IBM Technical Brief

IBM z Systems®: Performance Report on Leveraging IBM z Systems Scalability for SAP Insurance Policy Management

Version 1.0
June 20, 2017

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IBM SAP on z System Performance

Version: 1.00
Date: June 20, 2017
Filename: IBMSAP_Test_FSPM_zSystems.pdf

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Acknowledgements

The authors of this document would like to acknowledge the following individuals for their contributions to this project:

- Andrea Fuga and Tom Litty for system z programming support
- Johannes Schuetzner for DB2 performance consultation
- Klaus Scholten and Thomas Scholz for kicking off the project
- Andreas Klemm for definition of a valid business context and his presentations of our results
- Marko Kundacina and Arunchandra Chitpady for data generation tools and workload development
- Petra Weichselbaumer, Steffen Zerbe, Enrico Seibt, Peter Seidenhofer, Stefan Niedermeyer, Markus Weber, Sandra Pillmeier, Martin Bloechinger and Bernhard Hofmann for msg.PM TOMATOSX and CAIMAN support
- Bernhard Brinkmüller, Istvan Lohse, Michael Schmalzl, Uwe Wesch, Bernd Kohler, Bernhard Glaser and Robert Wang for basis and technical support
- Wolfgang Metzner for support with FS-ICM
- Bernhard Bohr and Elmar Schneider for support with FS-CD
- Christoph Sell and Daniel Cvetko for support with the PFO interface
- Min-Ho Hong for support with msg.PM product content
- Liane Will for support with Solution Manager configuration
- Christian Ortelt, Lars Vogelgesang-Moll, Sonja Dedeke, Balazs Karsay and Nick Zhang for support with FS-PM

Feedback

Please send comments or suggestions for changes to vengly@us.ibm.com

1.0 Introduction

IBM z Systems is an industry leader in business continuity, security, performance and scalability. It meets all the vital IT infrastructure requirements for the insurance industry. SAP has a vast array of insurance software applications. Together, they provide one of the best possible, end-to-end insurance solutions for today's fiercely challenging IT environment demands.

Recognizing this leverage, IBM and SAP SE held a joint project to demonstrate IBM z Systems performance and scalability with SAP Insurance. A cross global team in USA, Germany and China was assembled to collaborate on this project using the test environment located at IBM in Poughkeepsie, New York.

The team conducted experiments to evaluate the performance and scalability of SAP Insurance Policy Management solution running with DB2 for z/OS. The study focused on three most popular insurance lines of businesses (LoB): Property & Casualty, Life, and Automobile.

There is no SAP standard benchmark suite for insurance policy management. We used SAP internal tools to generate test data which was modeled after industry data by SAP insurance experts to emulate a real customer workload profile.

We started the evaluation with 200K contracts per LoB. By varying the numbers of parallel batch jobs, we reached a reasonable baseline for the test configuration. We then increased the hardware resource capacity to investigate the scaling effects on throughputs and elapsed times. We also expanded the database size to 2M and 4M contracts per LoB to evaluate the database scalability.

This paper documents our tests and findings. The completed measurements were stress tests, not certified benchmarks.

2.0 Executive Summary

Insurance industry is changing! Insurers face fierce competition vying for customers using new technologies. Insurers need to deliver superior services and products to market faster. They need to get the right information to the right customers at the right time. Thus, the nature of the insurance business requires an underlying IT infrastructure, particularly strong in business continuity, security, performance and scalability. These are vital requirements to have applications available 24x7 to ensure continuous operations, to protect customers and other sensitive data, and to perform as the system load varies substantially over time.

IBM z Systems is an industry leader in business continuity, security, performance and scalability [1]. It meets all the vital requirements for the insurance industry, and is capable and well suited to run modern applications, such as the vast array of SAP insurance applications.

Our study focused on a selected SAP insurance component: Policy Management. We conducted performance study on the most popular policy types: Property & Casualty, Life, and Automobile.

For a typical policy management workload or business process, the “update run” batch processing is performed periodically - monthly, quarterly, annually, as required and practiced. We chose the annual “update run” batch processing which has all policies and contracts updated and is the most processing intensive scenario.

Our measurements showed that as we doubled the hardware resources, we doubled the throughputs. As we scaled up to the larger database sizes from 200K, to 2M, and to 4M contracts per line of insurance business, the throughput remains consistent with constant hardware resource capacity. Finally, we upgraded the database server system from a zEC12 to a z13, the measurements showed that CPU utilization reduced by more than 10% for the z13 as compared to the zEC12.

Our measurements clearly demonstrated excellent performance and linear scalability of the z Systems running SAP policy management workload. Integrating the strengths of IBM z Systems with the robust SAP for Insurance solutions is an excellent IT architecture for the insurance industry [2].

3.0 Solution Overview, Workload and KPI Descriptions

The SAP Insurance Policy Management solution landscape is an integration of SAP Policy Management (FS-PM) system, Enterprise Resource Planning (ERP) system and msg.PM server (TOMATOSX). The central component is the SAP FS-PM system which comprises of the database and application server subcomponents. One of the main business processes within insurance policy management is to perform periodic update run for the insurance policies/contracts by accessing relevant information (e.g. Collections & Disbursements, Business Partner, Incentive & Commission, and Portfolio Assignment) from the ERP system and by calling the msg.PM TOMATOSX rating engine to apply/calculate insurance rules and mathematics. The interface communications are done via remote function calls (RFCs) and queued remote function calls (qRFCs).

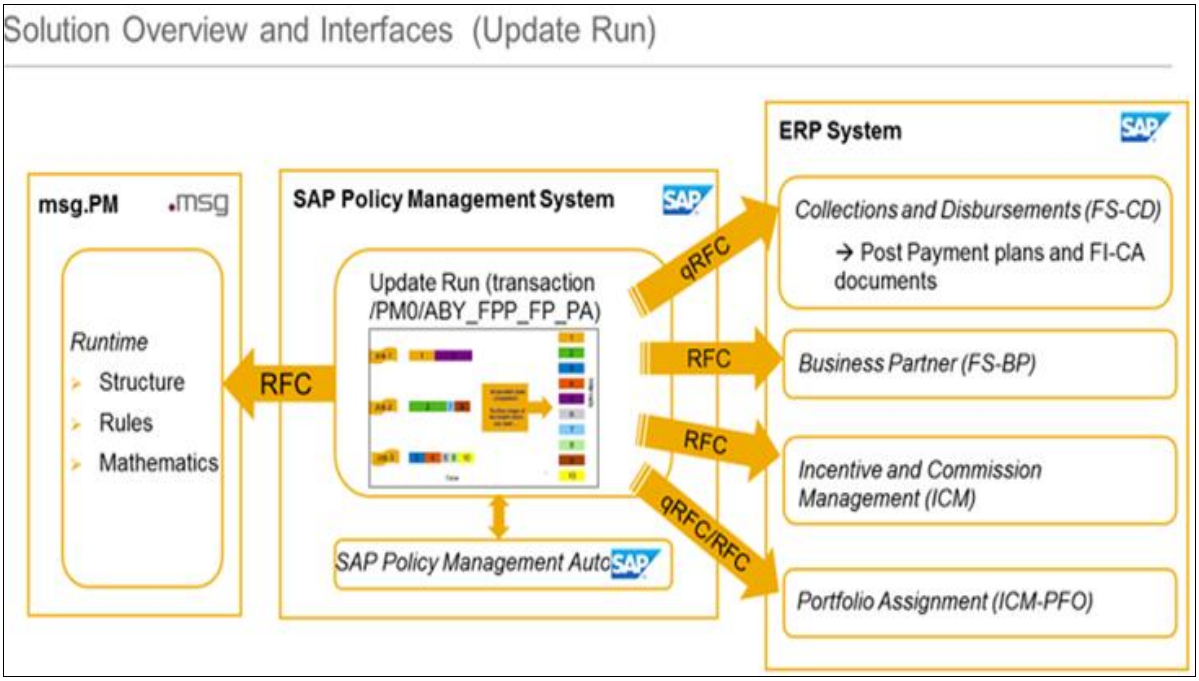

Figure 1: Solution Overview and Interfaces

Since there is no SAP standard benchmark suite for an insurance policy management workload, we used SAP internal tools to generate test data modeled after a real customer workload profile. The following figure shows an example of our test data profile for the automobile insurance coverage:

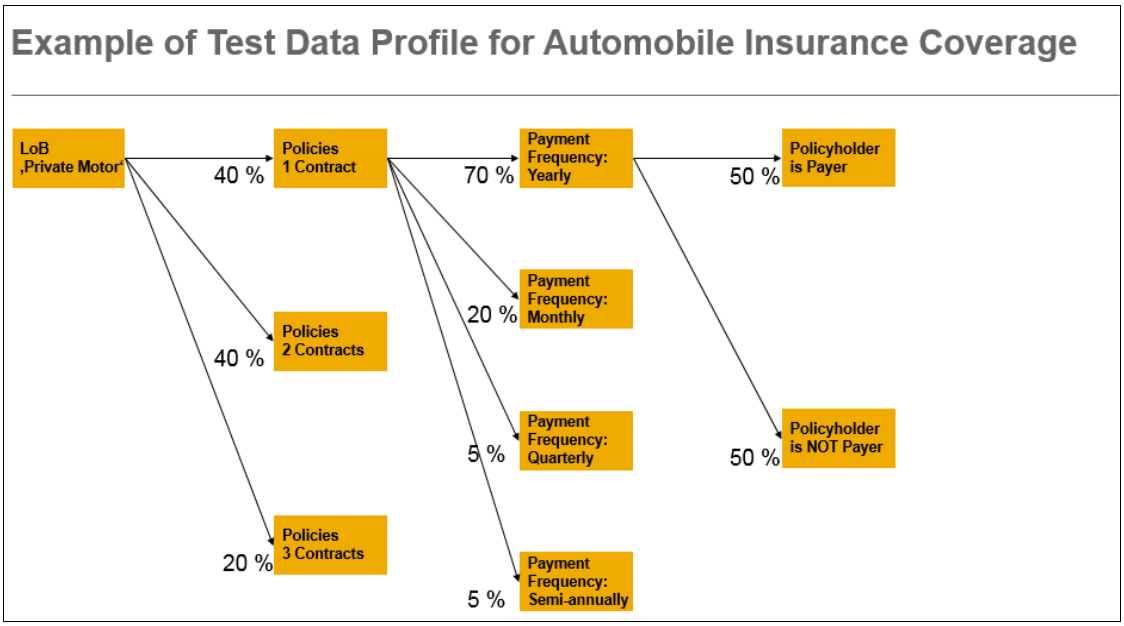

Figure 2: Example of Test Data Profile for Automobile Insurance Coverage

Our test workload processes the updates of the insurance contracts for a specified period. The update processing is done via multiple parallel batch jobs executed within a batch window for each of the three select insurance line of business (LoB) scenarios. All policy contracts are calculated and divided into intervals or packages to be processed by a set of parallel batch jobs. The following shows an example of the parallel processing framework:

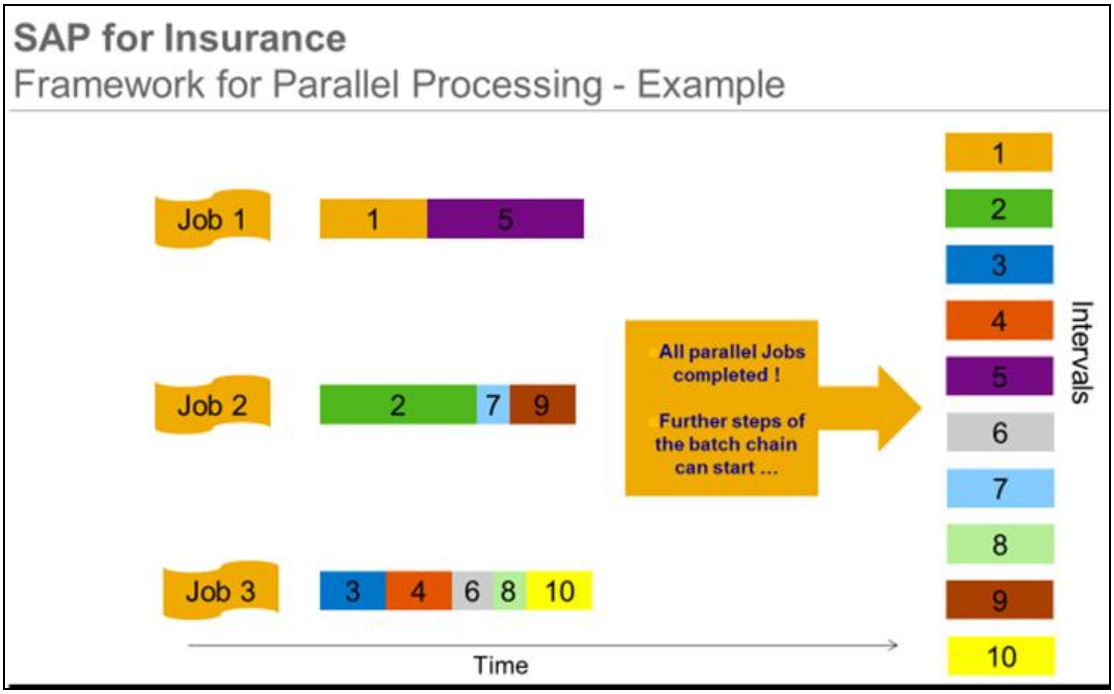

Figure 3: Example of Framework for Parallel Processing

To gauge the system resource requirements and to provide the insights of the performance and scalability of the SAP Policy Management solution, we captured the following Key Performance Indicators (KPIs) for each and every measurement in our test scenarios:

- Elapsed time of the “Update Run” batch processing
- CPU Utilization on Database Server, Application Server(s), and TOMATOSX
- External Throughput Rate (ETR)
- Internal Throughput Rate (ITR)

The most important metric is the elapsed time, addressing the batch window concern. The following is a simple illustration of elapsed time and external throughput rate.

