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

Enterprise software in an easily managed delivery platform

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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 2-socket / 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.
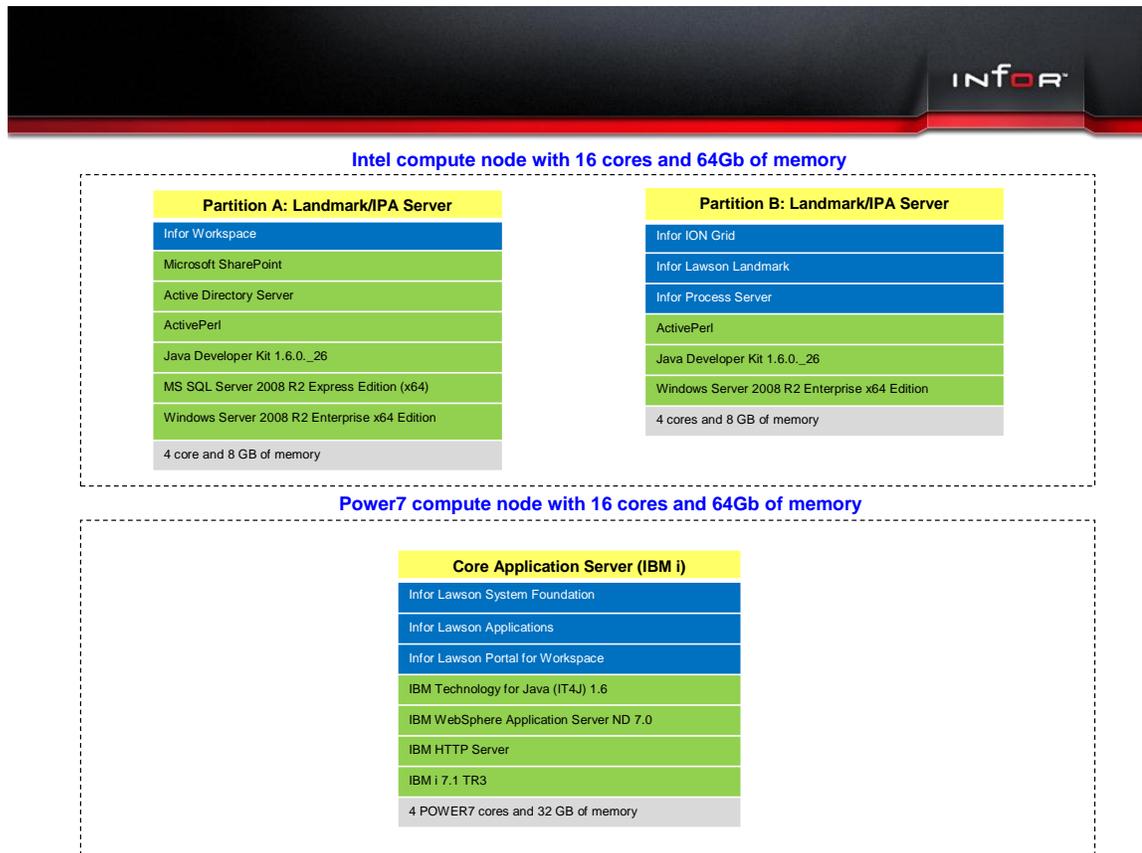
Figure 1: Infor Lawson PUREFLEX test environment

