



Performance Improvement for Web Based Application in the Insurance Domain

Client

The client is a leading provider of software for insurance in the US. It has the insurance software industry's largest customer base, with more than 20,000 agencies and more than 50,000 users, including 96 of the top 100 US agencies and more than 80 of the top 100 carriers. It invests more than \$50 million annually in R&D and \$20 million in data centers.

Challenge

The application under test is the industry-leading forms solution for agent contracting. This solution offers agent contracting through a Web-based Intelligent Interview process. The application offers an efficient way to contract with one or multiple carriers, eliminating the manual and paper-intensive contracting process. It can transmit accurate data between agents and distributors to a carrier's legacy systems. The application supports over 400 carriers and maintains over 10,000 active carrier forms.

Some features of the application were:

- The portal had two components: Admin and User
- Admin sites are for administrative purposes
- User-facing sites are for the Intelligent Interview, Data Collection, and Electronic Signature
- Integration with legacy systems (export data)

The application's Web page performance was a bottleneck, with some of the pages requiring more than 4 to 5 minutes to load and the overall interview process ranging between 11 to 20 minutes. It was a legacy application and had major performance issues.

The admin sites and user-facing sites needed thorough performance testing as well as performance improvement in page response time. Marlabs conducted performance testing on the application to identify and validate performance issues and performance improvement.

The customer's support team resources were devoted to the testing of user-facing websites, while most of the admin and user sites were being tested by developers due to a limited number of testing resources. The lack of dedicated focus towards performance testing meant that the performance degradation was continuous and not monitored.

Challenges:

- The client wanted to minimize the Web page load time for the pages that were not meeting SLAs during normal business hours and caused severe bottlenecks during the peak business hours
- The client was looking for a cost effective solution with maximum scalability and minimum downtime of the application
- The client's business priority was to reduce performance degradations of the application
- Performance testing had to be executed across multiple environments like development/testing/staging and pre-production.

Marlabs Solution

Analysis:

Marlabs performed profiling on both Application Server as well as Database Server and found the following:

- Many nested loops had been used in the code for the purpose of processing and rendering data. Within the loops there were too

many DB calls. Even though each DB call took less time, hitting the DB multiple times increased the processing time.

Solution Approach:

- Loops should have exited once the prevailing conditions were met. Within the interview process there were around 70 loops. About 4-5 loops had the issue of not exiting when the conditions were met. Unwanted nested loops could have been avoided by using Dictionary objects or Stored Procedure call. Detailed information is provided in the Marlabs Solution section
- SQL queries were selecting the entire table, when only column selection was required.

Marlabs team quickly understood the various admin/user functionalities of the portal and partnered with the customer for testing of almost all the admin/user sites of the portal. On user-facing sites, Marlabs conducted load testing of Interview Pages that were expected to have a high volume of hits, thus identifying issues related to performance, data processing, etc. After this the application underwent major code changes and performance improvements were validated.

Marlabs proposed a Performance Improvement approach by executing baseline test and multiple cycles of test executions after code optimizations comprising the following steps:

- Evaluate system and code optimization
- Develop performance test assets
- Performance baselines and benchmarks
- Analyze results

Solution implementation:

- Performance testing was executed with a target of 250 user load on the application to determine performance improvement when multiple users hit it simultaneously
- Conducted scalability testing for different user load levels, which assisted in detecting the issues and ensured better performance
- Priority was given to testing difficult business scenarios
- Wrote Store Procedure instead of inline SQL Statements within the Nested Loops
- Business Logic was incorporated to exit the loop once the conditions were met
- Used dictionary object to improve the performance instead of inner loops wherever applicable.

Benefits 

- The overall application response time for the Interview process was reduced by 60%
- The SQL Run post-deployment was reduced tremendously resulting in performance improvement
- Improved the response time of critical functions
- Eliminated the risk of potential loss of customers, clients, or partners
- issues in the application that had caused performance degradation

Technologies 

Web based application using Microsoft classic ASP with SQL-Server2005 DB as backend.

Marlabs helps drive digital agility for our clients. We deliver innovative business solutions using digital technologies such as cloud, mobile, analytics, Internet of Things and social. With a dedicated team of over 2,100 associates, a network of delivery centers in USA, Canada, Mexico and India, and strong partnerships with industry leaders, Marlabs offers a wide range of IT services across industries. Through our emphasis on quality driven by CMMi, PCMM, ISO 9001-2000, ISO 27001 and SSAE 16 Type II best practices and a customer-centric client engagement model, Marlabs has achieved a dependable track record of meeting high standards of excellence in every customer engagement. This has resulted in several awards and recognitions, including being consistently ranked in the Deloitte Technology Fast 50 and Fast 500 programs. Marlabs is headquartered in New Jersey, United States.

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