

Future Outlook

ACCESSING THE LATEST SIMULATION TECHNOLOGIES FROM SIMULIA ON THE CLOUD

You may not have noticed it, but the cloud has been quietly rolling in to many aspects of your personal and professional life. If you've used social media or streamed a video over the Internet, you've been accessing the cloud. In fact the cloud has become so reliable and so accessible that it is only natural that the most demanding of applications, realistic simulation, has begun leveraging the virtually limitless resources available on the cloud. These massive capabilities are provided to you on demand and can make it much easier for you to answer the difficult design challenges you face today and the more rigorous challenges you'll face in the future.

According to the article, "Predicts 2016: Cloud Computing to Drive Digital Business", published by Gartner, a leading research and advisory company, "By 2020, a corporate 'no-cloud' policy will be as rare as a 'no-Internet' policy is today". At SIMULIA we've seen acceptance of the cloud concept accelerate over the past couple of years, as our customers have increasingly asked for on-demand access to software and hardware.

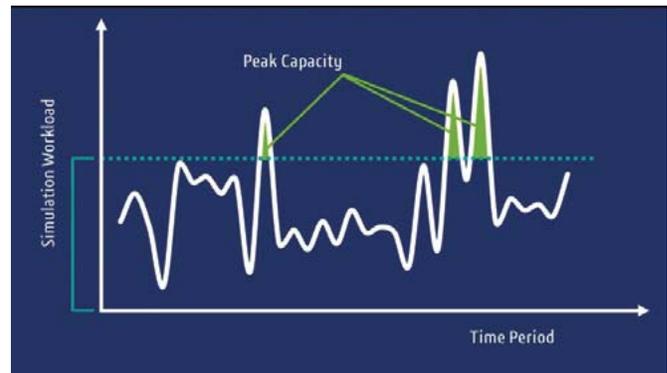
In response to customer demand, Dassault Systèmes has created the **3DEXPERIENCE** platform on the cloud, which combines robust software and elastic hardware infrastructure to provide an easy to deploy software-as-a-service (SaaS) solution with access to HPC compute power for simulation. Available via data centers located throughout the world, **3DEXPERIENCE** platform on the cloud is easily configured to suit the size of your business, fluctuations in your workload, and different levels of expertise within your teams. SIMULIA users will find the advantages of this offering particularly compelling, as it provides reliability, scalability, cost-savings, ease-of-use, and secure global collaboration.

A SOLUTION FOR SIMULATION USERS OF EVERY TYPE

Users of all types must have access to the tools they need to quickly test and evaluate ideas when innovation strikes. The designer may have a clever idea to fit a component into a reduced design space but must check that the new concept supports the product's life requirement, or a team of analysis specialists may need to check for an acoustic response in a complex assembly caused by lightweighting a component. You are likely experiencing situations like this yourself brought on by the ongoing competitive pressure to shorten the product design timelines while delivering products to meet an evermore difficult set of requirements. These demands have heightened the need for, and application of, the most advanced tools available for realistic simulation (FEA, CFD and coupled multiphysics, topology optimization and so on).

This more extensive use of sophisticated design and simulation software in turn requires more high-performance computing

(HPC) power. Yet there can still be a dramatic variation between the peak and lull of simulation demand. Consider the graph of simulation workload vs. time in the image below, which illustrates the rise and fall in demand that a typical SIMULIA customer experiences. Normally the level of token use doesn't exceed the dotted line of licensed coverage. But note the three peaks during which the average is significantly exceeded:



The spikes in simulation demand that typically occur near project deadlines are sometimes dealt with by adding new analysis tokens and adding compute hardware, but this approach is often cost- and time-prohibitive for the occasional peak. In other cases programs are simply delayed until the simulation data is available to make informed design decisions. In still other cases, critical design decisions are made without having the supporting data, often resulting in subpar product performance, or worse, product field failures.

The cloud now provides for another alternative to manage these occasional peaks in simulation demand by cost effectively accessing "burst compute" resources to secure the software and compute power only as they are needed.

Let's take a look at how the cloud can help different kinds of users overcome a variety of challenges:

Experts at large OEMs may already have a license that covers hundreds of thousands of simulations throughout the year. But suppose a new product is about to be launched, more validation tests need to be done quickly, and the existing token pool is being fully utilized by another internal team. Rather than raise the company's entire annual subscription, the additional software and compute capacity can be leased as a service from the cloud, for just a single business quarter (three months), in order to finalize the new product design.

Another benefit of the cloud for large OEMs is global reach. A company may have offices spread across the planet—say, Detroit, India, China and Brazil. But their data hub is located in Detroit, so any simulation-file traffic between offices involves copying and sending files over the

network, requiring huge amounts of time for downloads. Instead, by centralizing everything on the **3DEXPERIENCE** platform on the cloud infrastructure, users can log into the platform and view all their data on a secure web browser for instant access, easier sharing with colleagues, and enhanced collaboration throughout the enterprise.

Experts at small- and medium-sized companies (SMBs) can have very different needs from larger companies, which is where the cloud can provide real value in terms of competitive advantage. If they are a Tier 1 or 2 supplier to a large OEM, the SMB may be required to use the same FEA software tools as their clients. But if that work typically only comes in a few times a year, the cost of an annual Abaqus software license can be prohibitive. Instead, through the **3DEXPERIENCE** platform on the cloud, the supplier can subscribe to an Abaqus license for only a three-month period, doesn't need to hold onto a license that's not being used in the interim, and can re-subscribe when the next project comes in. Expertise, and the ability to compete at the highest levels, can be established and maintained by a smaller company without a huge advance investment.

Designers, design engineers, and other non-expert users will find that the advent of the **3DEXPERIENCE** platform on the cloud dramatically changes the landscape for them in other powerful ways. Those who are using our sister brand CAD tools like CATIA and SOLIDWORKS may not have been able to afford, or had the expertise to run, realistic simulations in the past. But now the user roles on the cloud come with what we call "embedded compute," so you can virtually test your product designs without having to purchase any additional coupons. And the best part is that, underneath the ease-of-use design tools created specifically for your non-expert role, runs

the very same 40-year-proven Abaqus solver technology that the experts use. So the floodgates are opening for the design-engineering community to access the resources they need to fully engage the power of simulation for product development.

SECURITY IS PARAMOUNT

Your data on the **3DEXPERIENCE** platform on the cloud is more secure than what most customers have access to on premise. That's due to data centralization, stringent procedures enforcing regulatory standards and best practices, and proven technologies from experienced cloud providers at both infrastructure and application levels. For more information see our whitepaper on Security in Depth.

THE DEMOCRATIZATION OF SIMULATION

Cloud computing on the **3DEXPERIENCE** platform is available to every kind of simulation user, regardless of the size of your team and company or your personal level of design engineering sophistication. By providing unprecedented access to industry-leading tools and hardware capabilities, as well as ease-of-use that enables everyone to collaborate from their own level of expertise, the cloud has truly democratized the use of simulation so that everyone can take advantage of its benefits. Many of our customers have already adopted cloud computing to help them achieve sustainable innovation. Let us know how we can help you begin your own cloud journey!

For More Information

<https://3dexperience.3ds.com/cloud/>

Whitepaper: Security in Depth—<http://bit.ly/2FfNQg8>

