

NAFEMS UK Regional Conference 2018 - Abstract Submission

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Please identify the event for which your submitting?	NAFEMS UK Conference 2018
Will you be the presenting author?	Yes
Presentation Title	Moving Simulation to the Cloud: Challenges and Opportunities
Relevant Themes / Keywords	cloud computing, data management, hpc, saas

Abstract (plain text)

I will present on our experience of moving simulation systems to the cloud. Enormous computing power has been made available by leading tech firms including Amazon Web Services, Google Cloud Platform and Microsoft Azure. These companies offer a suite of tools for provisioning servers, storing data, running analytics and keeping data secure that require less manual steps than traditional on-premises server set-ups, offering huge flexibility with minimal user input.

The challenges of moving simulations into the cloud fall into three main categories; security, connectivity and latency. It is impossible to escape the fact that, after moving services online, your data will travel across networks and be stored on machines that you do not own. It is also clear that any internet outage could have a serious impact on business operations. In addition, simulations produce large (and growing) amounts of data, sometimes stored in a single output file. Transferring this data to the engineer sitting at her desk for post-processing can introduce delays which offset many of the advantages described above. These problems are of particular concern to analysts in locations with poor access to high-speed internet services.

There is a further concern that will be discussed as part of this presentation; licencing. Many CAE package providers have strict licencing requirements and place restrictions on compute capacity that make it difficult to take advantages of cloud computing.

This presentation documents a system architecture using techniques such as end-to-end encryption, cross-cloud clustering, geo and latency based routing and distributed messaging queues for secure, effective and efficient simulation on remote servers.

A case study will be presented for a system created by AgileTek engineers to run simulations for the subsea industry. This system, called AELCloud, allowed our analysts to add huge compute capacity to our cluster when required for project delivery on an offshore windfarm project.

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