# Ansys Cloud

HPC as easy as it should be

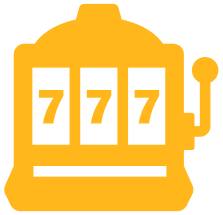
**Customer Facing Version**

# Menu

**Click Icons to get re-directed**

Challenges

Benefits




Solution

What's New ?

Customer Success

Pricing and Packaging

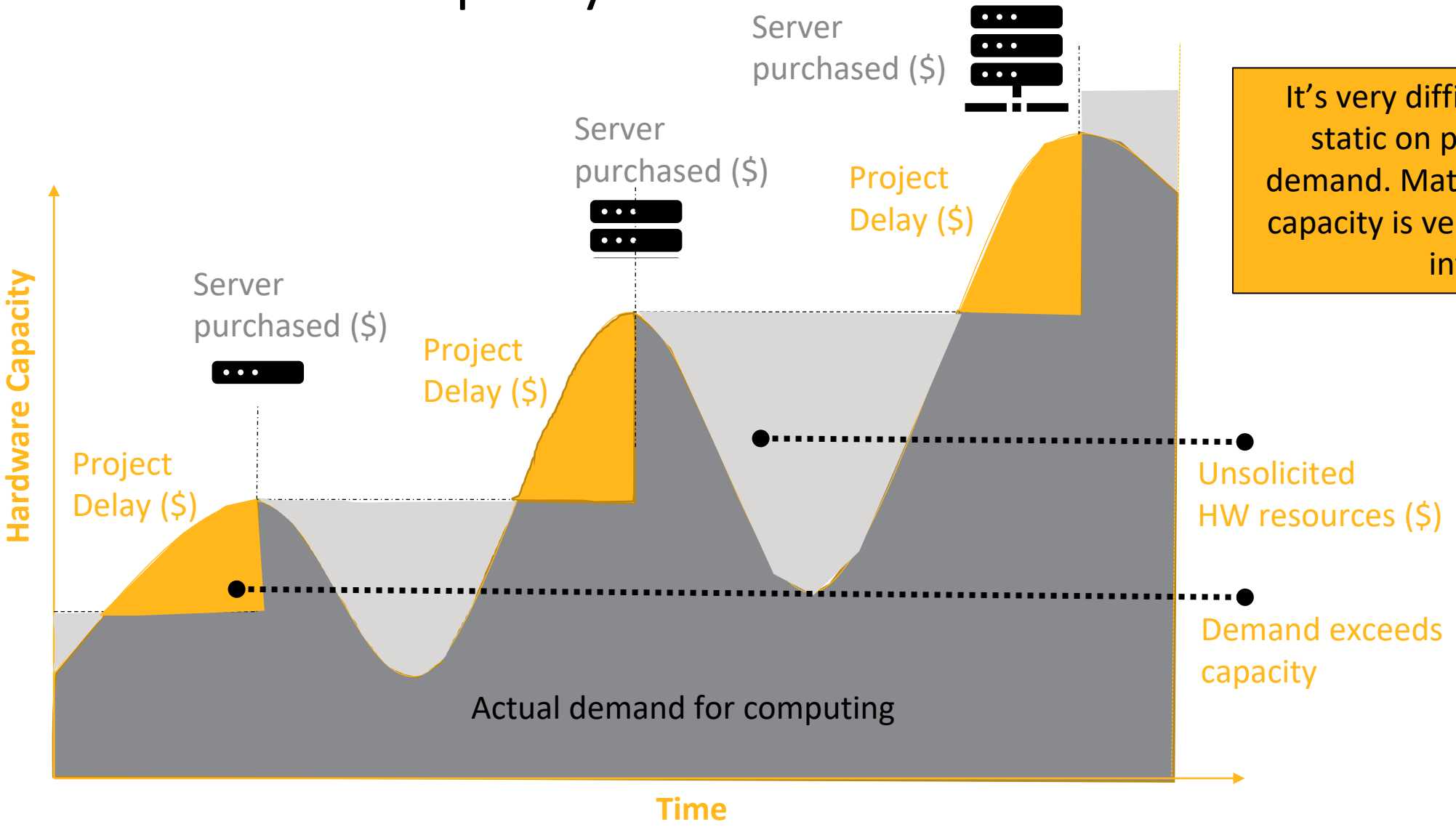
Extra Slides

*Click to return Agenda*

# Challenges

Ansys Cloud

# How to match capacity and demand ?




It's very difficult to anticipate static on prem computing demand. Matching demand and capacity is very time and capital intensive

# Challenges

- 52 %
- 25 %
- 21 %


https://www.ansys.com/resource-center/white-paper/study-on-highperformance-computing-usage-for-engineering-simulation

*2021 Ansys Surveys with 750+ IT Mangers and Engineers & C-Levels



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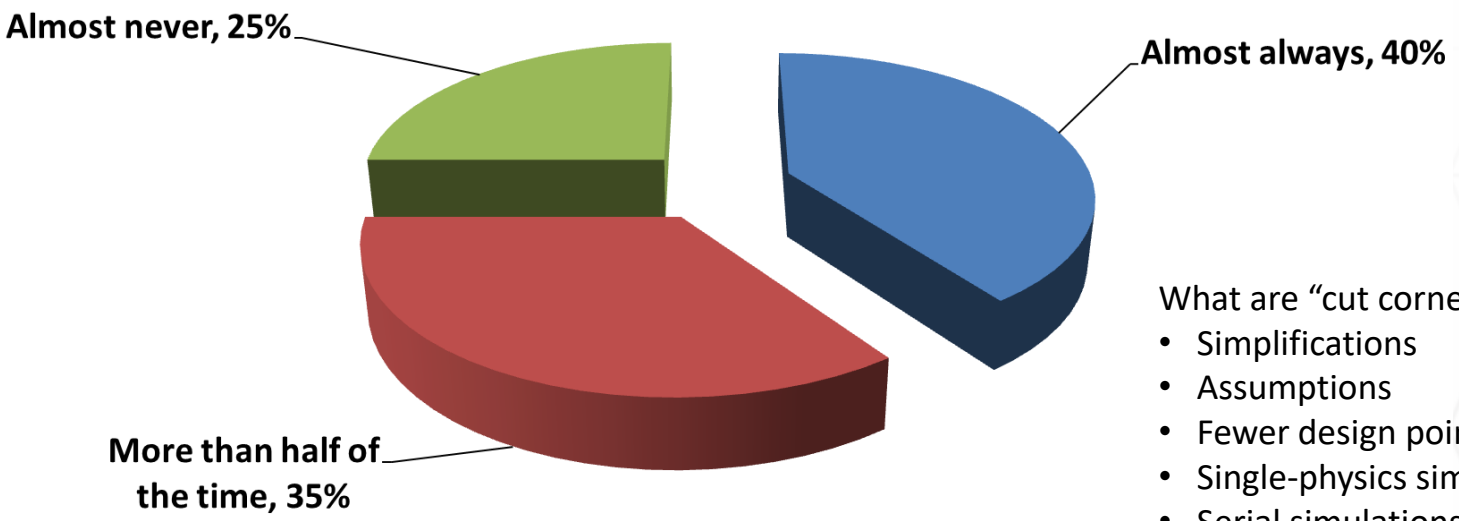
# Why Cloud: Costs of being compute bound

**How often do you "cut corners" due to your compute limitation?**




Survey of Ansys users

What are "cut corners"
- Simplifications
- Assumptions
- Fewer design points
- Single-physics simulations
- Serial simulations

**40% of Ansys user base run simulations exclusively on a laptop/desktop!**

**>56% less than 36 cores**

**HW constraints negatively impacted simulation effectiveness for almost 75% of users**

*Click to return Agenda*

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# Benefits

Ansys Cloud

# Ansys / CLOUD

**Ansys Cloud** increases simulation throughput by removing the **hardware** barrier. **Ansys** is one of the only Simulation Software vendor that has **cloud directly integrated** into our **simulation software**. We have a **secure , scalable** and **cost-effective** approach to **HPC in the cloud**.

**Key partnership :**


**Vision :**

**2020 : Ansys Flagships solvers**

**2021 : Extension with others Ansys Products**

**2022 and beyond:**

**Ansys Cloud as the backbone for cloud-based simulation solutions**



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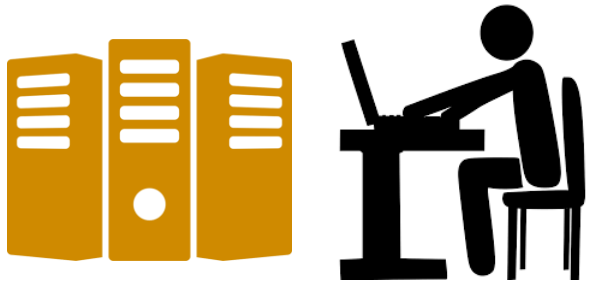
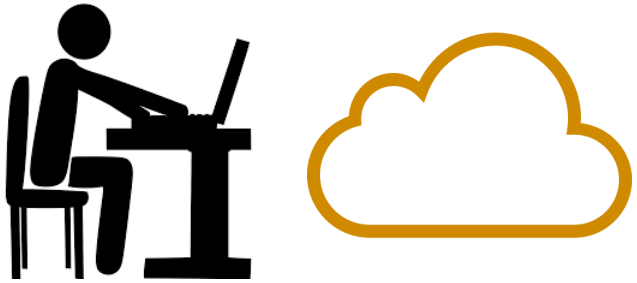
# Impacting engineering throughput

## Yesterday
Using Local Resources



## Tomorrow
Using Ansys Cloud



| | | |
|---|---|---|
| Use local machine for model setup | → | Use local machine for model setup |
| Use local machine for solving | → | Use **Ansys Cloud** for solving |
| 8 CPU cores | → | 132 CPU cores |
| 32 GB RAM | → | 1,056 GB RAM |
| Running 1 job at a time | → | Running 10 jobs at a time (12 cores per design point) |
| 8 hours per design point | → | 6 hours per design point |
| 10 design points = **80 hours** | → | 10 design points = **6 hours** |

✓ ***User Experience is identical.***

✓ ***Ansys handles all the IT.***



*Click to return Agenda*

# Ansys Cloud, unleash the power!

Tuned to deliver best performance

Local Computing

Ansys Flagship Solvers

Ansys Cloud : no speed limit !


*Click to return Agenda*

# The Benefits of Cloud

**Increase simulation throughput**

**Pay for only what you use**

**Access the latest hardware (at scale!)**

**Move fixed expenses to variable (CapEx -> OpEx)**

**Focus on engineering (not maintaining clusters)**

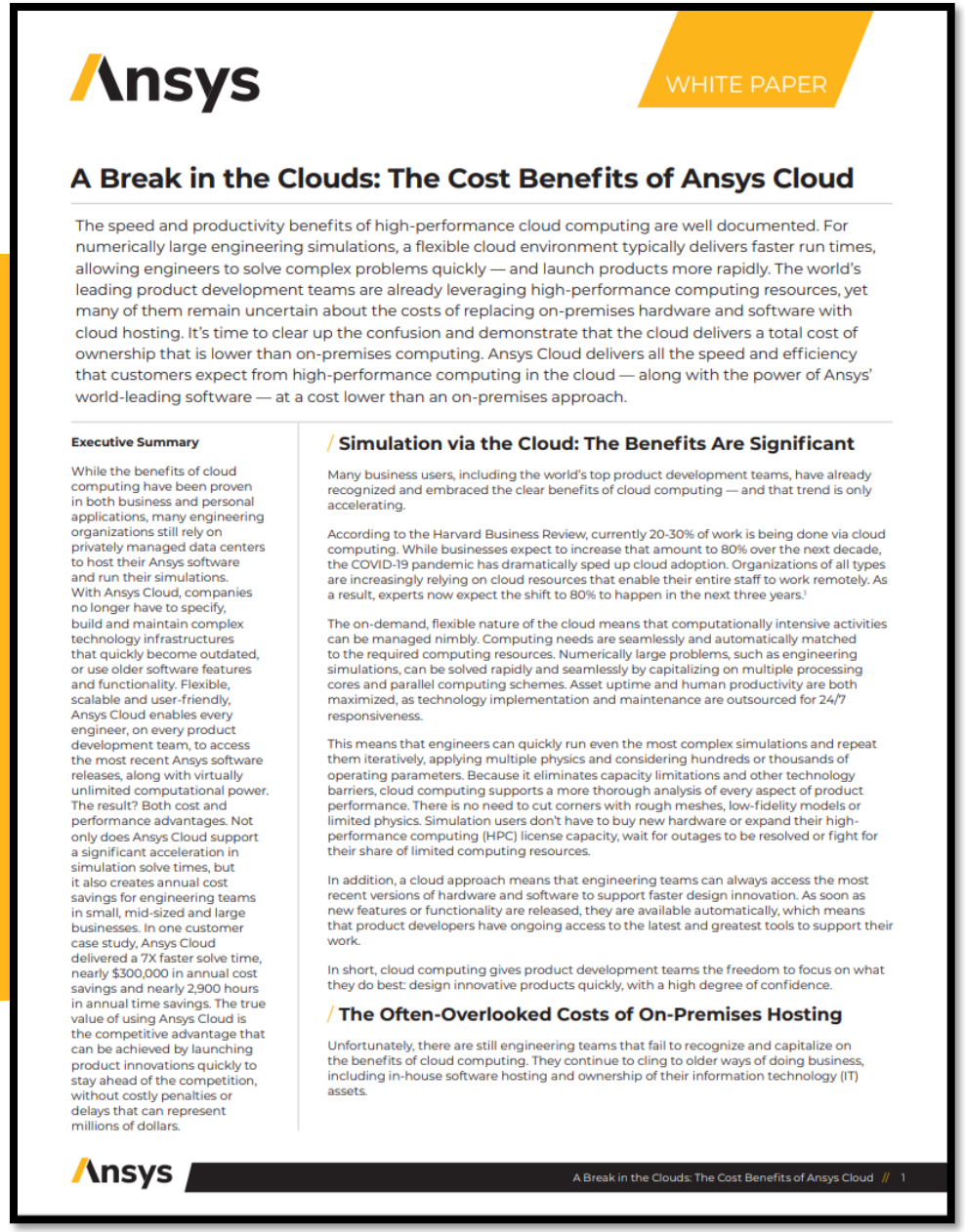
*Click to return Agenda*

# Total Cost of Ownership – White Paper

In one customer case study, Ansys Cloud delivered a **7X faster** solve time, nearly **$300,000** in annual cost savings and nearly **2,900 hours** in annual time savings.

The true value of using Ansys Cloud is the competitive advantage that can be achieved by launching product innovations quickly **to stay ahead of the competition**, **without costly penalties or delays** that can represent millions of dollars.

Read the full story



Ansys

WHITE PAPER

## A Break in the Clouds: The Cost Benefits of Ansys Cloud

The speed and productivity benefits of high-performance cloud computing are well documented. For numerically large engineering simulations, a flexible cloud environment typically delivers faster run times, allowing engineers to solve complex problems quickly — and launch products more rapidly. The world's leading product development teams are already leveraging high-performance computing resources, yet many of them remain uncertain about the costs of replacing on-premises hardware and software with cloud hosting. It's time to clear up the confusion and demonstrate that the cloud delivers a total cost of ownership that is lower than on-premises computing. Ansys Cloud delivers all the speed and efficiency that customers expect from high-performance computing in the cloud — along with the power of Ansys' world-leading software — at a cost lower than an on-premises approach.

**Executive Summary**

While the benefits of cloud computing have been proven in both business and personal applications, many engineering organizations still rely on privately managed data centers to host their Ansys software and run their simulations. With Ansys Cloud, companies no longer have to specify, build and maintain complex technology infrastructures that quickly become outdated, or use older software features and functionality. Flexible, scalable and user-friendly, Ansys Cloud enables every engineer, on every product development team, to access the most recent Ansys software releases, along with virtually unlimited computational power. The result? Both cost and performance advantages. Not only does Ansys Cloud support a significant acceleration in simulation solve times, but it also creates annual cost savings for engineering teams in small, mid-sized and large businesses. In one customer case study, Ansys Cloud delivered a 7X faster solve time, nearly $300,000 in annual cost savings and nearly 2,900 hours in annual time savings. The true value of using Ansys Cloud is the competitive advantage that can be achieved by launching product innovations quickly to stay ahead of the competition, without costly penalties or delays that can represent millions of dollars.

### Simulation via the Cloud: The Benefits Are Significant

Many business users, including the world's top product development teams, have already recognized and embraced the clear benefits of cloud computing — and that trend is only accelerating.

According to the Harvard Business Review, currently 20-30% of work is being done via cloud computing. While businesses expect to increase that amount to 80% over the next decade, the COVID-19 pandemic has dramatically sped up cloud adoption. Organizations of all types are increasingly relying on cloud resources that enable their entire staff to work remotely. As a result, experts now expect the shift to 80% to happen in the next three years.[1]

The on-demand, flexible nature of the cloud means that computationally intensive activities can be managed nimbly. Computing needs are seamlessly and automatically matched to the required computing resources. Numerically large problems, such as engineering simulations, can be solved rapidly and seamlessly by capitalizing on multiple processing cores and parallel computing schemes. Asset uptime and human productivity are both maximized, as technology implementation and maintenance are outsourced for 24/7 responsiveness.

This means that engineers can quickly run even the most complex simulations and repeat them iteratively, applying multiple physics and considering hundreds or thousands of operating parameters. Because it eliminates capacity limitations and other technology barriers, cloud computing supports a more thorough analysis of every aspect of product performance. There is no need to cut corners with rough meshes, low-fidelity models or limited physics. Simulation users don't have to buy new hardware or expand their high-performance computing (HPC) license capacity, wait for outages to be resolved or fight for their share of limited computing resources.

In addition, a cloud approach means that engineering teams can always access the most recent versions of hardware and software to support faster design innovation. As soon as new features or functionality are released, they are available automatically, which means that product developers have ongoing access to the latest and greatest tools to support their work.

In short, cloud computing gives product development teams the freedom to focus on what they do best: design innovative products quickly, with a high degree of confidence.

### The Often-Overlooked Costs of On-Premises Hosting

Unfortunately, there are still engineering teams that fail to recognize and capitalize on the benefits of cloud computing. They continue to cling to older ways of doing business, including in-house software hosting and ownership of their information technology (IT) assets.

Ansys A Break in the Clouds: The Cost Benefits of Ansys Cloud // 1

Ansys

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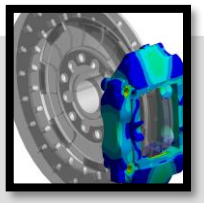
# Solution

Ansys Cloud

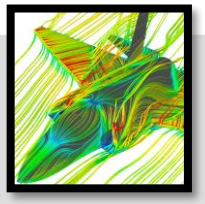
# Ansys Cloud – *"HPC as easy as it should be"*

**Batch submission & interactive use in Cloud**

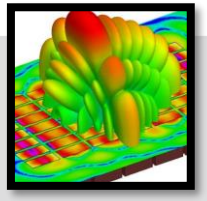
**Interactive Use in Cloud**



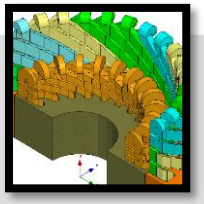
**Ansys Mechanical**
- 2019R2 & beyond



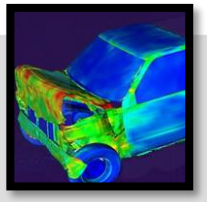
**Ansys Fluent**
- 2019R2 & beyond



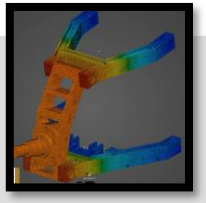
**Ansys HFSS, Slwave, Icepak**
- 2020R1 & beyond



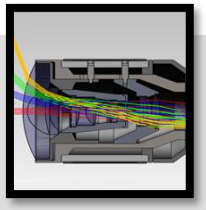
**Ansys Maxwell,Q3D (2D & 3D)**
- 2019R3 & beyond



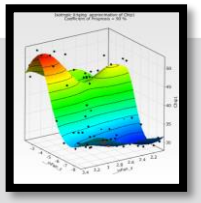
**Ansys LS-DYNA / LST***
- 2020R2
- *9.3.1 & beyond



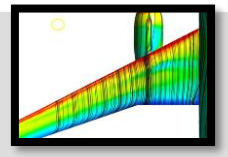
**Ansys Discovery**
- 2021R1 & beyond



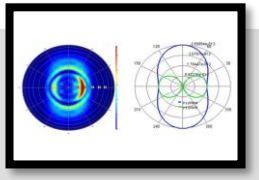
**Ansys SPEOS**
- 2021R1 & beyond



**Ansys optiSLang**
- 2021R1 & beyond



**Ansys CFX**
- In Browser & RDP



**Ansys Lumerical**
- In Browser & RDP

## BENEFITS :

- ✓ **Solve in the cloud** directly from the desktop application
- ✓ **Interactive use** to enable full in-cloud workflows.
- ✓ **Highly optimized** for Ansys solvers
- ✓ **Single** vendor solution for Software and Hardware
- ✓ **Nine** data centers worldwide
- ✓ Data **localized** and **secured**

## Compute Nodes

- **High memory** bandwidth
- **Large capacity** RAM
- **High performance** interconnect
  - Low latency **Message Passing Interface** (MPI)
  - **High Bandwidth**
- **Faster** working directory
- **Interactive** option including a **GPU for graphics performance.**

Microsoft Azure

AICPA SOC — SOC 2 TYPE II CERTIFIED

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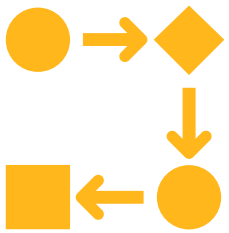
# Ansys Cloud is HPC optimized



## Workflow

Cloud access is integrated **directly** from your Ansys software. With **only a few mouse** clicks, you have the **power** of the cloud to use as you wish.

