IBM and Infor Lawson ERP applications: workload optimization on the new IBM PureFlex System

Enterprise software in an easily managed delivery platform

Paul Swenson IBM Systems and Technology Group ISV Enablement

October 2012

© Copyright IBM Corporation, 2012

Table of contents

Abstract	1
Introduction	1
Prerequisites	1
The Infor Lawson application suite	1
The IBM PUREFLEX environment	3
Test results	4
Installation	4
Test execution experience	4
Infor Lawson applications PUREFLEX test results	8
General Ledger Batch Benchmark	8
Accounts Payable Batch Benchmark	9
Payroll Batch Benchmark	
Infor Enwisen Payroll and HR Online Benchmark	11
Summary	13
Reference	14
Trademarks and special notices	15



Abstract

The power of a centrally managed, consolidated computing platform, which the IBM PUREFLEX computing environment delivers, lends itself ideally for use by business and data center providers. This paper describes the testing of the Infor Lawson enterprise resource planning (ERP) product suite on the IBM PUREFLEX System.

Introduction

The goal of this project is to verify and validate a customer like Infor[™] Lawson ERP application setup running in the IBM® i and Microsoft® Windows® environments. This test positions Infor Lawson applications to take advantage of the consolidation and flexibility offered by the new PUREFLEX Systems.

Prerequisites

The test of the Infor Lawson applications on the new IBM PUREFLEX System required the configuration and use of both hardware and software. The objective of this project is to enable and test the Infor Lawson applications in a virtualized environment that included:

- IBM POWER7® compute node
- Intel® compute node
- IBM Storwize® V7000 storage area network (SAN) disk storage
- Virtual I/O Server (VIOS)
- Microsoft Windows 2008 on three partitions, two cores each
- IBM i OS V7R1 TR3 partition with two cores
- Infor Lawson 10.0.1 applications
- Infor Workspace 10.1.3

The Infor Lawson application suite

With Infor Lawson applications, you get enterprise resource planning (ERP) software solutions that focus on your industry to provide you the competitive advantage and flexibility you expect in best-practice business process automation. The market-leading solutions from Infor are tailored to meet the specific conditions and requirements of individual industries. Refer to the solutions at the following URL for more details:

Infor Lawson Industry Solutions

http://www.lawson.com/Industries/

As Infor understands these industries, they are ideally suited to help customers make well-informed strategic decisions in the areas that matter the most to them.



Enterprise software suites derived using Infor expertise is tailored to meet the specific conditions and requirements of individual industries.

The Infor Lawson ERP solution tested here are applications which run on both IBM i and Microsoft Windows servers.



The IBM PUREFLEX environment

The PUREFLEX environment consists of one POWER7 node that contained one IBM i partition and one Intel node with two Windows 2008 partitions. The following core Infor Lawson applications were loaded on to a 2-socket / half-wide POWER7 compute node with 16 available processor cores and 64 GB memory. VIOS was installed as the bootable operating system. One IBM i partition was created and IBM i V7R1 TR3 was installed. The partition was given four processors and 32 GB of memory. The storage used to back up and store the operating systems and the Infor Lawson applications was a Storwize V7000 SAN storage device.

Core applications:

- Infor Lawson System Foundation
- Infor Lawson applications
- Infor portal for workspace
- IBM HTTP Server
- IBM WebSphere® Application Server

The following Infor Lawson Microsoft Windows technology-based applications were loaded on to a 2socket / half-wide Intel compute node with 16 available processor cores and 64 GB of memory Using VMWare VSphere, two Windows 2008 Server partitions were created as follows: Partition A with four cores and 8 GB of memory and Partition B with four cores and 8 GB of memory.

Partition A:

- Infor Workspace
- Microsoft SharePoint
- Microsoft SQL Server Express Edition
- Active Directory Server
- Perl
- Java

Partition B:

- Infor ION Grid
- Infor Landmark Technology with Infor Process Automation
- Infor Process Server
- Perl
- Java



Test results

The sections below describe the installation process that was used as well as tests that were done to validate Infor Lawson applications on the new IBM PUREFLEX System.

