Lawson M3 7.1 on IBM POWER® 520 and IBM i V6.1

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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 7.1 on the new IBM® Power 520 with processor feature code 5587, referred to in this report as 520-5587, and the IBM i™ V6.1 operating system. This report highlights the benefits of the latest IBM Power hardware and shows the enhanced scalability it can provide. First it shows how runtime performance the new 520-5587 has improved over the older Power 520 model with processor feature code 5633, referred to in this report as 520-5633. Second it shows scalability using a realistic number of order entry users on the new 520-5587 up to the full 4 processors it can have.

Overall the results show a 21% runtime performance improvement with the latest 520-5587 model over the previous 520-5633 model. Also the results show that we are able to scale up to 3400 users with 4 processors on the new 520-5587 with 70% CPU utilization. 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.

In the IBM Power 520-5587 Results section 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 in this section is to achieve the maximum throughput from the Lawson M3 Business Engine on a given system configuration.

In the Order Entry User Scaling Results section a realistic number of virtual users, or vusers, were used to drive the scenario. The number of vuser ran on each configuration represents the maximum number of users that configuration can support at 70% CPU. This is was done to more closely represent a customer environment

Note: The number of vusers used in the Order Entry User Scaling Results section was based on sizings done by Lawson. These sizings were done assuming an average configuration. A customer sizing may require more or less CPU per user and thus the number of users a system can support may vary from what is shown here.

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.

IBM Power 520-5587 Results

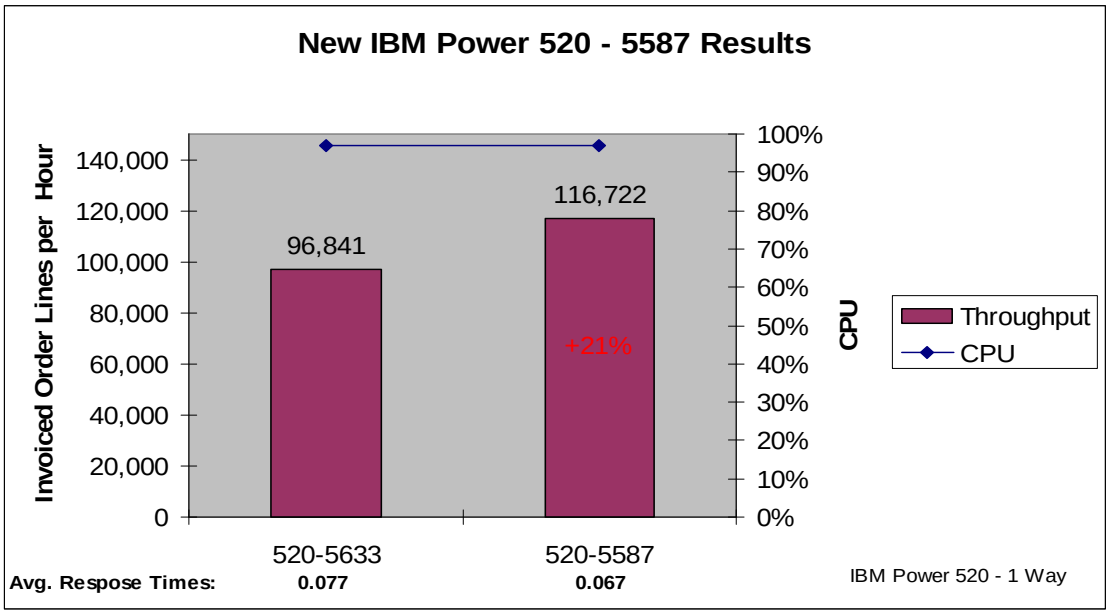
System Configuration:

Baseline 520 - 5633:
Model: IBM Power 520, Edition Feature: 5633
Number of Processors: 1, Chip Speed: 4.2 GHz, L3 cache: 0 MB
CPW rating: 4,300
Main storage: 16 GB
Disk: 6 arms (type 433D), 15k rpm, 280GB capacity
Disk configuration: Single ASP with device parity protection
Disk IOP: Disks spread across one 574F/5583 IOPs (390 MB write cache)
Network: 100Mbps Ethernet, full duplex

New 520- 5587:
Model: IBM Power 520, Edition Feature: 5587
Number of Processors: 1, Chip Speed: 4.7 GHz, L3 cache: 32 MB
CPW rating: ~5000
Main storage: 16 GB
Disk: 18 arms (type 433C), 15k rpm, 140GB capacity
Disk configuration: Single ASP with device parity protection
Disk IOP: Disks spread across one 57B8/5678 IOPs (175 MB write cache)
Network: 100Mbps Ethernet, full duplex

Results:

The chart below shows the results for the new IBM Power 520 - 5587 versus the IBM Power 520 - 5633. As the chart shows a 21% improvement is seen when moving up to the new IBM Power 520 – 5587. The improvement that is seen is higher than the CPW and GHz difference between the two systems. The reason the improvement is higher is the addition of L3 cache in the 520-5587. The 520—5633 has no L3 cache. Typically Java™ workloads such as Lawson M3 can see a bigger improvement, as chart below shows, when running on systems that have L3 cache.



