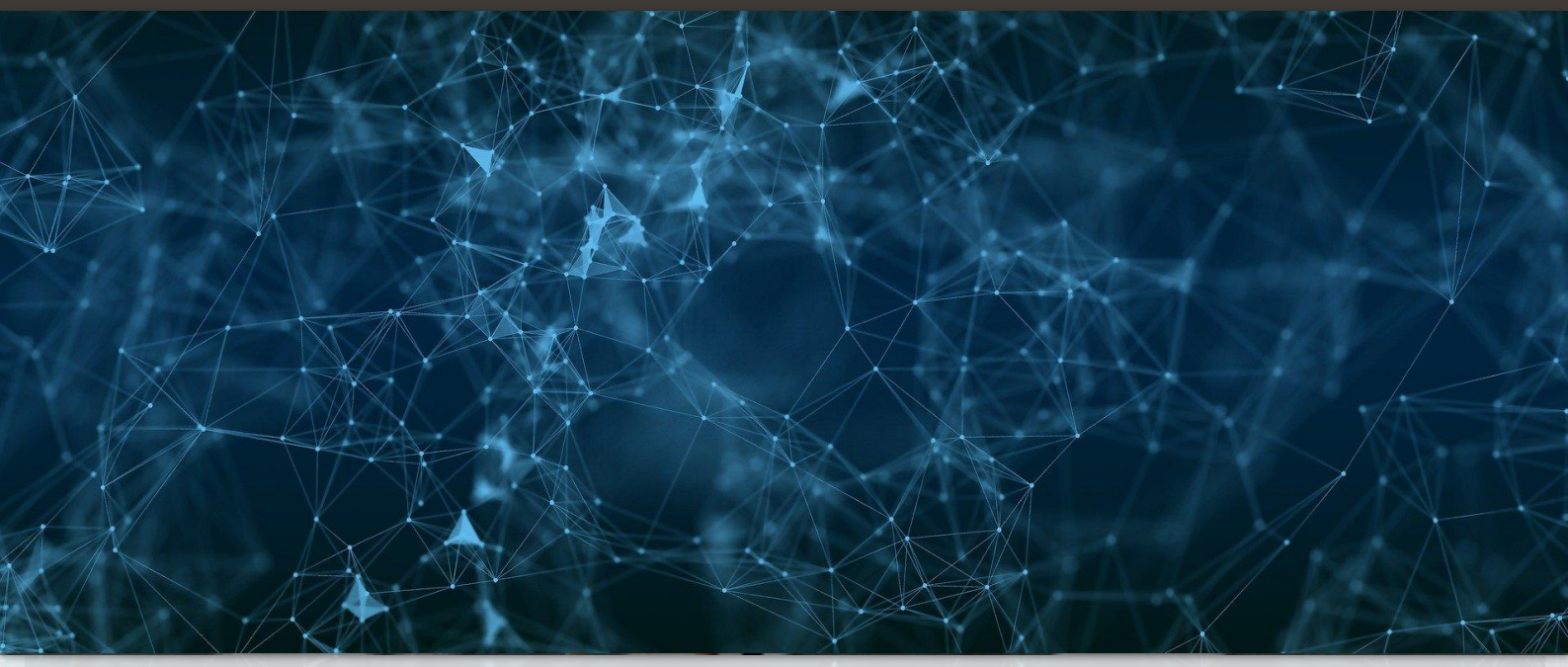
WHITE PAPER

ON-PREMISES VS. SAAS SIMULATION

A COMPARATIVE LOOK

This paper addresses the difference between on-premises software and SaaS solutions for computer-aided engineering, explaining how SaaS came to be and its key benefits.



SIMSCALE

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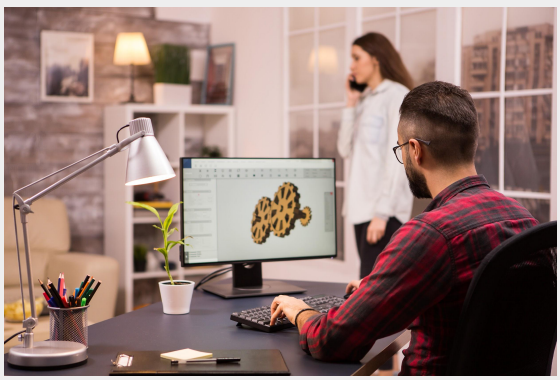
Introduction

The global computer-aided engineering (CAE) market is set to reach over $13 billion by 2026. Advancements in automation across almost all sectors have enabled a growth in the adoption of CAE. Automation has changed the face of product design and manufacturing processes by offering more accuracy with better efficiency. Engineers' focus on improving productivity by enhancing the design process is driving the adoption of CAE, mainly for computational fluid dynamics (CFD) and finite element analysis (FEA) technology. Historically, this was facilitated by only on-premises CAE solutions. As powerful as CAE is in driving efficiency, however, the limitations in using traditional simulation solutions reduce the benefits of using this technology. To this challenge, cloud computing brings a solution.

On-Premises CAE Software

Today, desktop-based and on-premises computer-aided engineering (CAE) still remains to have the largest hold on the market for each respective facet of engineering. This can be credited to its 30+ years of development, allowing this kind of software to adapt and offer features that boast high accuracy for specific and niche applications.

On-premises CAE software refers to all simulation software that supports and enables engineering analysis tasks from a stationary workplace, i.e., desktop computer. CAE software can encompass everything from finite element analysis (FEA), computational fluid dynamics (CFD), multibody dynamics (MDB), and thermodynamics to include further optimization capabilities and features.



