# Simulation in the Cloud: The New Imperative

ANSYS Cloud drives product innovation faster and more economically than ever — positioning your company to capitalize on today's transforming business landscape.

Today, the manufacturing sector is undergoing the most fundamental change since Henry Ford introduced the assembly line. The internet of things, artificial intelligence, machine learning, additive manufacturing and other advanced technologies are transforming the way products are designed and produced — giving rise to smart connected products, mass customization, autonomous solutions and other innovations that would have defied an engineer's imagination just a few years ago. And product development teams are being tasked with capitalizing on these technologies to launch revolutionary products that are assembled and delivered in new and exciting ways.

This means IT organizations must provide an advanced technology infrastructure that meets increasingly complex engineering needs and supports agility — while still maintaining lean resources and keeping budgets low. By minimizing capital investments, CIOs are protecting all-important profit margins.

How can product development teams hope to access the most advanced technology and stay ahead of the competition, at a minimal upfront financial investment? Enter ANSYS Cloud.

## ANSYS Cloud: New Era, New Solution

For over 40 years, engineering simulation software from ANSYS has helped the world's product development teams deliver extreme innovation. But, as engineering challenges grow more complex in the face of product autonomy and other trends, companies are recognizing that relying on on-premise hardware and processors is insufficient to support the speed, agility and sophistication of innovation-driven product development today. Engineers simply can't afford to wait in line for scarce computing resources, or limit the accuracy and scale of their simulations, because of internal IT constraints.

## Capture the Proven Benefits of Cloud Computing

Industry leaders in product development are using the cloud to increase simulation throughput — and this trend is growing. In fact, usage of ANSaYS software in the cloud increased by 90 percent in the first half of 2018. This mirrors a general growth in cloud computing across all industries; IDC predicts that by 2020, 67 percent of enterprise infrastructure and software will be for cloud-based offerings. Why the excitement? Because cloud computing is an efficient, economical solution that delivers these and other benefits:

- Access to latest processors, for more speed and power.
- Shift from CapEx to OpEx.
- Automatic software and hardware upgrades.
- Flexible, on-demand access.
- Support for a mobile workforce.
- Enhanced collaboration.
- Uncompromising security.

For the first time, ANSYS Cloud makes it seamless, easy and cost-effective to harness the power of the world's best simulation software on an as-needed basis — enabling fast, flexible access to both simulation software and the processing capabilities needed to run large simulations.
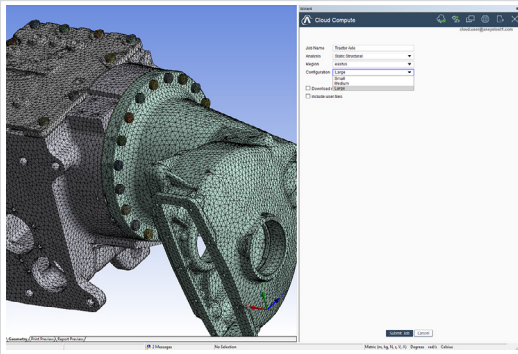


For current users of ANSYS Mechanical, Fluent and Electronics Desktop*, a simple interface within the software running on a desktop allows them to quickly and easily submit their solutions to the cloud.

ANSYS Cloud is a single-vendor solution that provides elastic, affordable software licensing and computational power — without investing in HPC clusters, building an internal data center or paying for long-term licenses that may not be fully utilized. This value-added offering recognizes the fact that computational and software licensing needs can vary over time — and most businesses don't have the financial resources to pay for the highest usage scenario on an ongoing basis.

