

Performance and Scalability Threats

For large and medium scale IT systems performance and scalability are significant risks. Achieving an acceptable balance of throughput and latency levels that meet customer and user experience requirements is difficult. Achieving this in ways that are not extremely vulnerable to small changes, disturbances or unusual demand can be very difficult. Sudden and unforeseen loss or severe degradation of high profile services are not unknown.

The need to scale, either to meet growing demands or for new large scale applications, adds further complexity. Systems with a history of dependable performance may unexpectedly degrade or fail when deployed and operated at a larger scale. Effective Performance and Scalability Assurance can be a key defence against the expensive consequences of these issues.

SQC Performance and Scalability Assurance Service

SQC provides a holistic approach to address performance and scalability threats. Whilst encompassing load testing the practices address a broader remit. The service we provide does not simply deliver a test of X thousand concurrent users or Y transactions per second. Our approach analyses and understands the demands on the system, determines the significant performance characteristics, identifies threats and vulnerabilities, assist in the upfront elimination of issues, delivers carefully targeted high fidelity tests and analyses the robustness and scalability of performance.

Working with end users or suppliers we select and undertake a targeted set of assurance activities. Sometimes after development is well underway in an evaluation mode but in other cases in parallel with development; helping to prevent problems rather than detect them retrospectively. The portfolio of capabilities from which a programme of work is built includes:

Service Portfolio	
Operational / business cycle and demand analysis	System architecture and technology review
System demand forecasting	Load test capability development and commissioning
Identifying relevant performance characteristics	Performance and resource cost benchmark measurements
Benchmark measurement of legacy or alternative systems	High fidelity load testing
Synthesis of meaningful performance requirements	Response under load analysis
Performance threat identification	Performance and Scalability assessment reports
<i>See the Service Portfolio section for a summary of each of these.</i>	

The mixture of services and available delivery models is very flexible and is always tailored to best suit the needs of the programme being supported. At one end of the spectrum SQC can act in an advisory or supervisory role with most technical work being delivered by the client or their suppliers whilst at the other end of the spectrum SQC can take on full responsibility for everything down to the implementation and execution of any required load testing.

Experience and Track Record

The high quality service that SQC can provide is founded on the experience and expertise of the people who deliver this service. They have a history of successful delivery of complex diverse assignments across a broad spectrum of the IT sectors. This includes:

- Supervision of performance assurance activities on architectural changes, upgrades and migrations impacting the business critical and very large scale OSS system of the UK's major telecommunications supplier.
- Supervision of performance assurance activities on migration of the public facing transaction web-site of a the UK's major telecommunications supplier.

- Providing emergency performance testing, problem diagnosis and performance problem resolution on an organisation's service booking system that was about to face an annual demand storm and that had rapidly collapsed when faced with the same storm the previous year.
- Support a UK government agency with workload analysis and load testing through a series of deployments of three strategic IT systems including a portal for direct transactional interactions with members of the public.
- Providing performance testing and performance assurance support to a principal supplier of IT bases learning and assessment solutions.
- Performance testing of a Video on Demand delivery platform.
- Scalability assessment for a distributed telecommunications real-time supervisory control system.

Technical Capability

Robust technical knowledge is fundamental to the effectiveness of this class of services. Technical capabilities covering both the techniques and tools used in load testing and the technology of and performance constraints on complex systems are applied to provide a highly effective service to clients and to enable the most demanding of assignments to be tackled. Founded in the world of real-time systems development and now encompassing enterprise scale distributed systems our systems and programming knowledge allow us to deliver both complex tool sets to apply tests and informed risk assessments and diagnosis of performance problems. Few teams working in this space offer the same breadth and depth of experience and self contained capability.

Service Portfolio

Services offerings are based around a selection of the service elements listed below:

- Operational / business cycle and demand analysis; to determine the cyclical profile of demand and to identify classes of demand periods such as 'busiest day of week', 'month end' and 'typical day'.
- System demand forecasting; combining the operational / business model together with system specific activities such as back-ups and replication cycles to identify significant classes of system operating conditions.
- Identifying relevant performance characteristics; explicitly identifying granular measures of system throughput and latency to allow agreement of meaningful performance profiles.
- Benchmark measurement of legacy or alternative systems to support target setting for new systems and scenarios.
- Synthesis of meaningful performance requirements; combining the identified operating conditions and performance characteristics to set appropriate targets for each characteristic in each operating condition.
- Performance threat identification; identifying events and conditions that elevate the risk of performance issues such as system maintenance and plausible but very unusual external events.
- System architecture and technology review; assessment of the architecture and implementation from a performance and scalability perspective.
- Load test capability development and commissioning; definition, design and implementation of tool scripts, data strategies, data tools and bespoke software for the delivery of load testing across user interfaces and technical interfaces such as web-services.
- Performance and resource cost benchmark measurements; establishing the offload latency and system resource costs associated with particular activities, transactions of operational sequences.
- High fidelity load testing; repeatable delivery of large scale load tests. Including representative composite workload testing, single aspect workload testing, elevated stress and endurance testing.
- Response under load analysis; analysis of the response of the system to load testing and the identification of materialised issues and performance and scalability risks for potential sensitivity analysis.