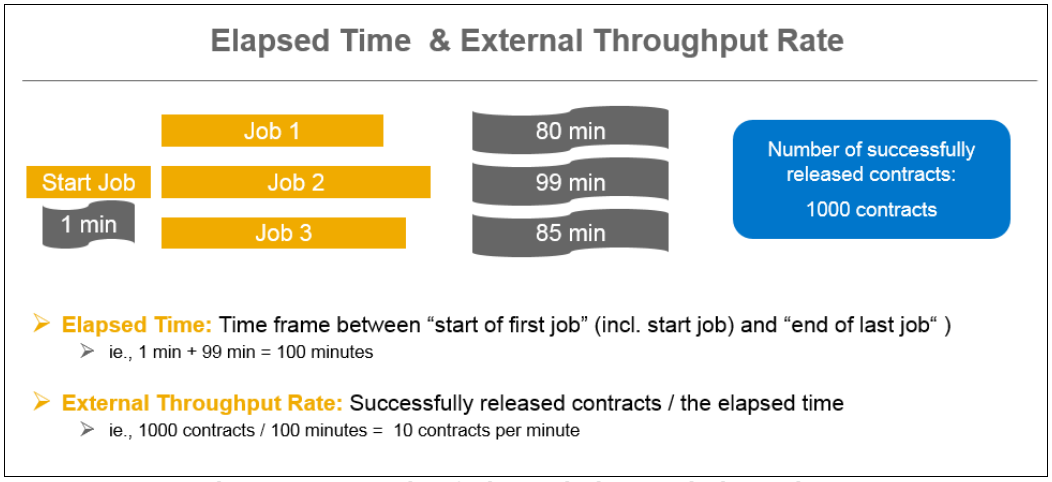

Figure 4: Example of Elapsed Time and Throughput

The External Throughput Rate (ETR) is the transaction rate, which is the successfully released contracts processed by the batch jobs over the elapsed time, as illustrated above. The Internal Throughput Rate (ITR) is the ETR normalized to 100% processor utilization. ITR provides a reliable basis for measuring processor capacity [3].

4.0 Test Environment

4.1 Hardware Environment

System z Database Server

We conducted our tests initially with the SAP database server using 128 GB of memory in an LPAR on an IBM z Systems model 2871-HA1 (zEC12). We started with 7 dedicated CPs and then increased to 12 dedicated CPs. For the final 4M policy measurements, we switched to an IBM z Systems model 2964-N30 (z13).

Database Storage

The database had a total of 18M insurance contracts in the final 4M measurements. It resided on an IBM System Storage DS8886 model 2831-981 which had 100 TB disk capacity consisted of both SSD and HDD drive sets. The active database used only SSD drives, configured as 320 emulated 3390-mod54 volumes. The rest of the disk storage system held 5 flash copies as database backups.

SAP Application Servers

The SAP application servers were two IBM Power 780 model 9179. Each had 64 cores @ 3.9 GHz. One had 1 TB RAM and the other had 512 GB RAM. Both ran AIX 7.1 as the operating system and were used as SAP application servers for both the ERP and the FS-PM systems.

Rating Engine

The msg.PM Runtime Servers (TOMATOSX) were the rating engines for the insurance mathematical calculations. They resided in an IBM Power 780 (64 cores @ 3.9 GHz, 512 GB RAM) and an IBM Power 750 (32 cores @ 3.6 GHz, 128 GB RAM).

Network

A dedicated 10 Gb Ethernet network was used to connect across the presentation server, the application servers, and the database server. Four OSA-Express4S adapters were used for the SAP DB server on the z Systems processor. The Optimized Latency Mode (OLM) option was enabled on the OSA-Express4S adapters to minimize the network latency between the DB server and the external application server layers.

The following figures are conceptual views of our hardware configuration. We conducted our initial test measurements for 200K, 2M, and 4M contracts using the test configuration, as illustrated in figure 5. We then replaced the zEC12 database server system with the z13, but kept everything else constant, as shown in figure 6.

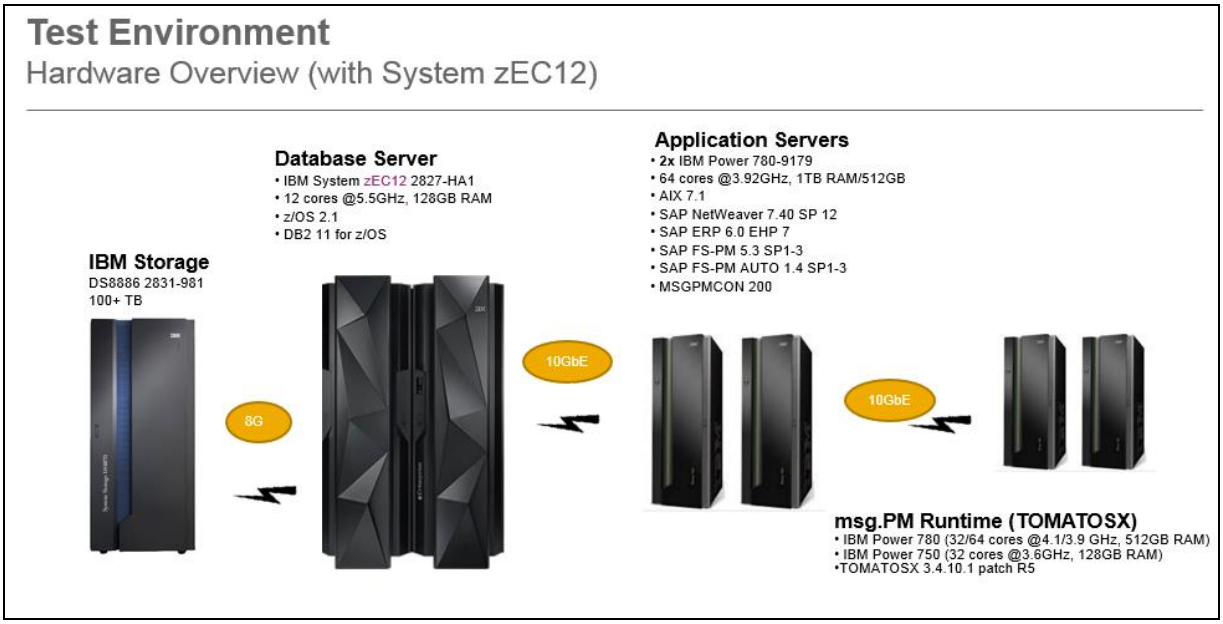

Figure 5: Hardware Test Environment with System zEC12

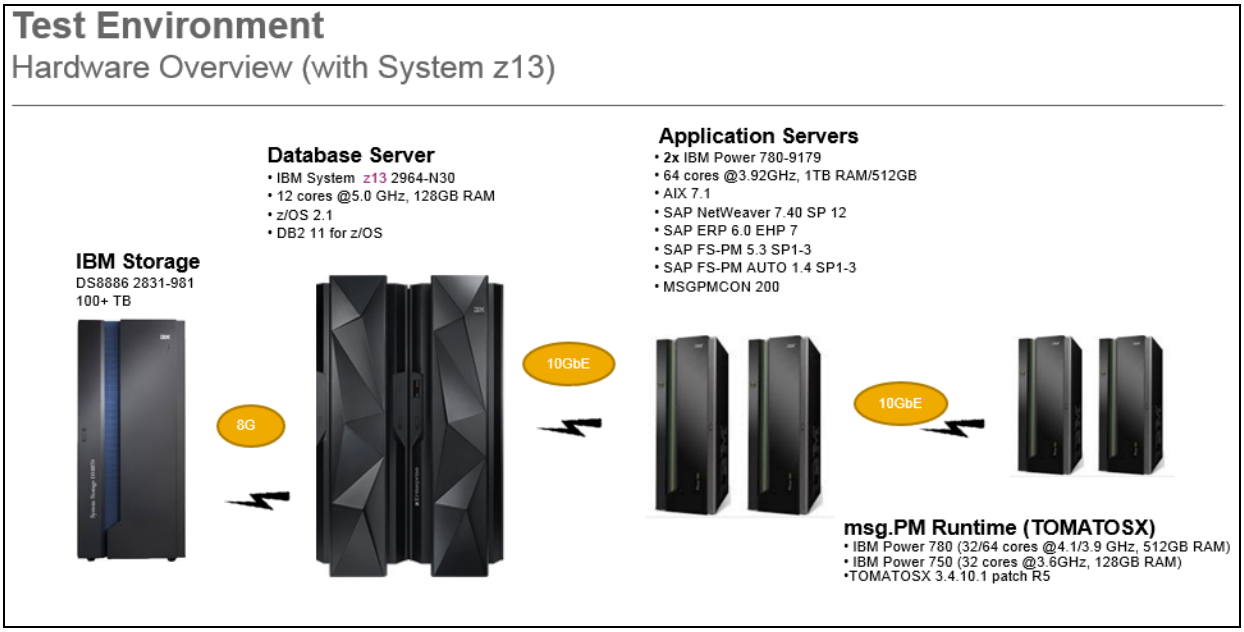

Figure 6: Hardware Test Environment with System z13

4.2 Software Environment

z/OS

z/OS release 2.1

DB2 for z/OS

DB2 11

DB2 Connect

IBM Data Server Driver for CLI that is shipped as part of DB2 Connect 10.5 FP5

AIX

7.1

SAP ERP System

SAP Kernel 742 patch 300
SAP NetWeaver 7.4 SP12
SAP ERP 6.0 EHP 7

SAP FS-PM System

SAP Kernel 742 patch 300
SAP NetWeaver 7.40 SP12/SP16
SAP FS-PM 5.3 SP1/SP2/SP3
SAP FS-PM AUTO 1.4 SP1/SP2/SP3
MSGPMCON 200

Msg.PM Runtime (TOMATOSX rating engine)

PMTOMATOSX 3.4.10.1 Patch R5 (Unicode 64-Bit)

The figure below shows the software configuration of our test environment. For the SAP Policy Management (FS-PM) system, we started with FS-PM 5.3 SP1 as it was available at the time of the 200K measurements. We picked up the later FS-PM 5.3 SP2 with fixes and enhancements for the 2M measurements; likewise, we updated to FS-PM 5.3 SP3 for the 4M measurements.

