Lawson M3 on IBM Power 740 Express

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Statement of Approval

Lawson M3 has reviewed, verified, and approved results for their applications which are shown in this report.

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Introduction

This paper describes testing that was done with Lawson M3 on the new IBM® Power 740 Express and the IBM i™ operating system. This report highlights the benefits of the latest low end IBM POWER® hardware and shows the enhanced scalability it can provide. First it shows how runtime performance the new POWER7® 740 has improved over the previous POWER6® 520 model. Second it shows scalability of the new IBM Power 740 with up to 6 processors. In addition when you combine the benefits of the new low end POWER7 hardware with the IBM i Solution Edition for Lawson you can create a complete hardware and software solution that is low cost and competitively priced.

The IBM i Solution Edition for Lawson is an infrastructure solution specifically designed, configured, and priced to reduce the cost, complexity, and risk of deploying Lawson M3 solutions on IBM i. It provides a complete hardware and software solution. In addition it provides powerful POWER7 processor-based technology at a lower cost than competing solutions.

Overall the results in this report show a 37% runtime performance improvement with the latest low end IBM Power 740 model over the previous IBM Power 520 model. Also the results show that we are able to scale up to 6 processors and drive a significant volume of orders with the new IBM Power 740. Thus a significant improvement can be seen when moving to the latest IBM Power hardware.

Note: All testing was done using the 32-bit IBM Technology for Java, or IT4J, JVM.

Benchmark Methodology

The IBM test team used the Lawson M3 Order Entry Benchmark kit for all results in this report. The benchmark kit uses a load generation tool to simulate a number of virtual users entering orders at a reasonable rate. The Order Entry transaction, OIS100, is what is used for this. The Order Entry transaction was chosen for its relative complexity and connection to a real life scenario. Further, it's easily repeatable, can be run infinitely and allows for a large variance in data.

The results from the order entry tests can be calculated into an entity called Universal Performance Unit or UPX. UPX is the sizing indicator used by Lawson M3 for customer sizings. The UPX is a theoretical transaction consisting of an average CPU time required for a typical customer load. A theoretical number of UPX'es per hour can calculated via a user number, activity and the production timeframe.

Thus even though a customer may have many other transactions types than just the order entry transaction that is running here, the results here likely still apply, since all other transaction can be derived via CPU time from this one transaction using UPX. It's is the overall performance of the Lawson M3 Business Engine to handle high volumes of transactions that is being stressed, the transaction type in not key in this, since all business logic share the same application foundation and architectural design.

Only a small number of virtual users, or vusers, were used to drive the scenario. The vusers were configured to wait an average of one second between each step. Thus there is almost no key think time between steps of a transaction. This is not at all representative of a customer environment, however, the goal of the benchmark is to achieve the maximum throughput from the Lawson M3 Business Engine on a given system configuration

The benchmark scenario works as follows:
After logging in, the user performed an order entry operation consisting of seven steps:

1. Create a new order
2. Enter order line 1
3. Enter order line 2
4. Enter order line 3
5. Enter order line 4
6. Enter order line 5
7. Close the order

Throughput is calculated by counting the number of fully invoiced order lines once every minute throughout the benchmark test. Once the run was complete, the number of invoiced order lines per hour over a particular measurement interval was calculated from this data. The measurement interval was defined to be a 90 minute period beginning 15 minutes after all vusers had started. The reported throughput metric for this benchmark is *number of invoiced order lines per hour*. An invoiced order line is one that has completed all of the interactive and batch processing required for that order and the order lines to have a status of 77 or completed. To demonstrate that the results were repeatable, each result consisted of two runs with identical parameters.

Note: The benchmark environment consists of the Lawson M3 Business Engine, M3 Workplace application, WebSphere® Application Server, and an HTTP server all setup and running on the same single system.

