

# Surviving in the real world

## Load Testing

**Essential Testing** Software systems have changed. They are no longer single user packages residing on the user's PC.

Today the systems you develop and use are multi-tier, multi-user systems operating in a network environment. They must perform in harsh operating environments where users can generate high peak levels of demand and the unexpected can happen.

The biggest risk is no longer functional errors. Now the risk areas are performance, scalability, endurance, response to stress, reliability and concurrency.

Load testing is a key tool to

help address these risks to the project.

### SQC Load Testing

**Services** With a small highly skilled team we can deliver cost effective load testing solutions. The team has a track record of delivering successful load & performance testing. We have the specialist aptitudes and skills needed for this type of work.

Our professionalism and absolute commitment to delivering whatever the client needs ensures that projects we work on get the best possible service.

We can deliver one off load tests or we can establish and operate load testing frameworks for your system. Our capabilities include:

- Analysis of the workload for the system.
- Risk analysis, what are the threats?
- Defining the test scenarios.
- Developing the testware
- Executing the tests.
- Analysing and reporting on the results.

We manage the assignment helping to ensure that the risks are dealt with in an effective and timely way.



We help to bring a focus on the risks in the early stages of the project before they get out of control.

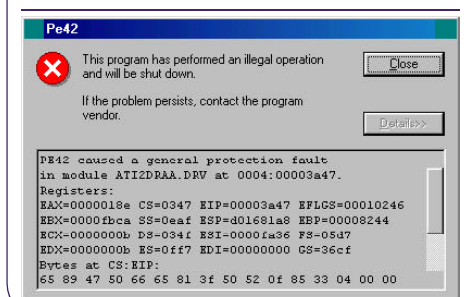
**Demanding Assignments** Load testing depends upon the use of specialist tools together with load testing domain knowledge. Our tool skills include the leading tools such as LoadRunner and QALoad. We have very advanced testware development skills, where necessary enhancing the tools to meet a need. We can undertake the most technically demanding assignments.

## The Many Uses of a Load Generator

**So what is Load Testing?** The terms Load Testing and Performance Testing tend to be used interchangeably. Performance Testing is a major part of the load testing business but it is not the only use for a load generator. Load test tools offer a powerful way of improving the quality of systems. Their use encompasses:

- **Performance testing** Measuring the response times for interactive work, the latency on batch work and the headroom available in the system.
- **Stress testing** What are the impacts of transitory overloads and backlogs?
- **Endurance testing** Does the system deteriorate after continual operation for long periods or after processing high numbers of transactions?
- **Reliability assessment** Are all transactions processed consistently, as seen during functional testing, or does the odd one in a thousand go wrong?
- **Concurrency testing** What happens when two or more people are working on the same account?
- **Scalability analysis** Can the system be scaled up, using more hardware, to support two thousand users?
- **Operation under load** Do functions work when the system is under load? What about replication, fail-over and recovery mechanisms are they stable when the system is busy?

**What to test?** The load testing of a system should be risk driven. Scenarios are chosen based on the level of threat they represent, how likely the event and how bad are the possible consequences. Our risk analysis approach ensures the most important tests get the highest priority.



**sqc**

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SQC Technology provides software testing, software test management and software test automation services and consultancy. This includes formulating software test strategies, test analysis and development of test suites, test automation and interim management. More information on our advanced capabilities and innovative approaches can be found on the company web-site. [www.sqc.co.uk](http://www.sqc.co.uk)

## Our Track Record Includes

**Online Bookings** An internet system used by customers to book and maintain appointments with peak period transaction rates of around 4000 per hour. The assignment included workload quantification, testware development, execution and analysis.

**SAP Accounting System** Performance testing of a replacement accounting system in a public sector body.

**Web Based Collaborative Working Environment** The system is an environment to support collaborative working on an intranet using web-technology. The developers needed to establish the scalability of the system.

This involved analysis of the future use of the system, to predict the likely data content and usage patterns. Synthesised content had to be defined, generated and loaded into the system. This involved setting up 50000 users and 375000 documents.