The usage-based model underlying ANSYS Cloud allows users the flexibility to mix and match long-term licenses for steady-state software utilization with usage-based licenses for peak simulation periods, including a usage-based model for hardware. This "pay as you go" model recognizes that engineering teams have simulation needs that fluctuate. The flexibility and elasticity of the ANSYS Cloud approach place world-class ANSYS solutions, and virtually unlimited computing resources, within the reach of every user at every company — all that's needed is an internet connection.
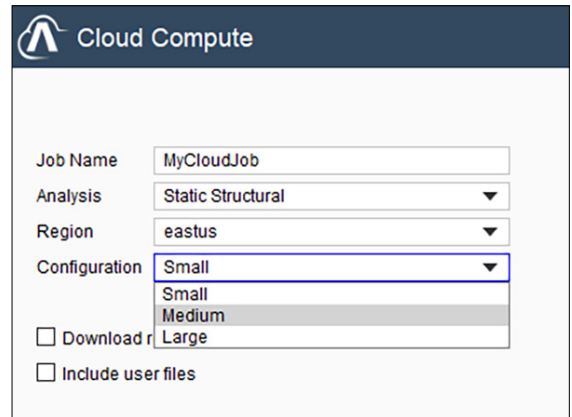


Most important, ANSYS Cloud is specifically designed for the way engineers actually run simulations today. The hardware is configured and optimized for ANSYS solvers. And, because product development is increasingly collaborative in nature, ANSYS Cloud also makes it easy to share results with other internal teams, as well as the ANSYS Customer Excellence support team, from within a user-friendly, web-based portal that can be accessed from any device.
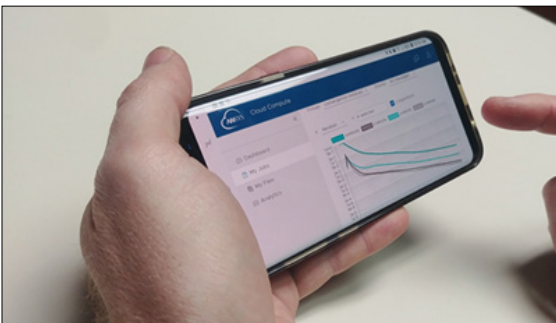


In addition, a 3D visualizer that runs in any web browser, including mobile, can be used to validate results and extract engineering value as soon as the solve is complete, without having to download any data. Users can leave — and share — large results files in the cloud, verify them and do basic post-processing, and then download the results only when they are ready to manage the data on-premise or do more detailed post-processing.

# What Customers Saying
## About ANSYS Cloud?

*"ANSYS Cloud is intuitive to use and integrates seamlessly into our Fluent workflow. By using an internet browser to check job status, view convergence plots, and pause or stop jobs, we had more control of our simulations than with other cloud services, and this made our computational work much more efficient."*

**Adam Kline-Schoder**
Flight Data Analyst, Altaeros

*"Cloud computing is the new standard for engineering analysis. ANSYS Cloud provides an easy-to-use option for quick access to cloud HPC directly from within ANSYS applications. This is especially useful for businesses with variable simulation workloads."*

**Professor Bert Blocken**
Eindhoven University of Technology & KU Leuven

*"Altaeros depends on the fast turnaround of dozens of operating points on high-fidelity ANSYS Fluent models to support flight dynamics and mechanical design needs. Cloud computing accelerates time to results and the built-in interface to Microsoft Azure within the ANSYS tools presents a compelling case for its adoption."*

**Jon Everitt**
Principal Aerodynamicist, Altaeros

*"High-efficiency equipment is critical for improving plant performance in the oil and gas industry. ANSYS Cloud enables Hytech Ingenieria to calculate large and complicated geometries within hours, instead of days or weeks - resulting in significant time savings."*

**Luis Baikauskas**
Process Engineer, Hytech Ingeniería

# Computing the Benefits

Accessing the power of ANSYS simulation software via a cost-effective, flexible cloud offering creates significant benefits for product development teams, including:
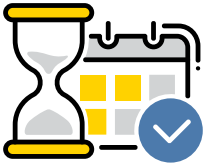
**Reduced Turnaround -** Simulation users no longer need to scale up their computing hardware or licenses to meet deadlines — or miss deadlines as they wait in a queue for computing resources. They can access ANSYS software on demand to run large, computationally intensive, multiphysics studies that examine a multitude of operating scenarios. This can cut months from the design cycle and speed market launch — so ideas are turned into revenues faster than ever.