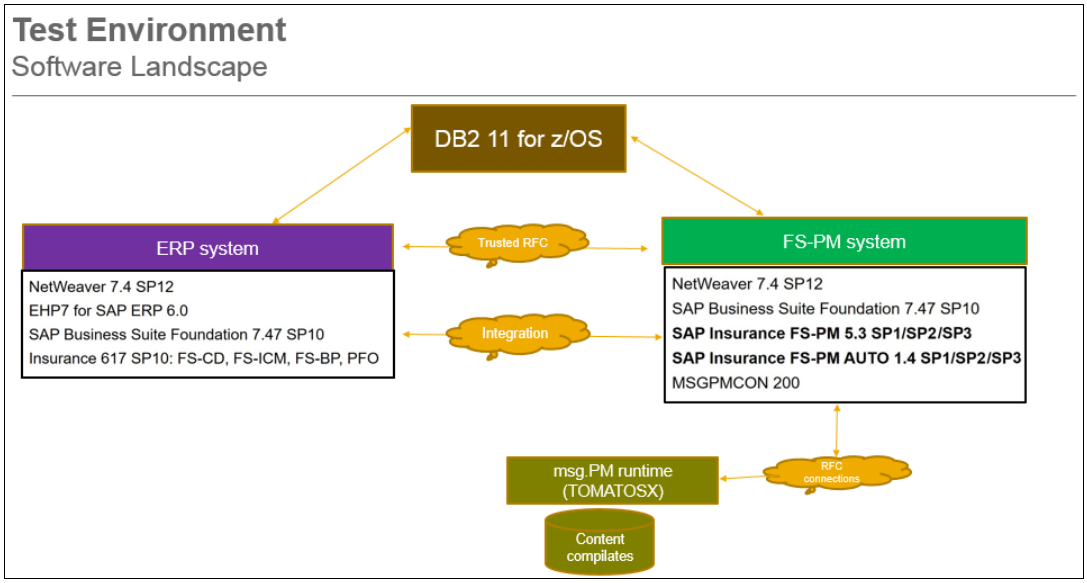

Figure 7: Software Test Environment

5.0 Measurement Results and Analysis

5.1 Measurement Results at 150 and 300 Jobs

We started our evaluation with 200K contracts per LoB, by varying numbers of parallel batch jobs until reaching a reasonable baseline for the test hardware configuration. Then we increased the hardware resource capacity to investigate the scaling effects on throughputs and elapsed times.

Starting with a single application server running 150 jobs, the application server has reached a substantially high CPU% point notably for P&C. We added a second application server to allow us to drive higher load. We kept the same load on each server with a total of 300 jobs. We also scaled other hardware resources proportionally. The following is a summary of the configuration change from one to two application servers:

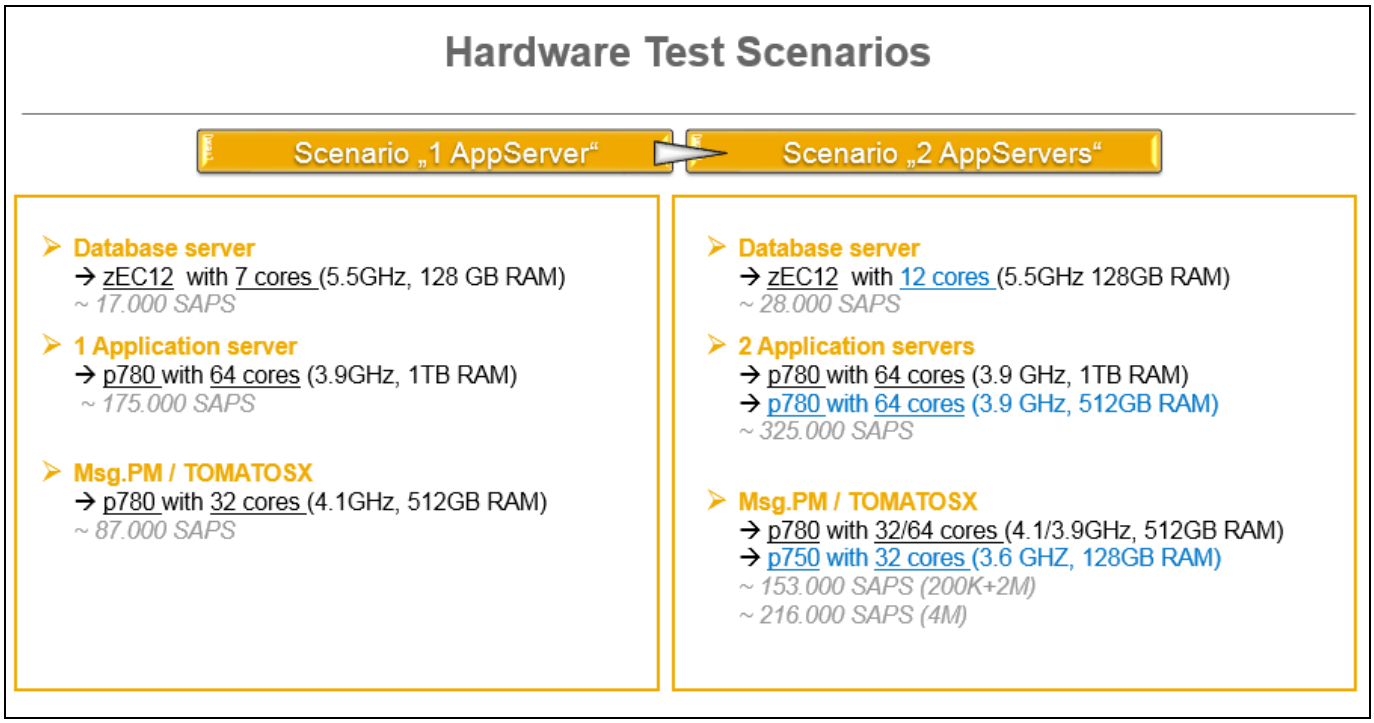

Figure 8: Hardware Test Scenarios: 150 and 300 Jobs

5.1.1 Measurement Results at 150 and 300 Jobs: Property & Casualty

The following is a summary of the results for Property & Casualty insurance comparing single application server (150 jobs) to two application servers (300 jobs) at 200K contracts:

Scenario	# of jobs	Elapsed Time	Throughput (contracts/min)	CPU TOMATOSX Rating Engine	CPU Application Server	CPU Database Server	ITR TOMATOSX Rating Engine	ITR Application Server	ITR Database Server
1-appserver	150	00:27:44	7,211	1%	81%	49%	n/a	8,878	14,716
2-appservers	300	00:14:18	13,985	2%	83%	64%	n/a	16,789	21,913

Table 1: Result Summary @ 150 and 300 Jobs for Property & Casualty

Addressing the customer batch window concerns, the elapsed time is deemed the most critical KPI. Figure 9 shows the elapsed times of the two run scenarios. With twice the application server processing capacity, the elapsed time is cut by half.

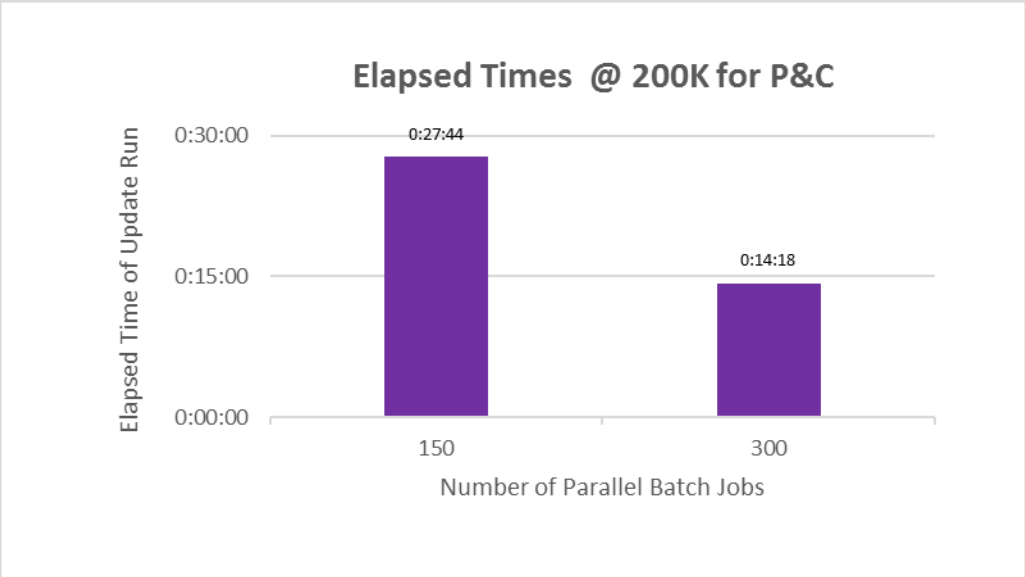

Figure 9: Property & Casualty @ 150 & 300 Jobs – Elapsed Times

The External Throughput Rate (ETR) of the insurance contract update processing is based on the number of successfully released contracts over the elapsed time. With two application servers as compared to a single application server, we observed that the ETR had doubled, as indicated in Figure 10.

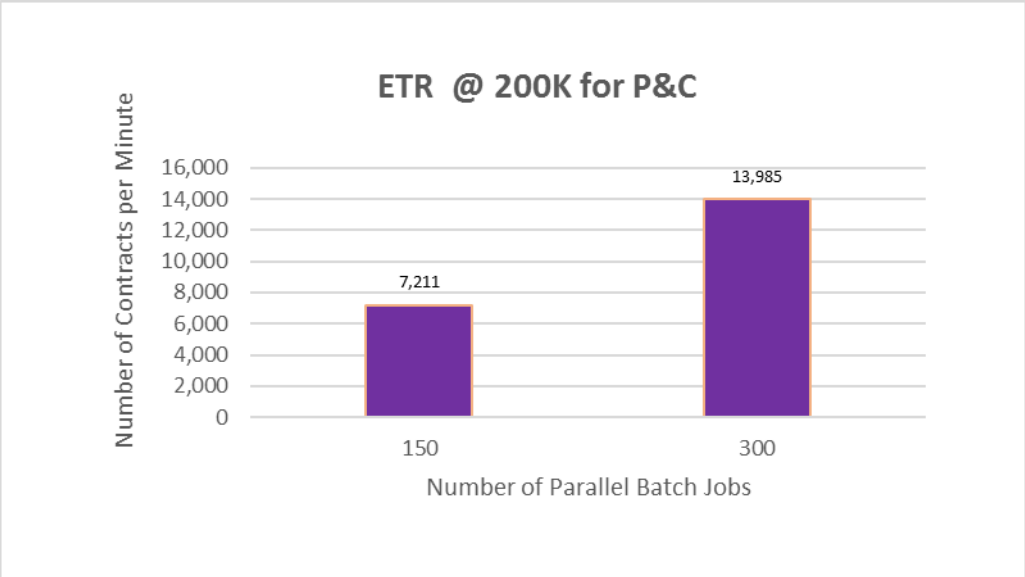

Figure 10: Property & Casualty @ 150 & 300 Jobs – ETR

The processor utilizations were monitored during the measurements to gauge the load and capacity of all processors in the test configuration. For Property & Casualty insurance, the utilizations were negligible on the TOMATOSX rating engine servers, significantly high on the SAP application server(s), and moderate on the database server.

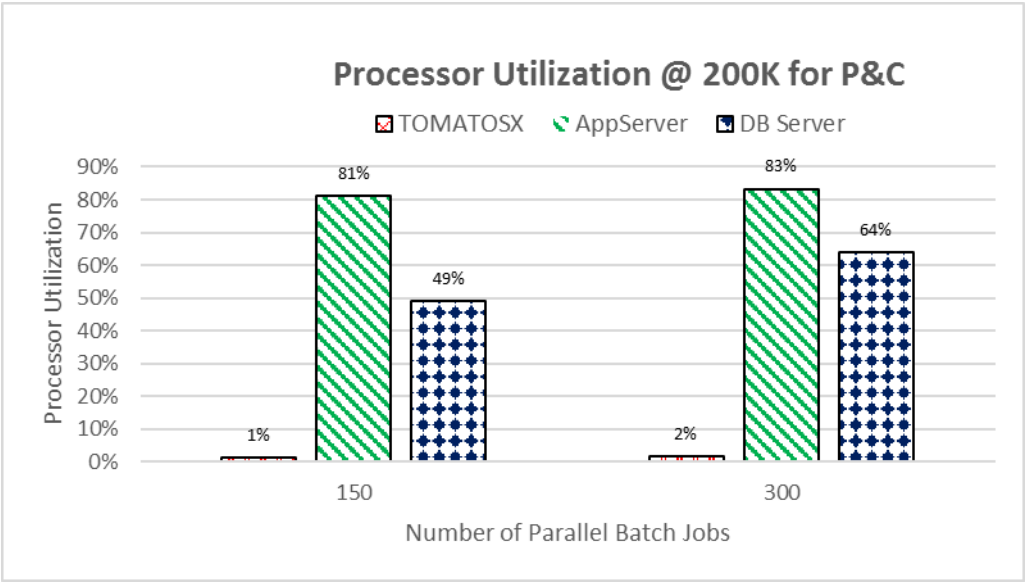

Figure 11: Property & Casualty @ 150 & 300 Jobs – CPU

The Internal Throughput Rate (ITR) is the ETR normalized to 100% processor utilization. ITR provides a reliable basis for measuring processor capacity. Since a second application server was added and the number of DB server cores had been increased, the respective ITRs also increased as shown in Figure 12. Note that we did not include the ITRs for TOMATOSX servers since their utilizations were negligible for the Property & Casualty test scenarios.

