Benchmark Tool for Microsoft Dynamics NAV version 4.0. Navision designed this toolkit specifically to test Microsoft Dynamics NAV performance in as realistic a situation as possible.**
- **The tests consisted of client workstations running concurrent Microsoft Dynamics NAV sessions. All sessions followed user roles that consisted of distinct tasks.**
- **Each database ran tests with different numbers of concurrent client sessions to represent businesses of varying sizes. Tests ran with 43, 128, and 215 concurrent sessions.**

Detailed Results

To simulate realistic use of Microsoft Dynamics NAV, the Navision Application Benchmark Tool for Microsoft Dynamics NAV 4.0 breaks processes into user roles and specific tasks. The toolkit further simulates actual use by running tasks with delays to mirror the time it takes a real user to accomplish a specific task.

The tests employed these user roles:

- **Salesperson**
- **Purchaser**
- **Accountant**
- **Sales lookup**
- **Purchase lookup**

Each user role consisted of at least one task:

- **The salesperson role created and posted sales orders (with five lines per order).**
- **The purchaser role created and posted purchase orders (with five lines per order).**
- **The accountant role created and posted general ledger (GL) transactions, vendor payments, and customer receipts.**
- **The sales lookup role looked up item and sales documents.**
- **The purchase lookup role looked up item and purchase documents.**

In addition to the role-based tasks, the benchmark toolkit ran these large complex reports during all tests:

- **Customer Top 10 List**
- **Inventory Top 10 List**
- **Vendor Top 10 List**

The test scenarios did not increase in complexity. The only change in the test progression was the total number of concurrent sessions and the number of sessions running per client computer.

The tests measured the number of task-specific documents that each session (or user) completed per hour. To clarify the performance of Microsoft Dynamics NAV with the different databases and numbers of concurrent sessions, the following illustration shows the total number of documents processed per user per hour. (For results broken down by individual tasks, see [Detailed Results by Task.](#))

Figure 1 Total documents per user per hour – 43 concurrent users

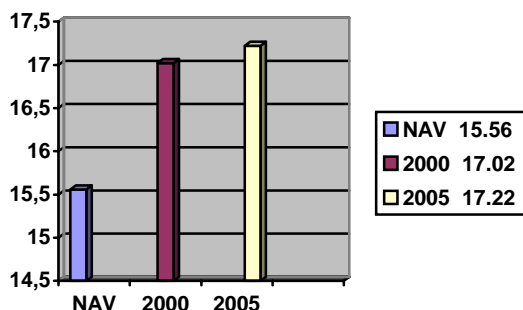


Figure 2 Total documents per user per hour – 128 concurrent users

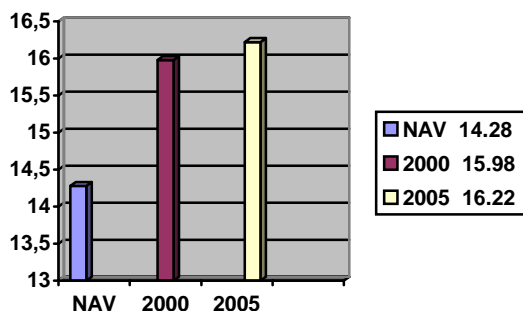
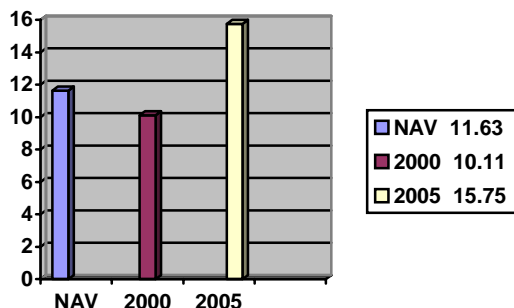


Figure 3 Total documents per user per hour – 215 concurrent users



The numbers clearly show that Microsoft Dynamics NAV 4.0 performs at a higher level with Microsoft SQL Server, and that SQL Server 2005 outperforms the other databases at higher levels of concurrent use.

In reality, this means that users can process an increased workload with SQL Server 2005. An improvement in efficiency, which is primarily a result of enhancements in the SQL Server 2005 database engine, has reduced the amount of blocking and locking that users previously experienced when running Microsoft Dynamics NAV 4.0 on SQL Server 2000. This reduction in blocking and locking allows users to process documents faster and more efficiently, which means that customers can push more business through the system.

These results emphasize that Microsoft Dynamics NAV 4.0 is a flexible and adaptable business management solution that meets customers' changing business needs, and that SQL Server 2005, which is a fundamental part of the Microsoft Dynamics NAV long term strategy, fully supports this ability to adapt to evolving business requirements. Together, Microsoft Dynamics NAV and SQL Server 2005 provide a reliable and scalable platform for growth.

Test Methodology

The tests ran on computers isolated from other activity and configured specifically for these tests. The tests ran through the Navision Application Benchmark Tool for Microsoft Dynamics NAV 4.0, which creates a realistic server load and generates random data based on predefined user roles.

Through the toolkit, the test scenario represented a complex business environment that consisted of basic business user roles and activities. Tests that represented different company sizes included varying numbers of client workstations and concurrent sessions per workstation; otherwise, the tests included no variations. The number of documents to be processed per user remained constant.

Test Starting Data

All tests ran on the same 39-GB database that contained financial, sales, and purchasing data. This database size is on the high end of average for current Microsoft Dynamics NAV installations with SQL Server. However, as the Microsoft Dynamics NAV customer base grows, the average database size is increasing.

