

A LEADING FINANCIAL SERVICES GROUP

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CASE STUDY

SOFTWARE TESTING

RISK & AUDIT SERVICES

INFORMATION SECURITY

1.0 Snapshot

1.1 Industry Type

The client is one of India's leading Financial Services Groups, with operations that span more than forty different lines of businesses and subsidiaries.

1.2 Business Challenges

- The application under test was newly developed by an external vendor for the company which was to be used for its employees.
- The application had the following features:
 - Community Portal, Post message, Post pictures, Search members, Travel plan, Check groups and various group sites.
- The client wanted to test the application. It was found that when the user level increased to more than 200 the application response time degraded and the system crashed hence, the business challenge was to simulate and capture response time under various user loads i.e. 100, 200.....500 users.
- To identify bottlenecks, validate hardware architecture, simulate the live environment and predict response times.
- The business challenges were to perform Capacity Planning, Performance Testing, Performance Monitoring and Hardware Sizing.

1.3 AUDITime's Solution

- The system architecture was studied & documented.
- Critical business processes and business transactions were identified in the application.
- Typical usage patterns were documented.
- Suggested code level changes for the application and configuration changes at the server level.
- The result sets were compared & analyzed to pinpoint bottlenecks.

1.4 Business Benefits

- Performance testing as a process was effectively established.
- The response time profile was not up to the mark for certain areas of the application. The same was notified to the client's management. These areas were then optimized by the development team.

- Key pointers were given on hardware resource utilization resulting in reduced utilization.
- Viability of the application for current and forecasted business volumes was assessed and established.
- Application is now running live with the current hardware while business usage has continued to grow.
- Optimization needed at application layer was identified & documented.
- Huge upfront infrastructure cost was reduced due to right hardware sizing.
- Improved the quality from a user's perspective, by forecasting the load and stress on critical systems for various bandwidths to ensure performance, scalability and reliability.

2.0 Client's Requirement Overview

The client expects a large number of users to use Intranet applications in the future. These applications would be gradually shared with various branches across India. The company developed an Intranet Portal with the help of an external vendor as per their requirements and this was made accessible through the intranet portal, based on the necessary access control mechanisms for employees of group companies. The module was accessible over the company's LAN. Users from various branches of the company could access the community portal, share thoughts, post pictures, travel plans etc.

3.0 Business Challenges

Application performance and scalability were the vital aspects that had to be measured. Hence the job of identifying bottlenecks and their root cause was imperative and challenging. Also, the capacity requirements of the application in terms of hardware and bandwidth for connectivity were essential parts of this phase of the project. The major challenge was to identify bottlenecks, validate hardware architecture, simulate the live environment and predict response times.

4.0 Technology Challenge

The application used LDAP authentication which made it very difficult to automate the

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testing a process using standard test automation tools. Applicability of low cost performance testing tools available off the shelf was not conducive as the results were not structured enough to reflect the performance parameters required to certify the product. Due to varied platforms collection of resource utilization, statistics and performance data through a manual process was time consuming. Collation of this data in a proper structured and reportable format was also a tedious and time consuming task.

5.0 AUDITime's Solution

The team of testers studied the application to gain a complete understanding of the system; the system architecture was studied & documented. Critical business processes and business transactions were identified in the application. Typical usage patterns were documented to simulate the live environment as closely as possible. The application usage scenarios were recorded for a single user for the transactions identified. These scenarios were used for injecting load onto the application. The resource profiling at the application server and the database server were done. Scripts created for various activities to be used as part of load injection were identified and this enabled data pooling for diverse user behavior. The results gathered were analyzed for breakdown in the application response times and were seen in comparison with the resource utilization on the application server and the database server. A second round of performance tests was then run on the application. The two result sets were compared & analyzed to pinpoint bottlenecks. Using the tool, the scripts were recorded and engineered to run for multiple users. Data pools were used to provide unique and actual data for each virtual user, thus simulating the live environment for testing. The team tested and engineered each script to run with multiple users. Different scripts were created to simulate different user behaviors and the

load was injected into the application at various speeds. Once all the scripts were executed the team captured the entire data and performed a comparative analysis, herein user response time, application Throughput, Memory utilization, CPU utilization etc. were analyzed and reported.

6.0 Business Benefits

- At the very first execution the team of testers had found that the application could not handle the load of 500 concurrent virtual users. After analyzing the root cause and suggesting changes at the application layer and server layer, the system can now handle a stress test of 500 simultaneous users and meets the 5 second average response time for 500 simultaneous users.
- With the help of performance test suite, there was early identification of some major application defects and architectural issues thus reducing the cost of change with a minor upgradation.
- Improved the quality from a user's perspective, by forecasting the load and stress on critical systems for various bandwidths to assure performance, scalability and reliability.

7.0 About AUDITime

AUDITime is a quality management specialist with expertise on software quality assurance. Our company includes experts in areas of banking, financial services, insurance, risk and compliance, technology effectiveness, investigations and quality assurance. Our consultants have deep insights on par with the thought leaders of the world. We are more accessible, adept and cost effective than any competitor in delivering value for our clients.

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