## Performance

This complete solution — from solvers to the cloud — was developed by Ansys for **full architecture integration**. Like a Formula 1 race car, Ansys Cloud is **tuned** for Ansys solvers.

## Support

Ansys **supports the entire simulation process** from **hardware to software**, from beginning to end.

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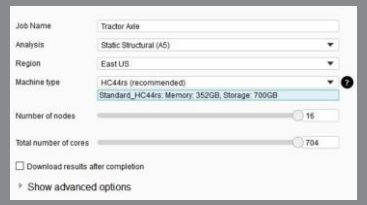
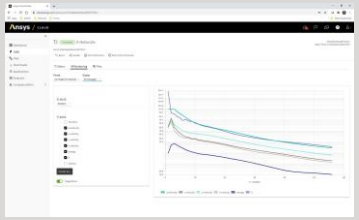
# Ansys Cloud workflow

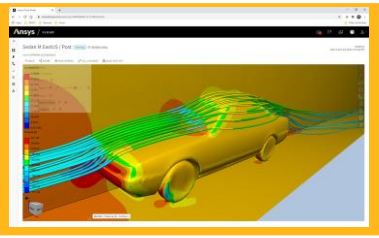
Submit jobs from desktop application



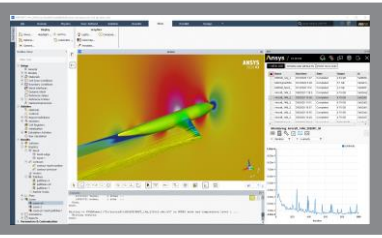

Monitor from app or cloud portal

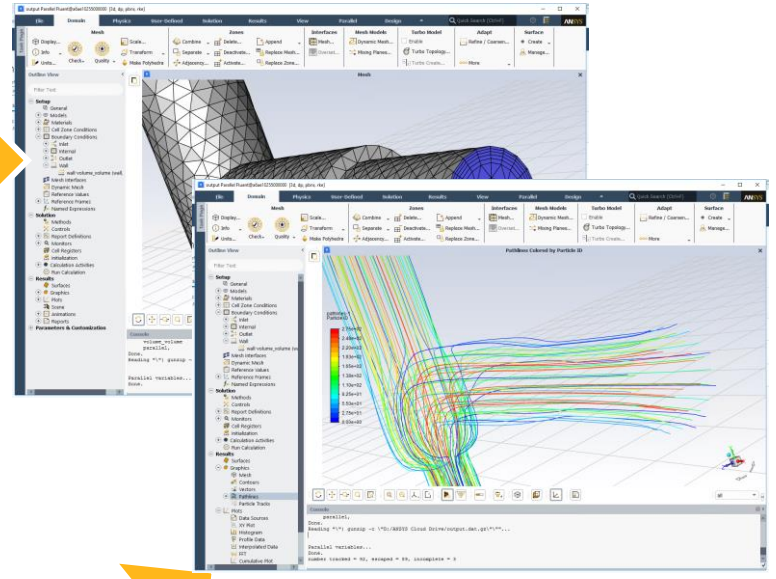


Visualize results in the cloud



Download to workstation





Newly added!
Ansys' In-Browser Cloud Offering for interactive cloud-based workflows



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# We support you !

**Ansys Customer Excellence**

*"I just spent few hours and walked through the desktop-remote solve and VDI workflows. We took his solve time on a single modal analysis from **8 hours down to 20 minutes**. The solver used most of the available RAM so that was probably a big factor."*

***Ansys ACE Engineer***

## Power of our single source of support for both HW and SW.

*"Every time you interface with an **Ansys AE** to get help with a cloud-related inquiry, there is a good chance you might walk away from the engagement with a **quick tip**, **an update** on a new feature you were not aware of, maybe some **guidance** on a better method, etc.. You can never get this level of holistic support from a CHP or DIY approach."*

# In-Browser Interactive Client

New HW configurations with an Nvidia GPU + In-browser client

From **6-core up to 120 cores cloud**-based workstation available in minutes

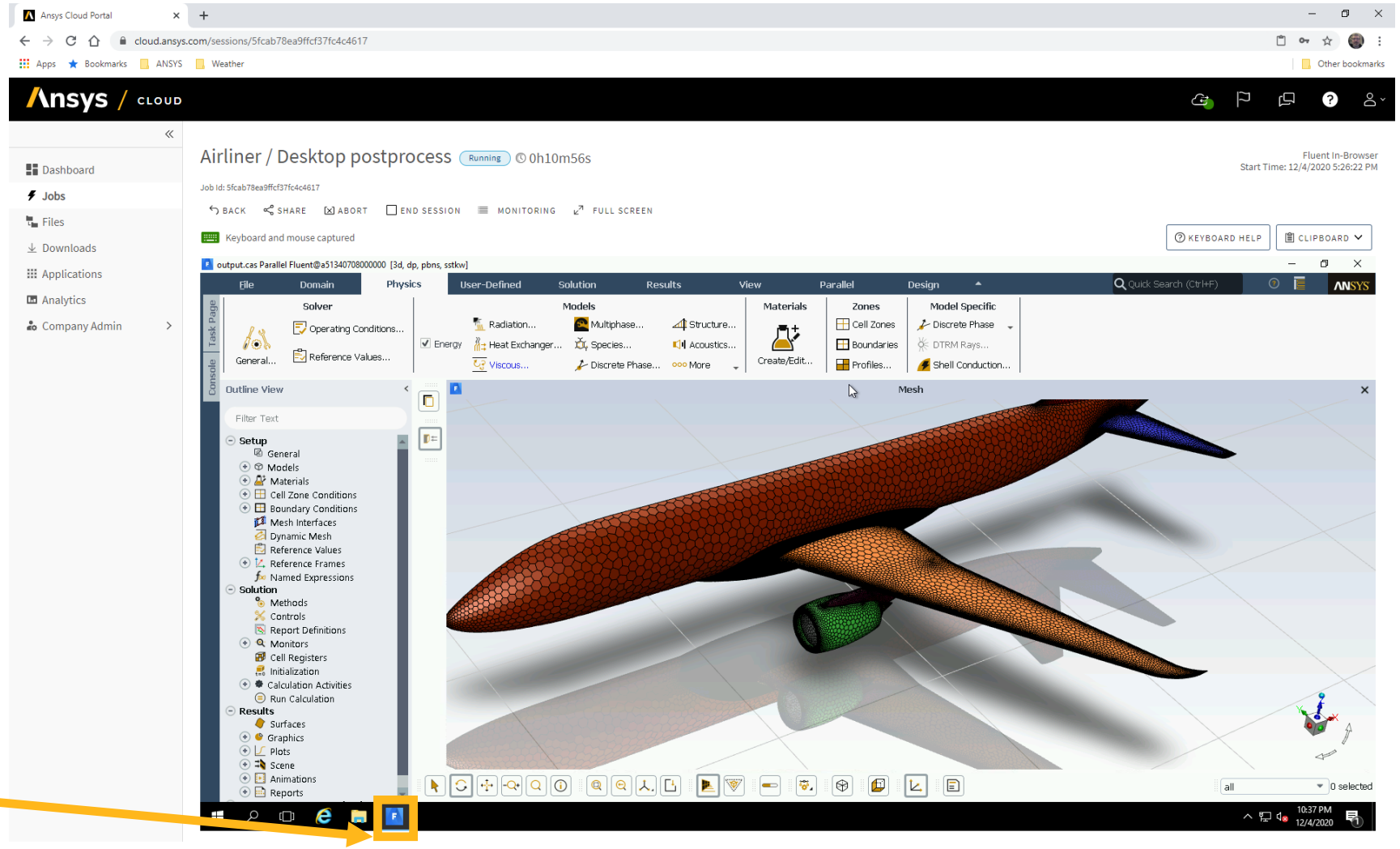
Ansys Solutions installed and ready to use

Can be used with **AEC/AHC's and BYOL**

Performance optimized to ensure **reduced latency**

**Pre or post process** in the **cloud** or complete a full workstation solve

Seamless remote application experience. Feels like you are working on your local machine.

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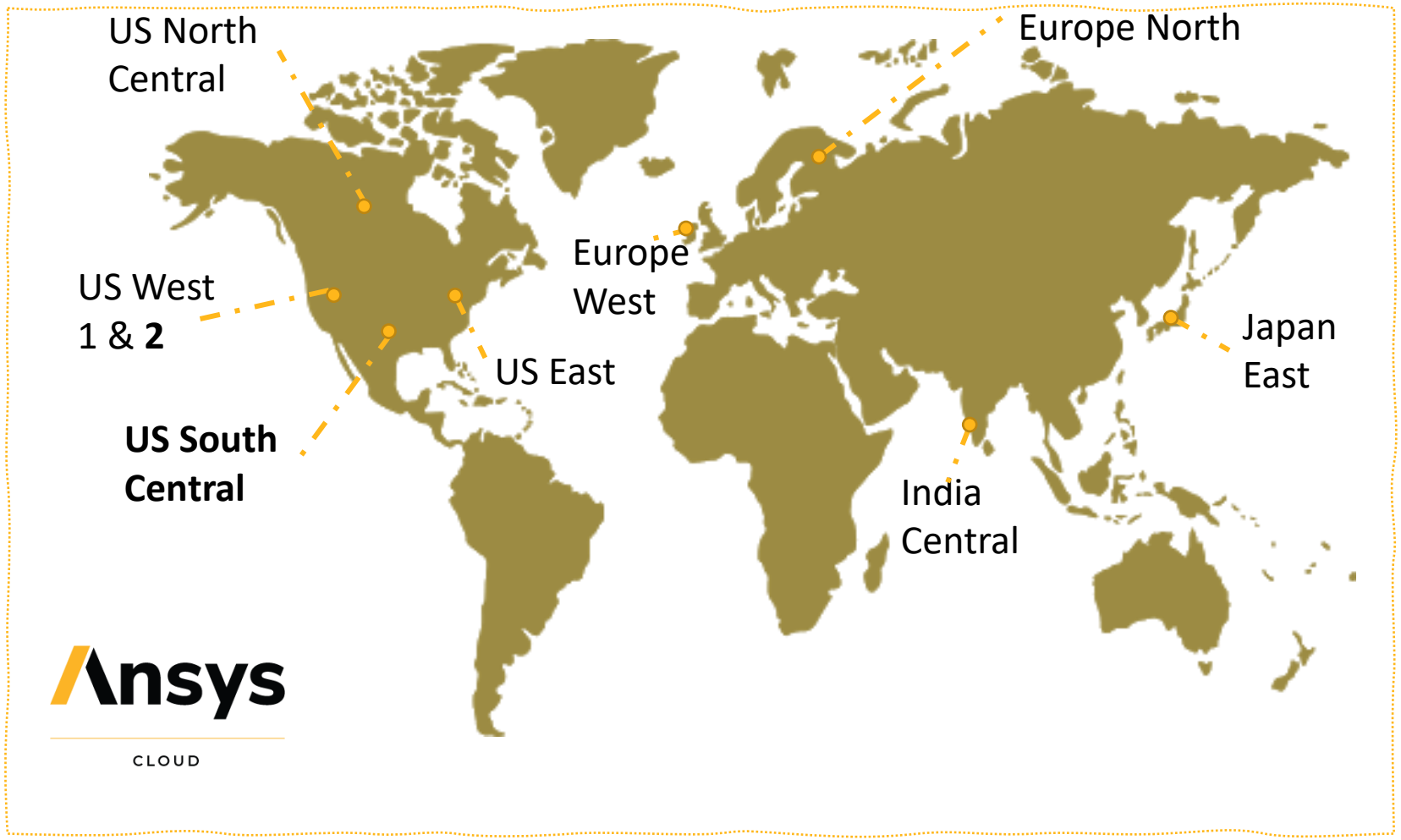
# Geos for Hardware




- WW coverage
- Broader Support/training
- Pricing adapted to your geo
- Better availability
- GDPR



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# More performance than ever with HBv3 VM's

| vCPU | Processor | Memory (GiB) | Memory bandwidth GB/s | Base CPU frequency (GHz) | All-cores frequency (GHz, peak) | Single-core frequency (GHz, peak) | RDMA performance (Gb/s) | MPI support | Temp storage (GiB) | Max data disks | Max Ethernet vNICs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 120 or 96 or 64 or 32 or 16 | AMD EPYC 7V13 | 448 | 350 | 2.45 | 3.1 | 3.675 | 200 | All | 2 * 960 | 32 | 8 |

hargrove engineers+constructors

*« So very impressed by Microsoft Azure HPC platform. The ability to scale up to 80,000 cores for actual high performance computing applications is wild enough, but the performance gain of 20-43% on distributed CFD going from AMD EPYC 7002 to 7003 is just mind-blowing. Very impressive! Can't wait to try the new HBv3 VM on Ansys Fluids in Ansys Cloud.... I just noticed the option to instantiate one today!"*

***Benjamin Turner, Senior Fixed Equipment Engineer / Hargrove Engineers + Constructors***

Ansys LS-DYNA

*« HBv3 are also good choices, especially for large models and when running with half of available cores. HBv3 improves performance by approximately 15% relative to HBv2"*

***Ansys LS-Dyna Product Manager***

Read our Technical WP

# New HW Configurations coming with HPC and In-Browser Interactive Client

*More choice, more flexibility, more power*

HPC

Interactive

| VM Type | Cores per node | Frequency Peak | RAM per Node | Memory Bandwidth | Interconnect |
|---|---|---|---|---|---|
| **HB60rs** | 60 | 2.55 GHz | 228GB | 263 GB/s | 100 Gb/s |
| **HB120rs_v2** | 120 | 3.1 GHz | 456GB | 350 GB/s | 200 Gb/s |
| **HB120rs_v3** | 120 | 3.1 GHz | 448 GB | 350 GB/s | 200 Gb/s |
| **HC44rs** | 44 | 3.4 GHz | 352 GB | 191 GB/s | 100 Gb/s |
| **H16mr** | 16 | 3.3 GHz | 224 GB | 80 GB/s | - |
| **NV6** | 6 cores, M60 GPU | 2.6 GHz | 56 GB | - | - |
| **NV12s_v3** | 12 cores, M60 GPU | 2.6 GHz | 112 GB | - | - |

*Applicable for Ansys versions 2021 R1 and newer*

**6 new HW configurations**

**Interconnect** is up to **X4**

**Memory** is up to **X4**

**Cores per node** is up to **X8**

**GPU Support**

- ✓ Ansys' in-browser interactive client which avoids the firewall issues of RDP
- ✓ New options for interactive use with HW configurations with an NVIDIA GPU (NV6, NV12s_v3)
- ✓ New high-core count interactive virtual machines (up to 120 cores on a single VM with HBv3)
- ✓ Broader product testing/support coverage for interactive use in Ansys Cloud

# The Nodes, Clusters and Supported Products

| VM | SUPPORTED Products – Batch Solve, Interactive Sessions, Command Line | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Node** | **Max Nodes** | **Max Cores** | **Max RAM (GB)** | **Mechanical** | **Fluent** | **Electronics** | **Discovery** | **SPEOS** | **Ansys LS-DYNA** | **optiSLang** | **CFX** | **LSTC LS-DYNA** | **Lumerical** |
| H16r* | 4 | 64 | 448 | | Batch | | | | FULL | FULL | VDI+CLI | VDI+CLI | |
| H16mr* | 4 | 64 | 896 | FULL | | | | | FULL | FULL | VDI+CLI | VDI+CLI | VDI |
| **HC** | 16 | 704 | 5,632 | FULL | FULL | FULL | | Batch | FULL | FULL | VDI+CLI | VDI+CLI | VDI |
| **HB** | 16 | 960 | 3,840 | FULL | FULL | FULL | | | FULL | FULL | VDI+CLI | VDI+CLI | VDI |
| **HBv2** | 8 | 960 | 3,840 | FULL | FULL | FULL | | Batch | FULL | FULL | VDI+CLI | VDI+CLI | VDI |
| **HBv3** | 8 | 960 | 3,584 | FULL | FULL | FULL | | Batch | FULL | FULL | VDI+CLI | VDI+CLI | VDI |
| **NV6** | 1 | 6 | 56 | VDI | VDI | VDI | VDI | VDI | VDI | VDI | VDI | VDI | |
| **NV12sv3** | 1 | 12 | 112 | VDI | VDI | VDI | VDI | VDI | VDI | VDI | VDI | VDI | |

FULL = Batch Solve & Interactive sessions

VDI = Interactive Sessions

VDI+CLI = Command Line & interactive sessions

*H16r/H16mr are no longer available for 2021R1 and newer releases

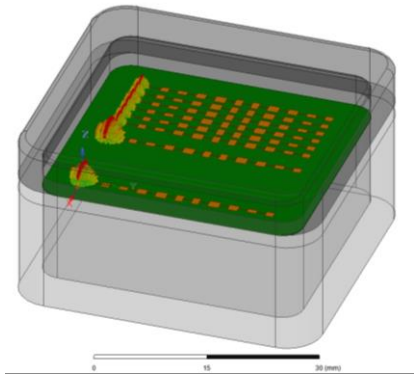
Some availabilities may change depending on selected geography

*Click to return Agenda*

# Optimize your Electronics simulation

## 77GHz Automotive Radar with Package and Radome

- Simulation specifications
  - Medium sized problem
  - Number of excitations: 8
  - Interpolating Frequency Sweep 401 points.
  - Solution Frequency 77 GHz (Save fields).
  - Total tetrahedra: 238k
  - Matrix size: 15.6M



**Smallest Virtual Machine : H16mr - Intel Xeon E5 v3 "Haswell". With 8 cores from the 16 available and 30% of the total ram used (64GB)*

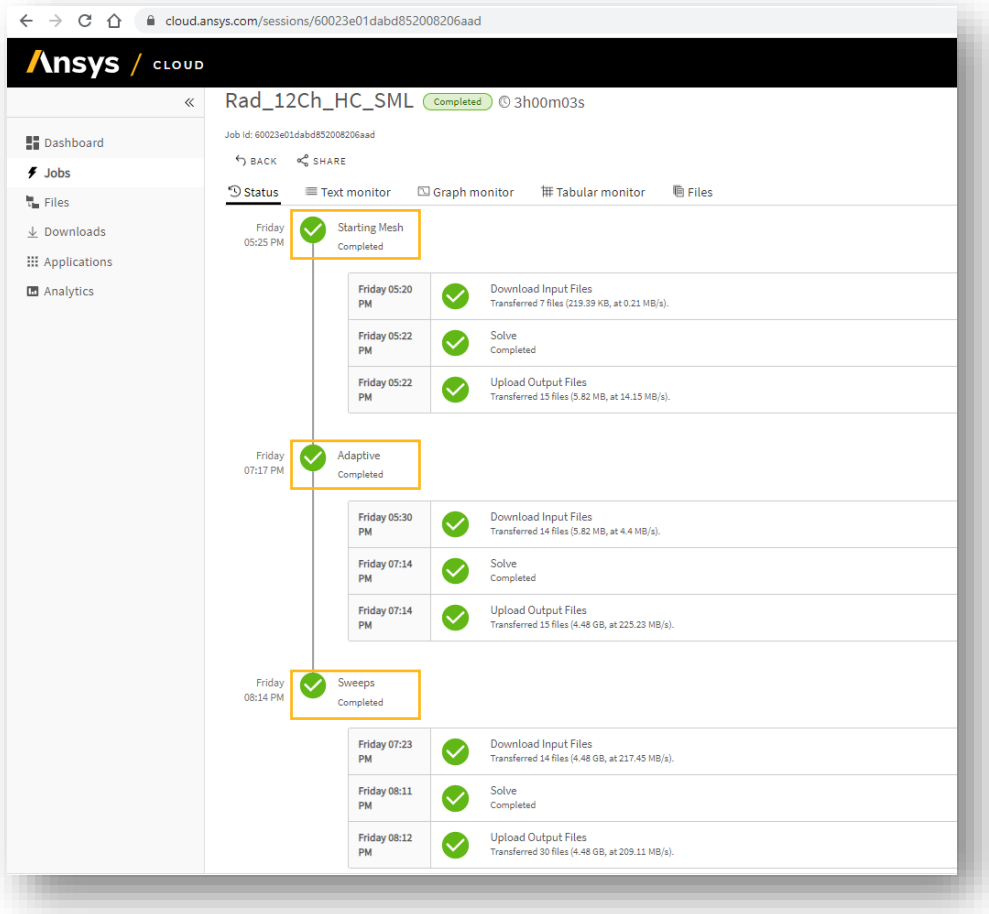
| | Settings | Confs | Cores | RAM (TB) | Total Time | AECs Usage | AECs Saving [%] |
|---|---|---|---|---|---|---|---|
| H16mr | Single | | 8 | 0.064 | **12:07:22** | | |
| | Single | L | 128 | 1.7 | 2:47:59 | 295.6 | |
| **H16mr** | 2 Step | M/L | 32/128 | 0.448 / 1.7 | **3:38:44** | **184.5** | **37.7** |
| | 3 Step | S/M/L | 16/32/128 | .224 / .448 / 1.7 | 3:37:02 | 238 | 19.52 |
| | Single | L | 176 | 1.4 | **2:25:09** | 292 | |
| **HC** | 2 Step | M / L | 88 / 176 | .704 / 1.4 | 2:51:56 | 247 | 15 |
| | 3 Step | S / M / L | 44 / 88 / 176 | .352 / .704 / 1.4 | 3:07:26 | 247 | 16 |

#0 : Solved in **12hrs 7min** using small 8 cores VM*

#1 : Solved in **2hrs 25min** with Ansys Cloud : **5X faster**.

