

Microsoft Dynamics CRM Scalability Benchmark

Executive Summary

June 2009

Summary

Microsoft Dynamics™ CRM 4.0 is designed to help enterprise organizations attain a 360-degree view of customers, achieve reliable user adoption, adapt quickly to business change, and accelerate project delivery and returns—all on a platform that provides enterprise levels of scalability and performance.

Microsoft, together with Intel Corporation, completed benchmark testing of Microsoft Dynamics CRM 4.0 running on Microsoft® Windows Server® 2008 operating system and Microsoft SQL Server® 2008 database software running Intel Xeon 5500 series processors and using Intel® X25-E Extreme Solid State Drives. Benchmark results demonstrate that Microsoft Dynamics CRM can scale to meet the needs of an enterprise-level, mission-critical workload of 50,000 concurrent users while maintaining performance at sub-second response times.

Test results were achieved with a system running several customizations, including workflows to simulate a real-world Microsoft Dynamics CRM deployment. Standard optimization was applied using guidelines published in the *Optimizing and Maintaining Microsoft Dynamics CRM 4.0* whitepaper. Extensive customer research formed the basis of the test design, test scenarios, database sizing, and record counts used in the testing.

These results reflect a snapshot of how Microsoft Dynamics CRM 4.0 performs in a specific environment. Customers may be able to achieve higher levels of performance and scalability through further customization and a finer level of optimization.

Test Results

The results of the benchmark study validate that Microsoft Dynamics CRM 4.0 can scale to support 50,000 concurrent users in a single instance while averaging sub-second response times. Using the same machine configurations test cases and data volumes the benchmark tests were executed against user groups of various sizes to demonstrate how the application performance was affected as users were added. The following table summarizes the performance of Microsoft Dynamics CRM 4.0 with 50,000 concurrent users:

Concurrent Users	Average Response Time	Web Requests	Business Transactions	SQL Server CPU Utilization	CRM Server CPU Utilization
50,000	.12 seconds	2.4 M/hr	374,400/hr	57.2%	60.9%

With 50,000 users, the application executed a projected transaction rate of 2,995,200 business transactions per day. The test results were achieved with some tuning and optimization. Advanced tuning and optimization may deliver better user scalability.

Testing Methodology

The benchmark testing was conducted by Microsoft in partnership with Intel Corporation to demonstrate the performance and scalability characteristics of Microsoft Dynamics CRM 4.0 in conjunction with Microsoft Windows Server 2008 and Microsoft SQL Server 2008. Microsoft Dynamics CRM 4.0 with Update Roll-up 4 was used in all testing. Basic application tuning was performed using best practices outlined in the whitepaper *Optimizing and Maintaining Microsoft Dynamics CRM 4.0*.

All business transactions were based on extensive customer research and defined using the Microsoft Dynamics CRM 4.0 Performance and Stress Testing Toolkit. This toolkit, [available as a free download](#), is designed to help formalize performance testing of Microsoft Dynamics CRM by facilitating load testing in customer environments. Each business transaction represents a series of interactions between the user and the system. All test cases used for this benchmark are included in the toolkit, and can be used by customers as a basis for their own benchmarking.

BUSINESS TRANSACTIONS

Test scenarios were designed to approximate typical usage of Microsoft Dynamics CRM 4.0 by an enterprise-level sales organization based on extensive customer feedback. Simulated users performed common tasks including Create, Search, Update, and Delete for CRM entities such as accounts, contacts, and leads. Each business transaction in the testing represented a user performing an end-to-end business process involving multiple interactions between the user and the system. For example, the following activities comprise the 'Create E-mail' business transaction:

1. Open the Workplace homepage.
2. Select New under Activities to create a new e-mail message.
3. Use Find to select the recipient from the user list.
4. Enter a subject and description.
5. Select an account from the list for the Regarding field.
6. Click Save.
7. Close the form.