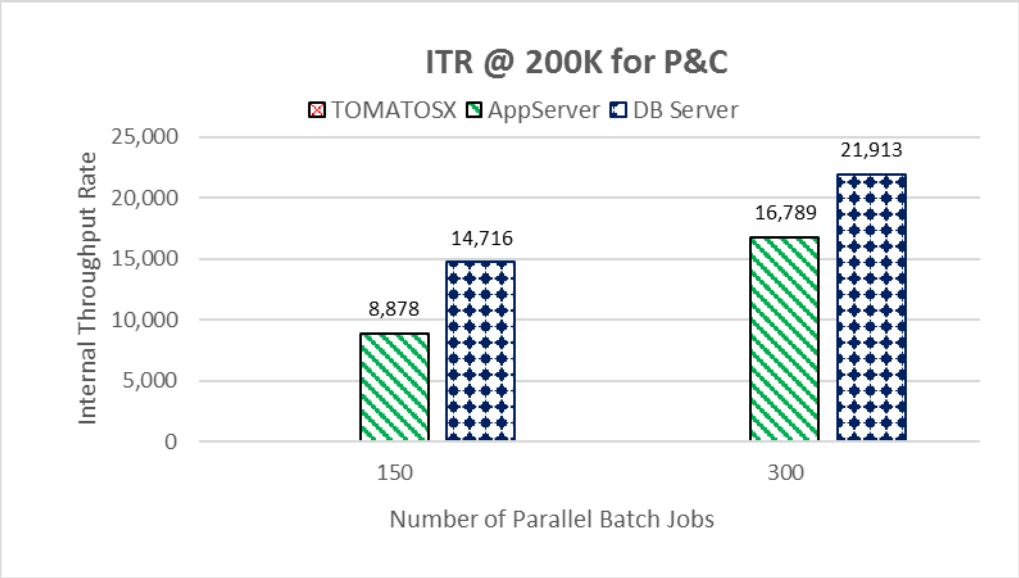

Figure 12: Property & Casualty @ 150 & 300 Jobs – ITR

5.1.2 Measurement Results at 150 and 300 Jobs: Life

The following is a summary of the results for Life insurance comparing single application server (150 jobs) to two application servers (300 jobs) at 200K contracts:

Scenario	# of jobs	Elapsed Time	Throughput (contracts/min)	CPU TOMATOSX Rating Engine	CPU Application Server	CPU Database Server	ITR TOMATOSX Rating Engine	ITR Application Server	ITR Database Server
1-appserver	150	1:54:31	1,746	75%	78%	54%	2,320	2,236	3,234
2-appservers	300	0:57:29	3,479	76%	77%	68%	4,595	4,503	5,096

Table 2: Result Summary @ 150 and 300 Jobs for Life

Figure13 shows the elapsed times of the two run scenarios. The elapsed time is the most critical KPI for the batch window considerations. With doubled the application server hardware capacity, the elapsed time is reduced by half.

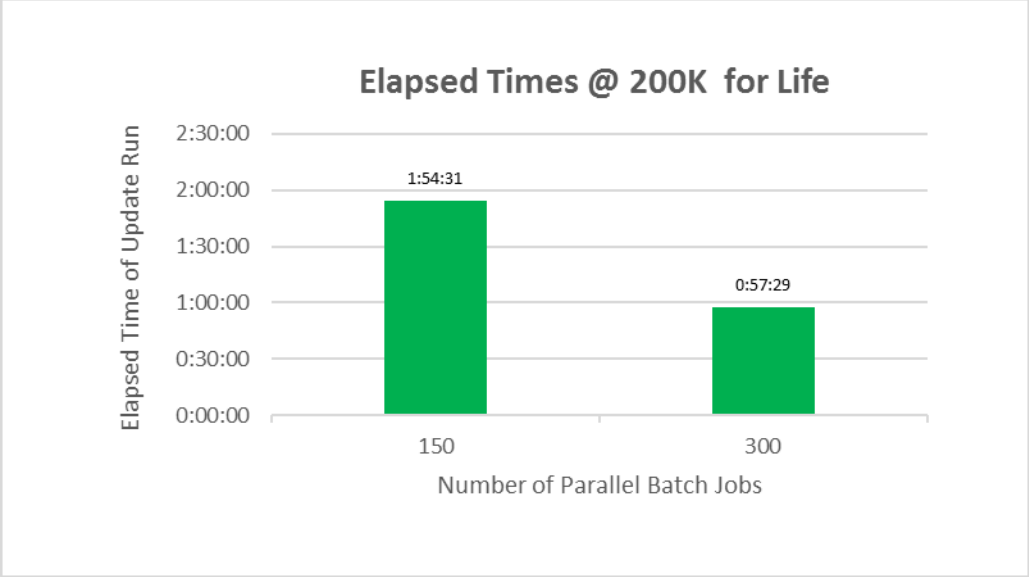

Figure 13: Life @ 150 & 300 Jobs – Elapsed Times

With two application servers as compared to a single application server, we observed that the ETR had doubled for the 200K Life insurance test scenario, as indicated in Figure 14.

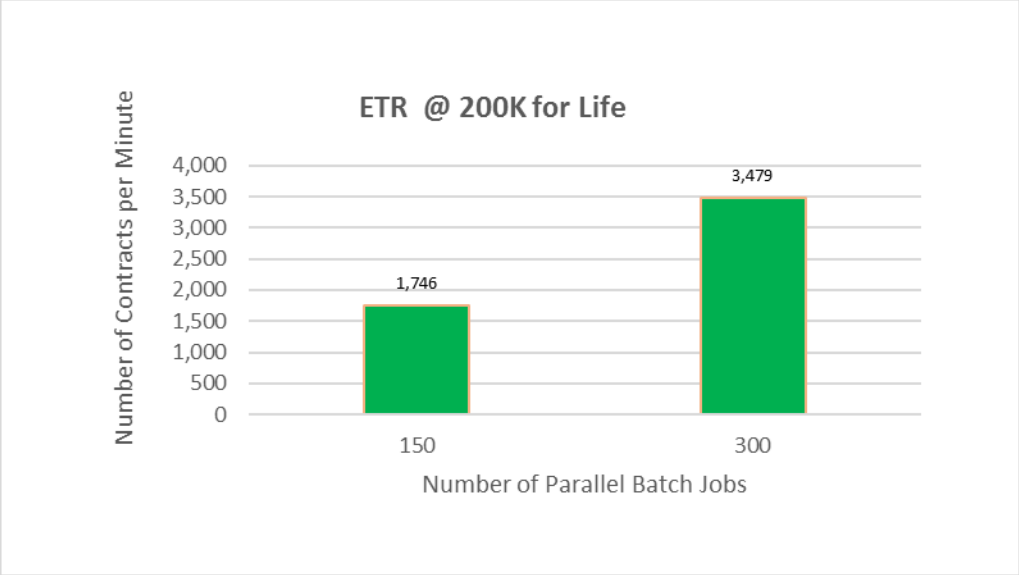

Figure 14: Life @ 150 & 300 Jobs – ETR

The processor utilizations were monitored to gauge the load and capacity of all processors in the test configuration. For the Life insurance test scenario, the utilizations were significantly high on both the TOMATOSX rating engine servers and the SAP application server(s), and moderate on the database server.

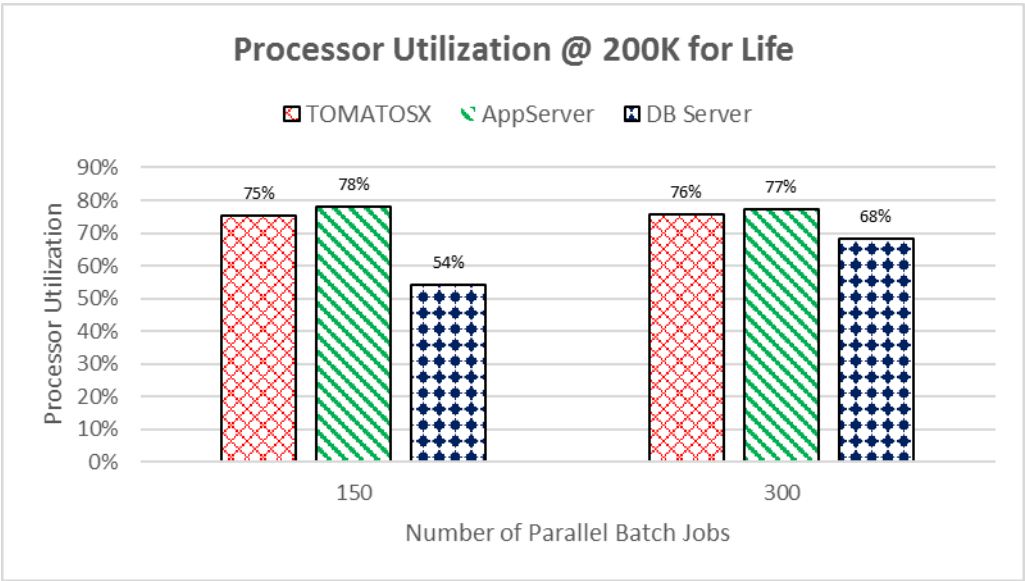

Figure 15: Life @ 150 & 300 Jobs – CPU

The Internal Throughput Rate (ITR) is the ETR normalized to 100% processor utilization. ITR provides a reliable basis for measuring processor capacity. Since a second application server and a second TOMATOSX server were added and the number of DB sever cores had been increased, the respective ITRs also increased as shown in Figure 16.

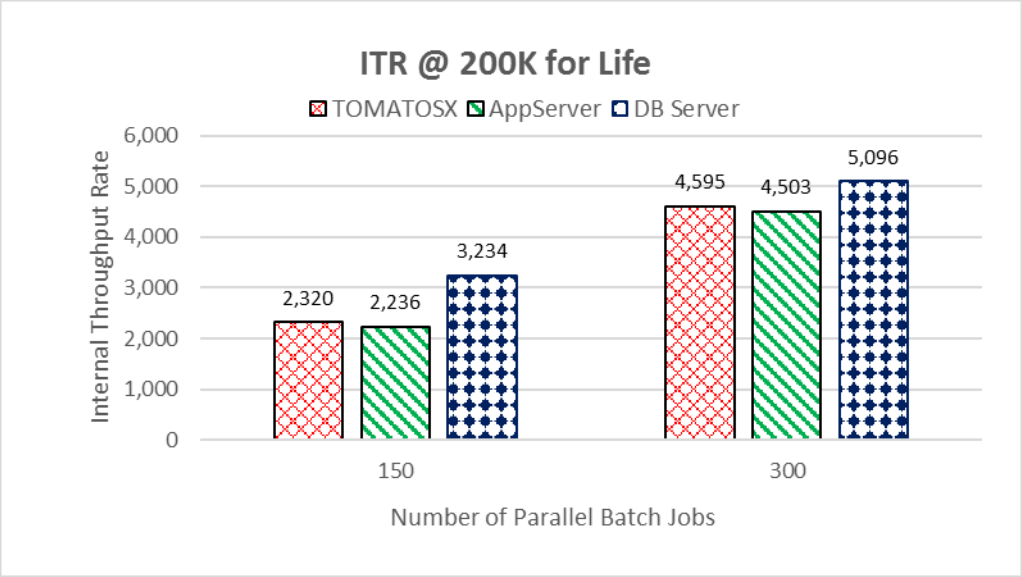

Figure 16: Life @ 150 & 300 Jobs – ITR

5.1.3 Measurement Results at 150 and 300 Jobs: Automobile

The following is a summary of the results for Automobile insurance comparing single application server (150 jobs) to double application servers (300 jobs) at 200K contracts:

Scenario	# of jobs	Elapsed Time	Throughput (contracts/min)	CPU TOMATOSX Rating Engine	CPU Application Server	CPU Database Server	ITR TOMATOSX Rating Engine	ITR Application Server	ITR Database Server
1-appserver	150	1:09:56	2,860	67%	77%	45%	4,241	3,726	6,290
2-appservers	300	0:32:58	6,067	74%	76%	51%	8,167	8,014	11,990

Table 3: Result Summary @ 150 and 300 Jobs for Automobile

Figure17 shows the elapsed times of the two run scenarios. The elapsed time is the most critical KPI for the batch window considerations. With doubled the application server hardware capacity, the elapsed time is reduced by half.

