

**Lawson M3 7.1 on IBM Power® Hardware and IBM i 6.1®
Operating System**

IBM i ERP, LawsonTeam

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Statement of Approval

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

- Lars Strandner, Sr. Analyst, Lawson Product Development, lars.strandner@se.lawson.com

Introduction

This paper describes testing that was done with M3 7.1 on the latest IBM Power hardware and the IBM i 6.1 operating system. This report highlights three benefits of this latest technology. First it shows how runtime performance on i V6.1 has improved over i V5.4. Second it shows how runtime performance with POWER6 processors has improved over previous POWER5+ models. Finally it shows the benefits of the new low-end IBM Power 520 Express offerings.

The new IBM Power 520 Express (9407-M15, 1-core edition) replaces the previous IBM System i 515 model. The 9407-M15 edition of the IBM Power 520 includes up to 6 disk units, a maximum of 16GB of memory, and 1 POWER6 processor core. As the results in the report show the runtime performance improvement moving up to the IBM Power 520 may not be as high as going to an IBM Power 570 system. This is due to a slower processor speed on the IBM Power 520 and lack of L3 cache. Both of these factors are also accounted for in the CPW rating of each model.

Overall the results show a 6% runtime performance improvement upgrading the operating system from i V5.4 to i V6.1. Also the results also show a 52% runtime performance improvement on an IBM Power 570 when going from a system with POWER5+ processors to a system with POWER6 processors. Finally, the results for the IBM Power 520 Express 9407-M15 1-core edition with i V6.1 show a 28% runtime performance over a similar system with POWER5+ processors and i V5.4. Thus a significant improvement can be seen when moving from POWER5+ hardware and older IBM i operating system releases, such as i V5.4, to POWER6 and i V6.1.

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 be 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 transactions can be derived via CPU time from this one transaction using UPX. It's the overall performance of the Lawson M3 Business Engine to handle high volumes of transactions that is being stressed, the transaction type is 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 the run 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 i 6.1 Results

System Configuration:

IBM Power 570

Edition Feature: 5460

Processors: 2

CPW rating: 10,800

Main storage: 96 GB

Disk: 90 arms (type 4327), 15k rpm, 70GB capacity

Disk configuration: Single ASP with device parity protection

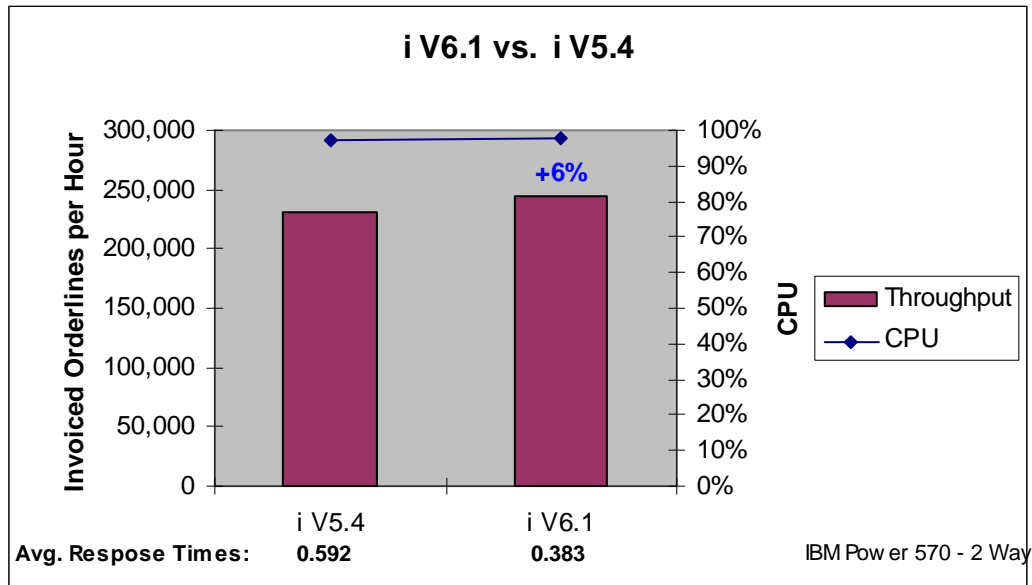
Disk IOP: Disks spread across six 574F/5583 IOPs (390 MB write cache)

Network: 100Mbps Ethernet, full duplex

Note: Both the i V5.4 and i V6.1 tests below used the same configuration above. Only the OS level was different.

Results:

The chart below shows the results for i V5.4 versus i V6.1.



