

## **HOW TO EFFICIENTLY LEVERAGE A CLOUD BASED SIMULATION PLATFORM TO RUN MULTIPHYSICS AND MULTISCALE WORKFLOW**

Fanny Tréheux, Director of Solution

Rescale - 944 Market St, San Francisco, CA 94102  
(415) - 900 - 6236

### **KEYWORDS**

Cloud, HPC, CAE, CFD, enterprise IT, business transformation, optimization, design of experiment, on-demand license, case studies

### **ABSTRACT**

Reliance on simulation results is ever-increasing, resulting in larger model sizes incorporating more physics, higher numbers of iterations, and more sophisticated multidisciplinary simulation workflows. The complex high-fidelity virtual test scenarios are modelled using different simulation software packages and run on local high-performance computers (HPC), taking days or sometimes even weeks to return results.

Meanwhile, chip manufacturers are coming up with increasingly specialized hardware (memory-intensive chips, SSD drives, low-latency networks, GPUs, specialty co-processors, etc.) that are being leveraged by specific simulation software to deliver better performance. The days where all simulation codes only use a CPU are quickly coming to an end. IT departments have to transform to address these challenges of a fragmented and rapidly evolving IT ecosystem to fully enable proper use of simulation and scale its usage.

The cloud is particularly well-suited to provide the engineer with instant access to the right software package to solve a specific engineering

scenario and always run the simulations on the best and scalable IT environment. Many simulation software applications now support an on-demand licensing system to enable users to leverage the more elastic nature of cloud computing.

So how can you migrate Multi-physics and multiscale workflow to the cloud and tap into its power cost-effectively?

In this presentation, we will discuss IaaS providers trends and describe an application centric tuning approach. Through benchmarks examples, we will highlight key engineering best practices to plan an efficient cloud HPC strategy across software providers to meet various simulation goals.

Through concrete use-cases, we will describe the engineering requirements to empowers simulation expert with not only speed but also the capabilities to efficiently interrogate the FE model, compare alternatives, share best practices and collaborate on the cloud. We will more specifically review the journey of a customer in deploying a multi-tool simulation optimization workflow into an ITAR certified cloud environment.