Installation

Installation of the core Infor Lawson applications both on the IBM i and Windows operating environments was done following the Infor Lawson Installation Guide for each application. In addition security for all applications was done through the Active Directory domain using Kerberos. Both the Active Directory server and Kerberos tickets were generated and configured following the guidelines in the Infor Lawson 10 installation guides.

Test execution experience

Figure 1 shows the PUREFLEX environment that was created, the Infor Lawson applications that were installed, and the server on which they were installed. This setup was chosen because it is similar to a real-customer environment.

Intel compute node	with 16 cores and 64Gb of memory
Partition A: Landmark/IPA Server	Partition B: Landmark/IPA Server
Infor Workspace	Infor ION Grid
Microsoft SharePoint	Infor Lawson Landmark
Active Directory Server	Infor Process Server
ActivePerl	ActivePerl
Java Developer Kit 1.6.026	Java Developer Kit 1.6.026
MS SQL Server 2008 R2 Express Edition (x64)	Windows Server 2008 R2 Enterprise x64 Edition
Windows Server 2008 R2 Enterprise x64 Edition	4 cores and 8 GB of memory
4 core and 8 GB of memory	
Power7 compute not	de with 16 cores and 64Gb of memory
Core App	lication Server (IBM i)
Infor Lawson System	n Foundation
Infor Lawson Applica	ations
Infor Lawson Portal	for Workspace
IBM Technology for	Java (IT4J) 1.6
IBM WebSphere App	plication Server ND 7.0
IBM HTTP Server	
IBM i 7.1 TR3	
4 POWER7 cores an	nd 32 GB of memory



After setting up the environment, tests were performed to validate proper functioning of the environment. These tests allowed the team to validate that the Infor Lawson applications installed on the IBM i and Windows partitions were fully functional and behaving as expected. The following smoke tests were performed.

Installation smoke tests

- Infor Lawson SharePoint installation smoke tests, as listed in the installation guide, were performed to verify the functionality of both the Infor Lawson System Foundation and Infor Lawson portal for workspace.
- Infor Workspace and SharePoint installation smoke test, verifies that both Infor Workspace and SharePoint could be started and connected to Infor Lawson System Foundation.
- A process flow was created and run as the smoke test to verify that Infor Process Designer, Infor Process Server and Infor Landmark Technology could be started and connected to Infor Lawson System Foundation.

Additional validation

The screen shots below show additional validation tests that were done to show that the applications setup here were working as expected. Figure 2 shows the logon to Infor Workspace through the Active Directory Domain, Figure 3 shows a successful launch of the Infor Workspace home page, Figure 4 shows a successful batch job that was run through SharePoint, Figure 5 shows a successful run of a process through Infor Process Designer, and Figure 6 shows the new value the process added via Infor Workspace.



Figure 2: Infor Workspace logon



🥭 Home - Sharepoint 80 - Wir	dows Internet Explorer								
Shifts 1 and 1	bmc.ibm.com/default.aspx 🔎	• + ×	🔢 Home - Sharepoir	nt 80 🗙					ଳ 🛧 🌣
Site Actions 🔹 🚺 🛛 Browse	Page			INTO	DR'				Lawson User 🔺 🗙
H	lome								
	Group Calendar								What's New 🔻
	🔶 ᡝ July 29 - Au	gust 04 2012	2						Personal Items
	00.	-	20.14-24-0	Turne days 4 14/a	darendari 2 Thi		2 Feider	4 Caburdan	There are no items to show in this view.
TT Home		29 Sunday	SU Monday ST	Tuesday T we	unesday 2 mu	ursuay	5 Fliday	4 Saturday	
A Lawson S3	Law son User >	c							whereabouts •
VS3 2411551155							🖶 Ad	d	[All users]
	Add Person:								There are no users in the group that you selected. To add users, click here to add.
									< Prev 1 Next >
	8/11								
	Add Resources								Links •
	Appouncemente							-	There are currently no favorite links to display. To add a new link, click "Add new link".
	There are currently no a	active annound	cements. To add a	new announceme	ent, click "Add	new anne	ouncement".		
									Add new link
	+ Add new announcer	nent							

