SenterNovem

IOP

IOP Generic Communication

SEQUAL (SErvice optimization and QUALity)

A better grip on quality for service providers

SUBJECT:

Quality assurance in Service-Oriented Architectures (SOAs)

OBJECTIVES:

• to develop a framework of rules and techniques for assuring the quality of composed services in SOA environments

• to develop quantitative models and methods for evaluating and optimising those rules and techniques

POSSIBLE APPLICATION:

the development of online services with a better price/quality ratio

RESEARCH PERIOD:

2008-2012

NUMBER OF PHD STUDENTS:

three

RESEARCH INSTITUTES:

TNO Information and Communication Technology, Center for Mathematics and Computer Science (CWI), Twente University

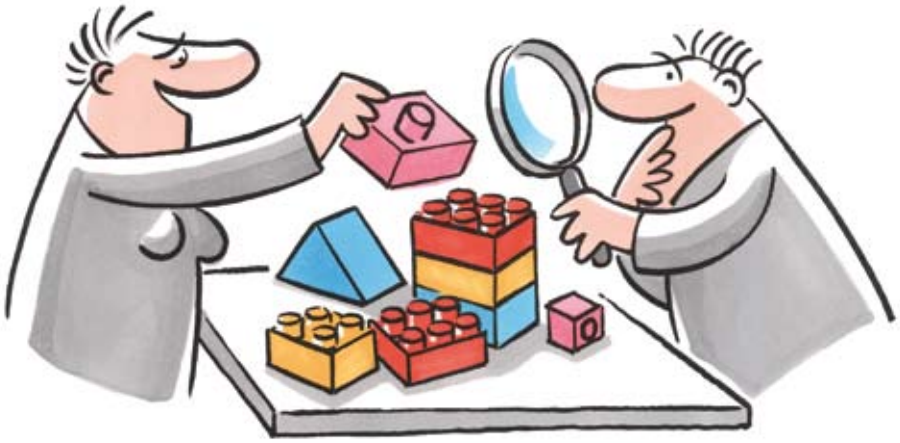
PROJECT MANAGER:

Prof. dr. Hans van den Berg (TNO-ICT), j.l.vandenberg@tno.nl

INDUSTRY INVOLVED:

IBM Nederland, Ericsson Nederland, Mobilaria

Service providers are developing new ICT applications by smartly combining existing applications and services. This is referred to as 'service-oriented architecture' (SOA). The IOP GenCom project 'SEQUAL' is studying how the quality of those applications can be assured.



In a SOA, a number of different, decentralised ICT services are combined to form a new, composite service. For example, consider an online booking service of a travel agency,. To come up with the cheapest flight, the most convenient connections and a hotel in the right price class, that service makes use of service components that are available elsewhere on the internet. A weather service works in the same way. But much more complex composite services are also conceivable, for example in logistics, the financial sector or healthcare. In theory, a service provider can make use of dozens of subservices that, in turn, are made up of numerous smaller subservices.

Quality

Using decentralised subservices, a service provider can develop a service much quicker – and thus at less cost – than if it had to do everything itself. The decentralised character of the composed service nevertheless makes it difficult to assure its quality ('Quality of Service'), since it relies on the behavoir of the subservices.

The position of a service provider within a SOA environment is comparable to that of a contractor in a construction project who hires subcontractors to install the sanitary facilities or the electrical wiring. A major difference is that SOA environments are much more dynamic in terms of supply and demand (there being more potential customers for the services and subservices), and the lifecycle of a service is much shorter than in the tangible world (usually a matter of seconds or minutes at most). The lifecycle of composite services is very short and demands close collaboration among the various subservice providers.

Service providers enter into so-called Service Level Agreements (SLAs) with the suppliers of subservices regarding the quality of service to be delivered. The SLAs address elements such as availability, throughput and response time. An important question is how service providers can best combine the SLAs for the various different subservices so that the composite service will offer the right quality at minimal cost. Another concern is how the subservice suppliers will actually be able to meet the quality levels defined in the SLA. Challenges could include fluctuations in the number of users or in the type of equipment or network being used. Mechanisms for managing the Quality of Service in SOAs have so far been defined only minimally, if at all.

The SEQUAL project aims to work out how the quality assurance of composite services within a SOA environment. The researchers will develop quantitative models and methods for evaluating and optimising the performance in various different scenarios. Their research will be based on a number of use cases. "That's the only way to do it," says project manager Hans van den Berg. "For this kind of research, you need a framework. Later on we then can generalise the results to other situations. The use cases will also ensure a solid embedding of our research within relevant application domains. That will make it much easier for the target groups to start working with the knowledge we gain."

As Van den Berg sees it, the results will soon enable service providers to put the theoretical advantages of SOAs to good use. "Whether or not service providers can offer services at a sharp price/quality ratio is what will make or break the commercial success of online services."

SenterNovem aims to implement governmental policies on innovation, environment and sustainability in inspiring, forward-looking and professional ways and to promote their coherence.
SenterNovem gets cost-effective quantifiable results, applying the best possible mix of policy instruments based on experience and synergy.

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1IOPGenCom0903
March 2009

Made by order of

Ministry of Economic Affairs