

Time approximation tool for concurrent programs

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Short description

The task is to design and implement an analysis tool to make estimations concerning resource and time consumption in virtualized environments

Background and motivation

Services provided by cloud service providers are in general regulated by a service-level agreement (SLA). Violations of SLA may entail expensive penalties. The service provider needs to ensure that the service is able to meet the SLA, for example, in terms of the end-user response time, by deciding on a resource management policy and determining the appropriate number of virtual machine instances (or containers) and their parameter settings (e.g., their CPU speeds).

Problem setting

A basic theory [2] has been developed to approximate execution time of current tasks running on virtual machine instances. The challenge now is to turn the theory into a useful tool for practical use. A prospective student would try to implement the analysis for concurrent programs written in the ABS language, which is an executable, high-level, object-oriented concurrent modelling language developed in our group. .

Keywords: service-level agreements, SLA, tool development, modelling, program analysis, resource consumption

References

- [1] The ABS collaboratory. <http://abs-models.org>, 2017.
- [2] E. Giachino, E. B. Johnsen, C. Laneve, and K. I. Pun. Time complexity of concurrent programs. In *FACS 2015*, volume 9539 of *Lecture Notes in Computer Science*, pages 199–216. Springer Verlag, 2015.