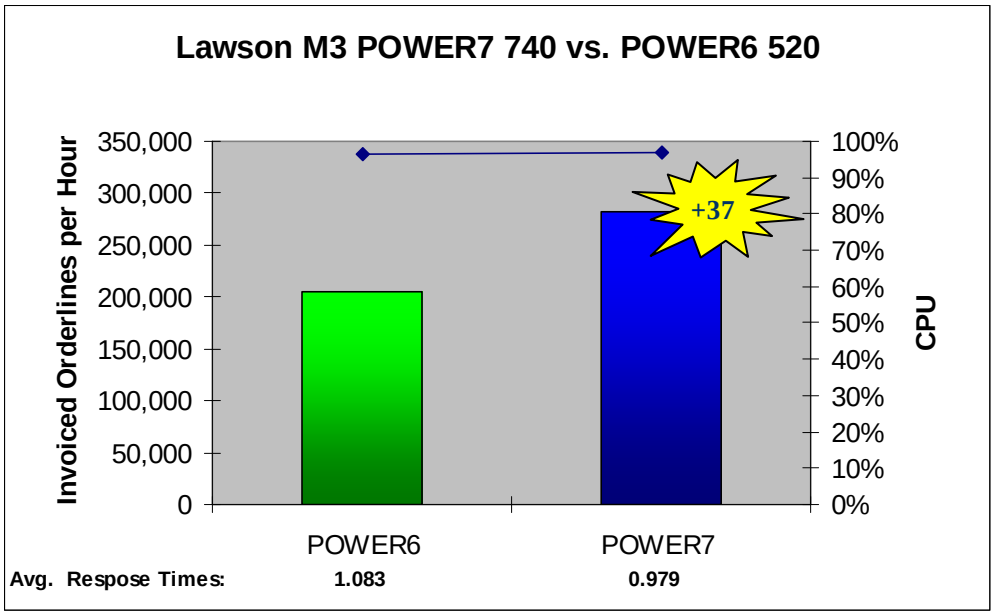
System Configuration:

IBM POWER6 520 - 5587:
Model: IBM POWER6 520, Edition Feature: 5587
Number of Processors: 2, Chip Speed: 4.7 GHz
CPW rating: 9,500
Main storage: 32 GB
Disk: 89 arms (type 4326), 15k rpm, 35GB capacity
Disk configuration: Single ASP with device parity protection
Disk IOP: Disks spread across six 2757 IOAs (235 MB write cache)
Network: 100Mbps Ethernet, full duplex

IBM POWER7 740- 8354:
Model: IBM POWER7 740, Edition Feature: 8354
Number of Processors: 6, Chip Speed: 3.7 GHz
CPW rating 2 Cores: ~14,600 (estimated)
CPW rating 4 Cores: 27,900
CPW rating 6 Cores: 41,600
Main storage: 32 GB
Disk: 24 arms (type 433D), 15k rpm, 280GB capacity
Disk configuration: Single ASP with device parity protection
Disk IOP: Disks spread across one 572F IOA (390 MB write cache)
Network: 100Mbps Ethernet, full duplex

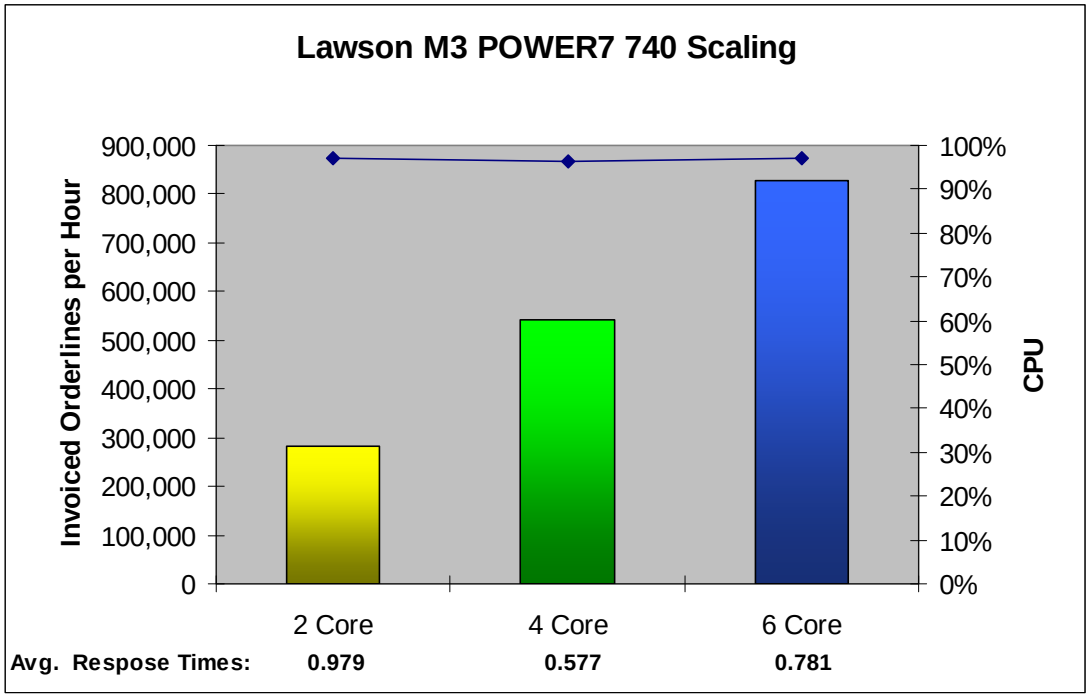
IBM Power 740 versus IBM Power 520 Results:

The chart below shows the results for the IBM Power 740 versus the IBM Power 520. As the chart shows a 37% improvement is seen when moving up to the new IBM Power 740.