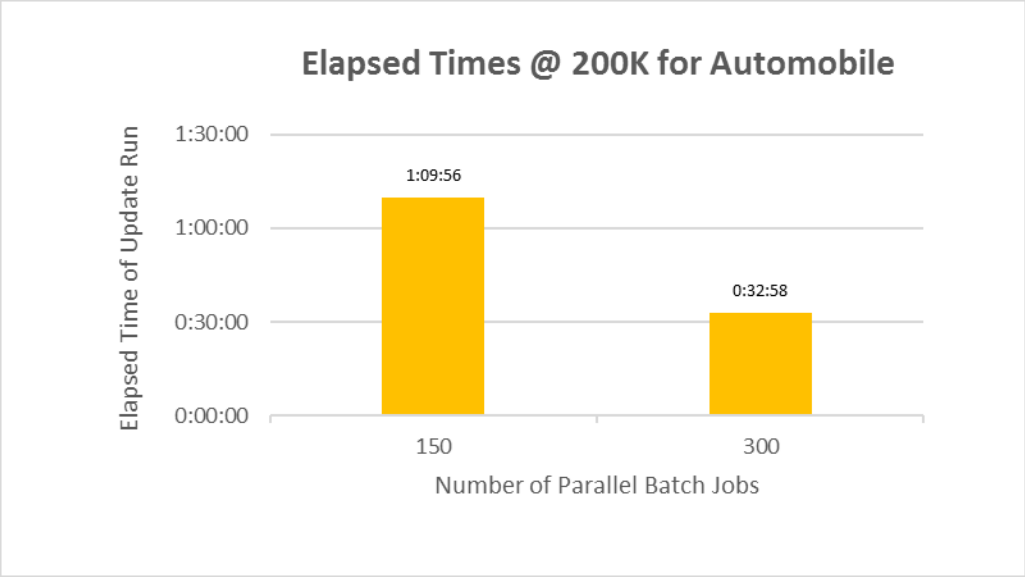

Figure 17: Automobile @150 & 300 Jobs – Elapsed Times

Similar to P&C and Life, the 200K Automobile test scenario also experienced doubling in ETR with double application servers, as indicated in Figure 18.

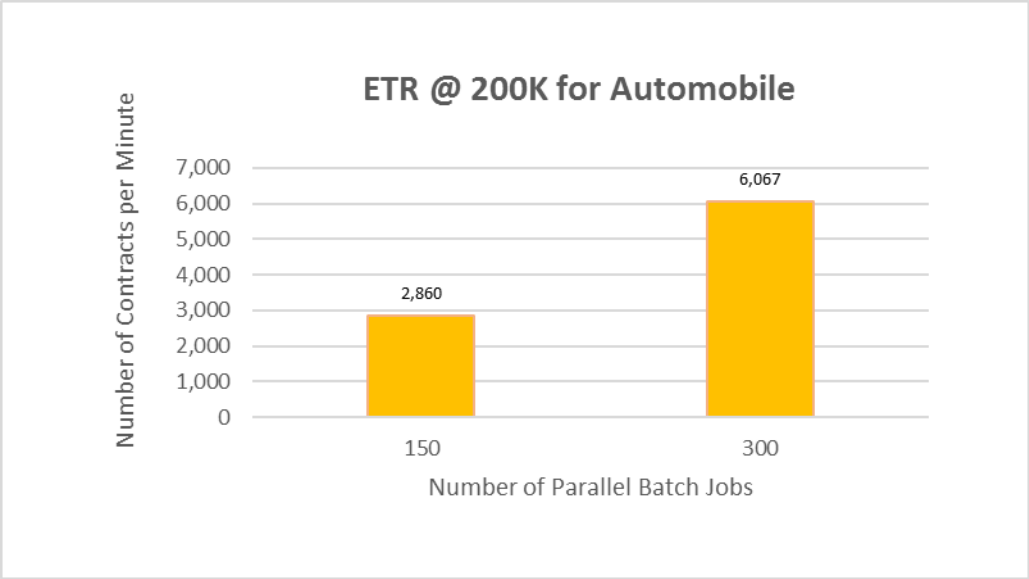

Figure 18: Automobile @150 & 300 Jobs – ETR

The processor utilizations for the Automobile insurance test scenario resembled those of the Life insurance. They were significantly high on both the TOMATOSX rating engine servers and the SAP application server(s), and moderate on the database server.

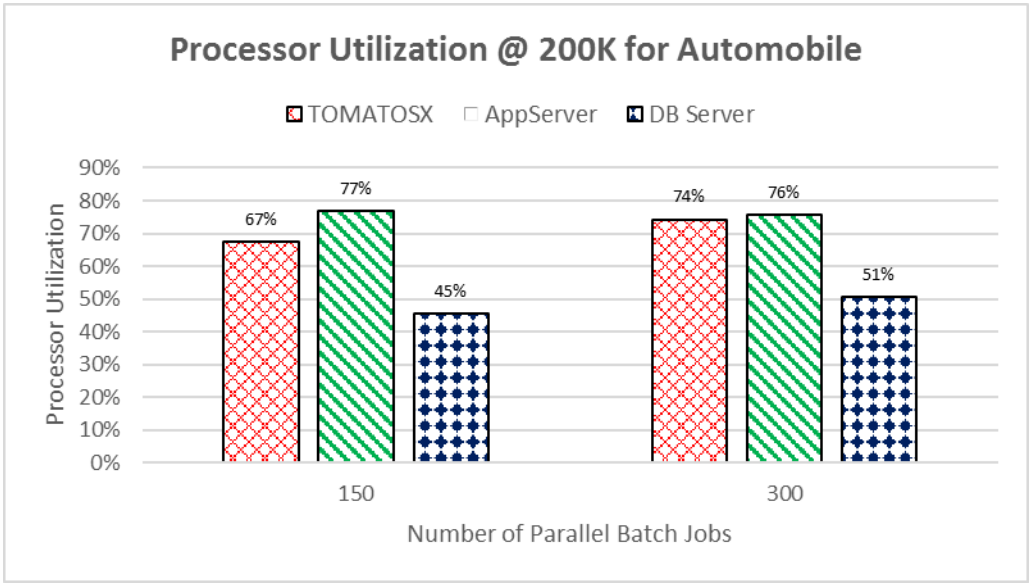

Figure 19: Automobile @150 & 300 Jobs – CPU

The Internal Throughput Rate (ITR) is the ETR normalized to 100% processor utilization. ITR provides a reliable basis for measuring processor capacity. Since a second application server and a second TOMATOSX server were added and the number of DB sever cores had been increased, the respective ITRs also increased as shown in Figure 20.

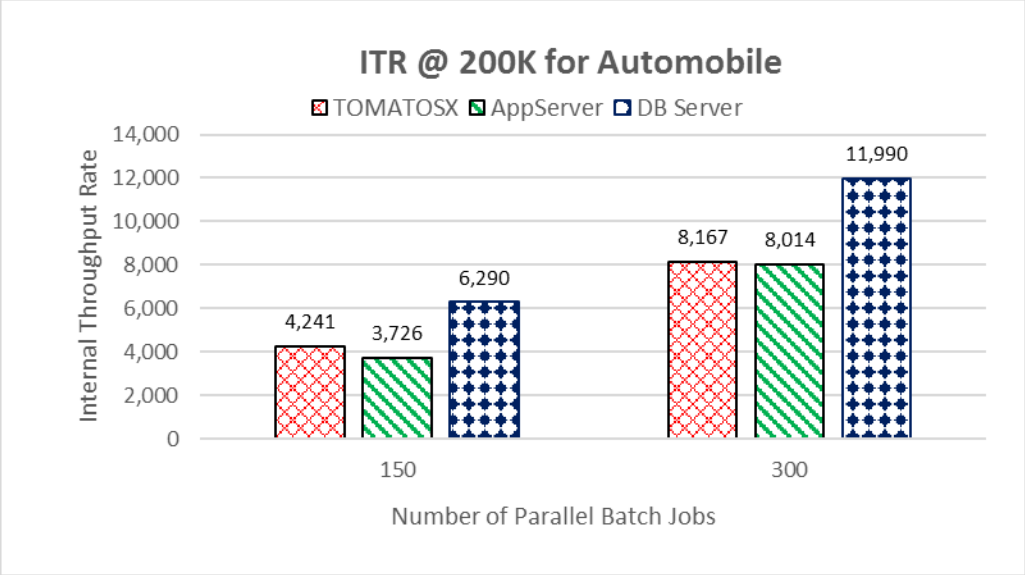

Figure 20: Automobile @150 & 300 Jobs – ITR

5.2 Measurement Results at 200K, 2M and 4M Contracts

At this point with the increased hardware processing capacity, we had a reasonable tuned environment running at 300 jobs. We then scaled up to the larger database sizes from 200K, to 2M, and to 4M insurance contracts per line of business (LoB). The External Throughput Rate per LoB was kept relatively constant with constant test hardware resource capacity, except the TOMATOSX server configuration.

In the 4M tests, we noticed that the TOMATOSX server had reached a high CPU% saturation point, especially for the Life insurance test scenario. We took a preventive measure to avoid the potential TOMATOSX constraint by increasing its processing capacity. We had two machines (p750 and p780) used as TOMATOSX servers. We simply switched the p780 server from the turbo core mode (32 core @ 4.1 GHz) to the max core mode (64 cores @ 3.9 GHz) configuration. With this change, we also increased the number of TOMATOSX servers/threads. See details in the following figure:

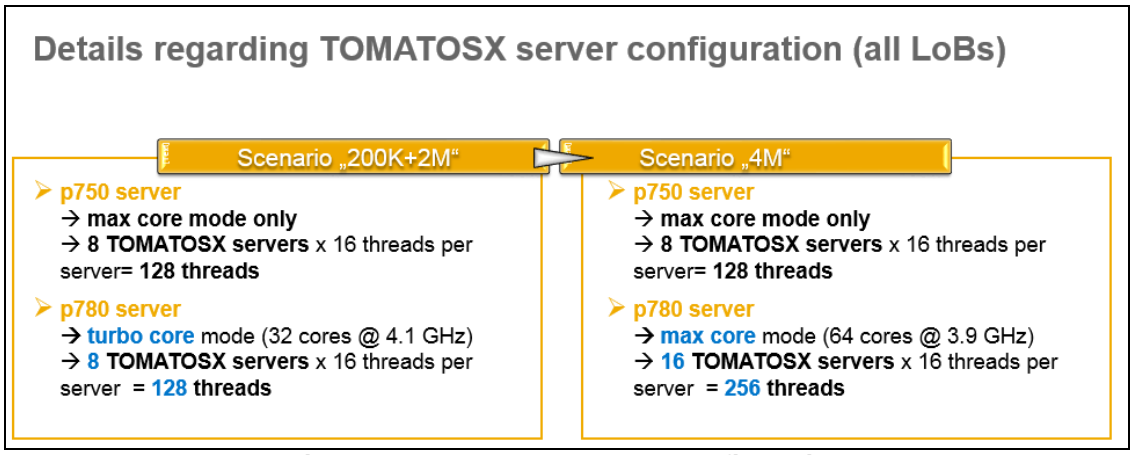

Figure 21: TOMATOSX Server Configuration

5.2.2 Measurement Results at 200K, 2M and 4M Contracts: Property & Casualty

Here are the results for the database size scaling from 200K, 2M, and 4M contracts for Property & Casualty insurance. The measurements were done with 300 jobs.

Scenario	# of jobs	Elapsed Time	Throughput (contracts/min)	CPU TOMATOSX Rating Engine	CPU Application Server	CPU Database Server	ITR TOMATOSX Rating Engine	ITR Application Server	ITR Database Server
200K	300	0:14:18	13,985	2%	83%	64%	n/a	16,789	21,913
2M	300	2:17:09	14,581	1%	82%	58%	n/a	17,742	25,140
4M	300	4:10:55	15,940	1%	83%	62%	n/a	19,321	25,553

Table 4: Result Summary @ 200K, 2M and 4M Contracts for Property & Casualty

As we scaled up the database sizes with more contracts but kept consistent load at the constant 300 jobs using constant hardware resources, the overall elapsed time increased linearly as expected. See figure 22.