IBM Power 570 Results

System Configuration:

IBM Power 570 (with POWER6 processors)

Operating System: i V5.4

Edition Feature: 5460

Processors: 4

CPW rating: 21,200

Main storage: 96 GB

Disk: 90 arms (type 4327), 15k rpm, 70GB capacity

Disk configuration: Single ASP with device parity protection

Disk IOP: Disks spread across six 574F/5583 IOPs (390 MB write cache)

Network: 100Mbps Ethernet, full duplex

IBM System i 570 (with POWER5+ processors)

Operating System: i V5.4

Edition Feature: 7749

Processors: 4

CPW rating: 16,700

Main storage: 256 GB

Disk: 180 arms (type 4327), 15k rpm, 70GB capacity

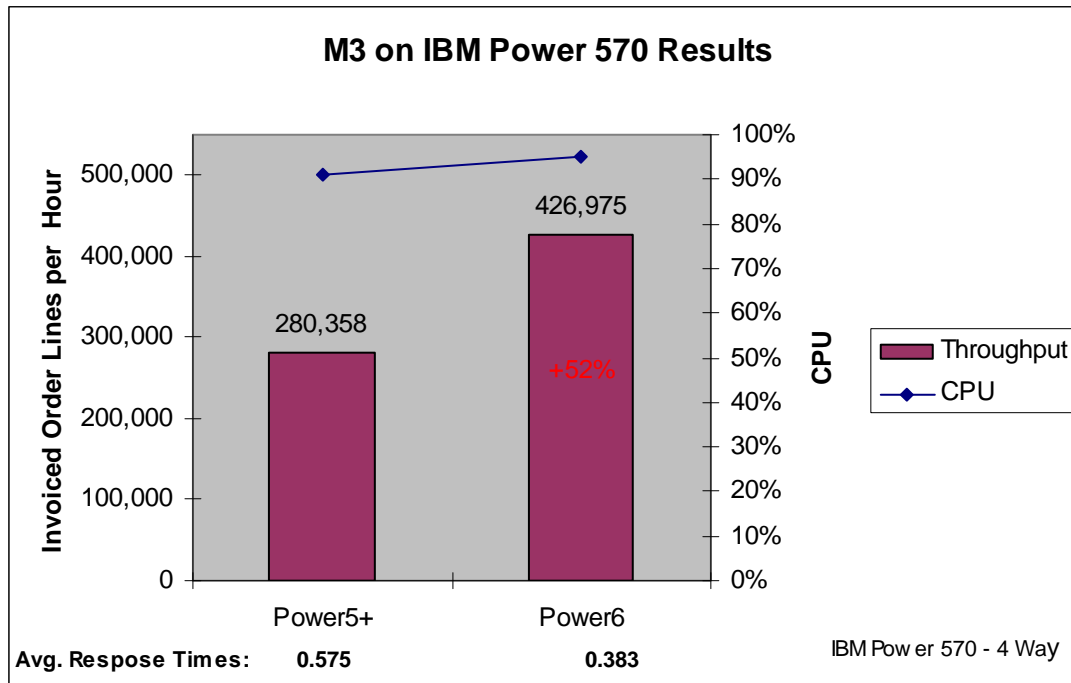
Disk configuration: Single ASP with device parity protection

Disk IOP: Disks spread across twelve 574F/5583 IOPs (390 MB write cache)

Network: 100Mbps Ethernet, full duplex

Results:

The chart below shows the results for an IBM Power 570 with POWER6 processors versus a IBM System i 570 with POWER5+ processors.



IBM Power 520 Express 9407-M15 1-core Edition Results

System Configuration:

IBM Power 520 Express (9407-M15 1-core POWER6 processor)

Operating System: i V6.1

Edition Feature: 9407-M15

Processors: 1

CPW rating: 4,100

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 1 574F/5583 IOPs (390 MB write cache)

Network: 100Mbps Ethernet, full duplex

IBM System i 520 (with POWER5+ processor)

Operating System: i V5.4

Edition Feature: 7149

Processors: 1

CPW rating: 3,800

Main storage: 16 GB

Disk: 44 arms, 15k rpm, 35GB capacity

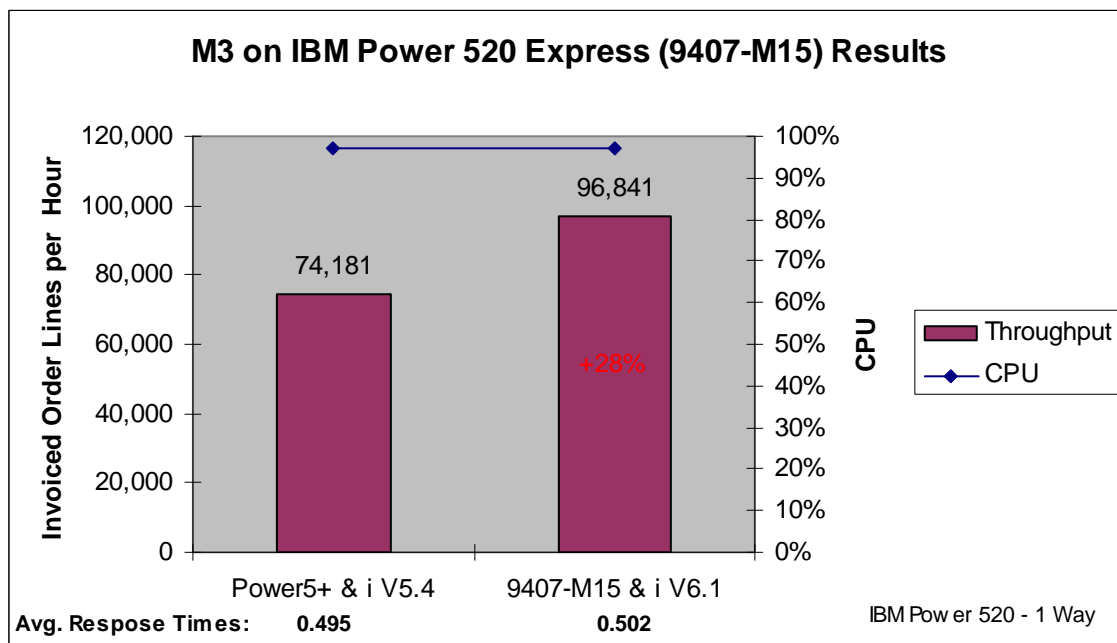
Disk configuration: Single ASP with device parity protection