Test Lab Hardware and Configurations

The hardware and configuration of database servers and storage hardware were the same for all tests: one HP ProLiant DL580 with four processors (hyperthread) and 8 GB of random access memory (RAM). The installation of Microsoft Dynamics NAV 4.0 Service Pack 1 and the different databases was as basic as possible, with no customization.

The client workstations ran a maximum of 10 concurrent sessions. The following table lists the number of each type of workstation.

Table 1 Client workstations

| Client workstation type | Quantity |
|----------------------------------|-----------------|
| One processor, 1 GB RAM | 20 |
| Two processors, 2 GB RAM | 21 |
| Four processors, 4 GB RAM | 2 |
| Eight processors, 16 GB RAM | 1 |
| Total client workstations | 43 |

Comparison to Previous Performance Reports

In 2004, Microsoft conducted benchmarks to measure the scalability of the Microsoft SQL Server option for Microsoft Navision version 3.7 (now named Microsoft Dynamics NAV). However, those tests compared only system performance with increasing numbers of concurrent sessions; they did not compare performance with different database systems.

Comparisons between any benchmark tests are problematic due to changes outside the scope of the tests, such as improvements in operating systems and hardware. However, one trend has clearly changed in Microsoft Dynamics NAV performance: The Navision 3.7 test showed a large drop in performance between the 50-user and 100-user tests. The test results state that the drop was due to table blocking and higher disk utilization. This trend no longer exists; SQL Server 2005 alleviates the table blocking problems described in *Benchmark Report for Navision 3.70*.

Detailed Results by Task

The following tables present the measurement of documents per user per hour, broken down into individual tasks. The tables illustrate the 43-user, 128-user, and 215-user tests.

Table 2 Documents per user per hour - 43 concurrent users

| | Create and post purchase order | Create and post sales order | Look up sales documents | Run Vendor Top 10 report | Look up vendors | Create GL transactions | Post all GL transactions | Post vendor payments |
|------------------------|--------------------------------|-----------------------------|-------------------------|--------------------------|-----------------|------------------------|--------------------------|----------------------|
| NAV C/SIDE | 2.74 | 5.35 | 2.72 | 0.42 | 2.77 | 1.05 | 0.28 | 0.23 |
| SQL Server 2000 | 2.67 | 5.74 | 2.77 | 1.49 | 2.79 | 1.05 | 0.28 | 0.23 |
| SQL Server 2005 | 2.70 | 5.91 | 2.79 | 1.42 | 2.79 | 1.07 | 0.28 | 0.26 |

Table 3 Documents per user per hour - 128 concurrent users

| | Create and post purchase order | Create and post sales order | Look up sales documents | Run Vendor Top 10 report | Look up vendors | Create GL transactions | Post all GL transactions | Post vendor payments |
|------------------------|--------------------------------|-----------------------------|-------------------------|--------------------------|-----------------|------------------------|--------------------------|----------------------|
| NAV C/SIDE | 2.45 | 5.45 | 2.31 | 0.12 | 2.30 | 1.12 | 0.27 | 0.26 |
| SQL Server 2000 | 2.51 | 6.17 | 2.32 | 1.08 | 2.32 | 1.05 | 0.25 | 0.28 |
| SQL Server 2005 | 2.56 | 6.27 | 2.34 | 1.10 | 2.33 | 1.08 | 0.26 | 0.28 |

Table 4 Documents per user per hour - 215 concurrent users

| | Create and post purchase order | Create and post sales order | Look up sales documents | Run Vendor Top 10 report | Look up vendors | Create GL transactions | Post all GL transactions | Post vendor payments |
|------------------------|--------------------------------|-----------------------------|-------------------------|--------------------------|-----------------|------------------------|--------------------------|----------------------|
| NAV C/SIDE | 1.89 | 3.63 | 2.34 | 0.07 | 2.35 | 0.93 | 0.22 | 0.20 |
| SQL Server 2000 | 1.16 | 1.87 | 2.49 | 0.82 | 2.49 | 0.93 | 0.17 | 0.18 |
| SQL Server 2005 | 2.50 | 6.28 | 2.23 | 0.82 | 2.49 | 0.95 | 0.24 | 0.24 |

About Microsoft Dynamics

Microsoft Dynamics is a line of integrated, adaptable business management solutions that enables you and your people to make business decisions with greater confidence. Microsoft Dynamics works like and with familiar Microsoft software, automating and streamlining financial, customer relationship and supply chain processes in a way that helps you drive business success.

The information contained in this document represents the current view of Microsoft Corporation on the issues discussed as of the date of publication. Because Microsoft must respond to changing market conditions, this document should not be interpreted to be a commitment on the part of Microsoft, and Microsoft cannot guarantee the accuracy of any information presented after the date of publication.

This White Paper is for informational purposes only. MICROSOFT MAKES NO WARRANTIES, EXPRESS, IMPLIED, OR STATUTORY, AS TO THE INFORMATION IN THIS DOCUMENT.

Complying with all applicable copyright laws is the responsibility of the user. Without limiting the rights under copyright, no part of this document may be reproduced, stored in or introduced into a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), or for any purpose, without the express written permission of Microsoft Corporation.

Microsoft may have patents, patent applications, trademarks, copyrights, or other intellectual property rights covering subject matter in this document. Except as expressly provided in any written license agreement from Microsoft, the furnishing of this document does not give you any license to these patents, trademarks, copyrights, or other intellectual property.

© 2006 Microsoft Corporation. All rights reserved.

Microsoft, The Microsoft Dynamics Logo, and Microsoft Dynamics are either registered trademarks or trademarks of Microsoft Corporation or Microsoft Business Solutions ApS in the United States and/or other countries. Microsoft Business Solutions ApS is a subsidiary of Microsoft Corporation.

Microsoft