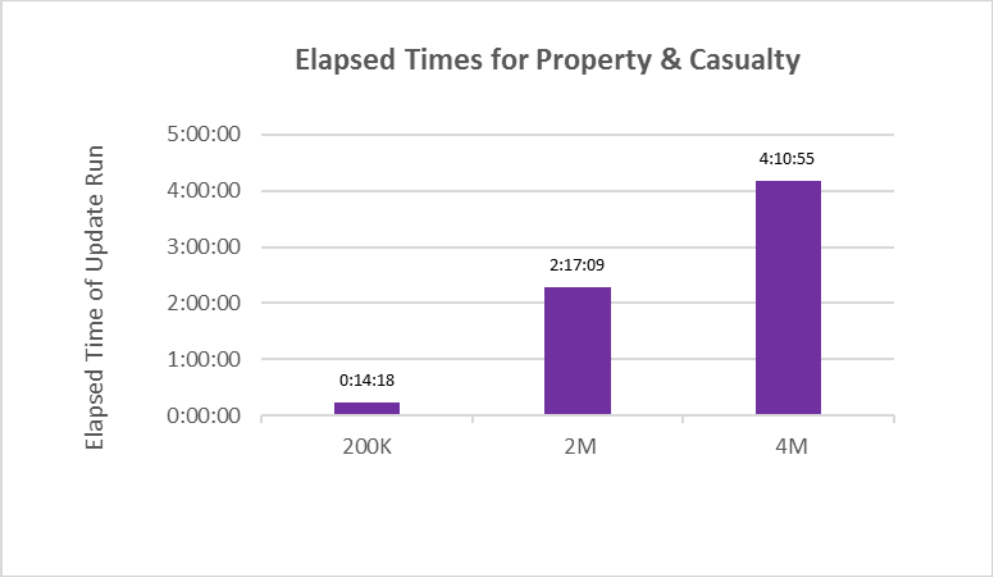

Figure 22: Property & Casualty @200K, 2M and 4M Contracts – Elapsed Times

With the consistent load and constant hardware processing capacity, we would expect a constant external throughput rate. Figure 23 indicates the external throughput rates increased as we scaled up the database sizes. The main improvement factor can be attributed to the SAP FS-PM upgrades from SP1 (for 200K) to SP2 (for 2M) and SP3 (for 4M).

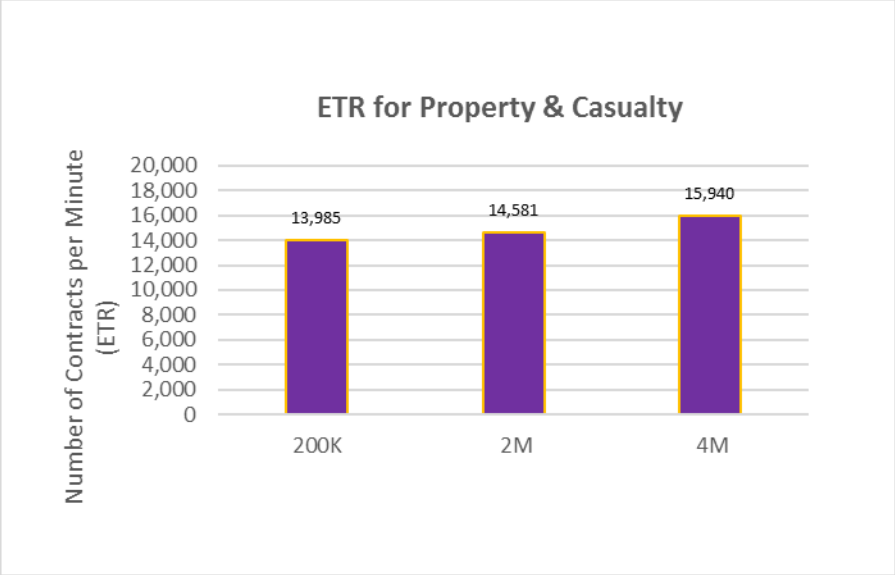

Figure 23: Property & Casualty @200K, 2M and 4M Contracts – ETR

For Property & Casualty insurance, the processor utilization is negligible for the TOMATOSX servers, significantly high for the SAP application servers, and moderate for the database server.

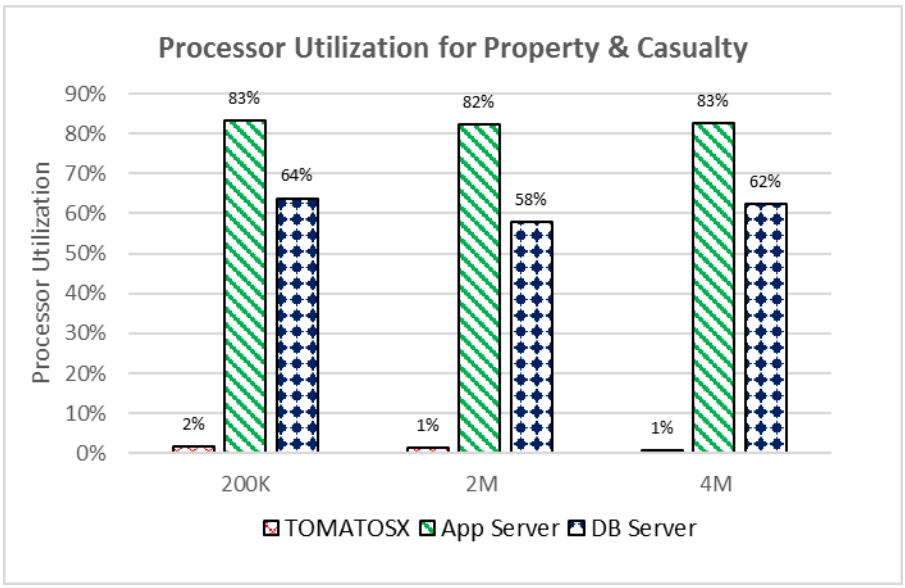

Figure 24: Property & Casualty @200K, 2M and 4M Contracts – CPU

Figure 25 shows the Internal Throughput Rate (ITR). ITR is the ETR normalized to 100% processor utilization. ITR provides a reliable basis for measuring processor capacity. The ITR for the TOMATOSX servers were not included since their utilizations were negligible for the Property & Casualty test scenarios.

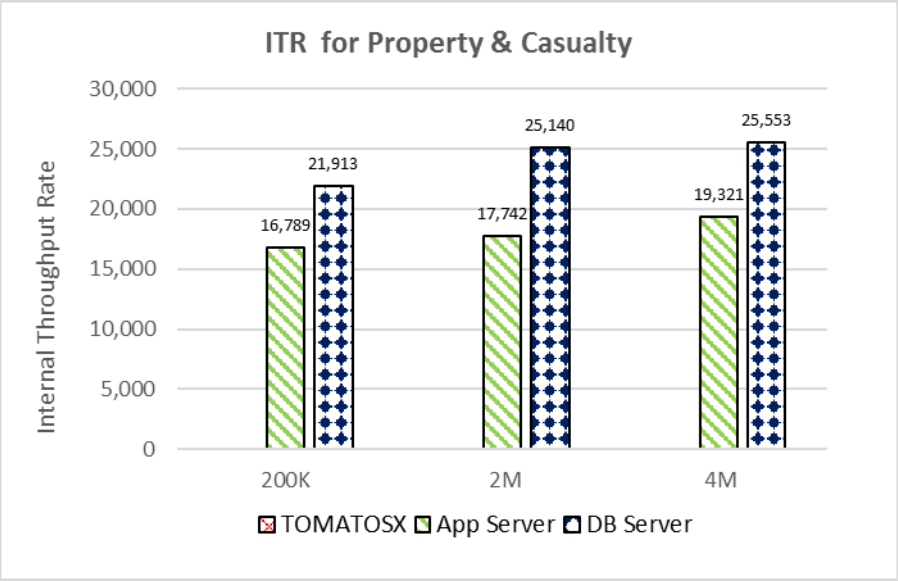

Figure 25: Property & Casualty @200K, 2M and 4M Contracts – ITR

5.2.3 Measurement Results at 200K, 2M and 4M Contracts: Life

Here are the results for database size scaling from 200K, 2M, and 4M contracts for Life insurance. The measurements were at 300 jobs.

Scenario	# of jobs	Elapsed Time	Throughput (contracts/min)	CPU TOMATOSX Rating Engine	CPU Application Server	CPU Database Server	ITR TOMATOSX Rating Engine	ITR Application Server	ITR Database Server
200K	300	0:57:29	3,479	76%	77%	68%	4,595	4,503	5,096
2M	300	9:11:00	3,630	76%	79%	51%	4,778	4,574	7,129
4M	300	16:22:26	4,071	56%	80%	53%	7,219	5,061	7,630

Table 5: Result Summary @ 200K, 2M and 4M Contracts for Life

The elapsed times were expected to be linear as we scaled up. Figure 26 shows that the elapsed times were in line with expectations.

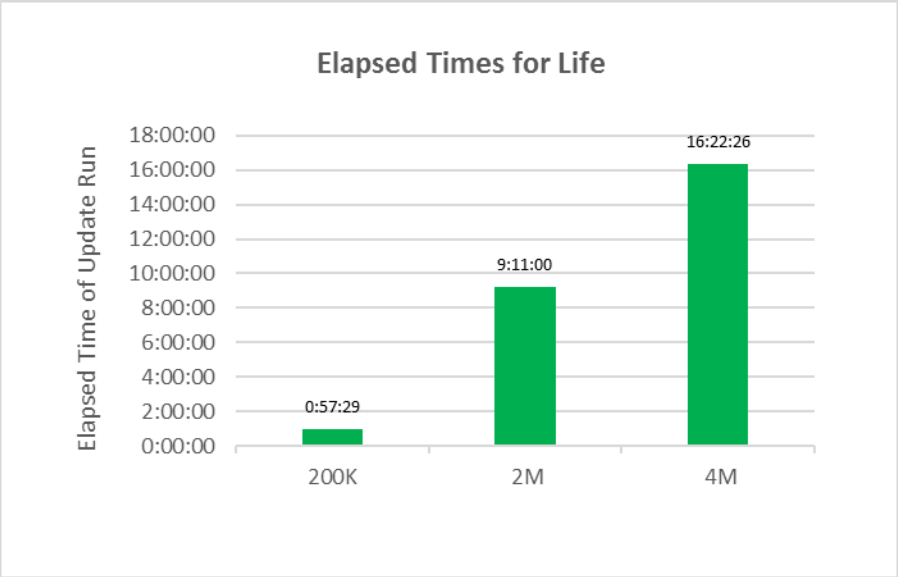

Figure 26: Life @200K, 2M and 4M Contracts – Elapsed Times

Likewise, the ETR numbers were expected to be consistent with constant load and constant test hardware environment. Figure 27 shows that there is a slight improvement in the throughput rates which can be attributed to the FS-PM support package upgrades.

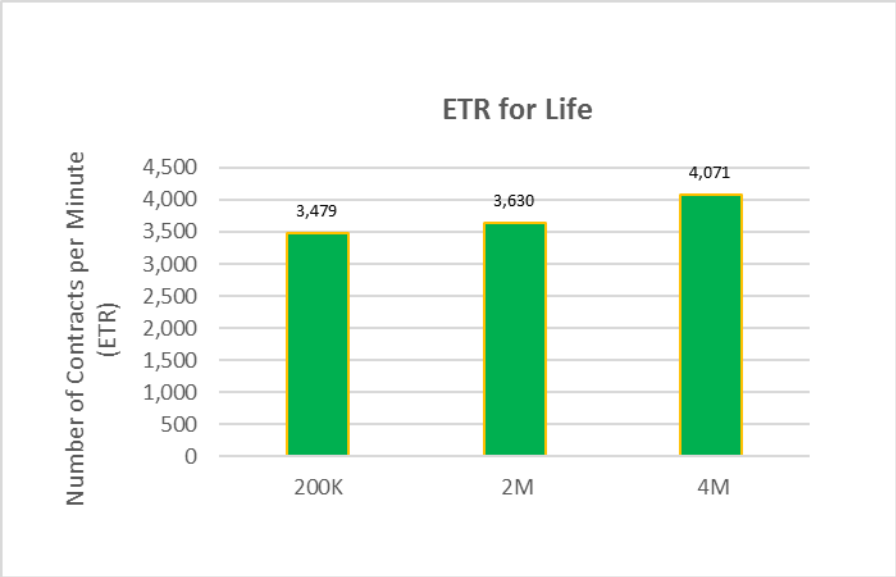

Figure 27: Life @200K, 2M and 4M Contracts – ETR

Figure 28 shows the processor utilizations of all servers: TOMATOSX rating engine servers, SAP application servers, and database server. At 200K, both TOMATOSX and SAP appserver were very high.