Tests were designed to provide information that could be used to analyse the scalability of the system. An analysis of the information we collected enabled us to work with the developers to establish the scalability characteristics of the system.

**Internet Service Portal** When the in-house performance test team of a telecoms company were developing load tests for an internet portal we provided specialist script development support. This included solving a problem getting the tool to work with a security challenge mechanism after the tool supplier's support team had stated that this could not be done.

**Secure Internet Submission** User of this system download interactive work packages and then, having completed



the work, submit the packages back to the system. The nature of the application means that downloads and uploads rates of up to 10000 transfers in a 15 minute period occur. The integrity of the data, even under failure conditions, was paramount.

The assignment involved simulating the peak throughput using the load test tool. With this workload in place server failures were simulated and the post failure integrity of the data audited.

**Revenue and Benefits System** Performance testing of a Oracle NCA based system providing Council Tax and Housing Benefit administration.

**Hosted Service Technology** We worked with a leading supplier of internet based software systems developing technology to enable them to deploy very large scale managed internet services with a target of up to 50000 concurrent users. We helped to quantify the demands the system could encounter if deployed at full scale and then provided recommendations to reduce the risk of scalability problems. We developed the test definitions and testware to test and benchmark the technology as it was being developed.

**Outsourced Acceptance** A system development project had been outsourced, but the delivered system had stability and performance problems. We developed a set of benchmark and acceptance load tests that the client used to manage rectification of the issues.

## Advanced Testware & Tool Skills

**Testware** Load testing is a technically demanding arena. For all but the simplest of systems the use of 'Record & Reply' is a myth put out by tool suppliers. Testware has to be designed and implemented using the tool's script development languages.

We have extensive experience of implementing advanced testing scripts and so can develop testware that delivers the tests the job requires. We understand the problems of load testing and so deliver effective test solutions faster.

**Tools** Load testing tools are inherently complex and effective use requires an in-depth knowledge of the tool. It is so easy to make a mistake and invalidate the test.

We have extensive tool experience, including QALoad and LoadRunner. We are CPC qualified on LoadRunner.

Our C and C++ programming experience allows us to develop custom scripts whilst using the full power of the tool frameworks.

**Special Solutions** Sometimes the testing problem requires special solutions that extend what a tool can do. We have developed a number of tool extensions:

- Wrapping Java RMI interface into a C / C++ scripted test tool.
- Development of a Web-Service / SOAP testing framework based on the automatic compilation of WSDL files into a test library.

## Why load test? Why use SQC?

**Why Load Test?** The nature of modern systems make load testing a fundamental part of a professional development process. Systems that go live without appropriate load testing risk a disaster.

**Why use SQC?** We have been involved in Software Assurance for over 14 years and understand software and how to challenge it. Working with us you get the benefits of:

- **Professionalism** We are professionals who pride ourselves on getting the best results possible. We will push ourselves the extra mile to ensure this.
- **Systematic Practices** Our systematic methods directed by a risk driven approach maximise the benefits obtained.
- **Breadth** Though technical, we are not just technicians. We understand business and operational contexts in which systems operate, understand that often good enough is not perfect. We can analyse the business / operational domain and quantify workloads.
- **Technical Ability** We understand software systems, how they work, what is going on inside the system. So we can work with development teams on the problems found during testing. Our tool and testware development knowledge is exceptionally comprehensive. Our structured approach to testware highly flexible and effective.

**Results!** The bottom line is about getting results! We take on demanding load testing assignments and deliver.

## More on SQC

**History** SQC has been operating in the field of software testing since 1991.

**What else do we do?** We can help organisations in many testing related areas. Areas such as, specialist functional testing, test automation and with SMART test approaches.

We can supply consultancy, services and skills transfer. When projects have problems we can help to clarify the situation and identify the options.

## More Information?

**Find Out More** To find out more about Load & Performance Testing and how we could help you please email Neil Hudson. [nahudson@sqc.co.uk](mailto:nahudson@sqc.co.uk)