Figure 3: SharePoint Infor Workspace home page

😅 nccp://win-co5an3zncn8.ia	wsul.omc.iom.com/Lawson%	053/SitePages/Default.as	px - windows Internet Exp	norer			
🔆 📀 🗢 🎑 http://win-co5	ian32hth8.law901.bmc. ib 🄎 💌	😏 🔀 🏉 ibm.com	×				ŵ
Site Actions - Browse Pa	age		INTOR			La	wson User 🦼
	Bookmarks					cu201	Q, ,
INTOR	Job Schedule - LAW SON						v ≎ ×
	Job Actions 💌 Inquire	earch Find Next Reset	Printable View			R	elated Forms 🔻
the Home	User Name LAWSON					Auto Monito	r
S3 Lawson S3	Active Jobs Waiting Jobs	Completed Jobs					
	Job Name	Parameters	Job Queue	Start Date	Stop Date	Status	
	CU201A	CU201	QBATCH D	8/03/2012 14:26:14 0	B/03/2012 14:27:41 N	Jormal Completion	<u> </u>

Figure 4: Successful run of CU01 Batch Job



Actives: 23 rocess Name: CU01 A Name In End Es Start S Stert S Properties: 23 Toperty V V V V V V V V V V V V V V V V) Ad d 30 d 30 d 30 d 30 at 30 at	toxky Type END SSTAN START	start	
Properties 23	ad Add	tixity Type END S3TRN START	Start Start Start Start Erd	
Name II End E S3Txn S Start S IProperties 23 voorty	> Add	twdy Type END S3TNN START	start	
End E End E STATA	nd 🤤	END \$337XN \$TART	Start	
S37xn S Start S Properties 23 roperty V V	JTANG330 Q	S3TAN START	Start	
Start S	art 🕑	START	Sart	
] Properties 23			S3Dm	
] Properties 23			S31xn	
Properties 23			S37xn	
Properties 23			S31m	
Properties 23			Silvn	
Properties 23			וגונב	
Properties 23				
Properties 23				
Properties ⊠				
roperties 23				
operty V				
	lue			
			9 Process Issues 89 Variables 59 Debug 🗳 Console 🙁	🖼 🔠 🖂 🖼
		<0	Completed> Process: CU01 - CU01	
		53	3Txn3330_informationCode = 0	
		33	sixn3330_returnnessage = Currency code created Tur2320_returntessage = Currency code created	DISLAMADDOCC DDI
		30	Tribits completed. STrn330	DEVERWAFF5
			Service compression services	
		Ac	ctivity started: End (Run Id: 7)	
		Ac	ctivity End: Executing End activity	
		En	nd_errorCode = 0	
		En	nd_informationCode = 0	
		En	nd_returnMessage =	
		En	nd_outputData =	
		AC	Stivity completed: End	
		11	1000000 completed - 00/03/2012 14.11.00	
		Pr	rocess ran successfully	
		In	nformation code: 0	
		Re	eturn message:	
		0u	utput data: (null)	
		Fi	inished: Aug 3, 2012 2:11:06 PM CDT	

3 for Workspace - Currency Code (CU01.1) - W	Vindows Internet Explorer			
📀 🗢 🧭 http://ngp1b4i4.law901.bmc. ibm)	🔎 🖻 [Drill Around® We	bpage Dialog		X
Bookmarks	Close Search	Find Next Reset Printable View Explorer	View	
rrency Code (CII01 1)	CURRENCY CODES			
	Currency	Description	Expression	Decimals
Special Actions * Add Change Delete Pre	evious Ing MIKE	MIKE	MIKE	Two Decimals
	USD	United States Dollar	USD	Two Decimals
	View 25 - Records	Previous 25	Next 25	Records 1 - 2



Infor Lawson applications PUREFLEX test results

The following results are from the Infor Lawson application's batch and online benchmark tests. Tests were run using Infor Lawson 9.0.1 System Foundation and Infor Lawson 9.0.1 applications. Infor Lawson 9.0.1 was used since, at the time this report was written, this was the most current level that benchmark scripts and data were available for. The results obtained here are inline with previous measurements that have been done on POWER7 systems (see Reference section). When taking into account that the test here used a configuration with significantly less memory and disks than the previous results, this also demonstrates that the results obtained here are in line with or better than expected.

General Ledger Batch Benchmark

For this batch test the Infor Lawson benchmark kit was used to create data for and facilitate the testing of the following Infor Lawson General Ledger (GL) closing processes:

GL165, GL190 and GL199.