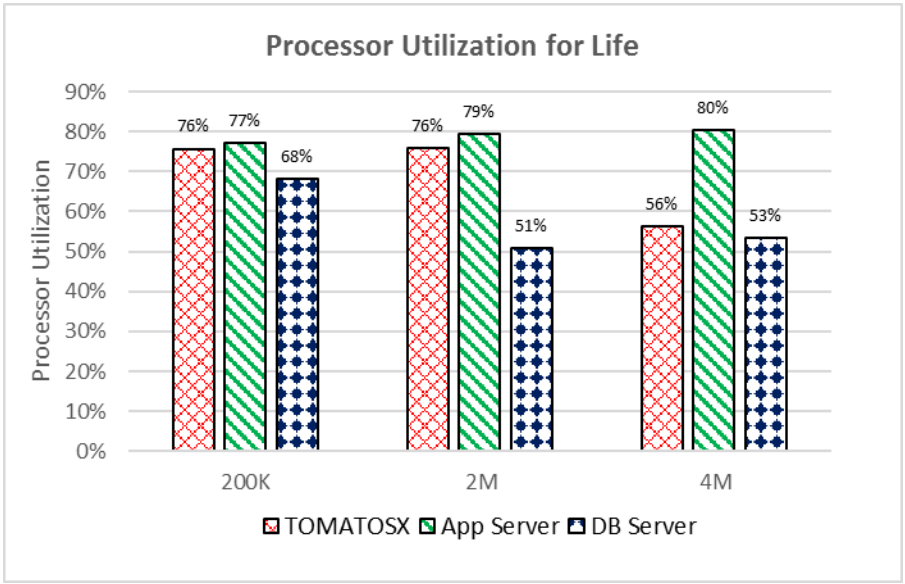

Figure 28: Life @200K, 2M and 4M Contracts – CPU

Figure 29 shows the Internal Throughput Rate (ITR). The ITR significantly increased for the database server from the 200K to the 2M and 4M test scenarios mainly due to the FS-PM support pacakage upgrades. The ITR for the TOMATOSX increased signficantly from 2M to 4M due to the added processing capacity for the TOMATOSX servers with increased number of TOMATOSX threads.

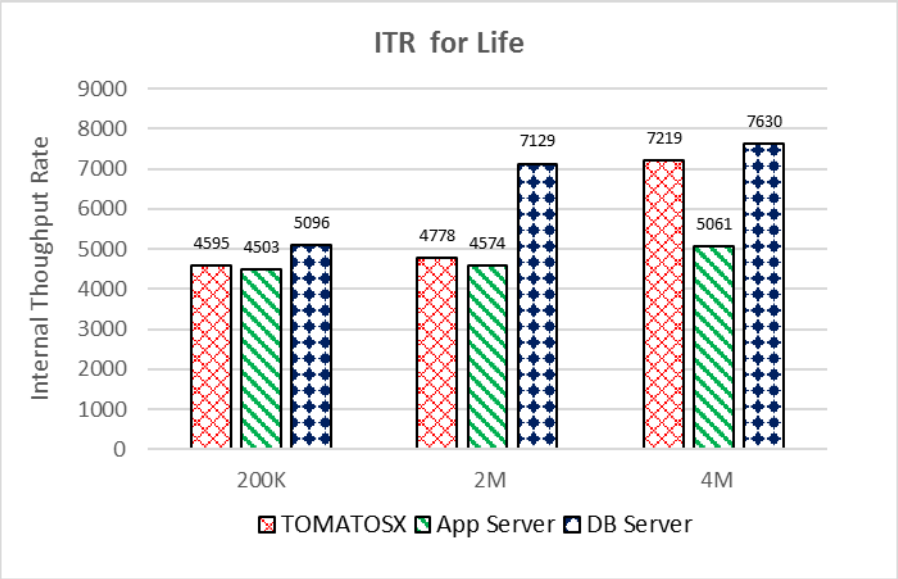

Figure 29: Life @200K, 2M and 4M Contracts – ITR

5.2.3 Measurement Results at 200K, 2M and 4M Contracts: Automobile

Here are the results for the database size scaling from 200K, 2M, and 4M contracts for Automobile insurance. The measurements were at 300 jobs.

Scenario	# of jobs	Elapsed Time	Throughput (contracts/min)	CPU TOMATOSX Rating Engine	CPU Application Server	CPU Database Server	ITR TOMATOSX Rating Engine	ITR Application Server	ITR Database Server
200K	300	0:32:58	6,067	74%	76%	51%	8,167	8,014	11,990
2M	300	5:07:56	6,465	67%	80%	48%	9,588	8,082	13,498
4M	300	8:49:09	7,559	20%	81%	53%	37,922	9,330	14,257

Table 6: Result Summary @ 200K, 2M and 4M Contracts for Automobile

The elapsed times were expected to be linear as we scaled up. Figure 30 shows that the elapsed times were in line with expectations.

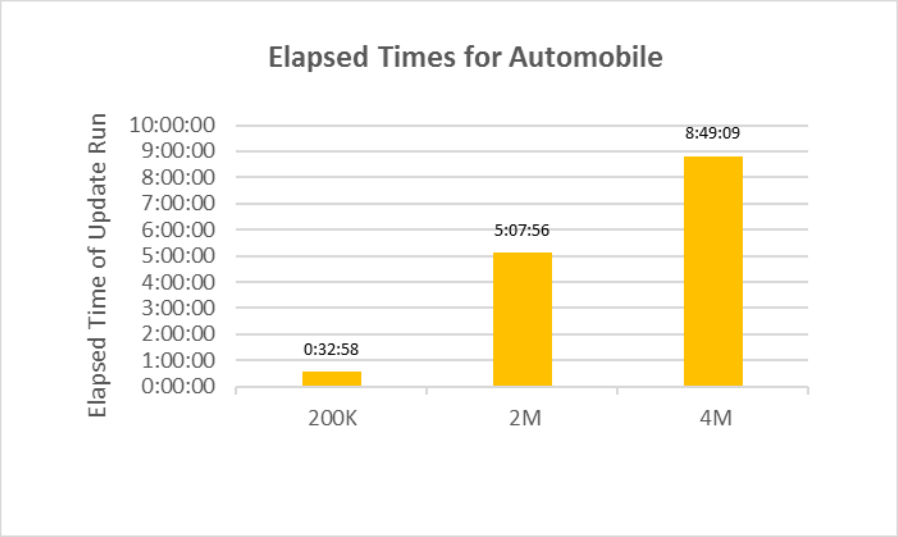

Figure 30: Automobile @200K, 2M and 4M Contracts – Elapsed Times

With constant load and processing hardware test environment, we would expect to have consistent throughput rate. Figure 31 indicates that there is a slight improvement in the throughput rates which can be attributed to the FS-PM support package upgrades.

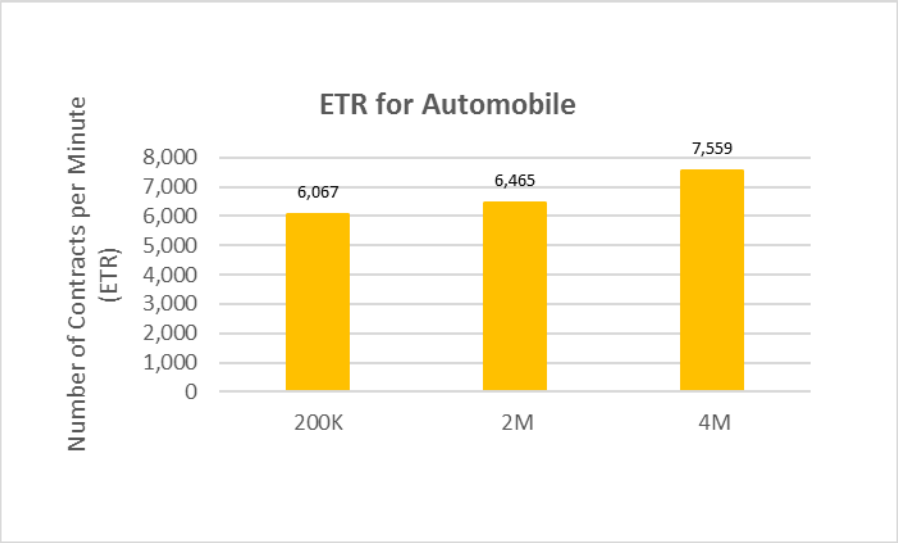

Figure 31: Automobile @200K, 2M and 4M Contracts – ETR

Figure 32 shows the processor utilization of all three server groups: TOMATOSX rating engine servers, SAP application servers, and database server. At the 4M test scenario, the TOMATOSX utilization dropped significantly. The contributing factors were an enhancement in FS-PM AUTO SP3 and the added processing capacity for the TOMATOSX servers with increased number of TOMATOSX threads.

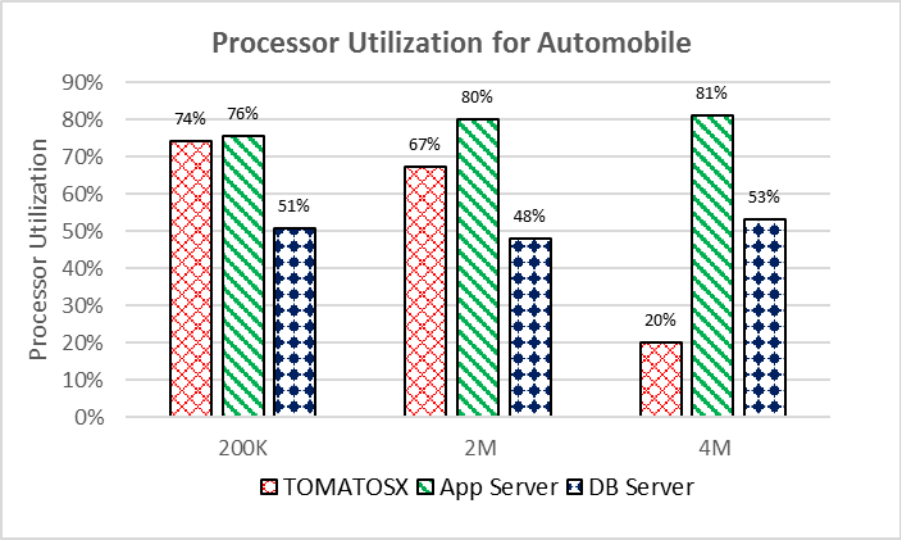

Figure 32: Automobile @200K, 2M and 4M Contracts – CPU

Figure 33 shows the ITR for all servers. The ITR for TOMATOSX at 4M increased significantly due to an enhancement in FS-PM AUTO SP3 and the added processing capacity for the TOMATOSX servers with increased number of TOMATOSX threads.

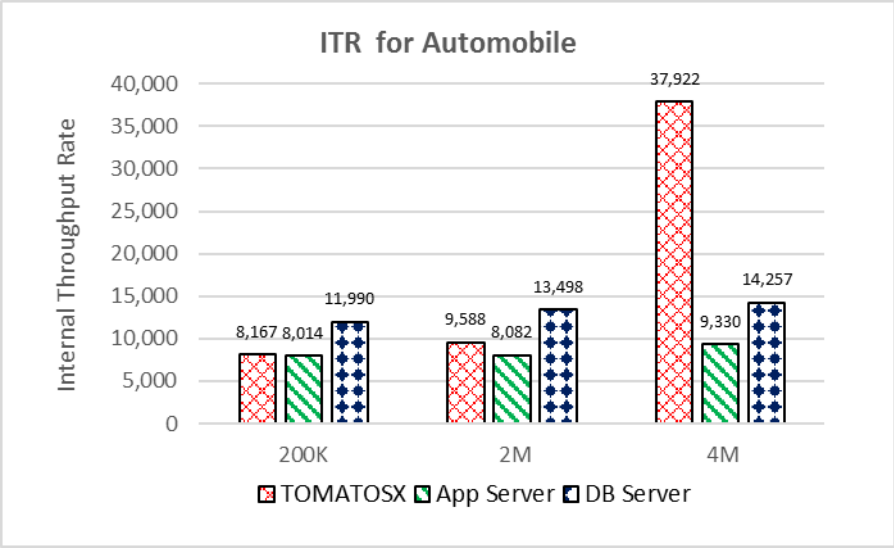

Figure 33: Automobile @200K, 2M and 4M Contracts – ITR

5.3 Measurement Results at 4M Contracts: Database Server z13 vs. zEC12

As the final set of measuremnets, we upgraded our database (DB) server from a zEC12 processor to a more current z13 processor. The following are meausurement results with 300 jobs and 4M contracts per Property & Casualty, Life, and Automobile on the two different DB servers.

