

InsFocus Performance Benchmarks

Performance benchmarks of InsFocus insurance analytic queries run over Microsoft SQL Server 2012 in MTC (Microsoft Technology Center) labs in Bangalore.

During the week of December 2nd 2012, performance benchmarks were carried out to demonstrate the scalability of InsFocus BI's insurance optimized data warehouse model on Microsoft SQL Server 2012. Tests were carried out in MTC (Microsoft Technology Center) in Bangalore, India, by a team of professionals from InsFocus Systems (Israel), Nous Infosystems (India) and Microsoft Technology Center (India).

The results demonstrated that InsFocus BI over Microsoft SQL Server 2012 can be used for very large insurance companies, with up to 100 million policy transactions in their data warehouse.

Preparation

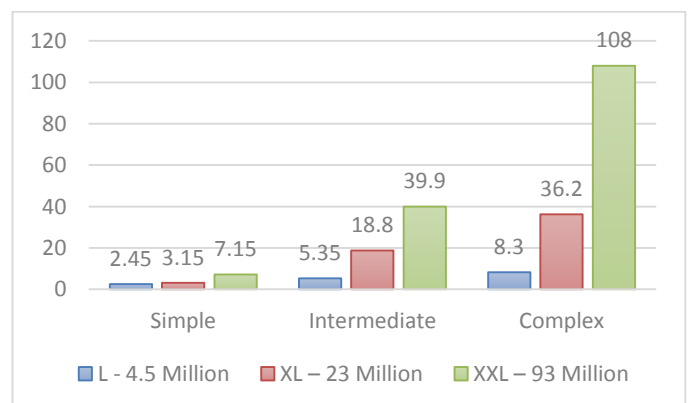
- Tests were conducted on standard, albeit powerful, Windows servers made available at MTC.
- Database environment used was SQL Server 2012 Enterprise version using its standard optimization features available off the shelf.
- Queries were run on three data warehouse sizes, measured in number of policy transactions:
 - L – 4.5 million
 - XL – 23 million
 - XXL – 93 million
- 12 different InsFocus BI analytic queries of varying complexity levels were run, simulating a variety of reports and queries typical to insurance companies.
- Tests were run on original line-by-line data with no pre-aggregations – real-world performance could be better.

Results Summary

Test results categorized reports into three groups – Simple, Intermediate and Complex.

Category	L - 4.5 Million	XL – 23 Million	XXL – 93 Million
Simple	0.5 – 4.4	1.1 – 5.2	2.2 – 12.1
Intermediate	3.3 – 7.4	11.0 – 26.6	20.2 – 59.6
Complex	7.4 – 9.2	31.0 – 41.4	91.9 – 124.1

Queries run time in seconds



Testing Details

Server Configuration

In Microsoft's MTC, testing was done on a robust server with the following characteristics:

- 2 x Intel 8-Core Xeon E5-2680 processors @2.70GHz
- 64 GB memory
- SAN RAID 5 array of drives + 64GB SSD used for temp DB on XXL database. Disk speed 311 MBs/sec, SSD speed 408 MBs/sec.
- Windows Server 2008 R2
- SQL Server 2012 Enterprise Edition

Databases Tested

The core data warehouse model used is the "InsFocus Large" database. It was then multiplied to 5 & 20 times its size, affecting number of policies, claims and clients.

	L - Large	XL - Large X 5	XXL - Large X 20
# of Policy Transactions	4,659,801	23,299,005	93,196,020
# of Policy Sections	9,021,874	45,109,370	180,437,480
# of Claim Payments	1,260,605	6,303,025	25,212,100
# of Claim O/S Estimates	318,288	1,591,440	6,365,760
Size in GB	47.24	96.19	250.43

All databases used standard SQL Server 2012 optimization methods, including standard indexes, clustered indexes and columnstore indexes.

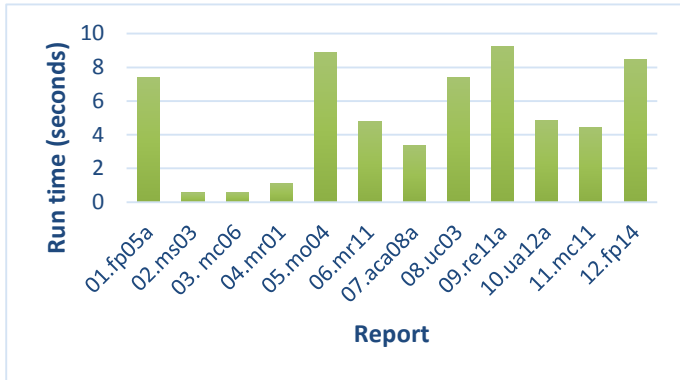
Reports Run

The tests were conducted on the SQL code of 12 typical InsFocus reports, ranging from simple sales measurements to full profitability and reinsurance analysis. All reports were run as full queries, without using aggregation tables, to simulate real world scenarios. All queries were run three times and durations were averaged between. Cache was cleared before running each query.