#2 : **Optimized** : solved in **3hrs 38 min** and **38% AECs saving** compared to #1 thanks to **Ansys Cloud + multi steps.**

# Improved Submission in HFSS




**Optimize** your cloud hardware usage

Up to **38% saving on HW** with **multi-step submission**

- **Monitor Job**
  - When the status of the job is completed, the user can proceed with the download results process in AEDT.
  - Note the 3 status of the 3 stages during the solution process, since we selected multi-step submission with 3 steps.

*Click to return Agenda*

# Benchmark Ansys Fluent with Ansys Cloud

**Smallest VM – 16 cores***

**Virtual Machine H16 : Intel Xeon E5 v3 "Haswell" – 16 cores*

12 cores :

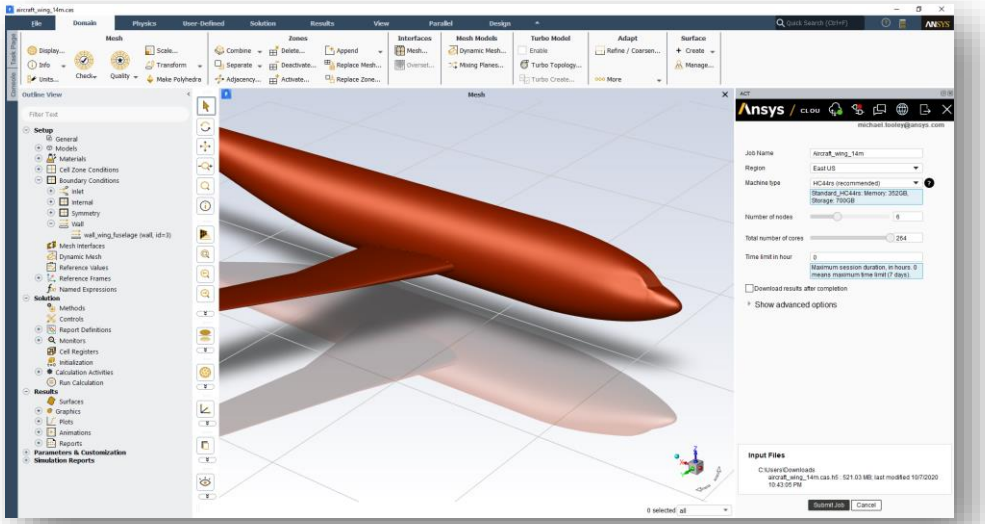
**5 hours 27 min**

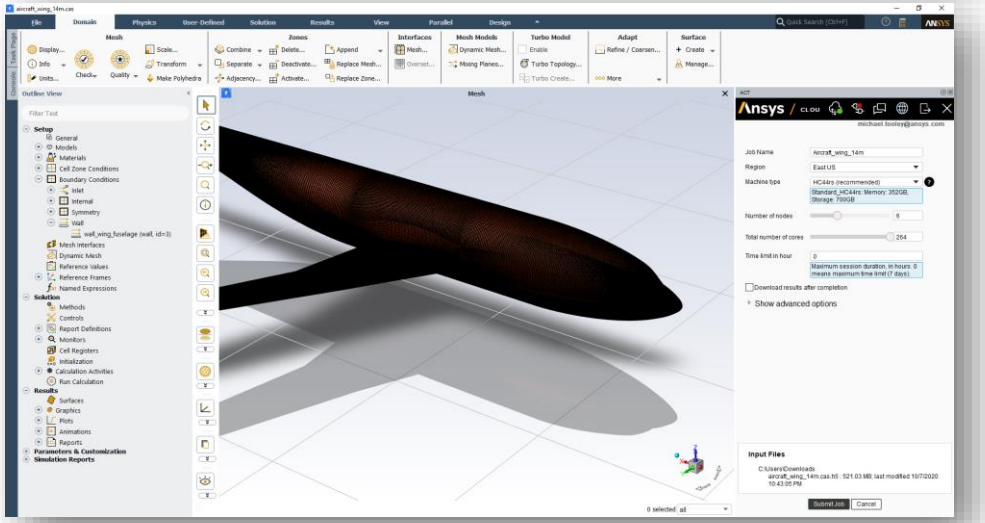
HC44rs 704 cores :

→ **13 minutes**

Ansys CLOUD

- ✓ Speed up to **25X** compared to H16cores VM
- ✓ Optimized Cloud cost/performance ratio





*Click to return Agenda*

# Benchmark - Ansys Mechanical with Ansys Cloud

**Smallest VM – 16 cores***

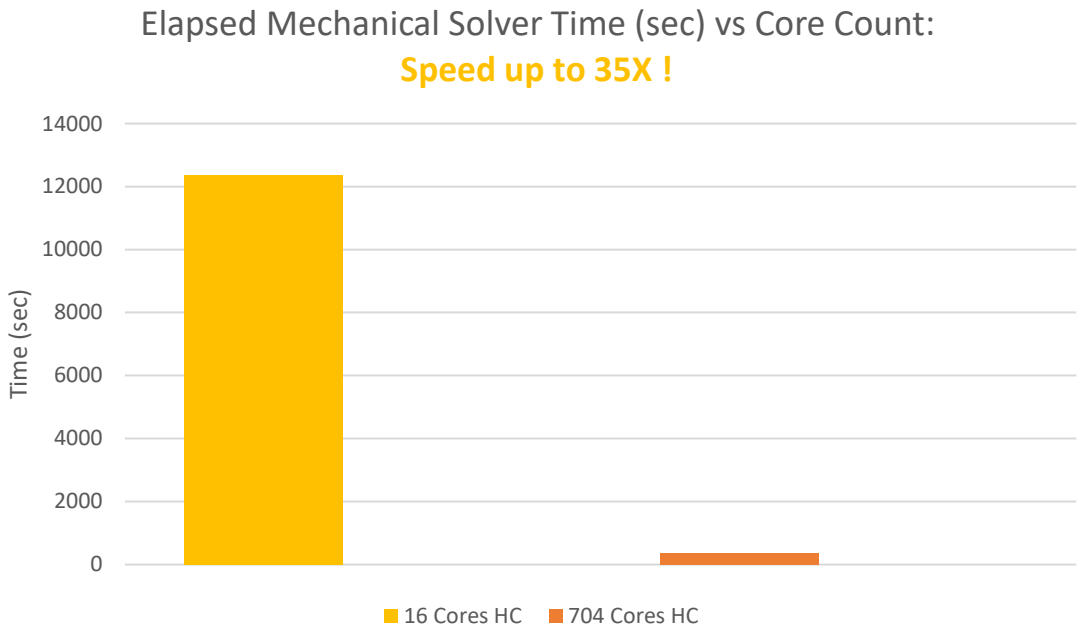
**Virtual Machine H16 : Intel Xeon E5 v3 "Haswell" – 16 cores*

16 cores :

**3 hours 26 min**

HC 704 cores :

→ **6 minutes**

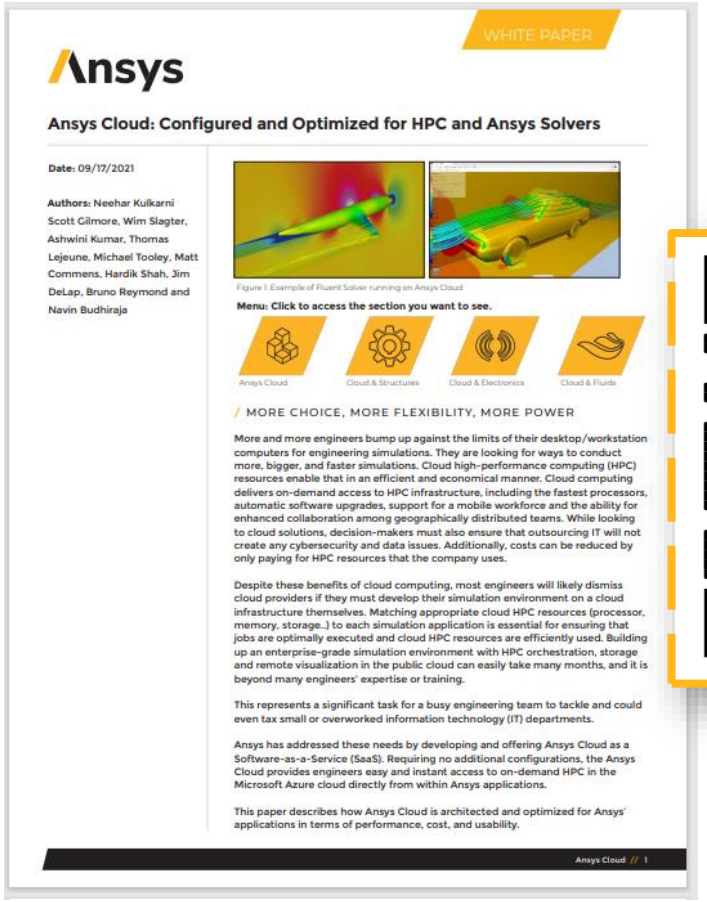



- ✓ Speed up to **26X – 35X** between H16cores VM (16 - Cores and 704 - Cores)**
- ✓ Optimized Cloud cost/performance ratio

** Benchmarking done for certain number of iterations

# We are doing benchmarks for you !

## Download our Technical White Paper and join the conversation on the cloud forum !



WHITE PAPER

Ansys

**Ansys Cloud: Configured and Optimized for HPC and Ansys Solvers**

**Date:** 09/17/2021

**Authors:** Neehar Kulkarni, Scott Gilmore, Wim Slagter, Ashwini Kumar, Thomas Lejeune, Michael Tooley, Matt Commens, Hardik Shah, Jim DeLap, Bruno Reymond and Navin Budhiraja

Figure 1: Example of Fluent Solver running on Ansys Cloud

**Menu: Click to access the section you want to see.**

Ansys Cloud | Cloud & Structures | Cloud & Electronics | Cloud & Fluids

/ MORE CHOICE, MORE FLEXIBILITY, MORE POWER

More and more engineers bump up against the limits of their desktop/workstation computers for engineering simulations. They are looking for ways to conduct more, bigger, and faster simulations. Cloud high-performance computing (HPC) resources enable that in an efficient and economical manner. Cloud computing delivers on-demand access to HPC infrastructure, including the fastest processors, automatic software upgrades, support for a mobile workforce and the ability for enhanced collaboration among geographically distributed teams. While looking to cloud solutions, decision-makers must also ensure that outsourcing IT will not create any cybersecurity and data issues. Additionally, costs can be reduced by only paying for HPC resources that the company uses.

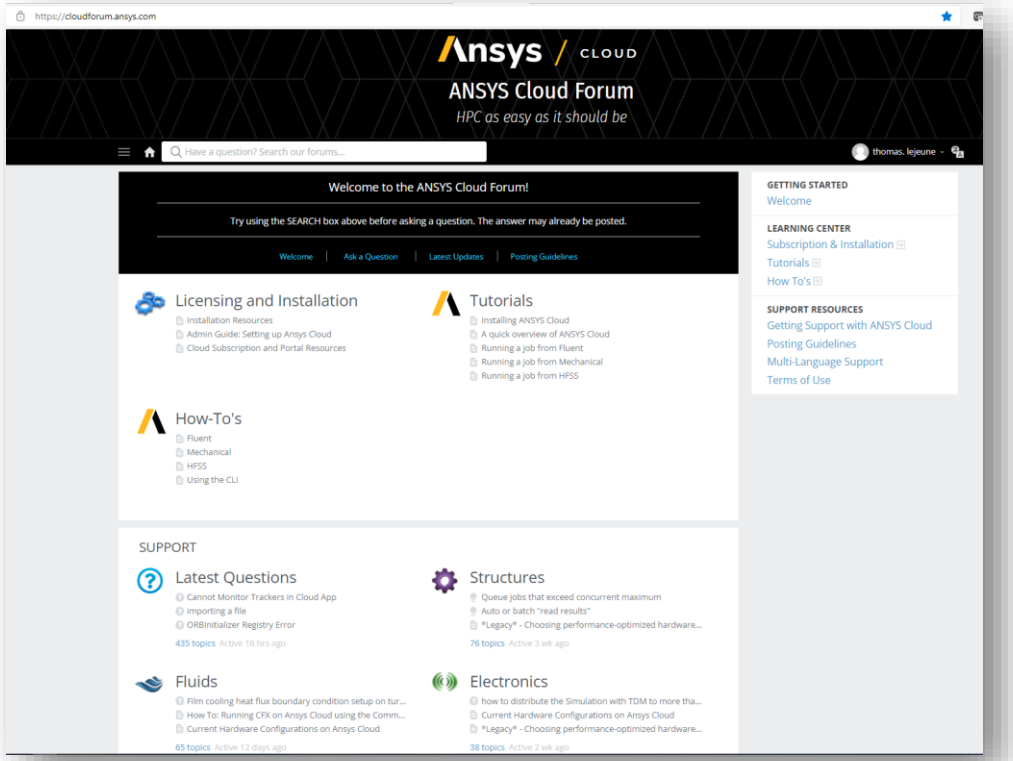
Despite these benefits of cloud computing, most engineers will likely dismiss cloud providers if they must develop their simulation environment on a cloud infrastructure themselves. Matching appropriate cloud HPC resources (processor, memory, storage..) to each simulation application is essential for ensuring that jobs are optimally executed and cloud HPC resources are efficiently used. Building up an enterprise-grade simulation environment with HPC orchestration, storage and remote visualization in the public cloud can easily take many months, and it is beyond many engineers' expertise or training.

This represents a significant task for a busy engineering team to tackle and could even tax small or overworked information technology (IT) departments.

Ansys has addressed these needs by developing and offering Ansys Cloud as a Software-as-a-Service (SaaS). Requiring no additional configurations, the Ansys Cloud provides engineers easy and instant access to on-demand HPC in the Microsoft Azure cloud directly from within Ansys applications.

This paper describes how Ansys Cloud is architected and optimized for Ansys' applications in terms of performance, cost, and usability.

Ansys Cloud // 1




**https://cloudforum.ansys.com/**

Ansys Cloud – Configured and Optimized for HPC and Ansys Solvers

*Click to return Agenda*

# Improved Security thanks to Single Sign On (SSO)

| Name | URL | SSO Enabled |
|---|---|---|
| **Cloud Portal** | https://cloud.ansys.com | ✔ |
| **Cloud Forum** | https://cloudforum.ansys.com | ✔ |
| **Discovery Forum** | https://discoveryforum.ansys.com | ✔ |
| **Discovery application** | N/A (desktop application) | ✔ |
| **Account Portal** | https://account.ansys.com | ✔ |
| **Account Admin Portal** | https://accountadmin.ansys.com | ✔ |
| **Store** | https://catalog.ansys.com | ✔ |
| **Customer Portal** | https://support.ansys.com | ✔ |
| **Help** | https://ansyshelp.ansys.com | ✔ |
| **Licensing Portal** | https://licensing.ansys.com | ✔ |
| **Medini Portal** | https://medini.ansys.com | ✔ |
| **Ansys API** | N/A | ✔ |
| **Customer Center** | https://customercenter.ansys.com | ✔ |
| **Lumerical Portals** | N/A | ✔ |

## Benefits

- Only 1 password / login
- More secure with Multi-Factor Authentication (MFA)
- Better protection against phishing/hackers

**First step for the federated SSO**



*Click to return Agenda*

# External Certifications & Compliances

Our cybersecurity management follows industry guidelines, including ISO and NIST frameworks, for internal assessments. Ansys also work with many third-party assessments and audits throughout the year to guarantee to our customer the market-leading certifications.

- Ansys has been issued an SOC 2 Type II certification
- We are working to achieve ISO27001 certification.



**What is SOC2 ? :** SOC 2 is an auditing procedure that ensures your service providers securely manage your data to protect the interests of your organization and the privacy of its clients.



*Click to return Agenda*

# Learn More about Architecture & Security

## Download our Architecture and Security Overview White Paper !

Ansys

WHITE PAPER

**Ansys Cloud Architecture and Security Overview**

**/ Introduction**

Ansys Cloud is a multi-tenant PaaS service in which a single instance of a software application serves multiple customers. Each customer is called a tenant, each of whom is part of a group of users who share a common access with specific privileges to the storage and software instance. This paper covers the following topics:

- Regions and Geographies.
- Data Retention and Deletion Policy.
- Scalability.
- Threat Modeling.
- Data residency.
- Functionality.
- Support.
- Architecture.

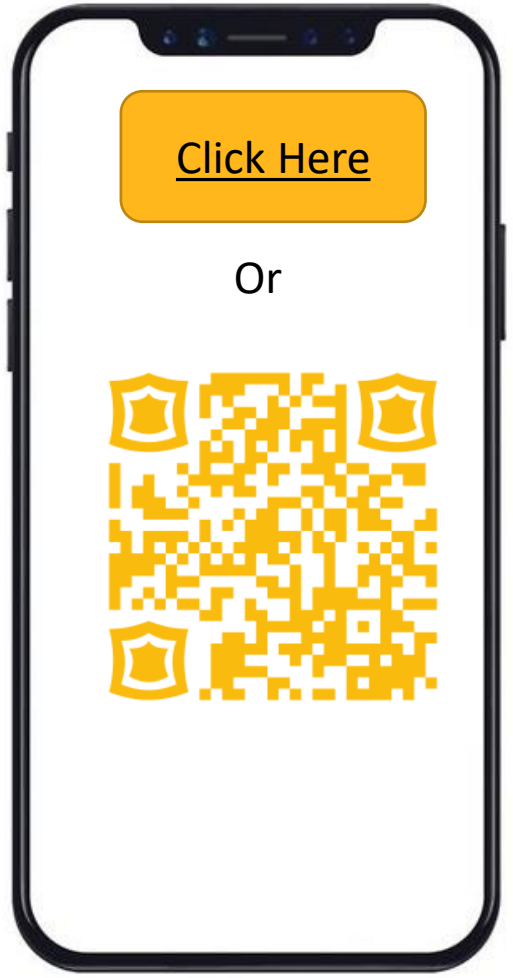
**/ Azure Regions and Geographies**

Azure is organized into regions and geographies (Geos). A region is a set of data centers deployed within a latency-defined perimeter and connected through a dedicated, regional low-latency network. A geography is a discrete market, typically containing two or more regions, that preserves data residency and compliance boundaries. Geographies allow customers with specific data-residency and compliance needs to keep their data and applications close. Geographies are fault-tolerant to withstand complete region failure through their connection to Azure's dedicated high-capacity networking infrastructure. Furthermore, each Azure region is paired with another region within the same geography, together making a regional pair. Across the region pairs Azure will serialize platform updates (planned maintenance) so that only one paired region will be updated at a time. In addition, in the event of an outage affecting multiple regions, at least one region in each pair will be prioritized for recovery. Ansys Cloud Service is architected to take full advantage of this feature by deploying shared resources in fault-tolerant, high-availability region pairs.

**/ Data Residency**

Ansys Cloud will not store customer data outside the customer-specified Geo except for the profile information that is stored in Azure Active Directory B2C, which is based on the geography of the company/tenant location. In this case, the Ansys tenant is in the United States. All customer simulation data is stored in Azure Globally Redundant Storage (GRS) and the data is copied between two regions within the same Geo for enhanced data durability in case of a major data center disaster. All virtual machines used for compute are started in the customer-specified Geo, so data residency persists based on the selected region.