The database was created with an extra large volume size of 256,000 journal entries plus a default of 6 months of general ledger history. For GL165, 64 distinct run groups, or jobs, were created, each with 4,000 journal entries. For GL190 there were 4 distinct run groups, and for GL199 there was only one run group.

To execute the test, the benchmark kit submits all run groups for each of the GL tests, GL165, GL190 and GL199. Results are calculated as the total time it takes to complete all of the run groups for each GL process. To show the scalability of both Infor Lawson 9.0.1 and IBM PureFlex System the job queue definition was changed to allow one or more jobs to run in QBATCH at one time.

Results:

GENERAL LEDGER PROCESS	PROGRAM	ELAPSED TIME (HH:MM:SS) BY NUMBER OF CONCURRENT JOBS			
		1	2	8	16
Interface Journal Entries	GL165	0:05:43	0:03:36	0:01:31	00:01:27
Journal Posting	GL190	0:00:48	00:00:31	00:00:20*	00:00:20*
Period Closing (Single job)	GL199	00:00:03	00:00:02	00:00:03	00:00:03
Average CPU Utilization		14 %	21%	36%	35%

Table1: GL Batch Transaction

* configured for four concurrent jobs

Note: Times reported are the total time required to complete all job groups for each GL process

Accounts Payable Batch Benchmark

For this batch test the Infor Lawson benchmark kit was used to create data for and to facilitate the testing of following Infor Lawson Accounts Payable (AP) closing processes:

AP520, AP150, AP155, AP170, AP175, AP125, AP265, and AP195.

The database was created with a large volume size of 120,000 invoices plus a default of 600,000 historical invoices for accounts payable history. For all transactions, except AP195, 12 distinct run groups, or jobs, were created each with 10,000 invoices to process. For AP195 there was only one distinct run group.

To execute the test the benchmark kit submits all run groups for each of the AP tests, AP520, AP150, AP155, AP170, AP175, AP125, AP265, and AP195. Results are calculated as the total time it takes to complete all the run groups for each AP process. To show the scalability of both Infor Lawson 9.0.1 and IBM PureFlex System the job queue definition was changed to allow one or more jobs to run in QBATCH at one time.

Results:

ACCOUNTS PAYABLE PROCESS	PROGRAM	ELAPSED TIME (HH:MM:SS)		
		By Numb	er of Concur	rent Jobs
		1	6	12
Invoice Interface	AP520	0:15:54	0:05:09	0:04:58
Expense Invoice Release	AP125	00:11:44	00:03:31	00:02:58
Cash Requirements	AP150	00:03:39	00:01:28	00:01:14
Payment Forms Creation	AP155	00:02:26	00:01:07	00:01:04
Check Register	AP265	00:12:15	00:04:11	00:03:14
Payment Closing	AP170	00:12:44	00:03:29	00:03:18
Invoice Distribution Closing	AP175	00:00:02	00:00:01	00:00:01
Period Close (Single Job)	AP195	0:00:19	00:00:11	00:00:11
Average CPU Utilization		14%	56%	78%

Table2: AP Batch Transaction

Note: Times reported are the total time required to complete all job groups for each process

Payroll Batch Benchmark

For this batch test the Infor Lawson benchmark kit was used to create data for and to facilitate the testing of the following Infor Enwisen Payroll (PR) processes:

PR140, PR160, PR197, and PR198.

The database was created with a medium volume size of 96,000 employees with a retail client type and 50 positions. In addition, a default of three years of payroll history data was created. For all transactions 48 distinct run groups (process levels), or jobs, were created each with 2,000 employees to process.

Note: A retail client type is defined as one that has 20% exempt employees and 80% non-exempt employees.

To execute the test the benchmark kit submits all run groups for each of the PR tests, PR140, PR160, PR197, and PR198. Results are calculated as the total time it takes to complete all the run groups for each PR process. To show the scalability of both Infor Lawson 9.0.1 and IBM PureFlex System the job queue definition was changed to allow one or more jobs to run in QBATCH at one time.

