

Benchmark Report

Microsoft Dynamics AX 2009

Enterprise Portal Benchmark – Order Entry for 1100 Concurrent Users with 58000 Lines per Hour

Date: June, 2008



In June 2008, Microsoft Corporation conducted a benchmark to measure the performance and scalability characteristics of the Microsoft Dynamics AX™ 2009 Enterprise Portal Solution in a simulated distribution scenario. This benchmark exercised core Accounts Receivables scenarios involving sales order creation thru Enterprise portal. The scenario generated load on Enterprise Portal Servers, Application Object Server (AOS)—in this benchmark, each AOS instance was hosted on a separate server. In a Microsoft Dynamics AX system, the AOS processes business logic in communication with clients and the database.

The Benchmark Architecture comprised of two load balanced AOS servers and four Enterprise Portal server in addition to one Reporting Server. The benchmark showcased 58,000+ lines created in an hour with Enterprise Portal servers running at ~75% load, Application Object Servers (AOS) servers around ~35% and SQL server around ~71% CPU. This workload was conducted with ~1100 Concurrent Users

Results Summary

The benchmark was conducted around the following core scenario:

Scenario 1: Sales Orders

- **Description:** Scenario to showcase ability to create sales orders thru Enterprise Portal without hitting scalability or response time issues.
- **Goal:** Provide a good sizing data point for customers/partners for the EP, AOS and database servers, with representative functionality.

High Level Results Summary

Server Type	Server Count	Server CPU%
Enterprise Portal Server	4	76.7% 75.4% 74.2% 76.4%
Application Object Server	2	35.8% 35.9%
Database Server (OLTP and SSAS)	1	71.3%
SSRS Server	1	33.4%

Response Times

Name	Response Time (sec)
Role Center Page	3.62
SO Create Finish	1.89
Report	1.48
Order Information	1.09
SO Line Add Popup OK	1.04
SO Lines Reload	1.02
SO Line Add	0.97
SO Delivery Address Next	0.95
SO Lines Update	0.84
SO Header Creation Next2	0.81
SO Header Creation Page	0.81
SO Delivery Address Load	0.69
SO Header Creation Next1	0.69
Logout	0.21

Transaction Counts

Measure	Count
Number of Sales Orders Created	7252
Number of Order Lines Created	58016

Benchmark Transaction Profile – Scenario : Sales Order

The workload consists of the transactions described in the following table.

Sales Order creation thru Enterprise Portal	8 Line Item Sales Order <i>Login to Order Processor Role Center (Susan Person)</i> <i>Create Sales Order Header</i> <i>Add 8 lines</i> <i>Add delivery address</i> <i>Save Sales Order</i> <i>Review Sales order</i> <i>Log out</i>
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Benchmark Methodology

Microsoft Corporation’s Visual Studio Team Suite (VSTS) was used as the load driver, simulating concurrent users through Microsoft Dynamics AX Enterprise portal. A business transaction was simulated at an average rate of once every nine minutes for each concurrent user.

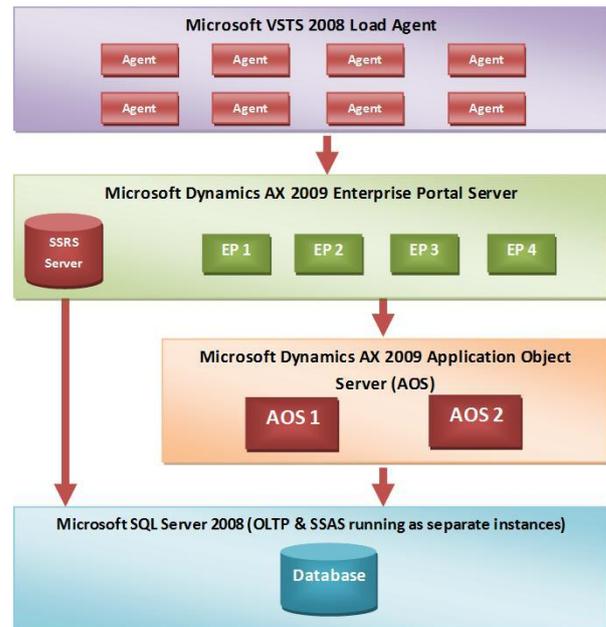
Measurements were recorded on all servers and were measured when the concurrency reached steady state. Steady state was maintained for a minimum of 60 minutes with repeat runs within acceptable deviation of throughput and response times.

