Open Master Thesis – Profiling Elastic systems

Keywords: Cloud computing; Infrastructure as a Service; Elastic systems; Design of experiments; System Modeling

Goals

Cloud computing enables the implementation of *elastic systems*, which are software systems that can be dynamically adjusted to provide a predictable and consistent behavior as working conditions and environment change. For example, elastic systems can dynamically scale and shrink to maintain a consistent performance as the incoming workload fluctuates.

Elastic systems are designed to accommodate such changes at runtime, however, their final behavior heavily depends on several factors that cannot be fully considered during their design. A common example is the speed of resources allocation of Cloud platforms that impacts the way elastic systems can react to spikes in the load: Fast provisioning lead to better performance than slow provisioning because resources are readily available to process the workload.

This work aims to (i) identify what are the main elements that impact on the final behavior of elastic systems, from both a design and a runtime point of view, (ii) understand how much elastic systems are sensitive to the discovered elements, (iii) and, develop a method to automatically profile elastic systems at runtime when they are deployed in new infrastructures to eventually adjust their internal elastic mechanisms.

Expected Outcome

The student is required to deliver the following three artifacts: A document that describes the proposed approach for profiling elastic systems over different Clouds, a working prototype that implements the proposed approach, and a design document that explain the main features of the prototype.

Required skills

We are looking for motivated students that will have a chance to improve their knowledge on Cloud computing and the emerging Elastic computing paradigm. Students are required to have some experience in developing Java based multi-threaded software.

Contact

The expected student will work with Alessio Gambi, Hong-Linh Truong and Schahram Dustdar at the Distributed Systems Group. Students will have opportunities to work on real-world cloud systems. For further information please contact Alessio Gambi (a.gambi@infosys.tuwien.ac.at)