Ansys Ansys Cloud Architecture and Security Overview // 1

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# Ansys 2022 R1 What's New

Ansys Cloud

# Innovations in Ansys Cloud 2022 R1 - Overview

## Admin Controls

- Access Admin controls from the Ansys Cloud portal without a Cloud Essential Subscription
- Manage User Groups and company Projects
- Control simulation costs by allocating budgets to Projects and monitoring consumption
- Assign Cloud Storage Subscriptions to users for additional storage

## User Experience

- New Ansys Cloud Dashboard
- Enriched Job-Sharing Capabilities. Share jobs/sessions with:
  - User Groups
  - Ansys Support
- Submit custom batch jobs using the Generic Solver Template

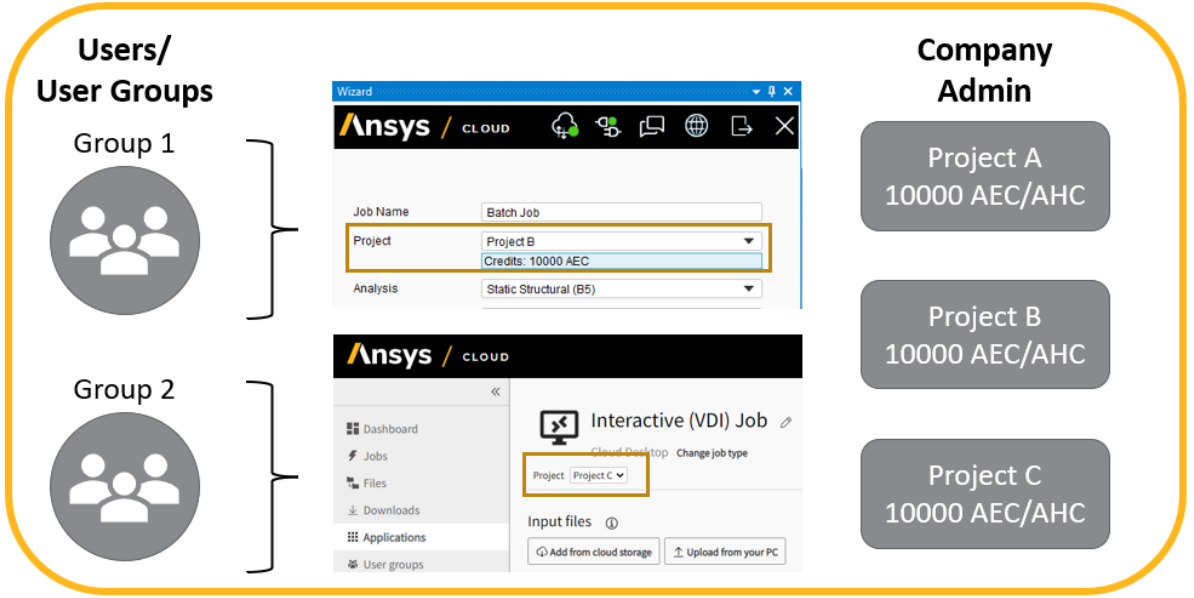
# Admin Controls

Ansys

# User Group Management and Admin Budget Controls

**User Group Management**

Create and manage User Groups




**Admin Budget Controls**

Allocate budgets to company Projects

## Why?

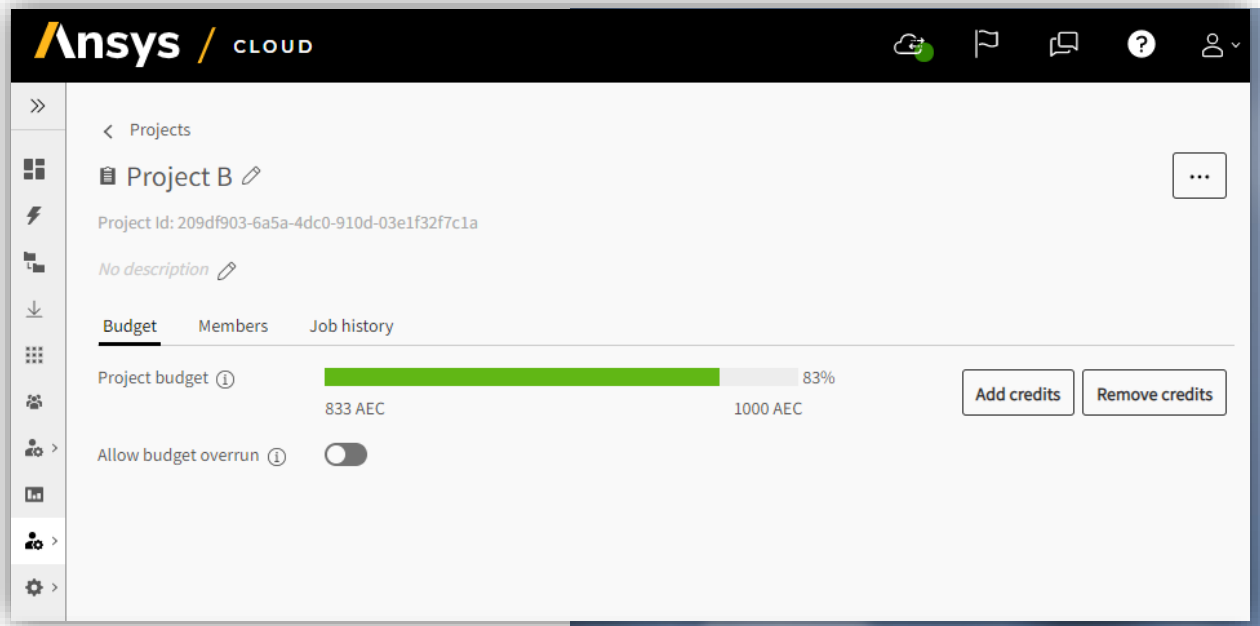
### Improved visibility and management of Cloud users:

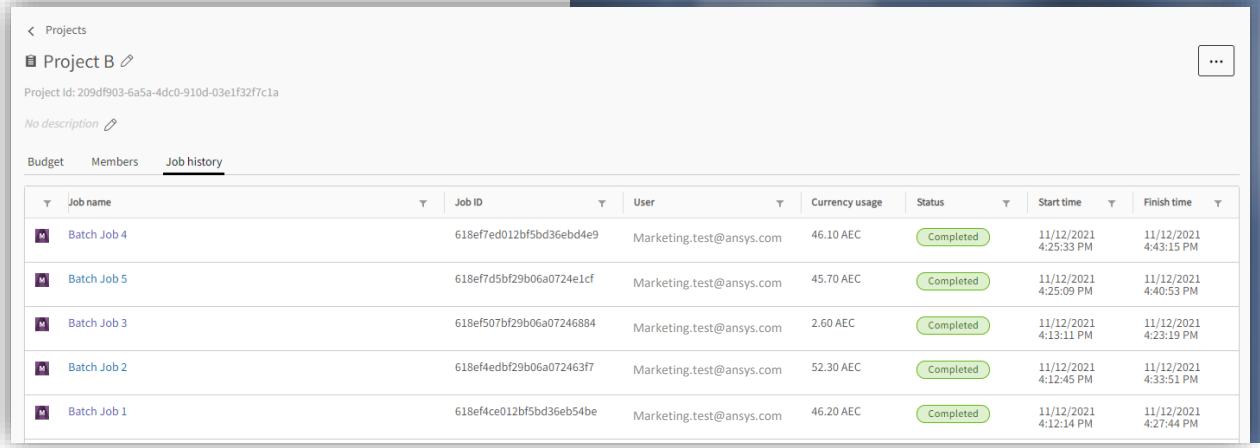
- Manage users at scale
- Collaborate efficiently in Ansys Cloud

### Enhanced cost management and reporting:

- Control project costs
- Monitor Ansys Cloud usage across user groups and projects

# Budget Allocation and Tracking

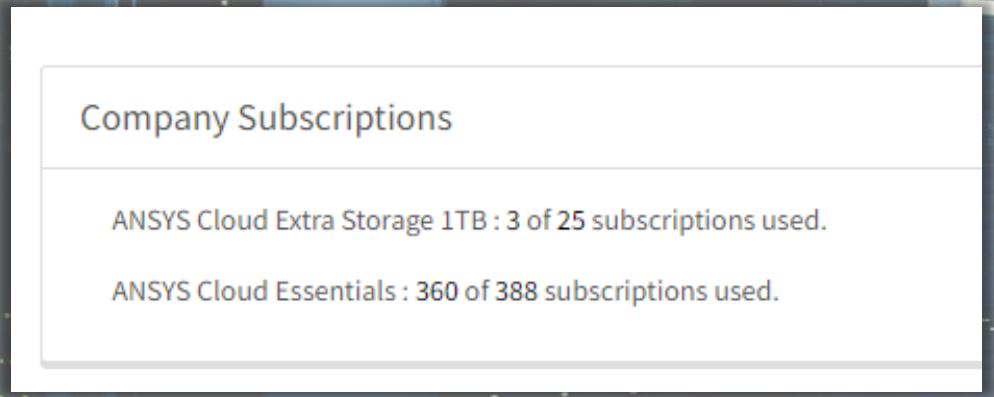


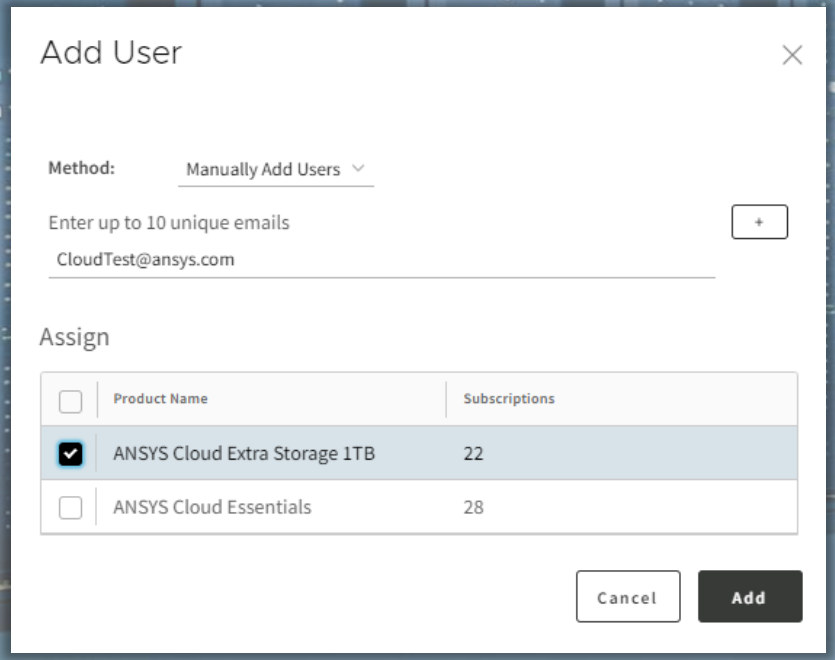




# Assign Cloud Storage Subscriptions to Users

More control over Cloud storage

Assign Cloud storage subscriptions to users via the Account portal (www.myaccount.ansys.com)



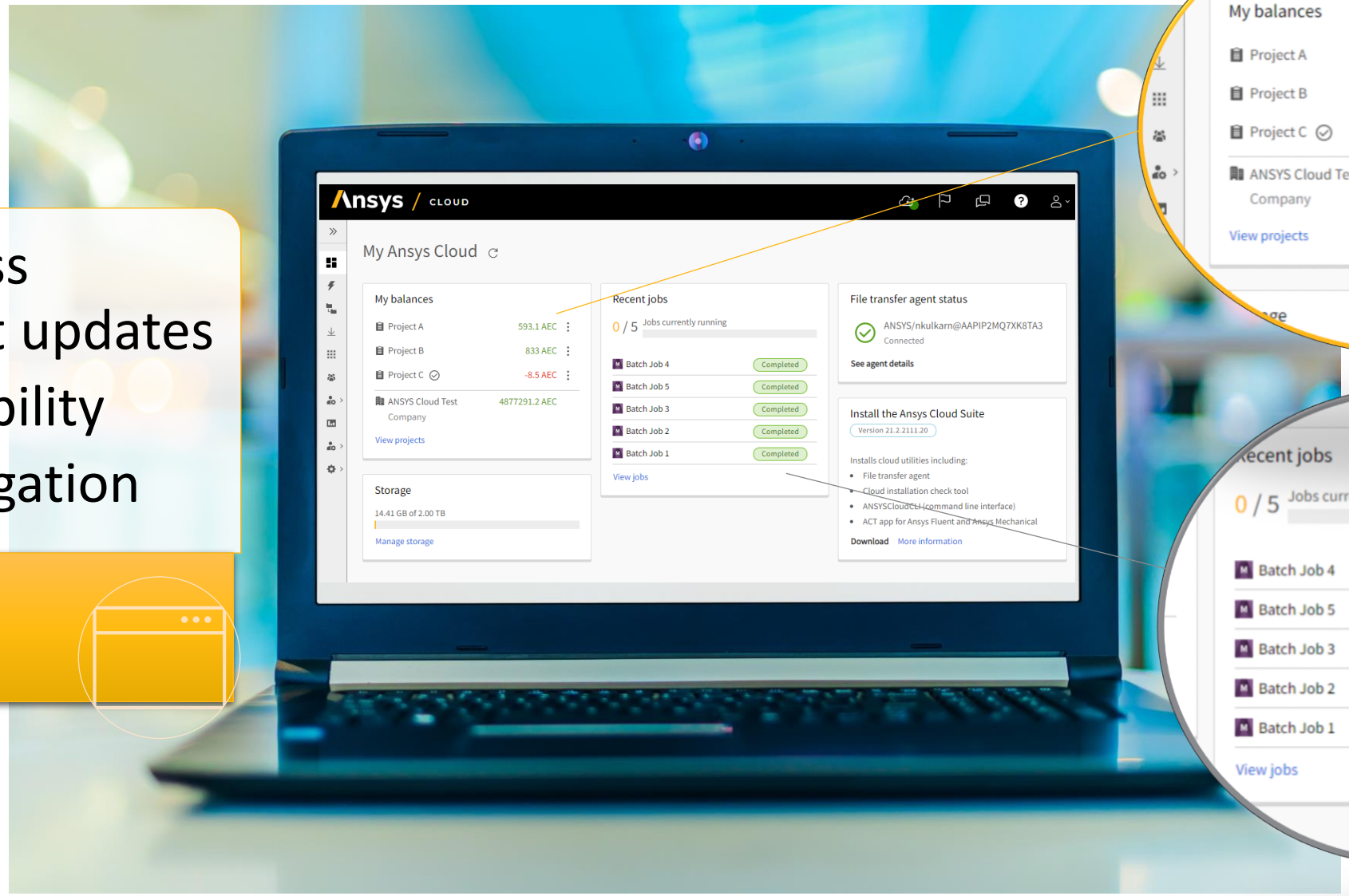
# User Experience

Ansys

# New Dashboard Page

- Never miss important updates
- More visibility
- Easy Navigation

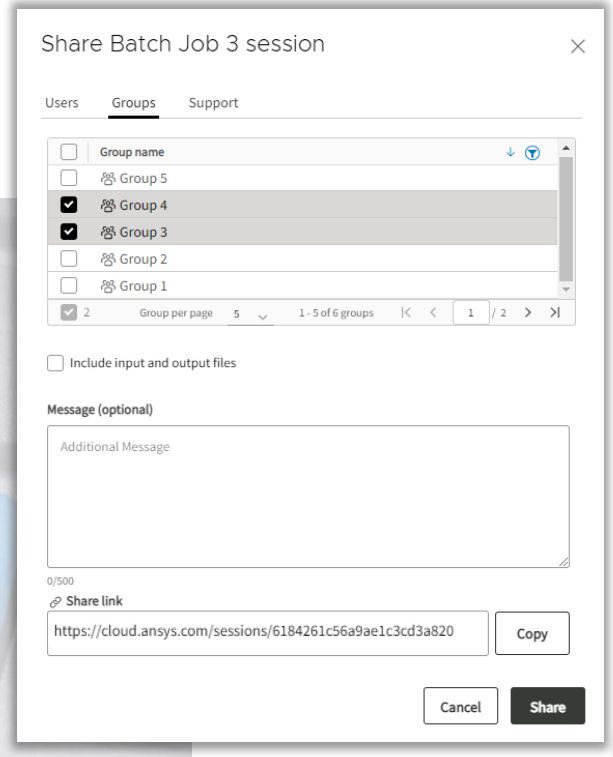
**Improved UX Design**

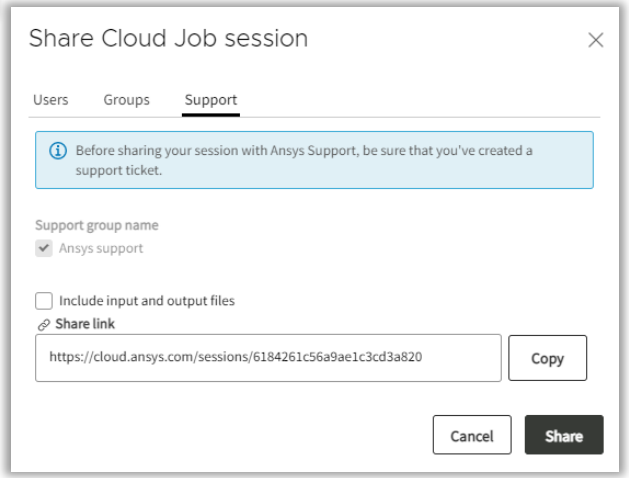


# Enriched Job-Sharing Capabilities

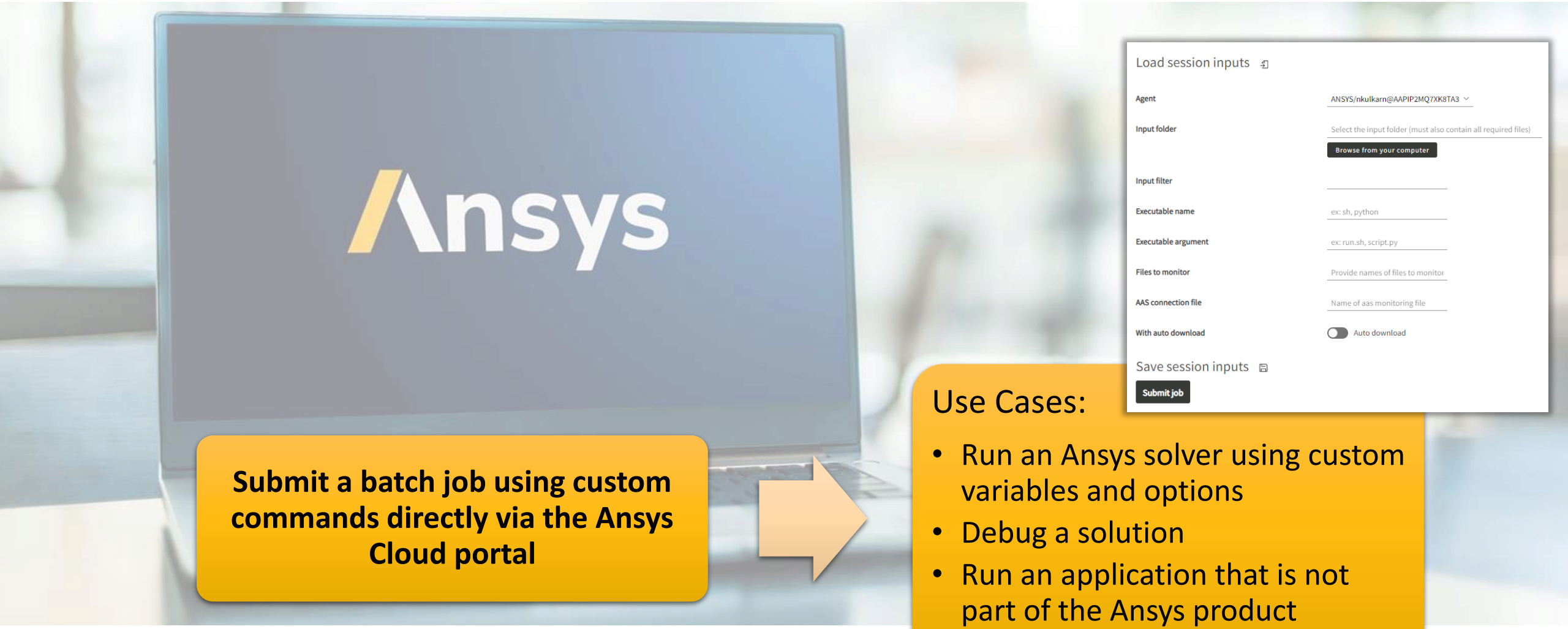
**Collaboration in Ansys Cloud:** Ability to share jobs/sessions with user groups within the company – no need to share jobs with each user individually

**Streamlined Customer Support:** Ability to share jobs directly with Ansys Support for debugging



# Generic Solver Template




**Submit a batch job using custom commands directly via the Ansys Cloud portal**




## Use Cases:

- Run an Ansys solver using custom variables and options
- Debug a solution
- Run an application that is not part of the Ansys product offering

*Click to return Agenda*

# Customer Success

Ansys Cloud

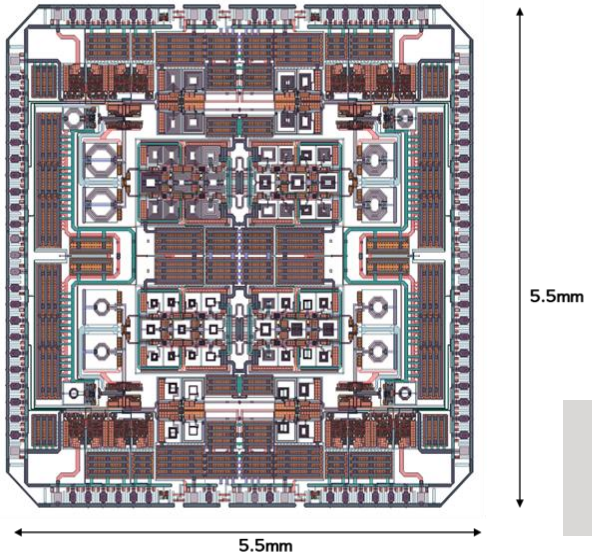
# HFSS and Ansys Cloud

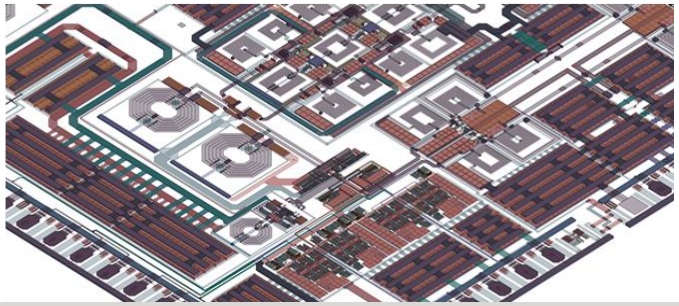
Ansys / ELECTRONICS

Ansys CLOUD

Read the article Here

***It was impossible, until now. It's true – a Full Chip Solved in HFSS and Cloud!***



Ansys **HFSS has solved** an entire RFIC (5.5 x 5.5mm) at **5GHz**

- ✓ Compute cores used: **704 cores (Intel Xeon Platinum 8168, Azure "HC" machines)**
- ✓ RAM: **2.6TB**
- ✓ Mesh size at adaptive pass 15: **23.5M** Tetrahedron and **93M** unknowns
- ✓ Initial Mesh Time: **1h55m**
- ✓ Adaptive Mesh Time: **29h47m**
- ✓ **16-node HC VM** in Ansys Cloud gives massive RAM to solve a huge problem in HFSS for **companies designing RFIC's.**

HFSS Layout automated IC-specific meshing in Ansys HFSS → Ansys Cloud on **Microsoft Azure**

*"It is so rewarding to see a problem of this size and complexity solved on Azure, putting this level of HPC power in the hands of engineers when they need it the most."*, says **Merrie Williamson, Microsoft VP Azure Apps and Infrastructure**.