**More Accurate Results -** Simulation users relying on scarce internal computing resources might have to cut corners — using rough meshes, applying a single physics or working at a low level of fidelity. ANSYS Cloud enables complete modeling freedom and much more accurate results. Engineers can easily apply multiple physics, create extremely fine meshes and otherwise replicate real-world product performance with the highest degree of accuracy.

**Better Design Trade-Offs -** One of the biggest challenges for today's engineers is optimizing overall product performance and making intelligent trade-offs in the face of real-world time constraints. Design of experiments (DOE) capabilities in ANSYS software enable engineers to apply thousands of operating parameters to their designs — but the resulting simulations are often prohibitively large for in-house IT resources. ANSYS Cloud eliminates this barrier, providing easy and flexible access to the hardware and processors needed to support even the largest optimization studies.
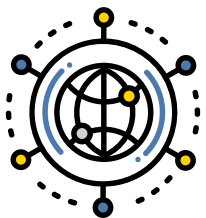
**New Markets and Applications -** Succeeding in today's increasingly global, competitive markets often requires dramatic agility and innovation. Companies can seize new revenues by adapting products for entirely new markets, or finding new applications for existing designs. ANSYS Cloud gives simulation users the freedom to apply simulation across the entire product life cycle. Instead of "saving" scarce simulation resources for the big development decisions and key milestones, engineers can ask and answer smaller questions every day, refining their designs and identifying brand new market opportunities via ongoing exploration.

 Azure

## Microsoft Azure: A Trusted Partner

In designing ANSYS Cloud, ANSYS made the strategic choice to partner with another trusted technology leader: Microsoft. By accessing ANSYS Cloud via the proven Microsoft Azure platform, users can be confident in the global access, speed, security and privacy of all their simulation runs.

Healthcare companies, financial institutions and other companies with sensitive data have trusted Microsoft Azure with their data and transactions for years. ANSYS Cloud users can now benefit from this same level of trust.

Microsoft Azure complies with all IT security standards and maintains strict protocols that restrict physical access to its facilities, securely store data, monitor unauthorized user activity and employ encryption to protect sensitive product development information. ANSYS Cloud leverages Azure Virtual Networks (VNet) to ensure a separate and secure network architecture for each customer. The network is isolated into customer-specific private subnets which deliver all the resources needed to run a simulation job, including managing any sensitive data.

For full details on the security controls at Microsoft Azure, Click Here.

## Getting Started With ANSYS Cloud

Ready to start enjoying the benefits of cloud-based simulation? It's never been easier. Because ANSYS Cloud and ANSYS simulation software are available from a single vendor, procurement and support are streamlined. You will benefit from a single invoice, a single source of support and a single business relationship. Whether it's your first step into the cloud, or you've made a larger commitment, ANSYS Cloud delivers the performance, convenience and business agility you need. Visit www.ansys.com/cloud-trial to request your FREE trial — and begin building a significant competitive advantage today.
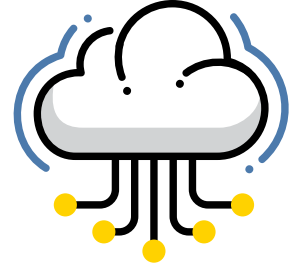
*Electronics Desktop will be cloud-enabled in June, 2019*

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If you've ever seen a rocket launch, flown on an airplane, driven a car, used a computer, touched a mobile device, crossed a bridge or put on wearable technology, chances are you've used a product where ANSYS software played a critical role in its creation. ANSYS is the global leader in engineering simulation. We help the world's most innovative companies deliver radically better products to their customers. By offering the best and broadest portfolio of engineering simulation software, we help them solve the most complex design challenges and engineer products limited only by imagination.
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