Results:

PAYROLL PROCESS	PRO-		ELAPSED TIMI	E (HH:MM:SS)			
	GRAM	By Number of Concurrent Jobs					
		1	2	4	8		
Calculate Gross to Net	PR140	1:29:04	0:51:28	0:31:07	0:20:33		
Print Checks	PR160	0:37:23	0:21:46	0:13:26	0:08:57		
Payroll Close	PR197	2:22:27	1:28:17	0:58:50	0:42:29		
Posting	PR198	2:16:10	1:23:08	0:38:03	0:32:26		
Average CPU Utilization		17%	28%	44%	67%		

Table 3: PR Batch Transaction

Note: Times reported are the total time required to complete all job groups for each process

Infor Enwisen Payroll and HR Online Benchmark

This Online Performance Test executes online Payroll and HR processes (PR36 and HR11) for Infor Lawson System Foundation 9.0.1. The Infor Lawson benchmark kit uses the HP LoadRunner load generation tool to simulate a number of virtual users entering PR36 or HR11 transaction at a reasonable rate through Infor Lawson Portal.

Each PR36 transaction adds three time records for an existing employee to the database. Each HR11 transaction adds a new employee record to the database. The HR11 and PR36 database was built using 12,000 employees with 12 time records per employee, retail client type and 500 supervisors as the base data set. No history data was generated for this database.

Note: A retail client type is defined as one that has 20% exempt employees and 80% non-exempt employees.

The chart below shows results for PR36 with 2,000 and 4,000 users. As the chart shows with 2,000 users IBM PureFlex System is able to process 38,375 PR36 transactions per hour using 12% CPU. With 4,000 users IBM PureFlex System is able to process 76,561 PR36 transactions per hour using 25% CPU. Response times were sub second for all tests.



Figure 7: PR36 online Transaction

The chart below shows results for HR11 with 500 and 1,000 users. As the chart shows with 500 users IBM PureFlex System is able to process 6,667 HR11 transactions per hour using 7% CPU. With 1,000 users IBM PureFlex System is able to process 13,325 HR11 transactions per hour using 131% CPU. Response times were sub second for all tests



Figure 8: HR11 online Transaction



Summary

The setup for this test was done to approximate a real-customer environment. A test run of this environment on the IBM PUREFLEX system and functional testing by Infor Lawson applications indicated that the POWER7 node was very responsive and stable. The test team did not need to tune any of the known IBM i performance knobs although the Rochester team applied the already known performance tuning techniques to VIOS / Storwize V7000 and IBM i when the environment was created. With multiple functional tests running on the system, the Infor Lawson software ran as expected without any application issues. Also, even though the focus of these tests was to verify functional compatibility, the team also noticed that the systems lived up to the expected performance guidelines.



Reference

Lawson 9.0.1 on IBM i V7.1 and IBM POWER7

http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP101816



Trademarks and special notices

© IBM Corporation 1994-2012. All rights reserved.

The following terms are trademarks of the International Business Machines Corporation in the United States, other countries, or both:

AS/400®	OS/400®
i5/OS®	System i™
IBM®	Redbooks®
IBM i ™	Redbooks (logo) ®
iSeries®	WebSphere®

References in this document to IBM products or services do not imply that IBM intends to make them available in every country.

Trademarks of International Business Machines Corporation in the United States, other countries, or both can be found on the World Wide Web at http://www.ibm.com/legal/copytrade.shtml.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.

Information is provided "AS IS" without warranty of any kind.

The customer examples described are presented as illustrations of how those customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics may vary by customer.

Information concerning non-IBM products was obtained from a supplier of these products, published announcement material, or other publicly available sources and does not constitute an endorsement of such products by IBM. Sources for non-IBM list prices and performance numbers are taken from publicly available information, including vendor announcements and vendor worldwide homepages. IBM has not tested these products and cannot confirm the accuracy of performance, capability, or any other claims related to non-IBM products. Questions on the capability of non-IBM products should be addressed to the supplier of those products.

All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Some information addresses anticipated future capabilities. Such information is not intended as a definitive statement of a commitment to specific levels of performance, function or delivery schedules with respect to any future products. Such commitments are only made in IBM product announcements. The information is presented here to communicate IBM's current investment and development activities as a good faith effort to help with our customers' future planning.

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput or performance improvements equivalent to the ratios stated here.

Photographs shown may be engineering prototypes. Changes may be incorporated in production models.