IBM Power 740 Scaling Results:

The chart below shows the scaling results that were achieved on three different processor configurations. As the chart shows near linear scaling was achieved. In addition CPU was ~97%'s for all tests and sub-second transaction response times were maintained as well.



Summary

As the results in this paper have shown, Lawson M3 sees significant performance benefit when moving to the latest low end IBM POWER7 hardware. Also the new IBM Power 740 Express provides significant scalability for a low end system. In addition when you combine the benefits of the new low end POWER 7 hardware with the IBM i Solution Edition for Lawson you can create a complete hardware and software solution that low cost and competitively priced.

Overall the results in this paper show a 37% runtime performance improvement going from the previous IBM Power 520 to the new IBM Power 740. The new IBM Power 740 also has great scalability. We were able to drive over 800,000 order lines per hour on the IBM Power 740 with 6 processors.

Thus a significant improvement can be seen with Lawson M3 when moving to the latest IBM POWER hardware and IBM i operating system.

For more information on the IBM i Solution Edition for Lawson please refer to the IBM i Solution Edition website. http://www.ibm.com/systems/power/hardware/editions/solutions.html

Appendix A.

Detailed Results: IBM Power 740 versus IBM Power 520

IBM Power 520 - 5587:
The IBM Power 520 invoiced 205,681 order lines per hour in one run and 205,282 order lines per hour in the second run. In both runs, 92 virtual users were used.

Response time. Table 1 shows the average response time for each Web browser transaction on the IBM Power 520. Response times do not include the average think time for each transaction and they measure the entire length of the run, not just the 90 minute measurement interval.

Step	Number per Order	Average Response Time (seconds)	
		Run 1	Run 2
Create Order Head	1	0.249	0.256
Insert Order Line	5	0.138	0.140
Close Order	1	0.133	0.137

Table 1. Average response times for the IBM Power 520

IBM Power 740- 8354:
The IBM Power 740 invoiced 282,189 order lines per hour in one run and 282,847 order lines per hour in the second run. In both runs, 131 virtual users were used.

Response time. Table 2 shows the average response time for each Web browser transaction on the IBM Power 740. Response times do not include the average think time for each transaction and they measure the entire length of the run, not just the 90 minute measurement interval.

Step	Number per Order	Average Response Time (seconds)	
		Run 1	Run 2
Create Order Head	1	0.203	0.200
Insert Order Line	5	0.134	0.131
Close Order	1	0.116	0.113

Table 2. Average response times for the IBM Power 740

Detailed Results: IBM Power 740 Scaling

2 Way:
The IBM Power 740 with 2 processors invoiced 282,189 order lines per hour in one run and 282,847 order lines per hour in the second run. In both runs, 131 virtual users were used.

Response time. Table 3 shows the average response time for each Web browser transaction on the IBM Power 740 with 2 processors. Response times do not include the average think time for each transaction and they measure the entire length of the run, not just the 90 minute measurement interval.

Step	Number per Order	Average Response Time (seconds)	
		Run 1	Run 2
Create Order Head	1	0.203	0.200
Insert Order Line	5	0.134	0.131
Close Order	1	0.116	0.113

***Table 3. Average response times for the* IBM Power 740 with 2 processors**

4 Way:
The IBM Power 740 with 4 processors invoiced 542,528 order lines per hour in one run and 542,379 order lines per hour in the second run. In both runs, 227 virtual users were used.

Response time. Table 4 shows the average response time for each Web browser transaction on the IBM Power 740 with 4 processors. Response times do not include the average think time for each transaction and they measure the entire length of the run, not just the 90 minute measurement interval.

Step	Number per Order	Average Response Time (seconds)	
		Run 1	Run 2
Create Order Head	1	0.129	0.129
Insert Order Line	5	0.075	0.076
Close Order	1	0.068	0.072

***Table 4. Average response times for the* IBM Power 740 with 4 processors**

6 Way:
The IBM Power 740 with 6 processors invoiced 827,900 order lines per hour in one run and 828,629 order lines per hour in the second run. In both runs, 357 virtual users were used.

Response time. Table 5 shows the average response time for each Web browser transaction on the IBM Power 740 with 6 processors. Response times do not include the average think time for each transaction and they measure the entire length of the run, not just the 90 minute measurement interval.

Step	Number per Order	Average Response Time (seconds)	
		Run 1	Run 2
Create Order Head	1	0.179	0.183
Insert Order Line	5	0.098	0.099
Close Order	1	0.106	0.109

***Table 5. Average response times for the* IBM Power 740 with 6 processors**

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