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.
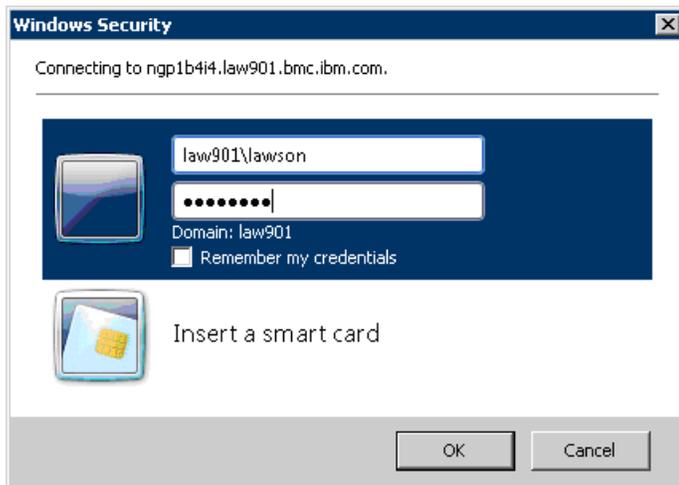
Figure 2: Infor Workspace logon
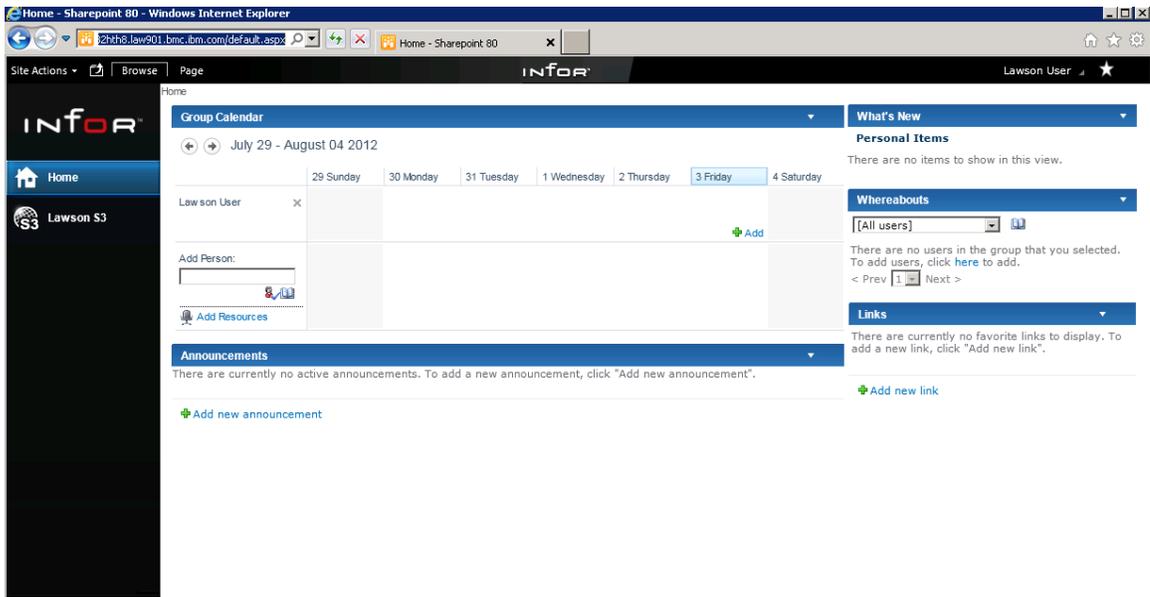
Figure 3: SharePoint Infor Workspace home page
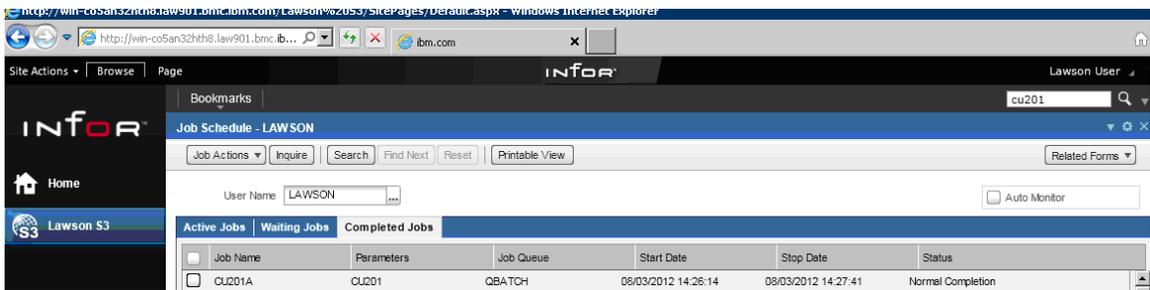
Figure 4: Successful run of CU01 Batch Job
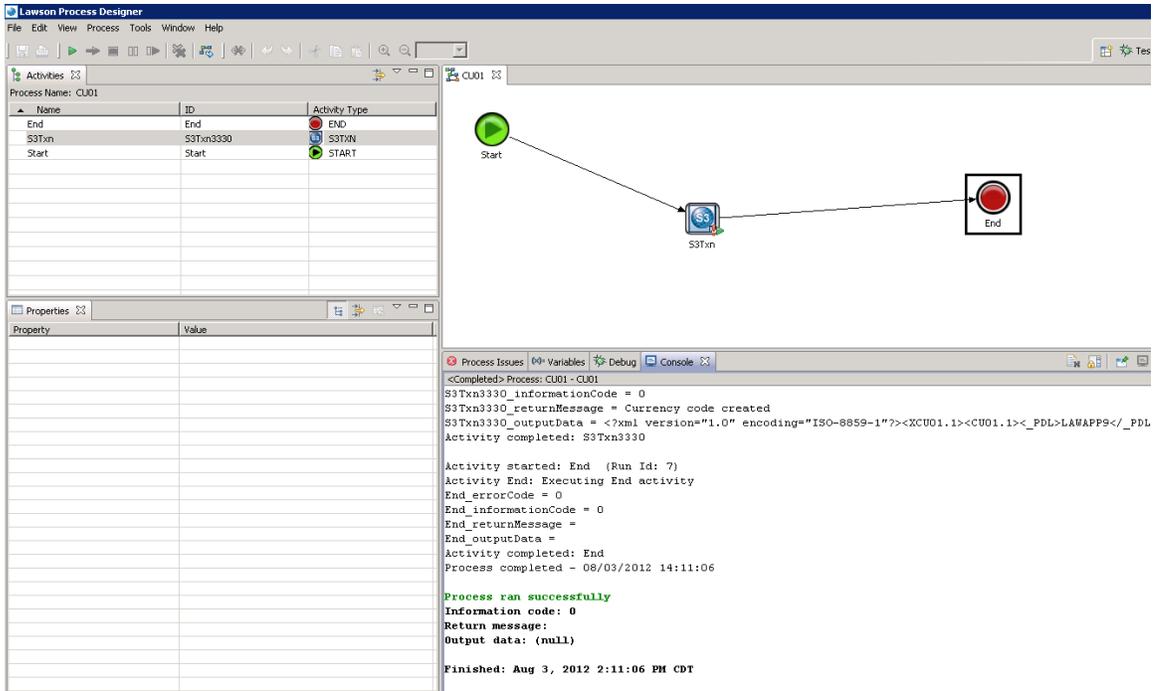
Figure 5: Successful run of a process through Infor Process Designer
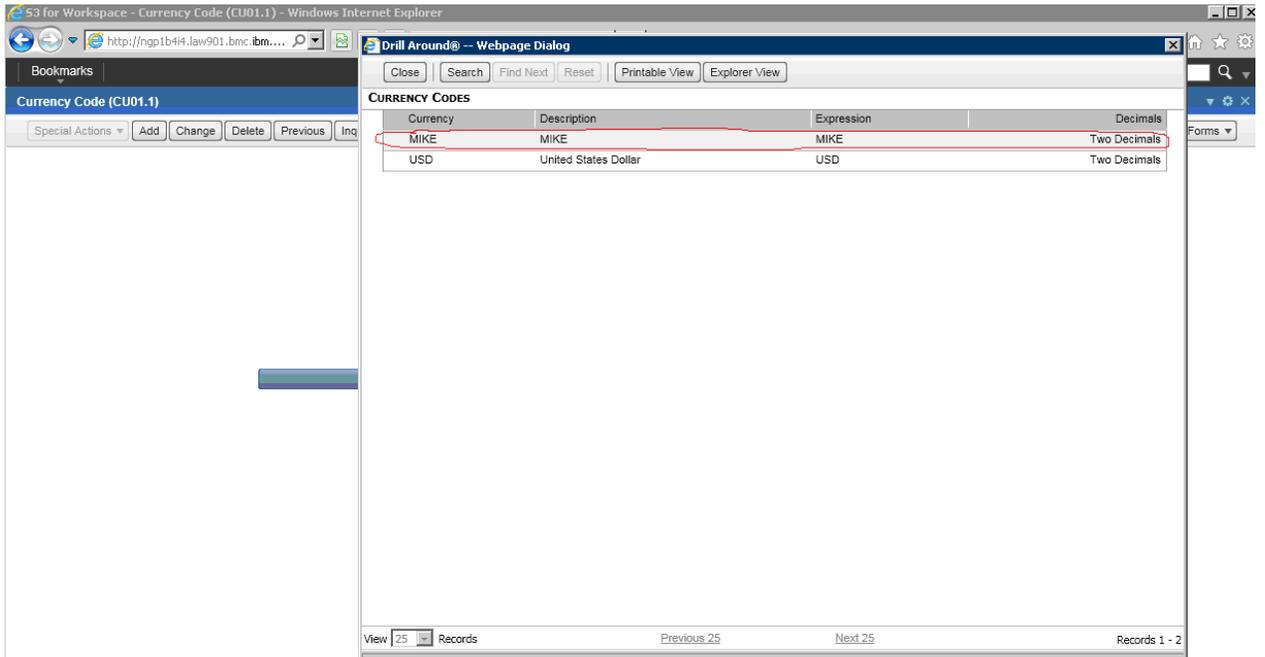
Figure 6: New value added by process that was run