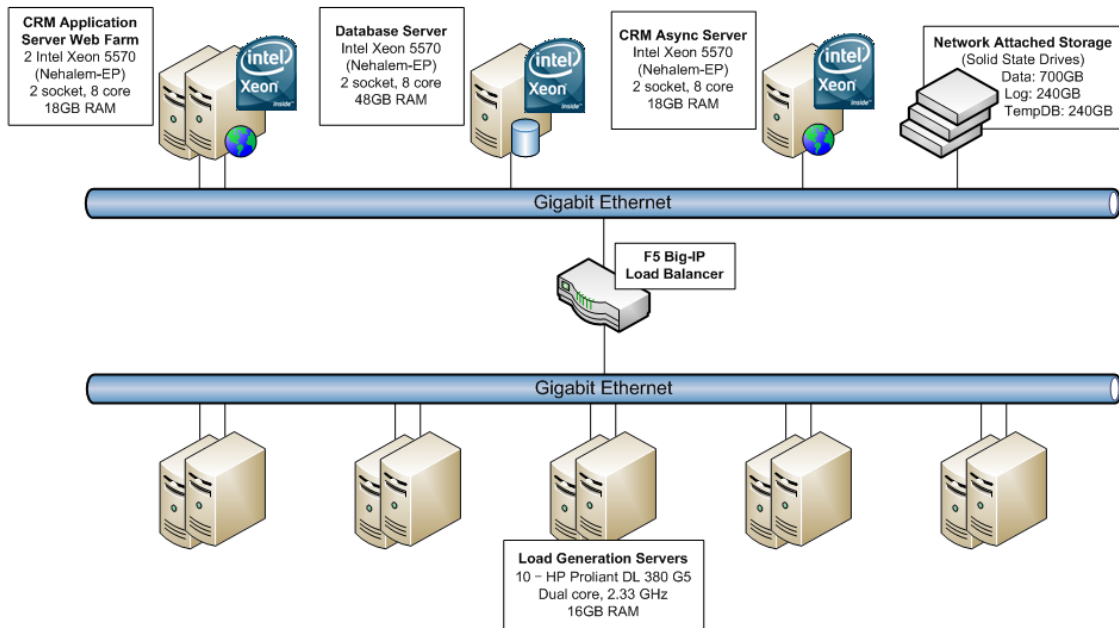
Additionally, five percent of all business transactions initiated a separate business transaction via a workflow activity. These transactions increased the amount of work the Microsoft Dynamics CRM system processed but were not counted in the total of all business transactions.

HARDWARE ENVIRONMENT

All hardware for the testing used Intel 5570 "Nehalem" processors. Database storage was from a network attached storage device using Intel X25-E 64GB solid state drives. The configuration used a F5 BIG-IP load balancer to distribute the traffic across the two Microsoft Dynamics CRM 4.0 application servers.

Figure 1 describes the servers, load balancing equipment and load generation system used in this testing.

Figure 1 Hardware description



Total cost of this environment will vary depending on specific hardware utilized. The approximate retail cost of application servers and controllers and not including load generation servers, in this environment was less than \$35,000 at the time of testing, or approximately USD \$0.70 per user. Table 1, below, describes the hardware cost of the application servers used in the testing.

Table 1 Approximate retail cost of application servers

Total Hardware Costs	\$32,700
Web Server 1	4,000
Web Server 2	4,000
SQL Server	4,500
JBOD Disk Controller	1,200
Intel X25-E SSDs (x20)	15,000
Async Server	4,000

Conclusion

Microsoft Dynamics CRM 4.0 demonstrated its ability to scale to support the needs of the largest global businesses. The benchmark testing showed that Microsoft Dynamics CRM 4.0, together with Microsoft Windows Server 2008 and Microsoft SQL Server 2008, scaled to support 50,000 users. When projected to the usage patterns of a global enterprise, these results indicate that a Microsoft Dynamics CRM implementation is capable of supporting millions of requests per day.

Microsoft Dynamics CRM helps companies realize cost benefits through deep integration with key Microsoft business applications and components, allowing companies to take advantage of existing investments in technology, infrastructure, and resources to maintain and optimize the application. Testing and benchmark results show that Microsoft Dynamics CRM is capable of supporting enterprise scenarios in the areas of user scalability and database scalability. Enterprise customers are taking advantage of the scalability and performance of the Microsoft Dynamics CRM platform. Contact your Microsoft representative for more information.