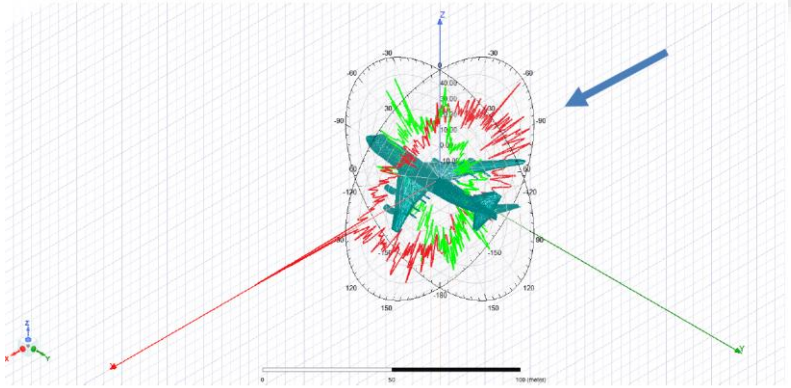




Ansys

# Case study : Hitachi Success with Ansys Cloud & HFSS

Hitachi Kokusai Electric Inc.



*"However, we have a limited number of licenses and have sometimes experienced **collisions among users**. I was not always able to run HFSS when I would like to. Furthermore, even if I could use an HFSS license, the machine **might not be powerful enough to run the analysis**. Ansys Cloud **solves this problem**, and I now use it whenever I need to run an analysis quickly. It is a very convenient system that **allows us to have an ideal machine environment without a huge investment.** I will continue to use HFSS effectively in the development of millimeter-wave radars by combining the local ANSYS HFSS and Ansys Cloud as necessary."* *Nobuhiko Shibagaki (Manager, Product Department, Product Division, MONOZUKURI Group), Hitachi Kokusai Electric Inc.*

## Challenge :

- In 2000, a supersonic airliner Concorde crashed five minutes after taking off from Charles de Gaulle Airport in Paris. The investigation revealed that the cause of the crash was just a 42 cm-long metal piece, which had fallen from the preceding aircraft onto the runway. In order to ensure there will be no more such tragedies, **Hitachi participate in a government project to develop millimeter-wave radars for detecting foreign objects on runways,** while using **Ansys HFSS & Ansys Cloud** for this purpose.

## Solution :

- Hitachi determined that given the electrical size of the problem that the most effective solver technologies in the HFSS portfolio for this analysis were the HFSS-IE Method of Moments based solver and the asymptotic capabilities of the SBR+ solver, which can handle large models very effectively. HFSS provides multiple solvers for a range of analysis scales in an integrated user interface, **allowing us to use different solvers for different analysis purposes.**

## Benefits :

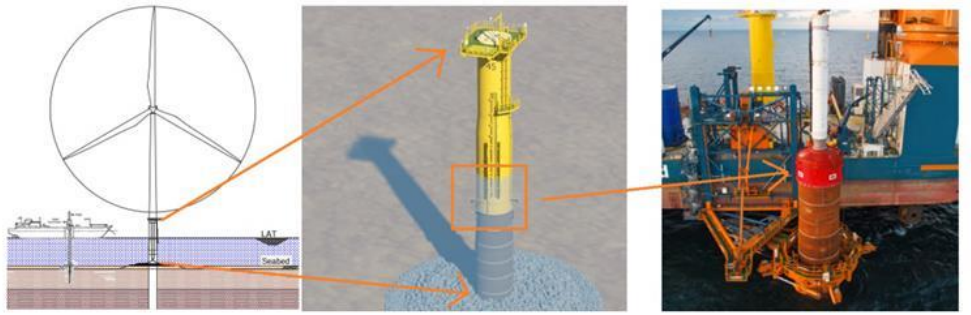
- Basic performance of FOD radar was confirmed in the demonstration system installed at Narita Airport and Kuala Lumpur Airport.
- Confirmation of basic performance as FOD radar
- HFSS is used for RCS calculation necessary for system evaluation.
- Using different analysis methods implemented in HFSS depending on the analysis target

**Ansys Cloud showed 20x faster than on-premise simulation.**
**(8.5 days -> just 10h!!)**

*Click to return Agenda*

# Van Oord – Success Story with Ansys Cloud

Van Oord
Marine ingenuity



"Van Oord engineers employ Ansys Cloud to spur new product innovation and solve the ever-growing number of Mechanical models, which may feature **over 5.5 million degrees of freedom, 1.8 million nodes and 550,000 elements**."

"Historically, these massive models each required **150 hours to run**, however, with Ansys Cloud, our team has reduced run times to **less than 24 hours per simulation**. This has substantially sped up product development, enabled us to expediate our negotiations with foundation steel suppliers and expedited delivery to our global customers."

*Ralph Luiken*, **Van Oord Engineering Manager**

Van Oord and Ansys Accelerate the Design of Highly Sustainable Offshore Wind Turbines

**Save Time : From 7 days to 1 (Speed up 7X)**

**Mitigate Risk and avoid costly penalties**

**Capability to change the fabrication process during the project phases**

**Reduce HW cost**

**Run 5x more design iterations on Cloud**

# Hargrove Engineers + Constructors Use Ansys Cloud to Extend the Life of a Client's Critical Asset

**Read the full case study on Ansys cloud webpage**

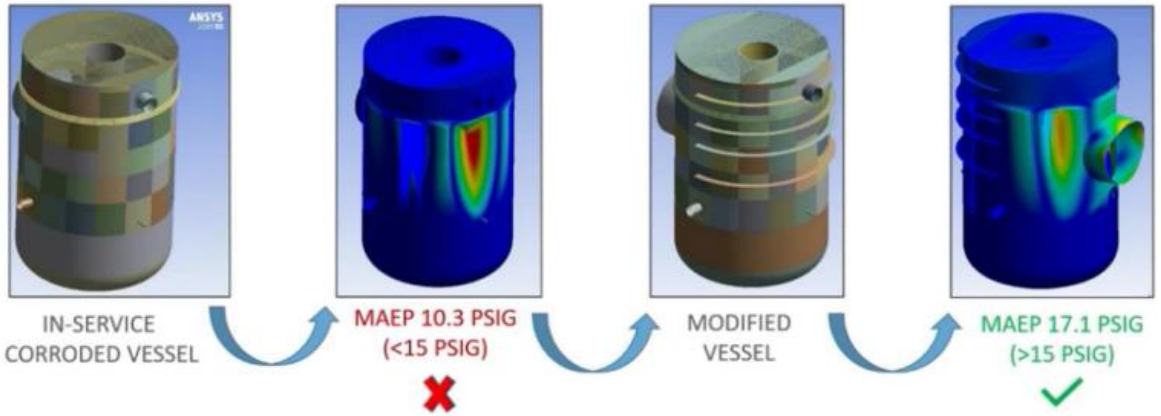
**Challenges :** Hargrove Engineers + Constructors was tasked with performing a Fitness-for-Service (FFS) analysis on a client's process condenser

**Solution** : Analysis confirmed the existing thickness was inadequate and required corrective action. Elastic plastic materials and large deformation theory was used to assess the maximum external pressure before buckling occurs.

**Benefits :** Leveraging Ansys Cloud's high-performance computing capabilities, Hargrove quickly scaled up their processing power to run simulations faster than ever, significantly reducing the development time and overhead costs.

RESULTS

- The level 3 FFS assessment indicates the asset was unsuitable for the original design pressure of external full vacuum.
- The vessel required modification and four stiffening rings were be added. The new MAEP after the modification is 17.1 psig.




Results obtained using Ansys simulations

"This type of nonlinear analysis is very computationally intensive, so we leveraged our Ansys Cloud solving capabilities to give us a boost we needed in terms of extra cores."

*Benjamin Turner Senior Fixed Equipment Engineer /* **Hargrove Engineers + Constructors**



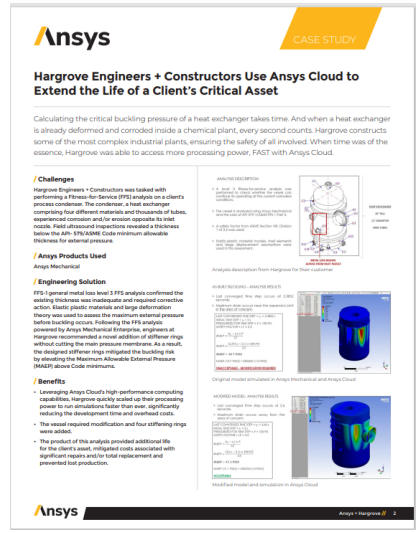
*Click to return Agenda*

# Elastic Licensing : Customer Testimonial

hargrove engineers+constructors

"Right now we have six engineers and designers working across four geographical regions in Ansys Fluent and Mechanical. Some are doing prep work in DesignModeler/SpaceClaim, some are actively solving, and others are writing reports and postprocessing. The **Elastic currency** allows us to **quickly scale up and down** our manpower without the added complexity of balancing peak and average loadings. My favorite part is that **scaling is not limited to just software licenses, but also hardware**. We solve problems as simple as loadings on a beam to problems as complex as transient multiphase reacting flows. We don't have to think or invest in a single large cluster because **Microsoft Azure assets backing Ansys Cloud are** continuously updated faster than we could possibly keep up with. When they switched to the newest **AMD processors**, for instance, we saw a **boost of 30-40% in performance on the 120-core instance** without having to pay a single dollar more or worry about purchasing or setup."

**Benjamin Turner, *Senior Fixed Equipment Engineer, Hargrove Engineers + Constructors***


Ansys

CASE STUDY

Hargrove Engineers + Constructors Use Ansys Cloud to Extend the Life of a Client's Critical Asset

Calculating the critical buckling pressure of a heat exchanger takes time. And when a heat exchanger is already deformed and corroded inside a chemical plant, every second counts. Hargrove constructs some of the most complex industrial plants, ensuring the safety of all involved. When time was of the essence, Hargrove was able to access more processing power, FAST with Ansys Cloud.

Challenges

Ansys Products Used

Ansys Mechanical

Engineering Solution

Benefits

Ansys

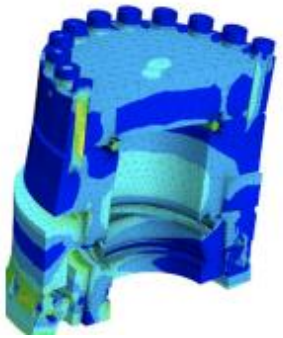
**Read the full story**

# Ansys + Downing

DOWNING
Energy Forward

## Challenges

Downing had to provide wellhead workers with a solution that saves time while being practical and simple to use.

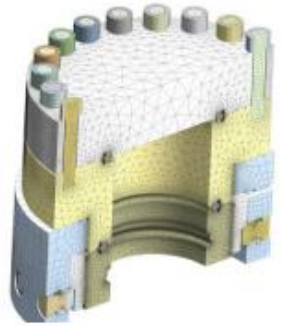


## Engineering Solution

- Used **Ansys Mechanical** to perform a highly nonlinear mechanical simulation involving bolt pretension, contact and nonlinear gasket materials. The resulting model had two million nodes and up to four load cases.
- Ran the mechanical simulations **on Ansys Cloud** enlisting 96 compute cores with distributed parallel processing.

## Benefits

- For each design case, Ansys Cloud reduced Ansys Mechanical simulation time from **15-20 hours** on a local workstation to only **2-4 hours.**
- Wellhead operators reported saving **8 hours on installation time using the Quick Connect system**.
- The Quick Connect system enabled Downing to win additional work where this type of system is a requirement.



**Speed up to 10X**

Read the full case study

"We've been using Ansys Cloud for five months now and it's been a **gamechanger for us from a productivity standpoint,** especially because we can submit multiple Ansys Mechanical jobs covering different scenarios and **run them overnight**. Ansys Cloud also eliminates any scheduling or memory capacity concerns regarding our own computing system. **It's been a fantastic product**."

*Tim Marvel Vice President /* **Business Development and Technology Downing, A Subsidiary of SEF Energy**

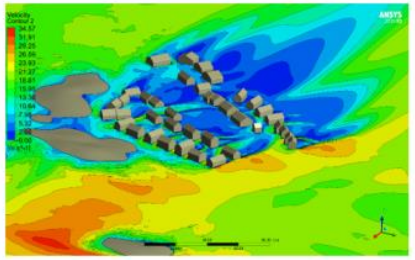
# Olav Olsen– Success Story with Ansys Cloud

DR. TECHN. OLAV OLSEN ARTELIA GROUP

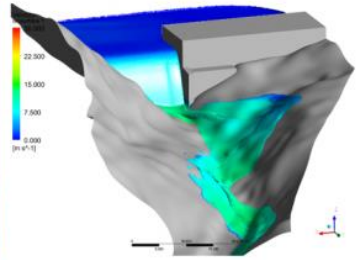
"Long experience within buildings and marine applications enables Dr.techn. Olav Olsen to incorporate CFD as a natural part of a larger project, and thereby safeguards both the load and response part of the design. Today, we use CFD for all of our business areas, examples mentioned below:

- Hydrodynamic loads and marine operations within Renewable energy / Offshore oil and gas / Port and industry
- Wind loads, wind comfort and ventilation within Buildings / Infrastructure
- Numerical modeling of flood channel capacity within Dams and waterways.

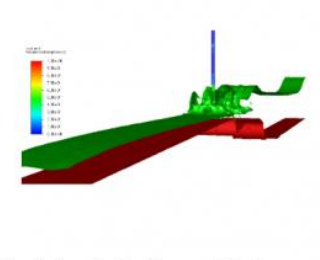
**As the main tool, the industry-leading CFD software Ansys Fluent is used, combined with commercial cloud solutions to meet the requirement for increased computing capacity."**



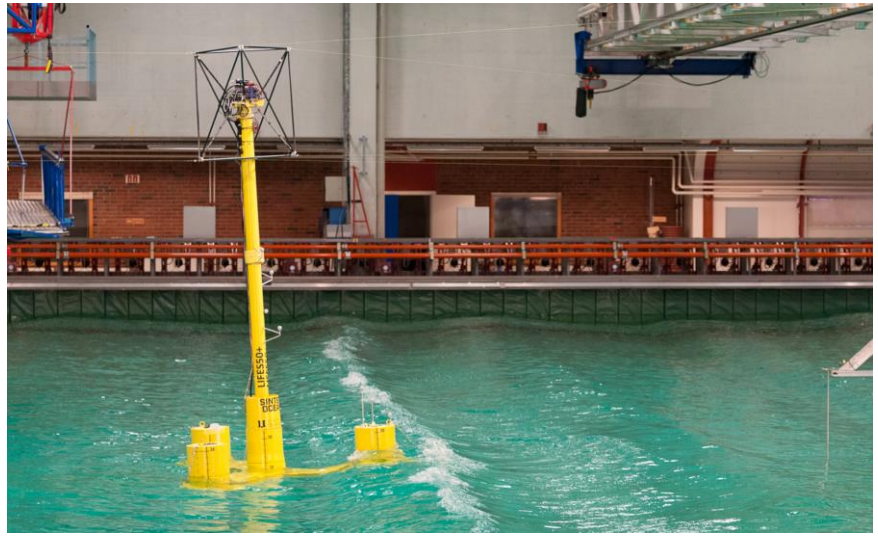
*Wind simulations on residential buildings with actual terrain*



*Flow simulations of waterway for design of new dam*



*Slamming forces from breaking wave and actual bathymetry. The simulations were performed with ANSYS Cloud HPC resources.*



*Ken-Robert Gjelstad Jakobsen*
**Technical Lead Marine and CFD**

https://www.olavolsen.no/en/services/cfd

# What Customer's are Saying

Microsoft

*« Our collaboration brings together Azure's compute and IoT capabilities with Ansys' simulation excellence to help businesses across industries transform at scale. During a time when autonomous systems are on the rise, Ansys will enable cloud engineers to increase productivity and accelerate the delivery of innovative solutions."*

*Scott Guthrie, Executive Vice President, Cloud + AI at Microsoft*

Downing Wellhead Equipment

*"Ansys Cloud has been a game-changer from a productivity standpoint. ... Ansys Cloud has reduced the time of each job from 20-25 hours to only 2-4 hours."*

*Tim Marvel, P.E.*
*Vice President, Business Development & Technology*

Rockwell Automation

*"As a strategic partner and customer of both Microsoft and Ansys, our engineering teams will accelerate their product development processes with these dynamic new cloud capabilities. Adding Ansys Cloud to our existing technology infrastructure sped up our simulations by 50% and we have solved larger problems with more accuracy. Together, we are boosting engineering productivity and driving top-line impact, even while our engineers work from home."*

*Scot Tutkovics, vice president, engineering operations, Rockwell Automation*



***Click to return Agenda***

# What Customer's are Saying

*"Marmon Holdings, a global industrial organization comprising 10 diverse business sectors and more than 100 autonomous manufacturing and service businesses, is adopting Ansys Cloud to make Ansys simulation technology readily available to its engineering community. On-demand access to HPC via Ansys Cloud will provide Marmon's engineering teams with simulation capacity exactly when and where it is needed."*

*Jeff Garascia, Chief Innovation Officer*

*"Ansys Cloud allowed us to tackle CFD simulations which were not practical for us to tackle before. Thanks to the flexibility and ease to access additional computational resources, we were able to solve more complicated simulations right from the Ansys GUI itself."*

*-Khaled Saleh, Ph.D., P.E | Engineering Manager- Simulation Group*
*Goodman Manufacturing, a member of Daikin group*

*"The Ansys Cloud service built into Ansys Mechanical provides intuitive, easy-to-access to HPC directly from the application. For large, high-fidelity models, Ansys Cloud reduced our solve times by 5-6X and cut the entire simulation workflow by half."*

*Marcos Blancho, Mechanical Simulation Engineer*

# What Customer's are Saying

*"Ansys Cloud Compute is intuitive to use and integrates seamlessly into our Fluent workflow. 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*


