

A Cloud-based Simulation Platform for Manufacturing, Engineering, and Beyond

Tuesday, 20 May 2014 14:20 (20 minutes)

Simulation software is widely used in both industry and academia. However, large scale simulation require extensive amount of resources. Cloud computing offers the potential for scalable, on-demand access to resources that can be used to speed up simulation and make it available from custom web interfaces.

CloudSME is an FP7 European research project that develops a cloud-based one-stop-shop solution to provide a scalable platform for small or larger scale simulations and enable the wider take-up of simulation technologies, especially in manufacturing and engineering SMEs. The CloudSME Simulation Platform supports end user SMEs to utilise customised simulation applications in the form of Software-as-a-Service (SaaS) based provision. Moreover, simulation software service providers and consulting companies have access to a Platform-as-a-Service (PaaS) solution that allows them to quickly assemble custom simulation solutions in the cloud for their clients.

The CloudSME Simulation Platform is being built on existing and proven technologies enabling the project to deliver its results faster. These baseline technologies, the gUSE/WS-PGRADE framework and the CloudBroker platform, are already widely utilised by EGI user communities. This presentation will provide an overview of the CloudSME Simulation Platform and the major industry use-cases currently being built. It will also outline plans and opportunities integrating the CloudSME platform with the EGI Federated Cloud.

Wider impact and conclusions

Cloud computing can bring widespread benefit to simulation in both industry and academia by making simulation software more widely accessible and by speeding up the time taken to receive results from simulation runs. The CloudSME project, based on technologies already widely utilised by the EGI community (WS-PGRADE and CloudBroker), builds a production quality cloud-based simulation platform that provides both SaaS and PaaS access to a large variety of cloud resources. Integration of the CloudSME platform to the EGI Federated Cloud could enable EGI users utilising its capabilities in the future.

URL(s) for further info

<http://cloudsme.eu/>

Description of work

Simulation can significantly improve the competitive position of manufacturing and engineering companies by reducing their costs and resulting in more efficient development, production, procurement, logistics or financial processes. However, the take-up of simulation software, especially by SMEs has been low until now due to high barriers of entry that include hardware prices, licensing costs and technical expertise. A cloud-based simulation platform can help overcome these barriers.

CloudSME is an FP7 European research project that develops such simulation platform and implements several industry use-cases to demonstrate its feasibility. The current project consortium incorporates twelve companies and four academic partners. The industrial partners are all SMEs, ranging from cloud hardware and platform providers, to simulation software providers, end users and technology integrators. The project showcases its technology with the implementation of five different use-cases. These use cases include discrete event simulation for manufacturing, for example supply chain optimisation, capacity management or maintenance planning, data mining for the optimisation of aircraft maintenance, fluid dynamics simulation, and the design of tailored insoles for sports footwear and for people with foot problems. To guarantee greater impact of the CloudSME Simulation Platform, additional use-cases will be provided by a further ten partners following an open call in the first half of 2014.

The CloudSME Simulation Platform will dramatically change the way in which manufacturing and engineering SMEs utilise simulation solutions today, and will provide new business opportunities not only to end-user SMEs, but also to simulation software and cloud service providers. The results of the project will also be fed

back to academic research and the platform will also be available for speeding up simulation applications for research purposes.

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Session Classification: EGI Federated cloud: state of the art and future steps

Track Classification: Advanced cloud services (Track Leaders: D. Wallom, M. Drescher, K. Nordlund)