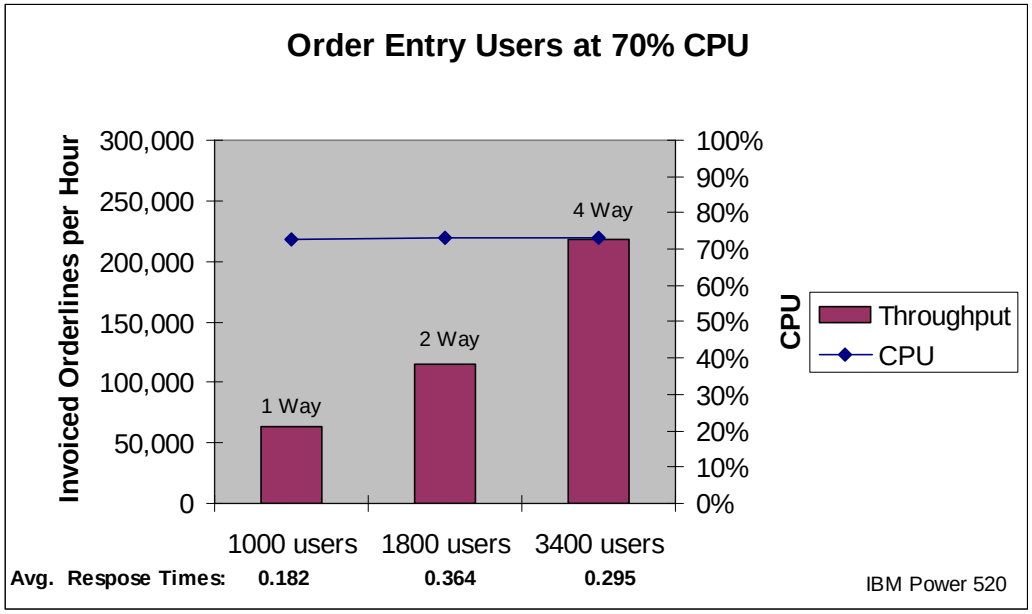
Order Entry User Scaling Results

System Configuration:

New 520- 5633:
Model: IBM Power 520
Edition Feature: 5587
Number of Processors: 1, 2, and 4
Chip Speed: 4.7 GHz, L3 cache: 32 MB
CPW rating: ~5000 (1-Way), 9500 (2-Way), 18,300 (4-Way)
Main storage: 64 GB
Disk: 18 arms (type 433C), 15k rpm, 140GB capacity
Disk configuration: Single ASP with device parity protection
Disk IOP: Disks spread across one 57B8/5678 IOPs (175 MB write cache)
Network: 100Mbps Ethernet, full duplex

Results:

The chart below shows the scaling results that were achieved on three different processor configurations with a realistic number of order entry users on each configuration. As the chart shows near linear scaling was achieved. In addition CPU was ~70%'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 7.1 sees significant performance benefit when moving to the latest IBM Power 520 hardware. Also the new IBM Power 520 hardware provides significant scalability for a low end system.

Overall the results in this paper show a 21% runtime performance improvement going from the older IBM Power 520-5633 to the new IBM Power 520-5587. The new IBM 520-5587 also has great scalability. We were able to simulate 3400 order entry users on the 520-5587 with 4 processors at only 70% CPU utilization.

Thus a significant improvement can be seen with Lawson M3 when moving to the latest IBM Power hardware and IBM i V6.1.

Appendix A.

Detailed Results: IBM Power 520-5587

Baseline 520 - 5633:
The 520-5633 invoiced 96,848 order lines per hour in one run and 96,833 order lines per hour in the second run. In both runs, 40 virtual users were used.

Response time. Table 1 shows the average response time for each Web browser transaction on the 520-5633. 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	0.108	0.111
Insert Order Line	5	0.067	0.068
Close Order	1	0.054	0.055

Table 1. Average response times for the 520-5633

New 520- 5587:
The 520-5587 invoiced 116,604 order lines per hour in one run and 116,839 order lines per hour in the second run. In both runs, 48 virtual users were used.

Response time. Table 2 shows the average response time for each Web browser transaction on the 520-5587. 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	0.097	0.096
Insert Order Line	5	0.059	0.059
Close Order	1	0.046	0.046

Table 2. Average response times for the 520-5587

Detailed Results: Order Entry User Scaling Results

1 Way
The 520-5587 with 1 processor invoiced 64,074 order lines per hour in one run and 64,002 order lines per hour in the second run.

Response time. Table 3 shows the average response time for each Web browser transaction on the 520-5587 with 1 processor. 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	0.262	0.286
Insert Order Line	5	0.113	0.163
Close Order	1	0.178	0.087

***Table 3. Average response times for the* 520-5587 with 1 processor**

2 Way
The 520-5587 with 2 processors invoiced 115,448 order lines per hour in one run and 115,363 order lines per hour in the second run.

Response time. Table 4 shows the average response time for each Web browser transaction on the 520-5587 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	0.502	0.498
Insert Order Line	5	0.242	0.236
Close Order	1	0.315	0.389

***Table 4. Average response times for the* 520-5587 with 2 processors**

4 Way
The 520-5587 with 4 processors invoiced 218,070 order lines per hour in one run and 218,067 order lines per hour in the second run.

Response time. Table 5 shows the average response time for each Web browser transaction on the 520-5587 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	0.380	0.443
Insert Order Line	5	0.210	0.202
Close Order	1	0.246	0.290

***Table 5. Average response times for the* 520-5587 with 4 processors**

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