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 Number of Concurrent 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-GRAM	ELAPSED TIME (HH:MM:SS) 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.
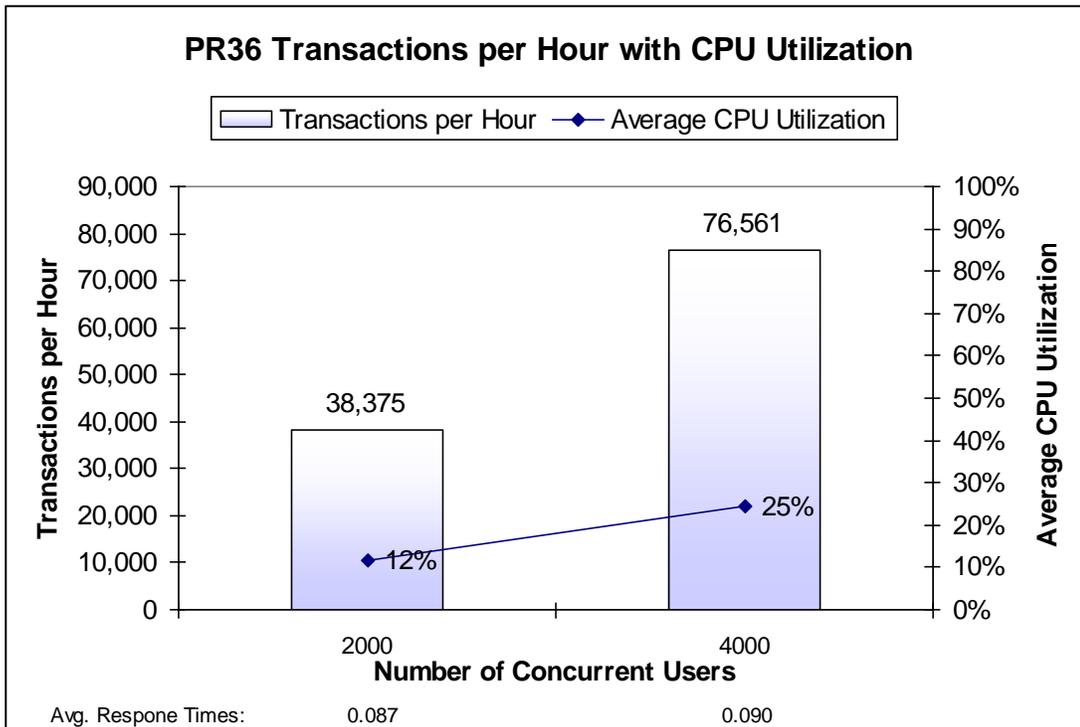
Figure 7: PR36 online Transaction