Disk IOP: Disks spread across three 2757 IOAs

Network: 100Mbps Ethernet, full duplex

Results:

The chart below shows the results for the new IBM Power 520 Express (9407-M15, 1-core) edition with i V6.1 versus a IBM System i 520 with POWER5+ processors and i V5.4.



Summary

As the results in this paper have shown, Lawson M3 7.1 sees significant performance benefit when moving to both i V6.1 and the latest IBM Power hardware with POWER6 processors. Also the new IBM Power 520 Express 9407-M15, 1-core edition provides significant runtime performance gains for a low end entry system.

Overall the results in this paper show a 6% runtime performance improvement going from i V5.4 to i V6.1. Runtime performance on a IBM Power 570 with POWER6 processors has improved up to 52% over a IBM System i 570 with POWER5+ processors. The new low end IBM Power 520 Express 9407-M15, 1-core edition with i V6.1 shows a runtime performance improvement of 28% over a similar system with Power5+ processors and i V5.4.

Thus a significant improvement can be seen when moving from a system with POWER5+ processors and an older i releases, such as i V5.4, to a system with POWER6 processors and the latest operation system i V6.1.

Appendix A.

Detailed Results: IBM i 6.1

i V5.4

i V5.4 invoiced 230,417 order lines per hour in one run and 230,794 order lines per hour in the second run. In both runs, 97 virtual users were used.

Response time. Table 1 shows the average response time for each Web browser transaction on *i V5.4*. 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	0.128	0.125
Insert Order Line	5	0.079	0.079
Close Order	1	0.070	0.071

Table 1. Average response times for *i V5.4*

Note: CPU was at 97% for both runs

i V6.1

i V6.1 invoiced 243,422 order lines per hour in one run and 243,857 order lines per hour in the second run. In both runs, 100 virtual users were used.

Response time. Table 2 shows the average response time for each Web browser transaction on *i V6.1*. 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	0.088	0.085
Insert Order Line	5	0.051	0.050
Close Order	1	0.044	0.043

Table 2. Average response times for *i V6.1*

Note: CPU was at 98% for both runs

Detailed Results: IBM Power 570

IBM System i 570 with POWER5+ processors

The IBM System i 570 with POWER5+ processors invoiced 280,183 order lines per hour in one run and 280,221 order lines per hour in the second run. In both runs, 118 virtual users were used.

Response time. Table 1 shows the average response time for each Web browser transaction on the IBM System i 570 with POWER5+ 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	0.132	0.132
Insert Order Line	5	0.076	0.075
Close Order	1	0.065	0.065

Table 3. Average response times for the IBM System i 570 with POWER5+ processors

Note: CPU was at 91% for both runs

IBM Power 570 with POWER6 processors

The IBM Power 570 with POWER6 processors invoiced 427,444 order lines per hour in one run and 426,505 order lines per hour in the second run. In both runs, 175 virtual users were used.

Response time. Table 2 shows the average response time for each Web browser transaction on the IBM Power 570 with POWER6 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	0.088	0.085
Insert Order Line	5	0.051	0.050
Close Order	1	0.044	0.043

Table 4. Average response times for the IBM Power 570 with POWER6 processors

Appendix A.

Detailed Results: IBM Power 520 Express 9407-M15 1-core Edition

IBM System i 520 with POWER5+ processors

The IBM System i 520 with POWER5+ processors invoiced 74,210 order lines per hour in one run and 74,152 order lines per hour in the second run. In both runs 30 virtual users were used.

Response time. Table 1 shows the average response time for each Web browser transaction on the IBM System i 520 with POWER5+ 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	0.126	0.123
Insert Order Line	5	0.062	0.061
Close Order	1	0.063	0.063

Table 5. Average response times for the IBM System i 520 with POWER5+ processors

Note: CPU was at 97% for both runs

IBM Power 520 Express 9407-M15 1-core Edition

The IBM Power 520 Express 9407-M15 1-core edition 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 2 shows the average response time for each Web browser transaction on the IBM Power 520 Express 9407-M15 1-core edition. 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 6. Average response times for the IBM Power i 520 Express 9407-M15 1 core Edition

Note: CPU was at 97% for both runs

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