*"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*


*"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."*

*Bert Blocken, Professor*

***Click to return Agenda***

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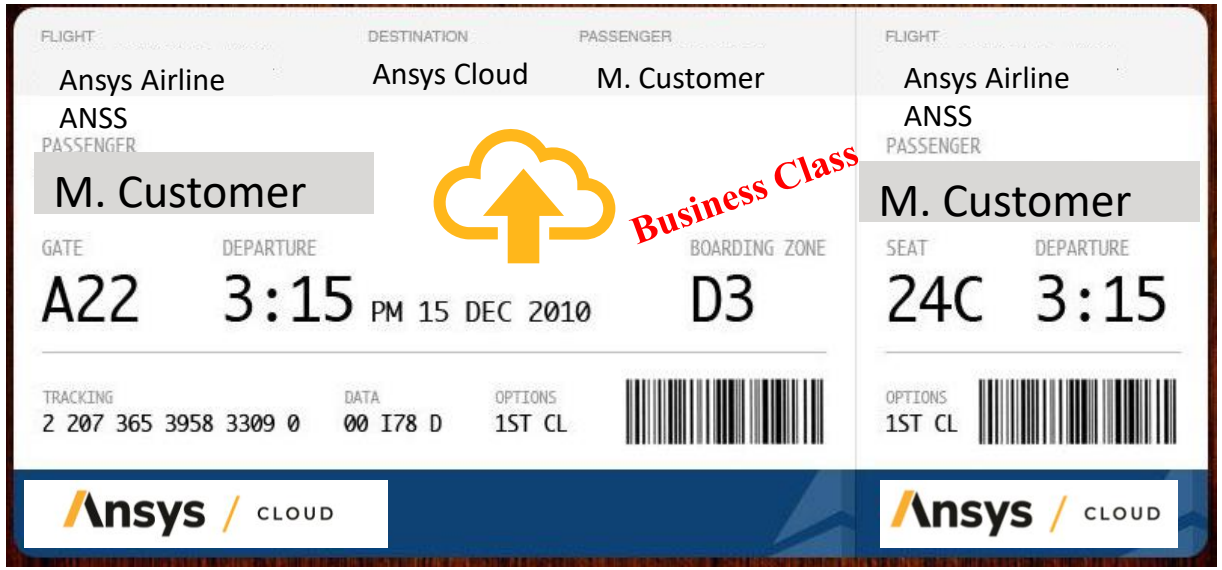
# Pricing & Packaging

Ansys Cloud

# Ansys Cloud Essentials Subscription

**Essentials Cloud Subscription : Your Named ticket to use Ansys Cloud.**




Available for :

- 3 months
- 12 months

It includes :

- Support
- Geo replication
- 1TB of Free Cloud Storage
- Data Transfert

*Click to return Agenda*

# Ansys Cloud Extra Storage

## Add more storage on Ansys Cloud

**Extend your Ansys Cloud Storage on demand when you need it.**

**Subscription available for :**

- 3 Months
- 12 months

**Increment of 1 TB (1000 GB) of Cloud Extra Storage**

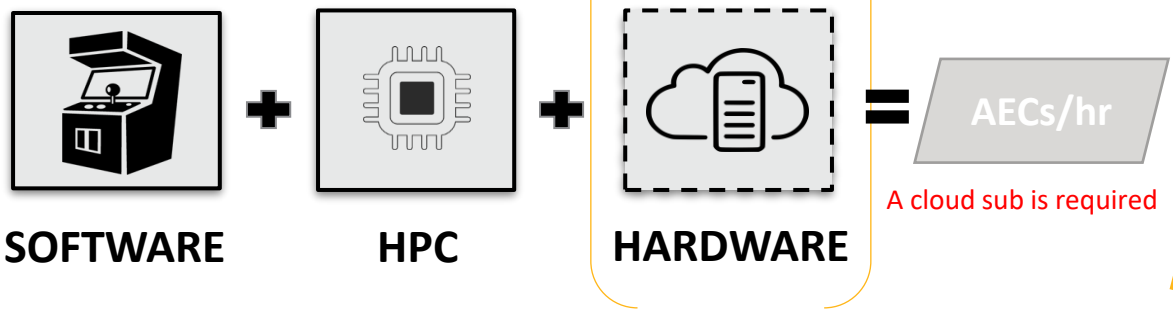
*Click to return Agenda*

# NEW Ansys Elastic Currency/ Ansys Managed Hardware Solution

## Ansys Elastic Currency (AEC)

**AEC can license SW, HPC and HW**

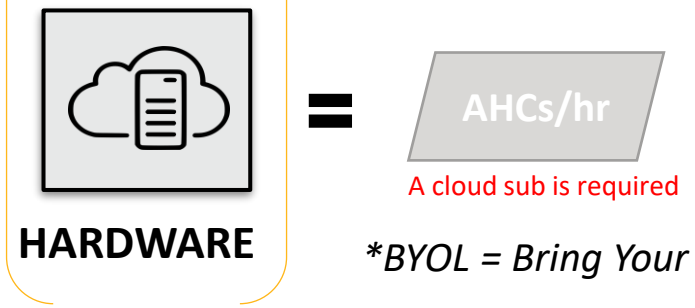
- SW + HPC + HW workflow on Ansys Cloud
- SW + HPC workflow on your existing hardware




## Ansys Managed Hardware Solution(AHC)

**AHC can license Ansys Cloud Hardware**

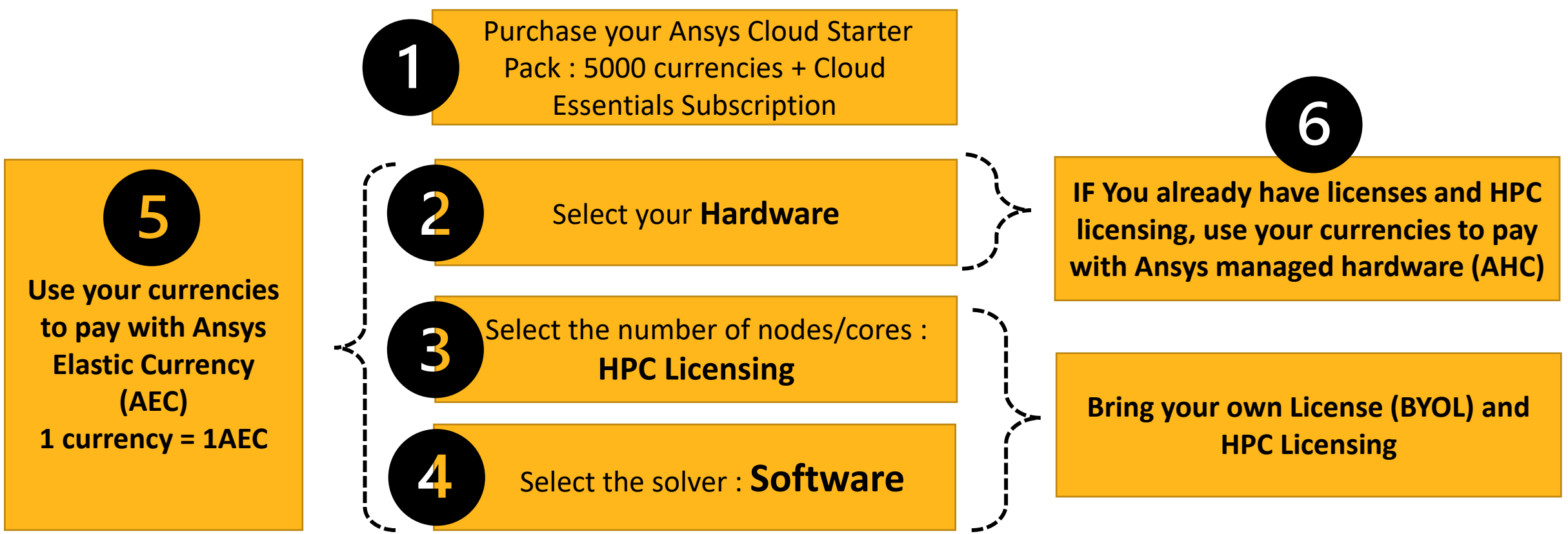
- BYOL* + HW workflow on Ansys Cloud




*BYOL = Bring Your Own License*

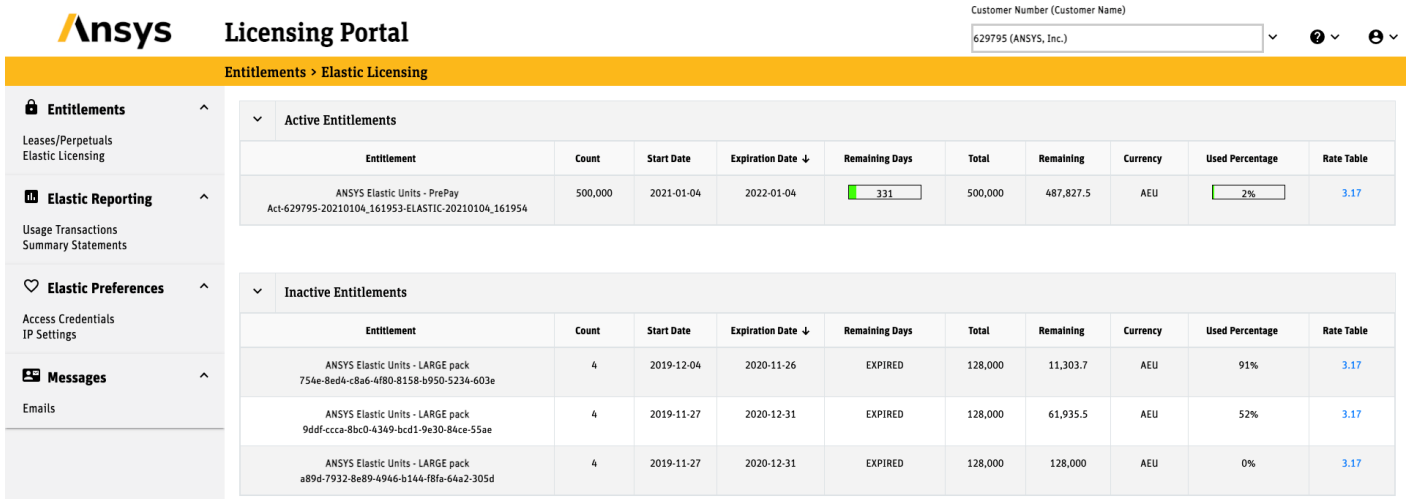
- ✓ Successor to Ansys Elastic Unit (AEU): Similar cost, simplified pricing, and no WAN uplift
- ✓ AEC: Ansys Elastic Currency: Enables SW usage anywhere AND enables HW usage on Ansys Cloud
- ✓ AHC: Ansys Managed Hardware Solution: Same rates as AEC but focus HW usage on Ansys Cloud
- ✓ **All new sales will be AEC/AHC**. AEUs remain supported through end of term.

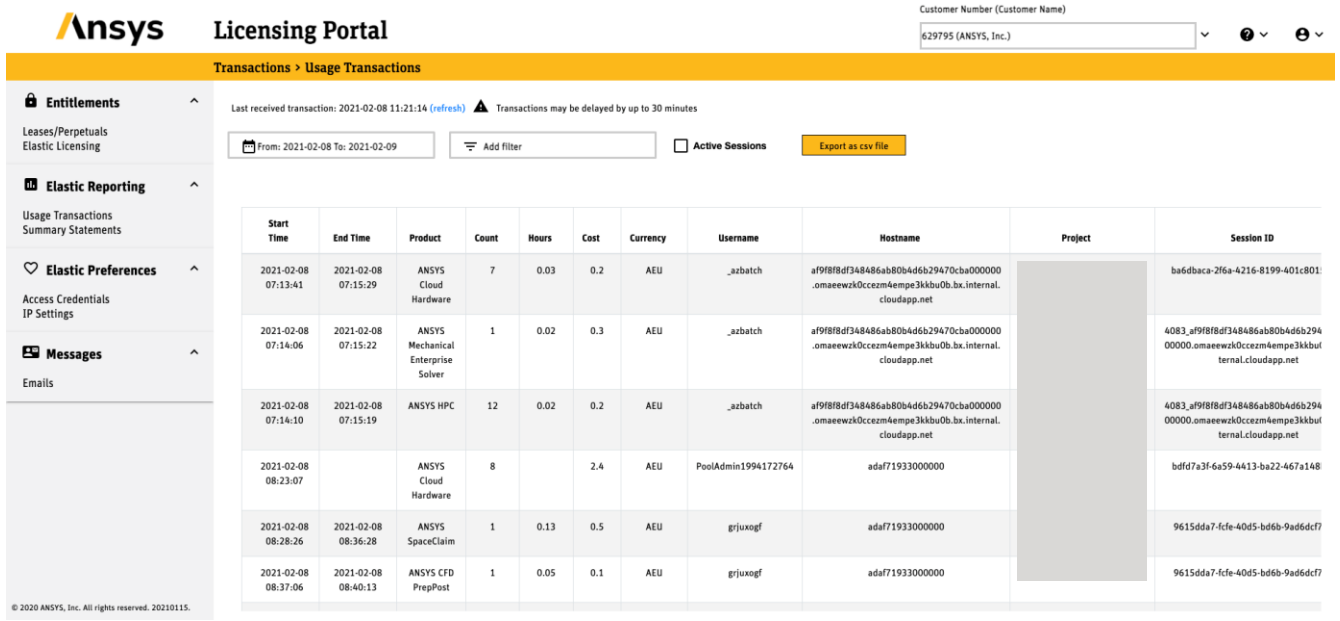
# How Ansys Cloud is priced ?




***Step 2, 3, 4 are hourly rates see full list***

# How to track AEC usage ?

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# Packaging and Hourly Rates

**Ansys Elastic Currency (5000) = 5000 AECs**

**Ansys Managed Hardware Solution (5000) = 5000 AHCs**

**OR** — **Ansys Elastic Currency (AEC)**

**Ansys Managed Hardware Solution (AHC)**

## Consumption Rates for HW

| Node Type | Cores per Node | RAM per Node (GB) | GPU | Target Physics | Node Hourly Rate* | Currency |
|---|---|---|---|---|---|---|
| **Hardware Licensing** | | | | | | |
| **H16r** | 16 | 112 | - | Fluids | **1.83** | AHC\|AEC |
| **H16mr** | 16 | 224 | - | Mech, Elect | **2.00** | AHC\|AEC |
| **HC** | 44 | 352 | - | All | **4.94** | AHC\|AEC |
| **HB** | 60 | 240 | - | Mech, Fluids | **3.56** | AHC\|AEC |
| **HBv2** | 120 | 480 | - | Mech, Fluids | **7.38** | AHC\|AEC |
| **HBv3** | 120 | 448 | - | M,F,S | **7.38** | AHC\|AEC |
| **NV6** | 6 | 56 | M60 | All | **1.78** | AHC\|AEC |
| **NV12sv3** | 12 | 112 | M60 | All | **2.34** | AHC\|AEC |

***Example for US East.***

## Consumption Rates for SW and HPC

| Product Category | Hourly Rates | Currency |
|---|---|---|
| **Software Licensing** | | |
| **Geometry Interfaces** | **2.5** | AEC |
| **Optimization** | **5** | AEC |
| **Pre/Post & 3D Design** | **10** | AEC |
| **Solvers** | **20** | AEC |
| **HPC Licensing** | | |
| **HPC (n cores)** | int(5*n^0.57) | AEC |

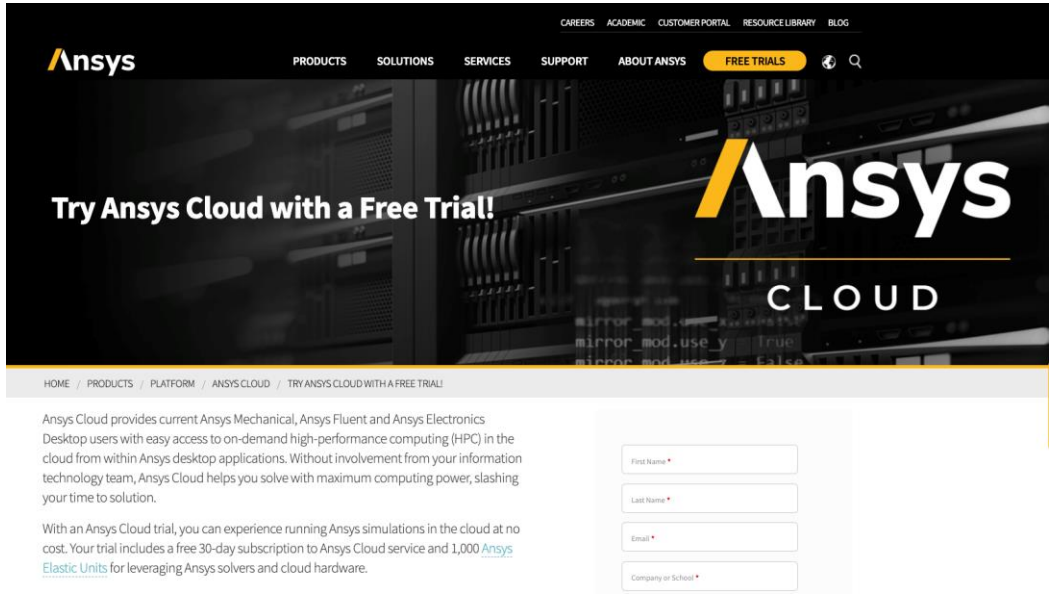
***The Node Hourly Rates values vary by region (see full list).***

*Click to return Agenda*

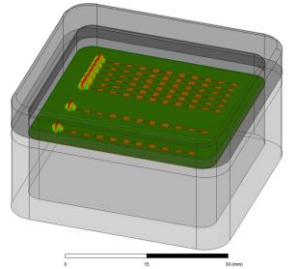
# Ansys Cloud FREE Trial

## What is included?

- ✓Access to **all machine configurations**
- ✓**In-Browser Interactive Session** (start Ansys Cloud in browser) or **directly in your Ansys application desktop** (GUI).
- ✓**1 TB** Storage
- ✓Access the **Cloud portal** to monitor your jobs and consumption.
- ✓Get **support** on Cloud Forum and with our support team.




**Define your use case and bring your own benchmark !**



**3.2x faster!**
**2 hrs. 31 min time savings!**

**Request your free Ansys Cloud trial today!**

➔ [www.ansys.com/cloud-trial](www.ansys.com/cloud-trial)



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# Engage with us !

