Call for Participation: CFD Experiment

Technical Computing at Your Fingertips, the next Utility?

Invitees: Industry end-users, HPC experts, compute resource and software providers

This is an open invitation to members of the CAE community to join us for a 3-month experiment, where we will apply the cloud computing service model to workloads on remote Cluster Computing resources in the areas of Computer Aided Engineering.

Why are we conducting this experiment?

Core ideas of cloud computing: multi-tenancy, remote access to centralized resources or metered use are not alien to the High Performance Technical Computing (HPTC) community and end-users from e.g. the CAE community. However, as the cloud computing delivery model takes off with the promise of easy access to pay-per-use computing resources, our community has been mostly on the fence, observing and discussing the potential hurdles to its adoption in High Performance Technical Computing.

With the challenges of security and data privacy, incompatible software licensing models, and a dozen others noted, it is about time we dip our toes in the water and experiment how to achieve the benefits of cloud computing model in the field of High Performance Technical Computing.

This is now the start of the second round of the experiment. Round 1 of the experiment took 3 months and finished end of October; it has attracted almost 200 organizations and individuals from all over the world, and 25 teams formed around an end-user CAE application have jointly explored the end-to-end process of moving the application onto the remote resources (Clouds and Computing Centers) and finally get the results back.

"The premise of this experiment and delivering a chronicle of the process is exciting to us", said Tom Tabor, President of Tabor Communications. "Watching industrial users go through every single step of the process for HPC as a Service, from easy access to remote resources, to the implementation of the end user task, to running it on the computing resource and to finally get the results back will provide a great resource for all levels of potential users".

We now desire wider participation. We are opening up the experiment and encourage CAE end-users, area experts, application software providers, and HPC resource providers to join us in this experiment.

Who would qualify to participate in the experiment?

Simple answer: you; either as an industrial CAE end-user in need of additional computing power, as a resource provider with occasional available compute cycles, as a software provider interested in catering to an ever changing user community, or as an area expert with knowledge to offer to industry end users. You can participate under your full name and brand, or anonymously (if necessary). And if you are unable to actively participate, we would be happy to include you as a collaborator or an observer.

The downside for active participants? Yes, it will cost you some time and effort (but no money). The upside however is big: you will work with THE expert team; get insight into a new service paradigm, hands-on; understand the process and its potential implications for your business; and thus you are much better prepared for doing (or not doing) the next decisions and steps, with much reduced risk. We believe this is worth the modest investment.

Already on board? Great, so please register at www.cfdexperiment.com

The industry end-user: Ideally, you are small or medium size manufacturer, in the process of designing and prototyping your next molecule, drug, product or service, supported by computer simulations. Performing all the computation on your workstations would be too lengthy of a process. Adding new computing power is cumbersome or not in your budget. High-Performance Technical Computing (HPTC) may not be your core expertise, so you can use additional HPTC help. So why not join this experiment; it's free, except the time you invest to gain these valuable insights.

The resource provider: You own a bunch of resources, computers, storage, network connecting to the Internet, and then you are the ideal partner. You could be a classic HPC center, a standard data center used to handle batch jobs, an industry cluster willing to run non-competitive workload in your low cpu utilization phases. By donating part of these unused cycles to the experiment you may learn how to turn this into a future business model.

The application software provider: You own software, either as an ISV, as a public domain organization or as an individual developer supporting a special piece of software. Yes, we are looking for rock-solid software, which could be used potentially on a wider scale. For the purpose of this experiment we will not charge for the software, however, we will track on-demand license usage, which may become an attractive new revenue stream for your business in the near future.

Finally, the Expert: That's everybody else! You are an individual, or an employee, or a consulting company with HPC and/ subject matter expertise, because you have worked in a specific computational Life Sciences application area for years, or you have even mastered a compute cluster in all details, or you are doing all kinds of Life Sciences and/or HPC related consulting, or you are a young PhD with an extraordinary in-depth knowledge in a modern area where you are an expert. In any case, if you want to learn how to work with industrial end-users, with computer centers, and with software providers, and if you can contribute a few hours per week to the experiment, we would like to hear from you!

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How will the experiment work?

Suppose the industrial end-user is in need of additional compute resources, say for speeding up the design cycle, for simulating a more sophisticated geometries, or for running many more simulations for a higher quality result. We, the experiment orchestrators, will jointly look at the end-user's task and requirements, select appropriate resources, software, and the best-suited HPC experts depending on the end-users needs.

Then, with only modest guidance, this quintet of end-user, resource provider, software provider, expert, and us (the organizers), will try to implement and run the end-user's task and deliver the results back to the end user.

The resource providers (hardware and software) will measure resource usage, the expert will summarize the steps of analysis and implementation, the end-user will evaluate the quality of the process and of the results, and the degree of user-(un)friendliness this process provided.

As the experiment orchestrators we will analyze the feedback received. Finally, the whole team will get together (virtually), extract lessons learned, and present further recommendations as input for the corresponding case study.

Who are we?

The experiment managers: Wolfgang Gentzsch and Burak Yenier. Wolfgang is an HPC veteran. Having worked in leading positions in CAE application research, academia, and industry for some 30 years, Wolfgang is now an applications and HPC consultant and the Chairman of the ISC Cloud conference series for HPC and Big Data in the Cloud. Burak is the Vice President of Operations at CashEdge a software-as-a-service company in Silicon Valley, which provides innovative payments and aggregation solutions to financial institutions.

The observer and reporter: Tom Tabor is the President of Tabor Communications running HPCwire, HPC in the Cloud, and the Digital Manufacturing Report, among others. Tom decided to become a sponsor and closely follow this experiment and being its daily mirror. Tom will regularly publish high-level status reports about the experiment; provide high-level analyses of the process and interviews with active participants; and broadcast webinars. With still more in-depth and low-level information regularly sent to our registered participants of the experiment via electronic newsletter.

Finally on board? Great, so please register at www.cfdexperiment.com

And please enter any additional question you might have on the registration site, and we will provide the answers on our Q&A page.

We welcome you to the experiment and looking forward to working with you on the CAE Experiment: Technical Computing at Your Fingertips, the next utility?

Wolfgang Gentzsch and Burak Yenier