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# Stress Testing of Web Services Interface

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**Abstract.** The aim of this paper is a stress testing of the developed UAS for home care agencies. The developed testing application is possible to use on any others UAS with web service interface. The whole system, including applications developed for the stress testing is based on Microsoft technology .NET. By the help of our test application, the hardware solution for the server was selected on the base of selected home care agency needs.

**Keywords:** Stress testing; Response Time; Mobile Device; SQL Server

## 1 Introduction and Test Results Evaluation

The area of stress testing shows the tested system behavioral in case the data are accessed by several users simultaneously. For the testing of affection on the length of the time response by the number of the simultaneous accesses to the database, the application was developed in C# language in the development environment of Microsoft Visual Studio 2008. The developed application simulates simultaneous access of any number of users, on the methods implemented by the Web service and measure the response time of the web service for the requirement depended on the number of users who approach to service at the moment. The application measures and creates: (1) The duration of one call of the given method, (2) The duration of the call of the method to the specified number of simultaneous user access, (3) The overall response time Web service by a given number of users including travel time requirement for Web services, (4) Build the required collection of data from the database, (5) The way of this collection back from Web service to the application, (6) The duration of the complete fulfillment of the requirement from the start button is pressed to the end of the test.

Each type of tests are made in five iterations, all the values are then processed into arranged tables. For tests in which users are gradually generation, from these values are then calculated "MODUS", "MEDIAN" values and "arithmetic mean". Since it was measured only 5 iterations, not always experienced the same measurements values, therefore some items of calculated values contains value # N/A. Our measurements are not on the accuracy and repeatability values critical and diversity of individual measurements by a few milliseconds is not essential for us, it is only informative measurements, detecting how long time the server needs to respond to the request, which is also influenced by the current server utilization.

Application allows measurement of response time of SQL Server to query based on the number of simultaneous access to data. The application was created within the development environment Microsoft Visual Studio 2008 and the database accessed by Web services. The application allows you to measure the response time of database server, but also the time it takes delivery of the request to the server, packaging data collection and their subsequent transfer to the user. Period of the data processing in the developed application isn't at the time of the response included. The application also provides the user directing itself a Web service, which has delayed for the execution of user request a major impact. This delay includes the connection to database and subsequent compilation of web services. Data obtained by measurements are presented in a column chart and tables are summarized in text fields. The results indicate that the length of the response increases proportionally with increasing number of users and even the large number of 1000 users of the database should handle the problem of demand, which for the purposes of the agency over-sufficient. The response times but has a great influence machine on which the database server is stored. Test results shows that when using a desktop PC with a memory of only 512MB and tact 850MHz processor, amount of response for the 1000 user responses to long-7s, which is contrary to the requirement of the Agency, which called for the maximum response in 5 seconds. It is to be reckoned with the fact that the response will grow with increasing the number of records in the database.

## **2 Conclusion**

Application has been tested by several stress tests for different numbers of simultaneous accessing users. The number of users has been gradually increased by the entered step or was generated randomness in the specified range. In the case the same number of users are accessing server, the time needed to process the query is almost unchanged. In this case the differences caused by network latency or the need to process the first request with higher priority results in the millisecond.

For smaller agencies is not a problem to use the processing requirements through Web services. For larger agencies, however, processing of large amounts of data for simultaneous access to a large number of employees could take excessive time, therefore it is preferable to use the handle requests directly to the database.

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