VSTS was used to record Interactions with Enterprise Portal. Load test Scripts built from these recordings were used to simulate the high volume workload thru VSTS Load Agents.

Additional Notes:

- All runs had a minimum steady state of 1 hour.
- Ramp up duration was 16 minutes
- Scenarios were considered successful when deviations between runs were within 3% in terms of response time and system utilization.

Benchmark Configuration



Hardware Layout and Configuration

4 EP servers, 2 AOS servers, 1 Report Server, 1 database server were used for the benchmark.

Application Object Server (AOS) Server Specification

Fujitsu RX 300 S3, 2 Proc Dual Core, Intel Xeon E5345 2.33 GHz
 Memory 16 GB RAM
 HardDisk (BootDrive)
 HardDisk (PageFile)
 Network Broadcom NetXtreme Gigabit Ethernet

Application Object Server (AOS) Software Settings

64-bit version of Microsoft Windows Server® 2008 Enterprise Edition
 Single AOS instance per server

Enterprise Portal (EP) Server Specification

Fujitsu RX 300 S3, 2 Proc Dual Core, Intel Xeon E5345 2.33 GHz
 Memory 16 GB RAM
 HardDisk (BootDrive)
 HardDisk (PageFile)

Network Broadcom NetXtreme Gigabit Ethernet

Enterprise Portal(EP) Software Settings

64-bit version of Microsoft Windows Server® 2008 Enterprise Edition
Single IIS instance per server
Share pointer server

SSRS Report Server Specification

Fujitsu RX 300 S3, 2 Proc Dual Core, Intel Xeon E5345 2.33 GHz
Memory 16 GB RAM
HardDisk (BootDrive)
HardDisk (PageFile)
Network Broadcom NetXtreme Gigabit Ethernet

SSRS Report Server Software Settings

64-bit version of Microsoft Windows Server® 2008 Enterprise Edition
SQL Server 2005 Report server

Database Server Specification

Fujitsu RX 600 S3 4 Proc Dual Code, Intel Xeon EM 64T, Memory 32 GB RAM
HardDisk (BootDrive)
HardDisk (PageFile)
Network Broadcom NetXtream Gigabit Ethernet

Database Software Settings

64-bit version of Windows Server®2008 Enterprise Edition
64-bit version of Microsoft SQL Server 2008 RC

Database Disk Configuration

Hitachi SAN USP 600 Tagmastore
120 72GB 15K RPM disks

(Data Volumes)

Each LUN = 8 x 72GB 15K RPM disks in RAID 10
11 such LUNs were used for 11 data files

(Log Volume)

1 LUN = 8 x 72GB 15K RPM disks in RAID 10
1 log file in this LUN

(TempDB)

1 LUN = 8 x 72GB 15K RPM disks in RAID 10

8 TempDB database files in this LUN

1 LUN = 8 x 72GB 15K RPM disks in RAID 10

1 Temp DB log file in this LUN

Benchmark Data Composition

The benchmark was run on a 177 GB base database. The system was configured as follows:

- 1,000,000 customers across 100 customer groups
- 150,000 items across 100 item groups
- Pricing enabled for all items (Quantity >10 gets 2% line discount or total sale > \$ 500 gets 2% discount
- Chart of Accounts set up to generate 22 entries per 10 line sales order
- One Sales Tax Code set up for orders
- 10 different Miscellaneous Charges per company
- Commission calculation set up
- History:
 - 5.25 million Invoiced sales orders,
 - 21.5 million lines

Disclaimer

These benchmark results were returned in a controlled lab environment, with Microsoft Dynamics AX 2009 as the running applications (No other applications running on these servers). The benchmark was executed on optimized hardware, using the Microsoft Dynamics AX 2009 SYS layer without reporting activity during execution. This benchmark is accurate only for the listed hardware, non-customized version of Microsoft Dynamics AX, transaction mix, data composition, and indexes. Microsoft Dynamics is publishing a Benchmark Toolkit for Microsoft Dynamics AX in October 2009 on CustomerSource and PartnerSource. Any customer or partner running benchmarks on their own system should expect varying results based on their hardware, customizations, transaction mix, data composition, and indexes. Transaction mix and data composition will have an effect on sizing and hardware requirements. Inherently, Microsoft believes that the Dynamics AX 2009 Stack and application is built to scale and changes to the code base need to go thru localized performance testing.

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