LOB	System z	# of jobs	Elapsed Time	Throughput (contracts/min)	CPU TOMATOSX Rating Engine	CPU Application Server	CPU Database Server	ITR TOMATOSX Rating Engine	ITR Application Server	ITR Database Server
P&C	zEC12	300	4:10:55	15,940	1%	83%	62%	n/a	19,321	25,553
P&C	z13	300	4:13:12	15,796	1%	82%	49%	n/a	19,205	32,356
LIFE	zEC12	300	16:22:26	4,071	56%	80%	53%	7,219	5,061	7,630
LIFE	z13	300	16:22:40	4,070	56%	81%	43%	7,217	5,053	9,390
AUTO	zEC12	300	8:49:09	7,559	20%	81%	53%	37,922	9,330	14,257
AUTO	z13	300	8:49:53	7,549	20%	81%	41%	37,493	9,314	18,542

Table 7: Result Summary @ 4M for ALL LoB's – z13 vs. zEC12

For each LoB test scenario, the elapsed times were approximately the same whether the DB server was on a zEC12 or a z13. This is expected as the gating factor was likely the application servers running at a high utilization with the constant 300 jobs.

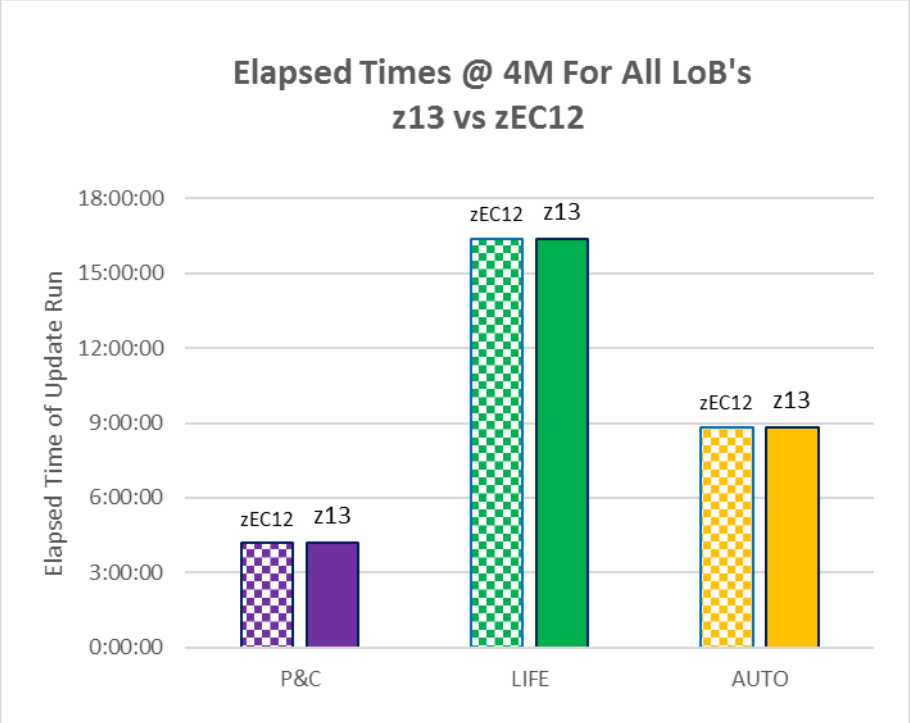

Figure 34: DB Server z13 vs. zEC12 – Elapsed Times

The throughput rate per LoB scenario remained consistent and in line with the elapsed times regardless the DB server was on a zEC12 processor or a z13 processor.

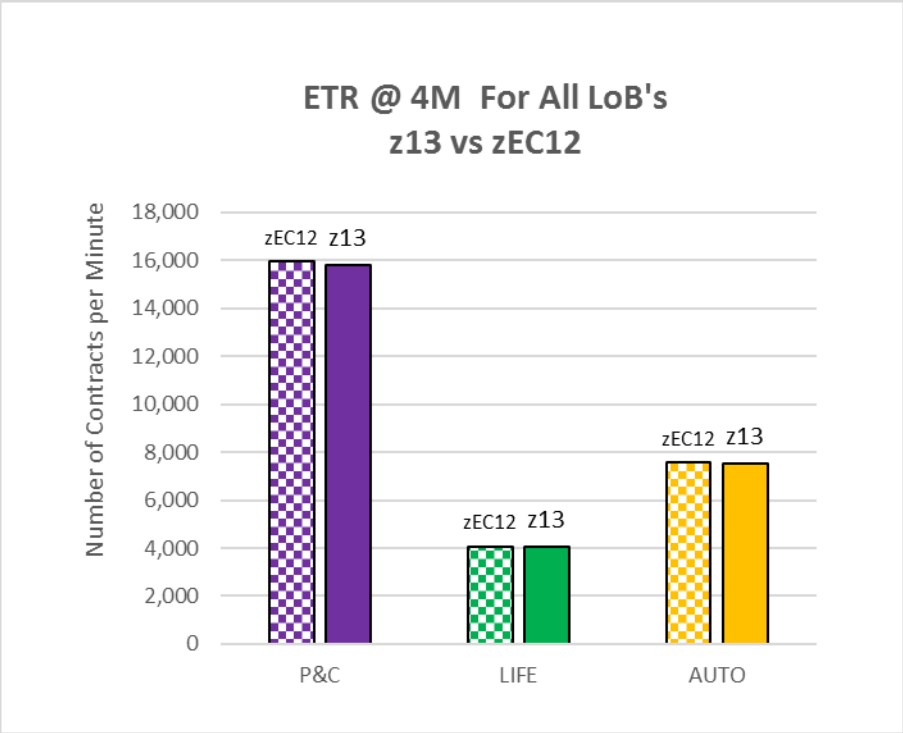

Figure 35: DB Server z13 vs. zEC12 – ETR

The CPU utilization for the TOMATOSX servers remained constant. Likewise, the CPU utilization for the application servers stayed the same. Figure 36 shows only the CPU utilization for the DB servers. With z13, the CPU utlization decreased more than 10% as compared to zEC12.

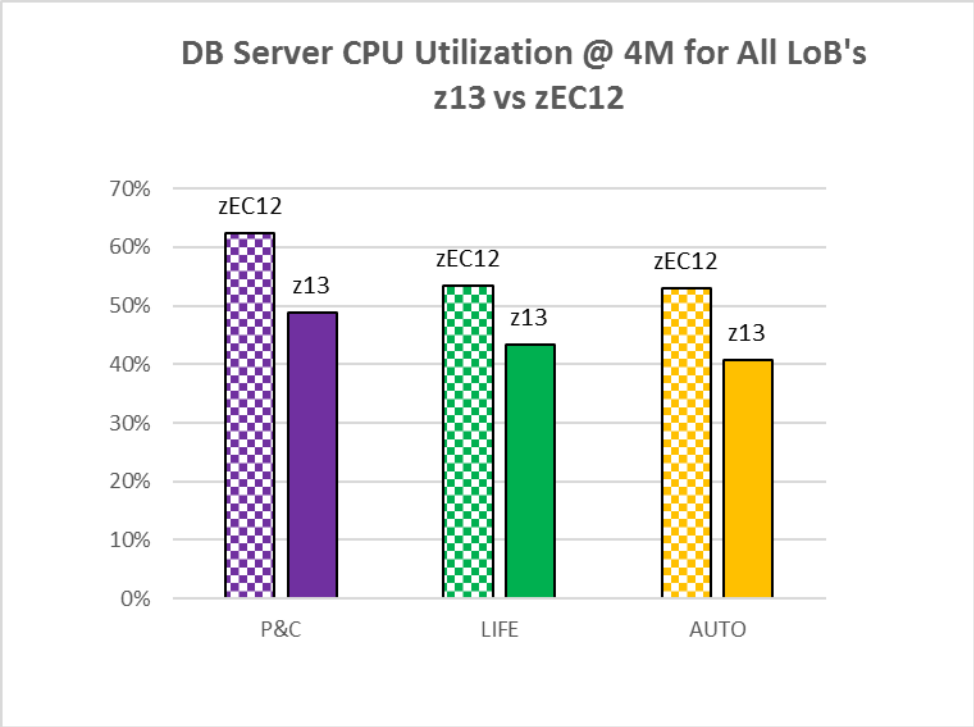

Figure 36: DB Server z13 vs. zEC12 – CPU

Figure 37 shows the ITR gains for z13 as compared to zEC12 for all three insurance lines of business.

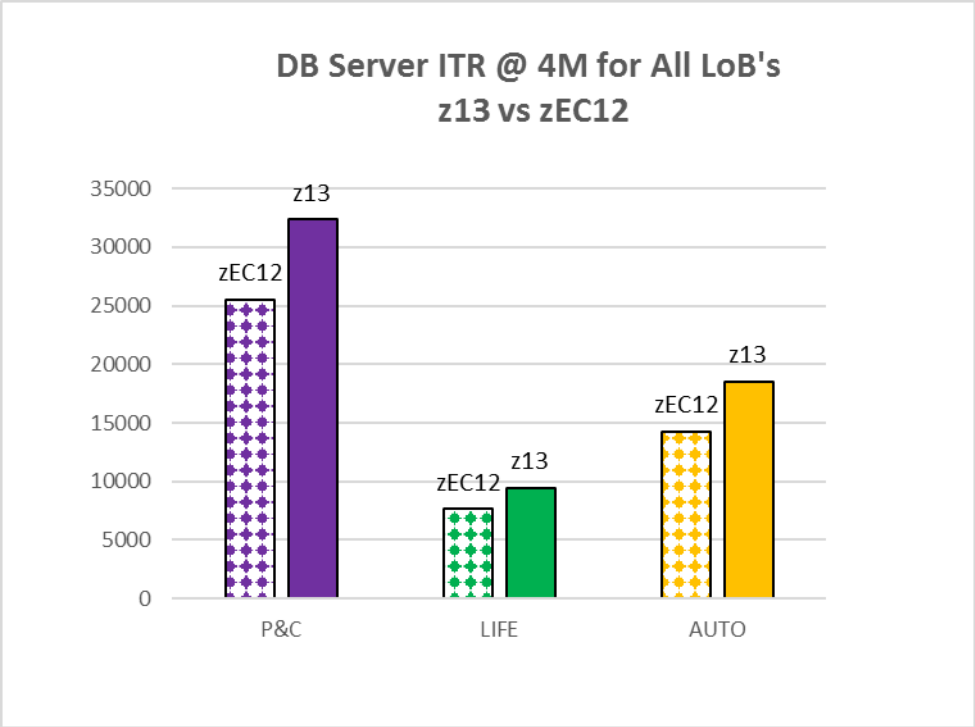

Figure 37: DB Server z13 vs. zEC12 – ITR

6.0 Conclusions

Insurance industry hosts intense competition for new generation of customers using new technologies. Insurers need to deliver superior services and products to market faster, and to get the right information to the right customers at the right time. The nature of the insurance business requires an underlying IT infrastructure, particularly strong in business continuity, security, performance and scalability. There are stringent requirements to have applications available 24x7 to ensure continuous operations, to protect customer and other sensitive data, and to scale as the system load varies substantially over time.

IBM z Systems is a recognized industry leader in business continuity, security, performance and scalability. It meets all the vital requirements for the insurance industry, and is capable and well suited to run modern applications, such as the comprehensive array of SAP insurance components including the SAP Insurance Policy Management.

The SAP Insurance Policy Management supports a wide range of insurance business processes. This paper focuses on one critical business process, specifically the periodic contract updates. The study covers three different insurance lines of business: Property & Casualty, Life, and Automobile coverages. The study shows consistent performance results on database scalability with sizes ranging from 200K, 2M, and to 4M contracts per lines of insurance business. Moreover, the study demonstrates linear performance scalability by which doubling the application server capacity doubles the throughput rate.

As shown by the final set of measurements, upgrading the database server from an IBM zEC12 to a newer IBM z13 with the same number of cores, the processor utilization is reduced by more than 10%. This demonstrates that each successive generation of the IBM z Systems processors delivers increasing capacity to support the continuous growing demand needed by the Insurance industry.

IBM z Systems with its superior strength in business continuity, security, performance and scalability, is proofed impressively to be an excellent platform for the SAP Insurance Policy Management solution to satisfy the stringent needs of the insurance industry.

7.0 References

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