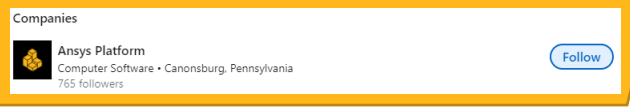
Follow us on LinkedIn

1

Search “Ansys Platform”

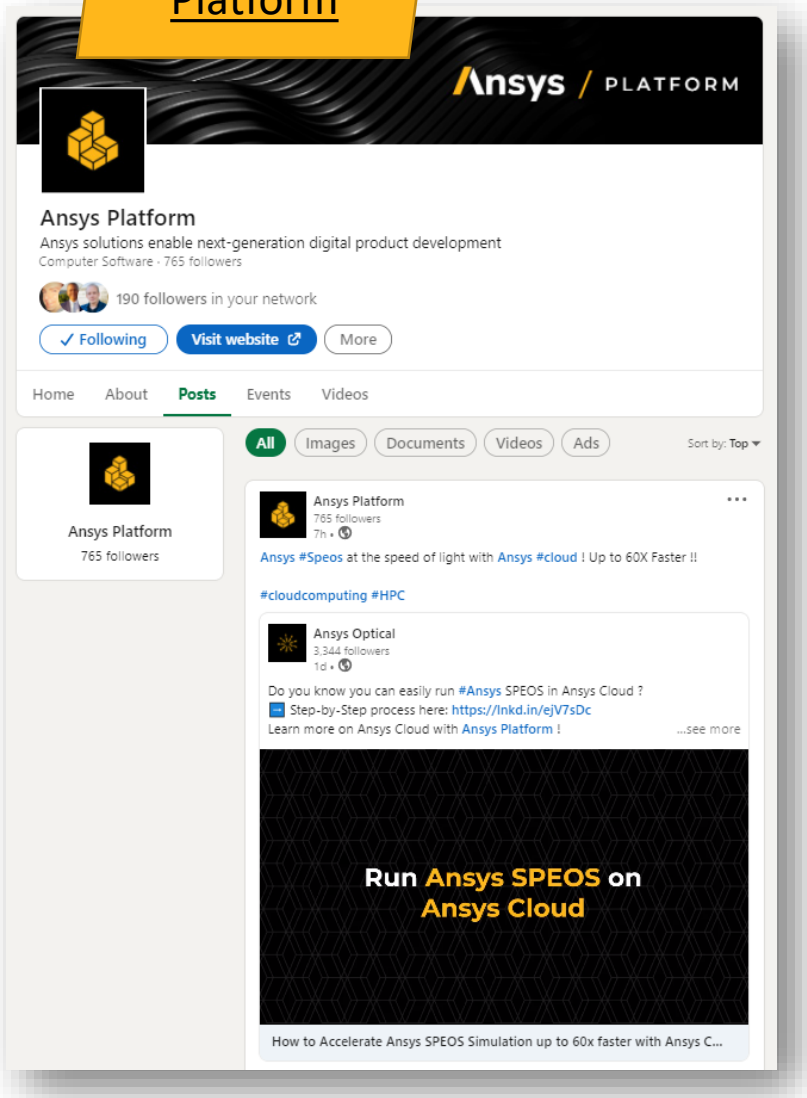

2

Hit “Follow”




Or Scan

Ansys Platform

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Ansys

*Click to return Agenda*

# Extra Slides

Ansys Cloud benchmarks & Security slides

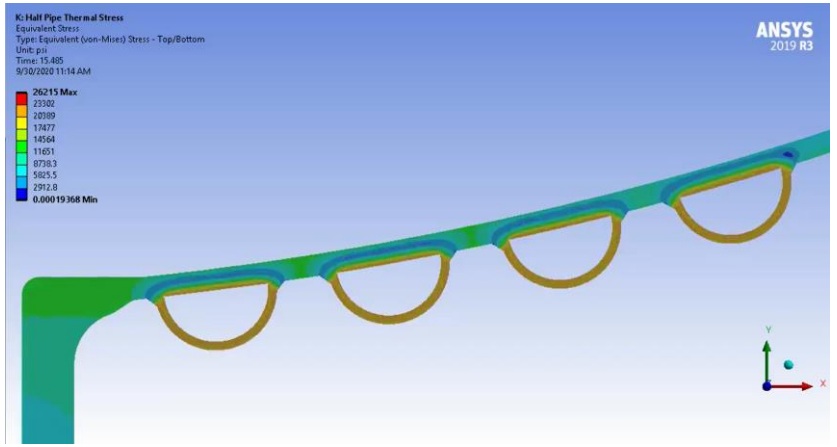
# Hargrove Engineers + Constructors

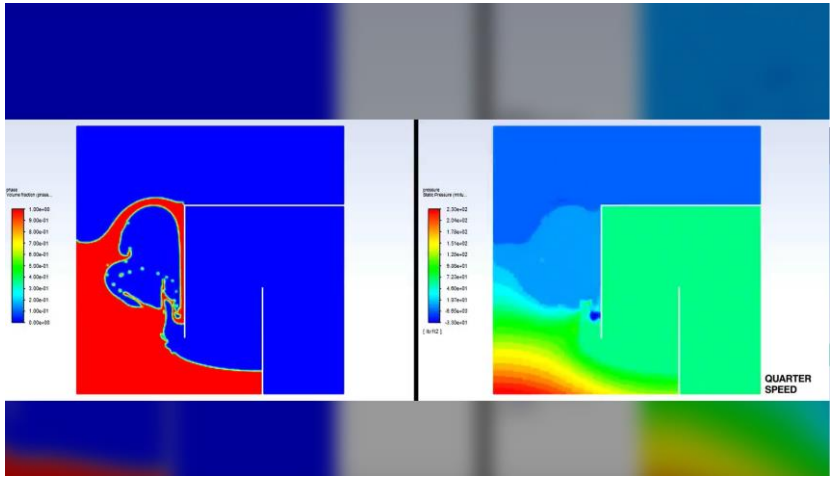
hargrove engineers+constructors

"The ability to **scale** is incredible. As a kid I grew up and never thought I would have **this power** one day. Now with Ansys Cloud I can have thousand of cores **supercomputer** at my fingertips and at a **reasonable cost**. That is very exciting. For example, I'm using it on my TV at home thanks to the **remote desktop session**. I can check my phone to see what is the status of my simulation, I can do that **anywhere**."

"Ansys Cloud open the door for **very complex simulation** that include **Multiphysics** such as heat transfer and complex chemical reaction with 3D visualization."

**Ben Turner**, *Pressurized Equipment Specialist*



# Secured Admin Controls & Account Settings

IT administrators can establish controls on account settings for Ansys Cloud users. In addition, Organization Administrators can configure permissions and privileges for their organization.

- Ansys Cloud uses Multi-Factor Authentication login to ensure the best security against hacking.
- All users can collaborate by using Manage job sharing.
- Organization Administrators can set other users in their org to Org. Administrators

*Click to return Agenda*

# Best-in-Class Data Encryption

Ansys Cloud uses proprietary methods and industry-standard to ensure that data is encrypted at every step of the process (both during transit and at rest).

- Encryption is used during upload and download over https and encryption-at-rest with AES-256
- Simulations always executed in customer-specific private subnets on dynamic, private clusters
- Encryption keys are securely stored in separate locations
- Ansys Cloud encrypts data before it leaves the desktop, and it is kept encrypted.
- Supported standards include custom file encryption @ AES256 and HTTPS TLS1.2

*Click to return Agenda*

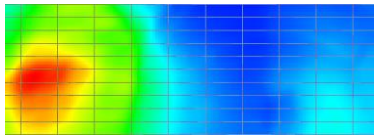
# Availability & Data Center Security

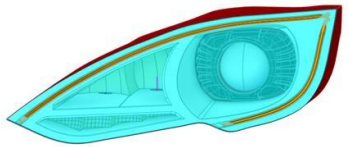
The Ansys Cloud Service application is deployed in multiple regions :

- In case of service interruption, no critical data is lost due to replication.
- Physical security is deployed to secure datacenters with access request and approval, facility's perimeter and building entrance with two-factor authentication (with biometrics), professional security officers, cameras inside the datacenter and patrol but also security scan. Learn more about it.
- Isolated Compute regions. In addition to deploying shared resources in a highly redundant way, each compute region consists of only enough resources needed to successfully execute a job. It is deployed into numerous regions and a customer is offered a choice of which region to use for running simulation jobs. All customer data persist in the customer-specified region and are never copied outside of the geo.

# SPEOS Benchmark : Choose either HBv2 or HC ?

## Use Case #1 : Light Guide

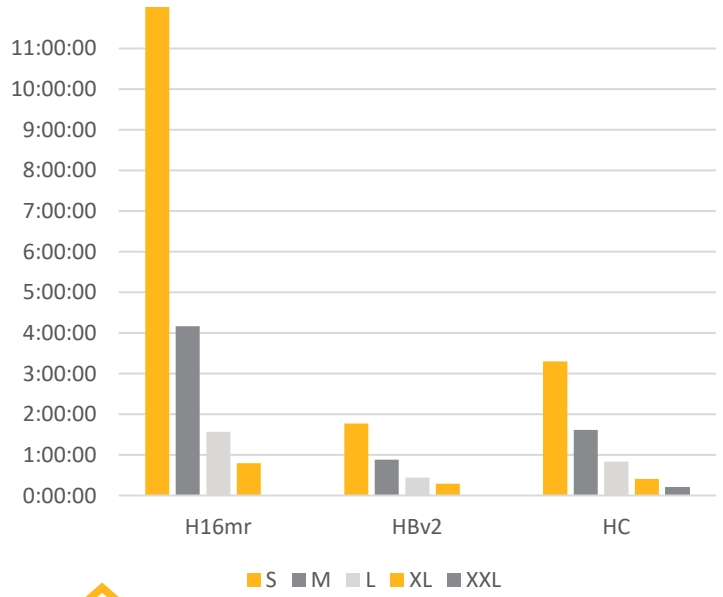




**Direct Simulation**

Number of bodies : 4
Number of faces : 1296
Number of triangles : 19728
Number of rays :1E+09

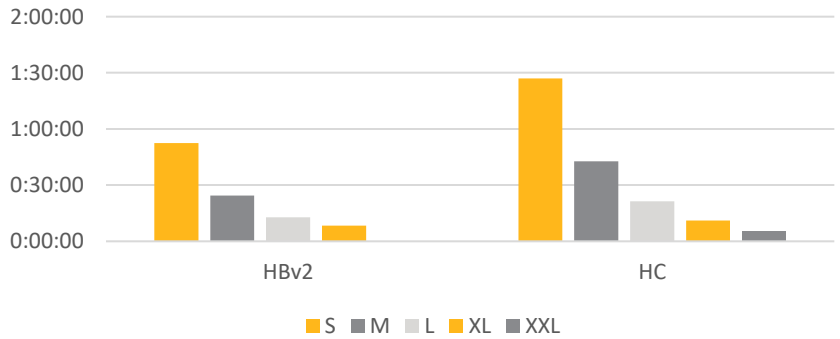
Benchmark on Lightguide




## Use Case #2 : Headlamp

**Inverse Simulation**
Number of bodies : 64
Number of faces : 7440
Number of triangles: 658211
Number of Passes: 500

Benchmark on rearlamp rendering




| Number of nodes | | |
|---|---|---|
| | HBv2 | HC |
| S | 1 | 1 |
| M | 2 | 2 |
| L | 4 | 4 |
| XL | 6 | 8 |
| XXL | | 16 |

**Virtual Machine H16 : Intel Xeon E5 v3 "Haswell" – 16 cores*

Use Case #1 takes **12h 34 min** to solve on small **16 cores VM*** where it only takes **12min with HC XXL** : Speed up to **60X** while optimizing your **cost/performance ratio***

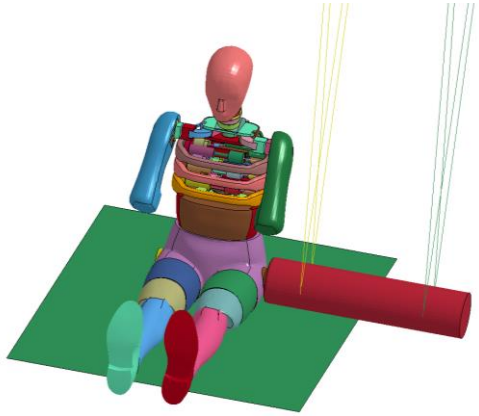
*on this example we divided by 8 total cost by running the most powerful VMs versus the smallest one (16cores) .

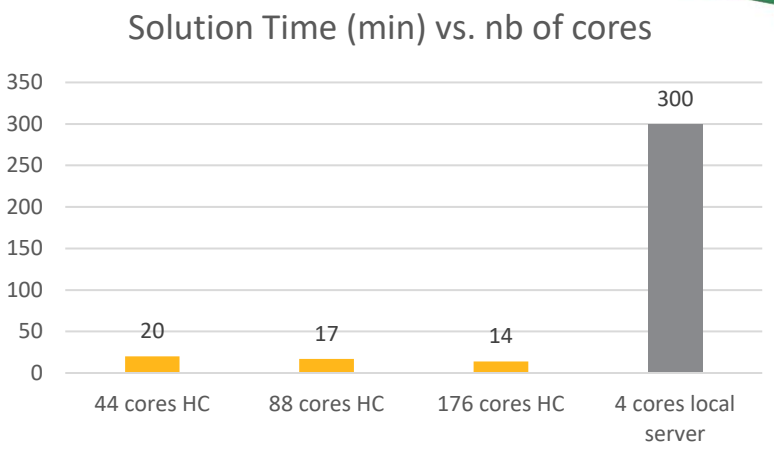
***Click to return Agenda***

# Ansys LS-Dyna on Ansys Cloud – Scalability Benchmark

## Pelvis Crush

- *314k elements*

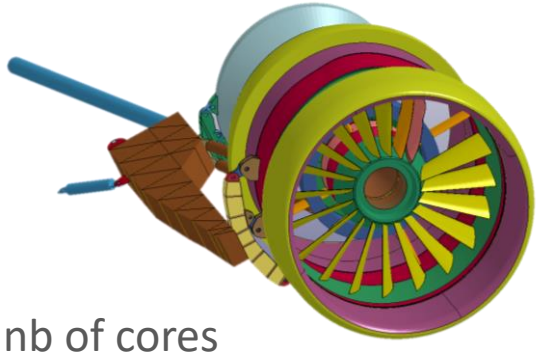


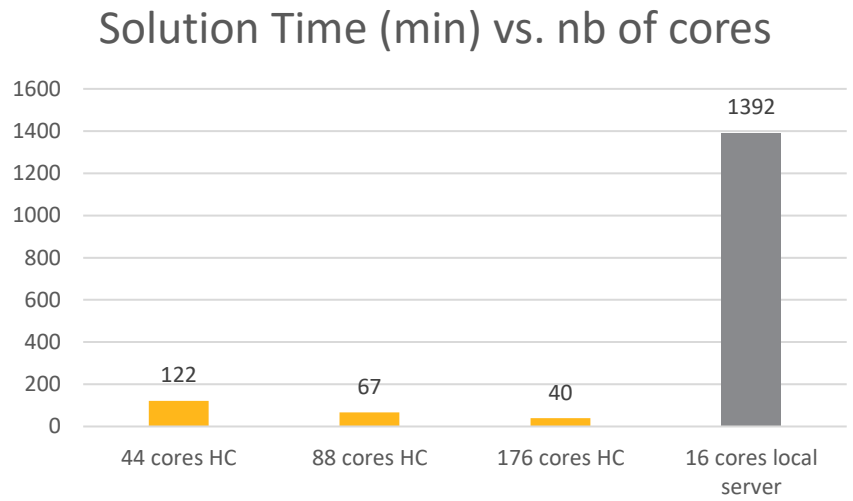



Local Workstation 4 cores : **300 min**
Ansys Cloud HC 176 cores : **14 min**
**Speed up : 21 X**

## Fan Blade Out

- *1.3 M elements*






Local Workstation 16 cores : **1392 min**
Ansys Cloud HC 176 cores : **40 min**
**Speed up : 35 X**

# Benchmark - LS-Dyna with Ansys Cloud

**Ansys LS-Dyna**
Multiphysics Solver

**Use Case : 3cars**
0.83 Million nodes
0.79 Million Shell Elements

44 cores (Small HC) :
**29.3 minutes**

352 cores (Xlarge HC) :
**7.2 minutes**

**4 times faster** than 44 cores Virtual Machine.



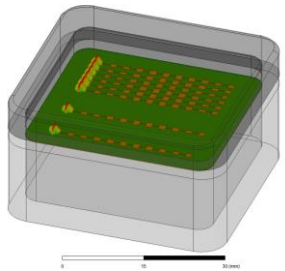
*Click to return Agenda*

# Bring your own Benchmark !!

Define your use case → Request a Cloud free trial → Run your own benchmark to compare local computing performance vs Cloud. → Measure your saving and send us the result to get some advice

**Example** : HFSS Frequency Sweep Extraction Scaling Benchmark

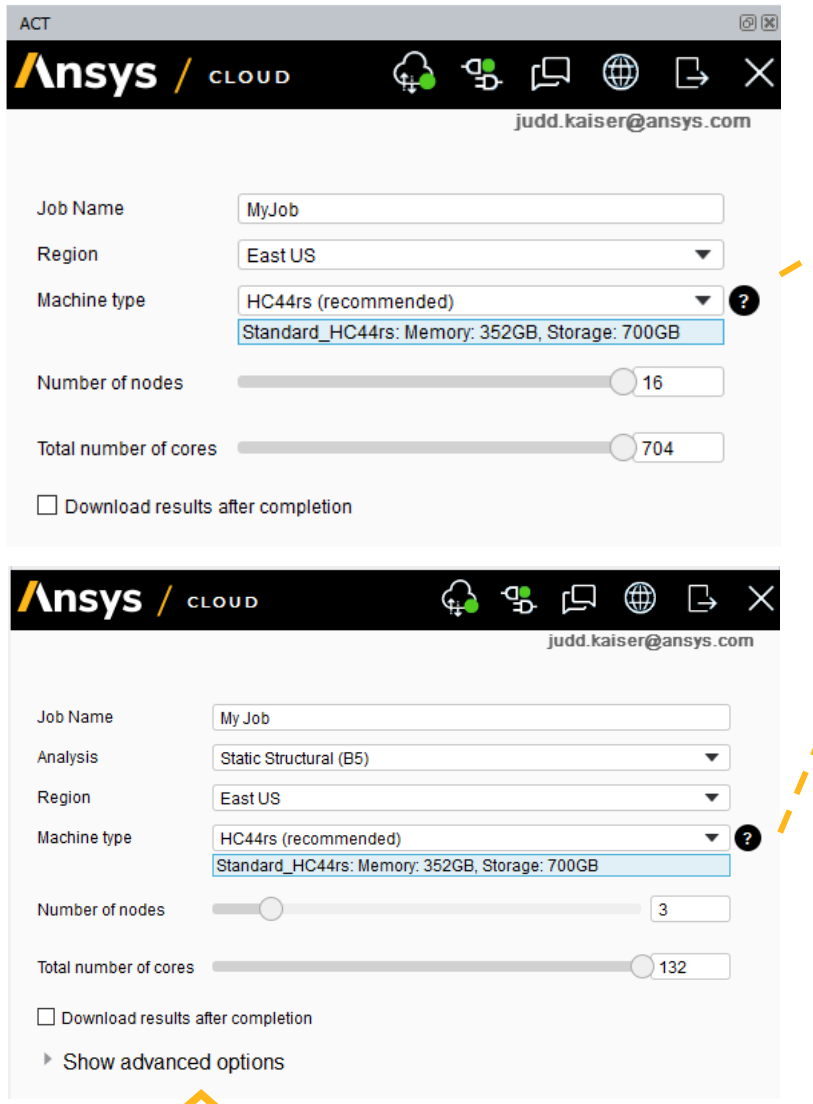
| Hardware | Server | | | | |
|---|---|---|---|---|---|
| **Cores** | 16 | 16 | 32 | 128 | 256 |
| **RAM (GB)** | 256 | 224 | 448 | 1800 | 3600 |
| **Total time** | 3:42:13 | 2:15:59 | 1:58:28 | 1:15:00 | 1:10:23 |



**3.2x faster!**
**2 hrs. 31 min time savings!**

# Ansys Cloud forum

Read The Technical WP




- ✓ NEW UI with possibility to change number of nodes, total number of cores
- ✓ Access the recommandation for your solver on Ansys Cloud Forum

## Choosing performance-optimized hardware configurations for Fluids jobs

Updated 3 days ago

You now have multiple options for the virtual machine types to be used for Fluids HPC jobs. In this article, we'll share a sampling of benchmarking that Ansys has done with the Fluent application in order to help guide you in making these choices.

## Choosing performance-optimized hardware configurations for Mechanical jobs

Updated 3 days ago

You now have multiple options for the virtual machine types to be used for Mechanical HPC jobs. In this article, we'll share a sampling of benchmarking that Ansys has done with the Mechanical application in order to help guide you in making these choices. The data shown in this article corresponds to analyses using the MAPDL solver. For results relevant to Ansys LS-DYNA, refer to this article.

## Choosing performance-optimized hardware configurations for Ansys LS-DYNA jobs

Updated 3 days ago

You now have multiple options for the virtual machine types to be used for ANSYS LS-DYNA jobs. In this article, we'll share a sampling of benchmarking that Ansys has done with in order to help guide you in making these choices.

*Click to return Agenda*

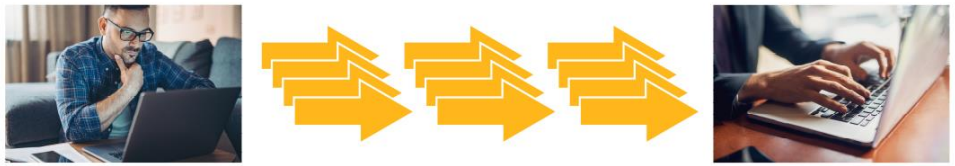
# Ansys optiSLang and Ansys Cloud

## Classical

*Cost: N* engineer+N* solve + postprocess*


## optiSLang + 4 parallel solve runs (local workstation)

*Cost: 1* engineer+N* solve*



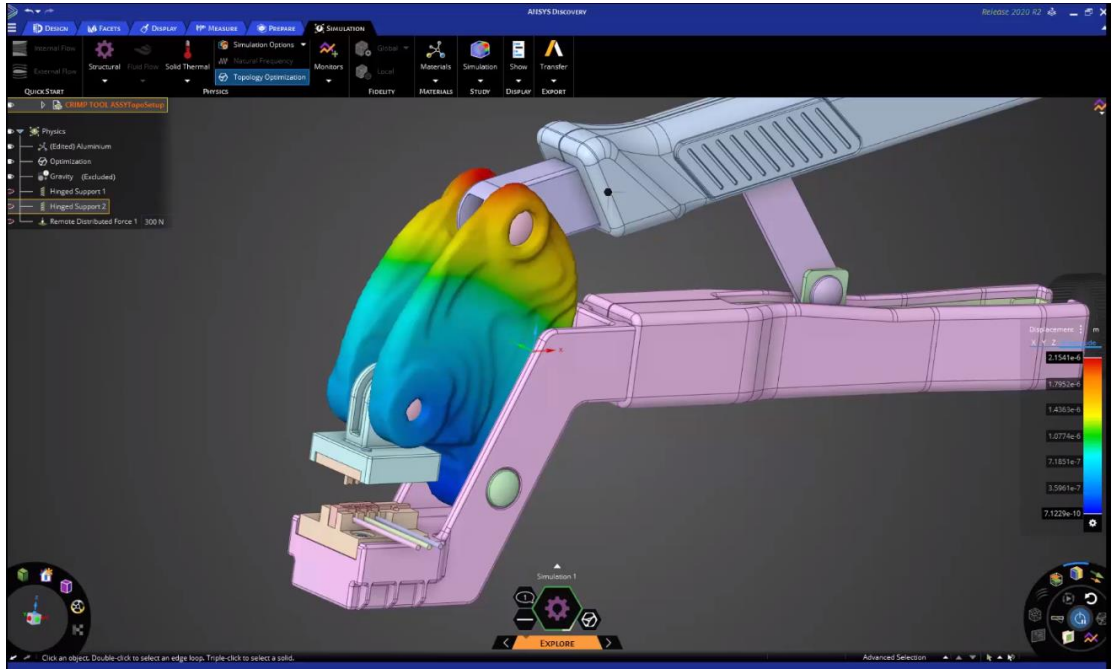

## optiSLang + unlimited computation in Cloud

*Cost: 1* engineer+N* solve*


With Cloud reduced the time you need to design a better product.