CAE software enables engineers to simulate, validate, and optimize products. The top CAE software solutions, including on-premises and cloud-based as announced by g2.com, include MATLAB, Fusion 360 Simulink, NI Multisim, SimScale, Abaqus, Solid Edge, etc.

Industry-standard CAE software solutions historically run using on-premises infrastructure, but cloud-based solutions are gaining popularity. This cloud-based alternative, or SaaS solution, typically has more flexible pricing structures, allows an infinite number of parallel jobs, and was created to optimize what on-premises software has been doing for decades before. SaaS solutions fill this growing untapped potential for on-demand simulation capabilities by leveraging the performance and scalability of HPC systems in the cloud.

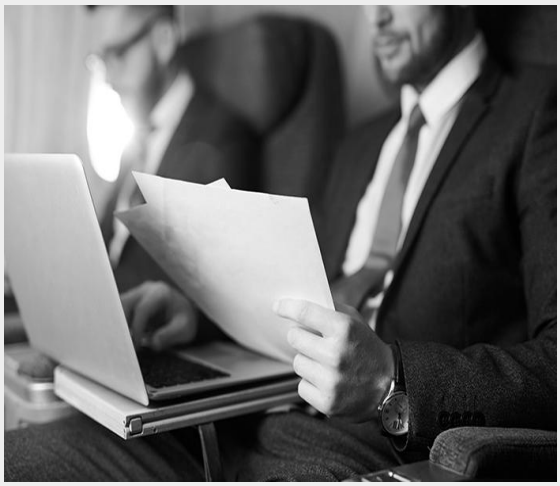
What Is SaaS?

Software as a Service, also known as SaaS, is a cloud-based service where instead of downloading and installing software from your desktop PC or business network to run and update manually, you alternatively enter an application via an Internet browser.



The subscription-based software application could be anything from office software to unified communications among a wide range of other business apps that are available, as well as CAE. SaaS has essentially changed the landscape for software, through harnessing the power of the cloud. Yet, that's not to say it doesn't come without some drawbacks.

The largest issue users can note about SaaS products is that they require an Internet connection to operate. Of course, without the Internet, one cannot run a simulation on the cloud, while in an airplane (in the clouds).



However, the increasingly wide availability of broadband and high-speed phone networks such as 5G makes this less of an issue. Today, there is almost nowhere you can go that does not offer WiFi or some rendition of Internet access. Additionally, some SaaS applications have combatted this issue by offering offline modes that allow basic functionality; for example, Google Docs.

Benefits of SaaS Tools

Key benefits of SaaS cover accessibility, compatibility, and operational management. SaaS models allow lower upfront investments than traditional software download and installation, making them more affordable and by proxy available to a wider range of individual users and businesses alike, making it easier for smaller companies to disrupt existing markets while empowering suppliers.

The most commonly cited benefit of SaaS products is accessibility. All SaaS applications can be run via a web browser. This brings a level of versatility never before seen in standard desktop-based software, as not only does it mean users of Mac, Windows, and Linux operating systems can coexist on the same cloud-based platform, but it allows users to access their data across different devices, whether it be a desktop PC, laptop, or even a tablet. Let's look at some other key advantage areas.



Updates and Maintenance

Another major advantage of SaaS is that because they run in the cloud, the provider can update its software centrally without negatively affecting business operations for its users. This is an innate difference to desktop-based or on-premise software that will often require a degree of compatibility and endpoint security.

Data and Analytics

Companies using SaaS products normally have access to reporting and intelligence tools and visualizations that can give invaluable insights into operations, allowing workflow streamlining and

optimization. Since access depends on a paid subscription, vendors and end users can sleep soundly with no concerns about piracy which might otherwise cost the supplier, thereby damaging both access and pricing models.

Saving and Storage

On-premises storage of data requires heavy investment in reliable backups such as through online cloud storage in order to mitigate hardware crashes that might otherwise cause a significant loss of data. SaaS, on the other hand, routinely saves data in the cloud automatically. Through the cloud, employees from all over the globe can access information, and switch between devices without losing work or data.





Market Reach

For the providers of SaaS, this refers to being able to supply a software service to the majority of the respective market, instead of just a limited and targeted market segment. Pricing plans can be offered at cheaper prices, and make software options more accessible to businesses of every size. For users this implies being able to reach services not commonly available, thus both expanding and enhancing business services, productivity, and endless opportunities.



About SimScale

Founded in 2012 with offices in Munich, New York, and Boston, **SimScale** is the world's first production-ready SaaS application for simulation. From any web browser, instantly access a full-fledged HPC-powered simulation platform, up to 96-core machines, plenty of simulation features, and learning resources.

By providing instant access to computational fluid dynamics (CFD) and finite element analysis (FEA), SimScale supports over 200,000 users (from beginners to experts) through a user-friendly cloud application accessible online via a subscription-based pricing model.

Why SimScale?

Zero hardware investment
By leveraging the power of the cloud, SimScale helps small, medium, to large enterprises alike save on average $30K by cutting the cost of expensive hardware and software maintenance fees.

No installation. No maintenance
All you need is Internet connection to run demanding simulations on a laptop or PC of your choice.

Seamless collaboration
Through SimScale, globally distributed design and engineering teams can easily share and collaborate on their projects in real time. No more hassle with data exchange or hidden costs.



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