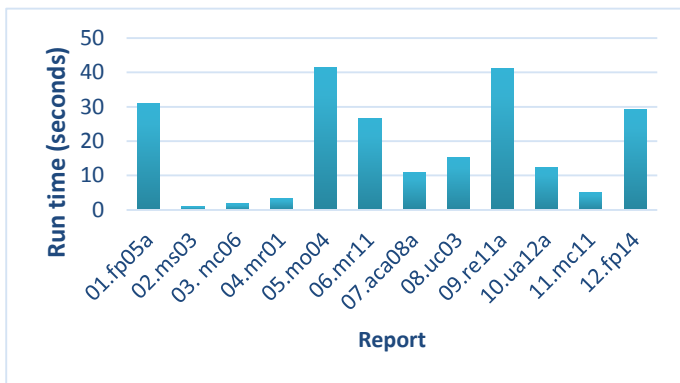
Report	Report name
1. fp05a	Gross profitability five year executive view Insurance portfolio profitability calculation over five years, incorporating runtime pro-rata unearned premium (UPR) calculations on policy by policy basis, overall 18 measurements calculated.
2. ms03	Sales comparison YTD by product Simple year on year comparison of premiums, policies issued and average premium by insurance product.
3. mc06	Cancellation premium by agents Analysis of cancelled premiums compared to issued premiums on underwriting year basis, by agents.
4. mr01	Agent lapse analysis by product group Renewal-lapse analysis by agent separately calculated for seven main product groups.
5. mo04	Private clients profile by premium bands Banding mechanism profiles clients by their premium grouping them into eight bands, then presenting six measurements per band.
6. mr11	Full month renewal list A list of all policies coming up for renewal in the current month, based on expired policy ending date, showing annualized premium for renewal compared to renewed premium, where renewed.
7. aca08a	Claims profile by claim types for selected product Profiling claims incurred (paid amounts plus outstanding estimates) by incurred value at date.
8. uc03	Product loss frequency analysis by clients Pro-rata calculation of policies exposed compared to number of claims on occurrence basis, providing claim frequency analysis per client to be mapped on a scatter chart.
9. re11a	Gross risk profile for selected line Banding mechanism used on <u>policy section</u> sum-insured to provide a dynamic (user driven) risk profile report. Sums insured at specified date are first categorized into bands defined by user, then report is produced.
10. ua12a	Product profitability analysis by sections Underwriting based profitability analysis for 10 products, analyzing each product by coverage sections, including unearned premium (UPR) pro-rata calculation, loss ratios and loss frequency.
11. mc11	Profitability 36 months exposure by agents Exposure based profitability analysis over 36 months per agent.
12. fp14	Net profit-loss five year development Complete five years financial based profit-loss account on Gross-Reinsurance-Net basis. Report contains ~ 40 measurements, each year is calculated separately.

Result Charts

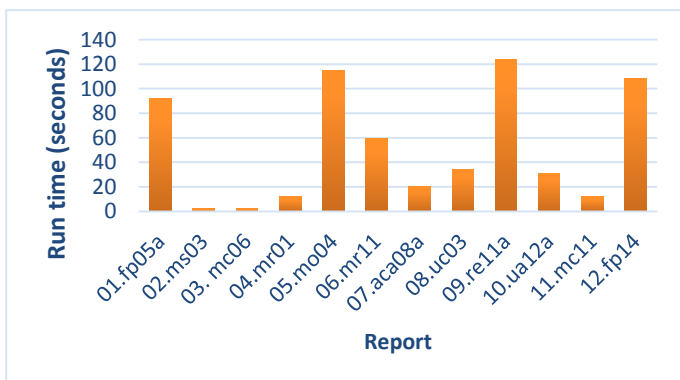
Query Times – L (4.5 Million)



Query Times – XL (23 Million)



Query Times – XXL (93 Million)



Result Details

Report	L - (4.5 M)	XL - (23 M)	XXL (93 M)	Category
01.fp05a	7.393	30.978	91.917	Complex
02.ms03	0.539	1.141	2.231	Simple
03.mc06	0.607	1.878	2.2863	Simple
04.mr01	1.124	3.365	12.129	Simple
05.mo04	8.911	41.417	115.115	Complex
06.mr11	4.793	26.602	59.5938	Intermediate
07.aca08a	3.346	10.974	20.208	Intermediate
08.uc03	7.385	15.153	34.341	Intermediate
09.re11a	9.238	41.077	124.124	Complex
10.ua12a	4.815	12.462	31.311	Intermediate
11.mc11	4.461	5.214	12.126	Simple
12.fp14	8.489	29.295	108.108	Complex

Query run times in seconds

Conclusions

Microsoft SQL Server 2012 is proved to be a very scalable platform that delivers rapid query response times even on very large data sets. Using InsFocus' data model and optimized queries, insurance companies have a basis for running a large variety of reports and queries from very simple to very complex to meet their great variety of analytic requirements.

More Information

For more information on the reports conducted, please contact one of the following:

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