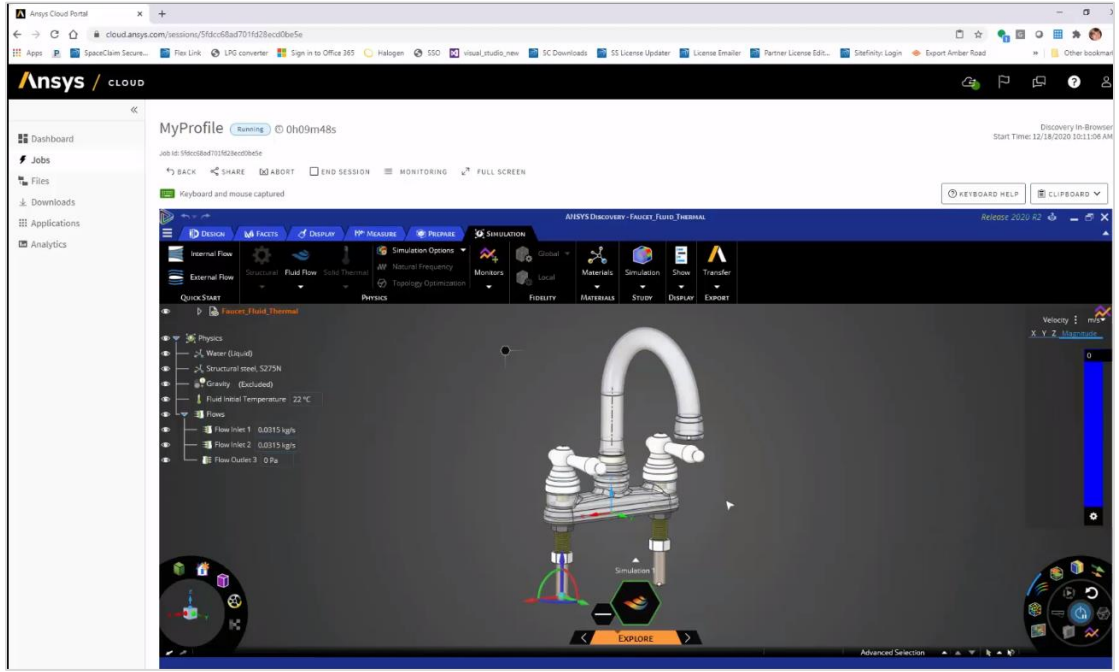
Reduced your simulation queue and run in parallel multi jobs

# Ansys Discovery : Choose RDP or In Browser



## RDP

- More immersive user experience
- Feels like a native desktop app
- Can have firewall restrictions



## In Browser

- Easier access to the cloud portal
- Restricted access to some keyboard shortcuts
- No firewall restrictions

*Click to return Agenda*

# What’s new in 2021 R2 ?

**Ansys LS-DYNA / LSTC SUPPORT**



**MONITOR YOUR USAGE VIA ANALYTICS**

**MORE SECURITY VIA SINGLE SIGN ON (SSO)**

**IMPROVED FILE MANAGEMENT**

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# More control .. more security !

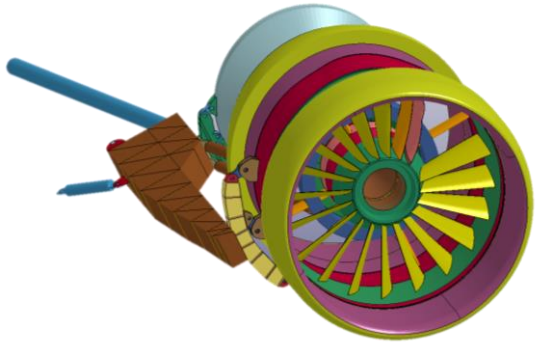
**Better file management for files stored on the cloud :** enabled periodic copy of files from interactive virtual machine to cloud storage while job is running. Portal file management enhancements (support copy/cut/paste and rename).

**Improved visibility of usage for admin users** : company admins now have access to usage data via analytics.

New **sign in experience** offering multi-factor authentication for **improved security**

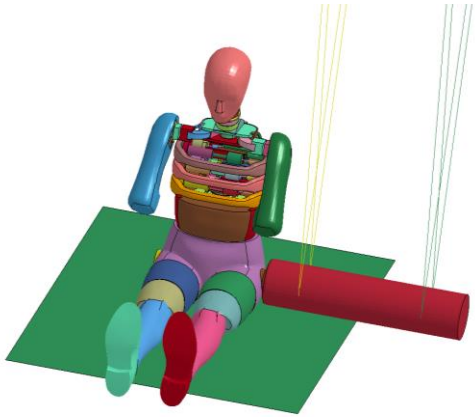
*Click to return Agenda*

# Ansys Cloud & Ansys LS-Dyna / LST



Introduced job template for batch job submission for LST versions of LS-DYNA

Added **support Command Line Interface batch jobs submission** for LST versions of LS-DYNA



Added **support for LS PrePost** in **interactive sessions**

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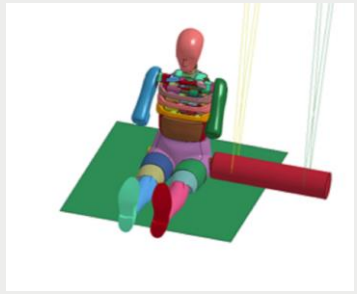
# What's New in 2021R2 ?

Ansys 2021R2 Engineering What's Ahead.



## New Product Support: Welcome Ansys LS-DYNA/LST LS-DYNA

- Introduced job template for **batch job submission** for **LST versions** of LS-DYNA (extension to LSTC Dyna).
- Added support **Command Line Interface batch jobs submission** for LST versions of LS-DYNA.
- Added **support for LS PrePost** in interactive sessions.


## More Control. More Security.

- Better **file management** for files stored on the cloud, including enabled periodic copy of files from interactive virtual machines to cloud storage while a job is running. Portal file management enhancements include support for **copy/cut/paste and rename.**
- Company admins now have access to **usage data via Analytics**. This is the first step toward enabling admin users to manage usage at the company level.
- **New sign-in experience** offering multifactor authentication for **improved security**.



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# What's New in 2021 R1 ?

Ansys CLOUD

## HPC Optimized

- Better **Price/Performance up to 960 cores**
- Increased **flexibility** for flagship solvers
- New AEDT Configurations


## Run Ansys Applications Interactively In-Browser

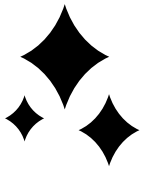
- Interactive cloud-based workstations: **Now running in-browser**
- New HW configurations supporting Nvidia **GPU**
- New high-core count configurations, **up to 120 cores**
- Broader product **testing/support** coverage for interactive applications in Ansys Cloud

## Ansys Elastic Pricing

- New "Ansys Elastic Currency" simplified pricing with a **single rate**
- **AEC – Ansys Elastic Currency** – like AEUs – enables SW usage on Cloud and on prem AND enables HW usage on Cloud
- **AHC – Ansys Managed Hardware Solution** – the same as AEC (pricing, rates) except that it ONLY enables use of cloud hardware

## New Products

- **SPEOS** in the Cloud : More Speed , More Flexibility, **Up to 60X** faster than local computing
- **DISCOVERY** in the Cloud : Bring **more Physics in Browser** (VDI)
- Improvement in **AEDT** : **Optimize performance/cost ratio** of your simulation





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# Cloud Interface – Fluent/Mechanical

## Cloud Interface in application

File transfer Agent status
- Green – running, ready
- Red – Stepped
- Yellow - busy

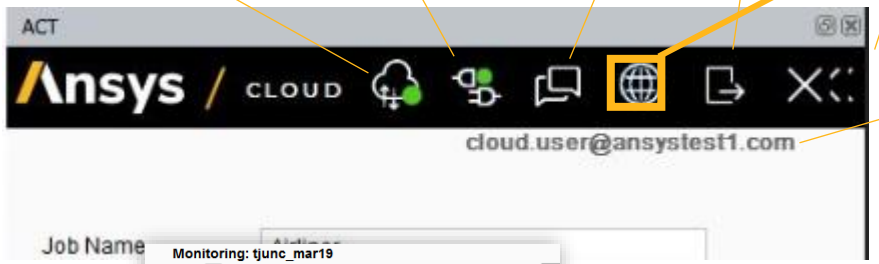
Cloud Connection status
- Green – Connected
- Red – not connected

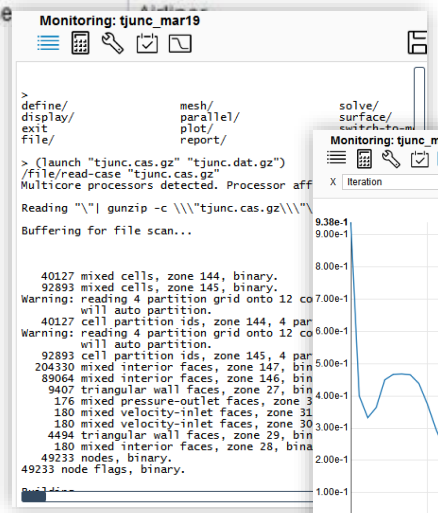
Forum

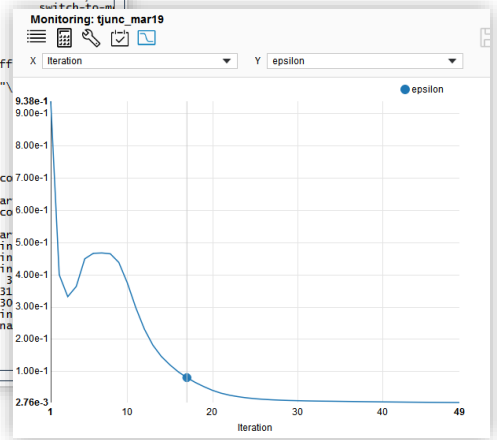
Sign out

Exit app

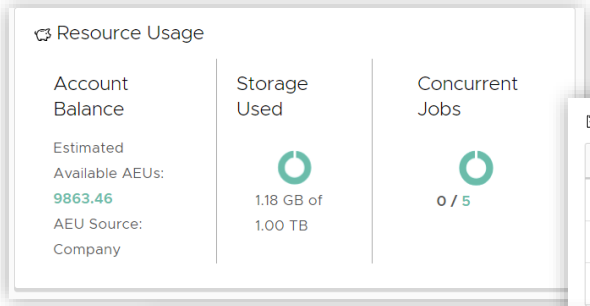
Account logged in

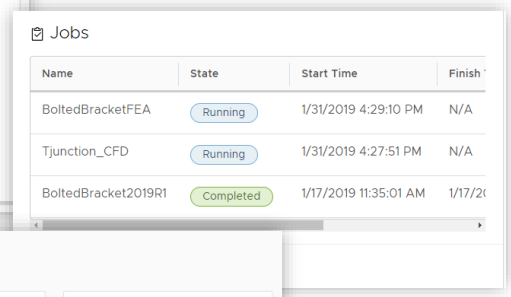


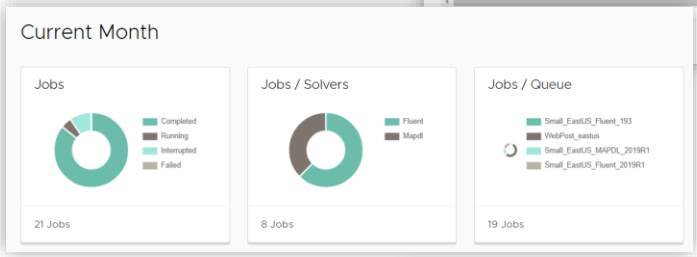



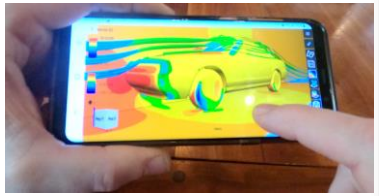



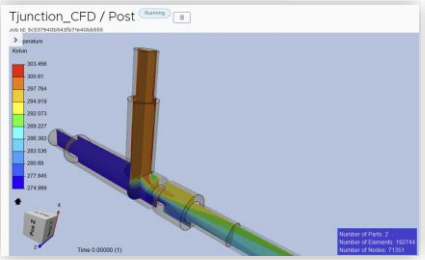

**Ansys Cloud Portal:**
- Job management
- Analytics and dashboards,
- Postprocessing
- App download



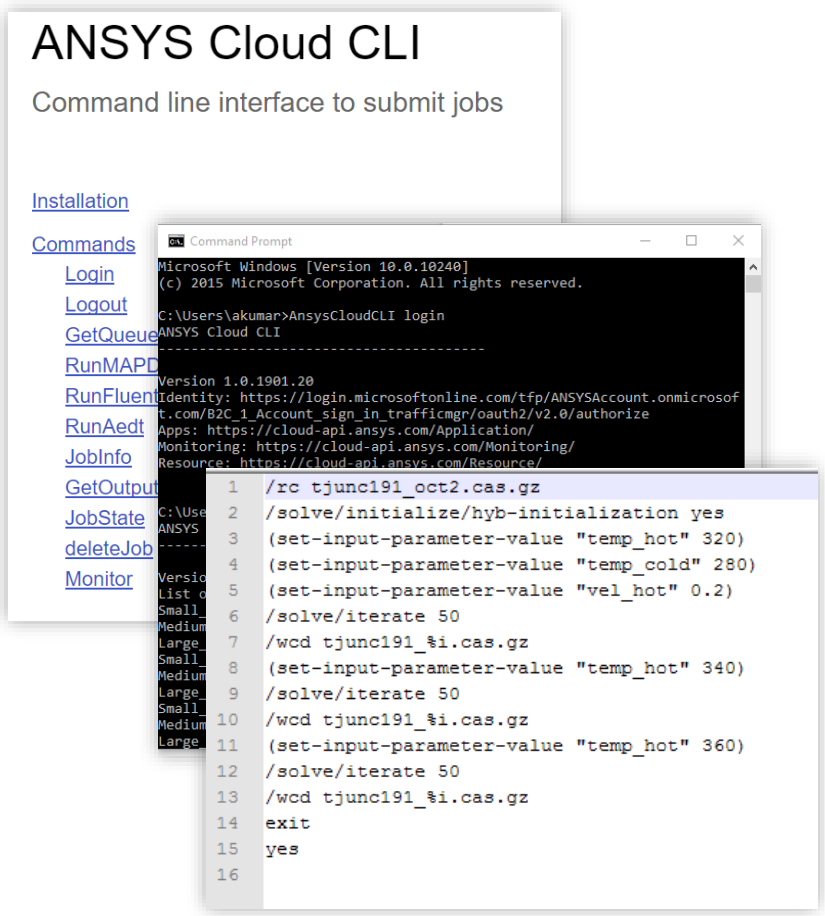



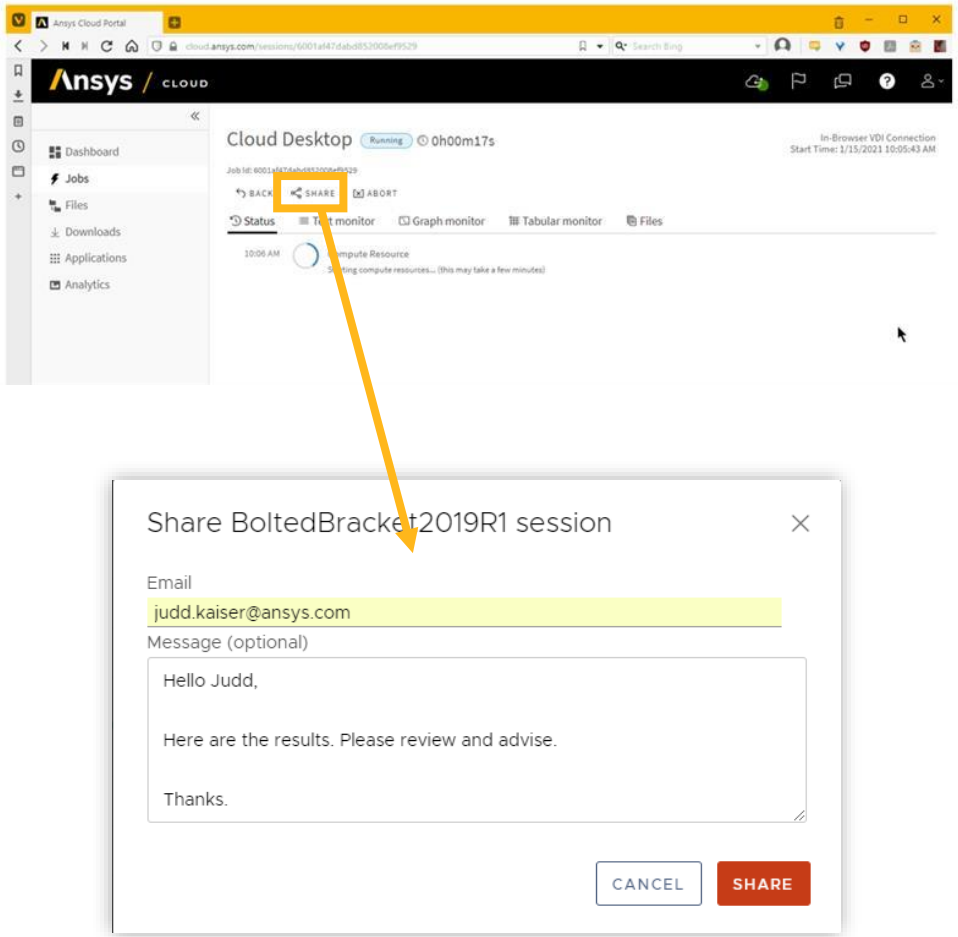


# Other Features

## Command Line Interface (CLI)

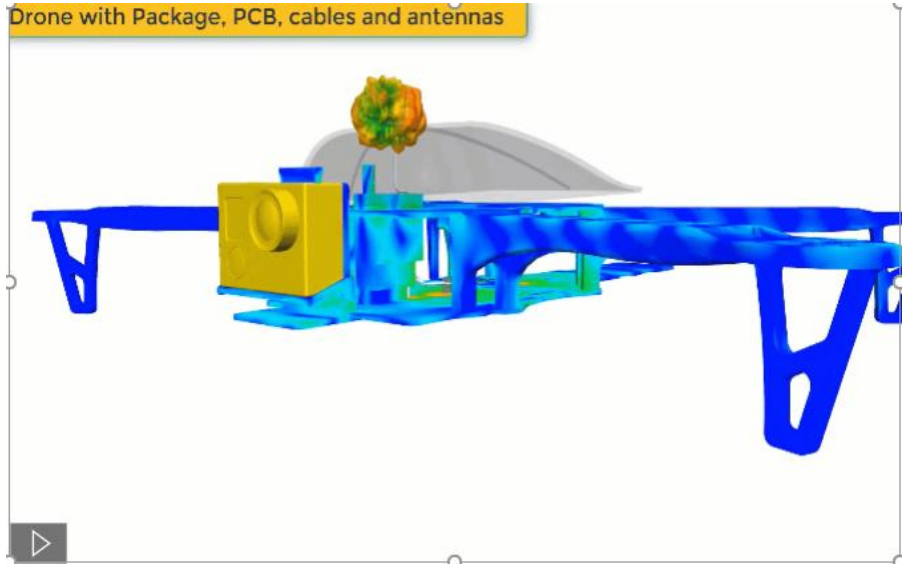



## Customers can collaborate or seek help



# Ansys Cloud and Electronics

- **Complexity:** Smaller form factors plus higher dates rates and frequency content demand more complex, and comprehensive, products to be designed and simulated
- **System:** Electronics content is growing and will continue to do so. Large system level simulations needed to understand interaction, intended or otherwise
- **Scale up and optimize:** Cloud capacity provides ability to rapidly simulate design points to optimize designs and understand yields
- **Risk mitigation:** Cloud capacity turns simulation weeks to days and days to hours allowing rapid design iteration which will minimize the chance of design failure




- **Ansys electronics workflow:** Tight integration of HFSS to Cloud with easy access to HPC resources or ability to run HFSS from your browser