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
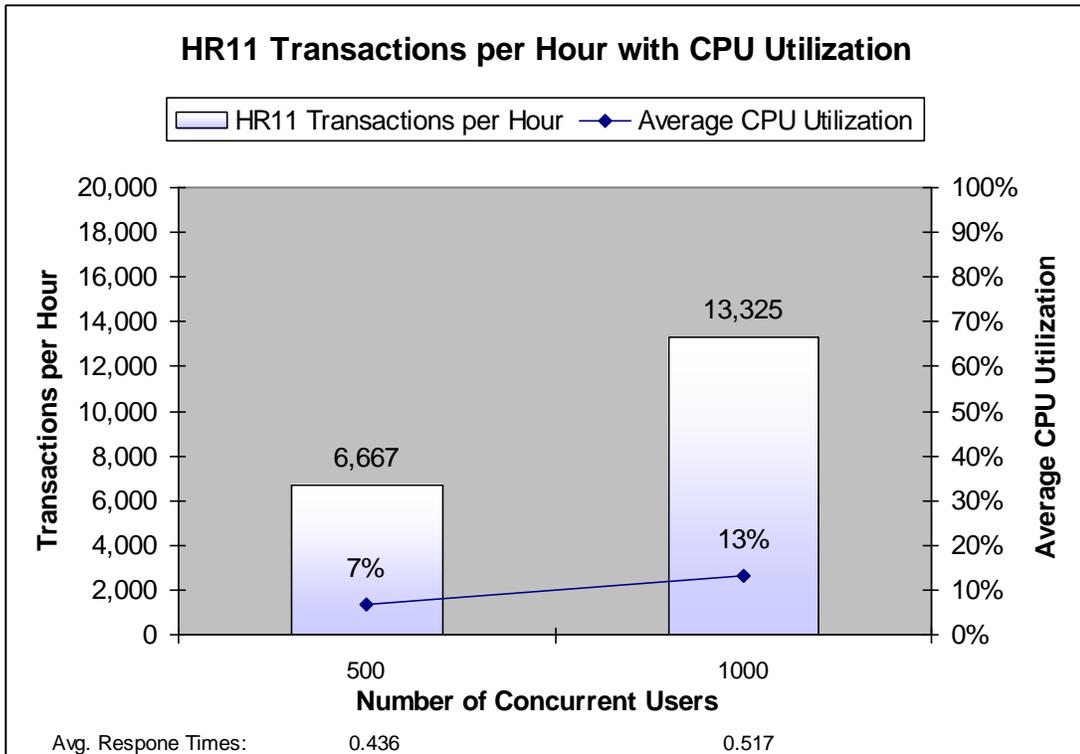
Figure 8: HR11 online Transaction

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

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