Powering Innovation That Drives Human Advancement

Deploying on AWS and Azure with Ansys' Bring-Your-Own-Cloud solutions.

Dr. John Baker

EMEA Cloud Business Development Manager - Ansys

Continuing to Expand and Redefine Simulation

Innovating every day to deliver the most comprehensive simulation portfolio in the industry

***Best-in-class** physics and multiphysics solvers, powerful analytics and modeling*

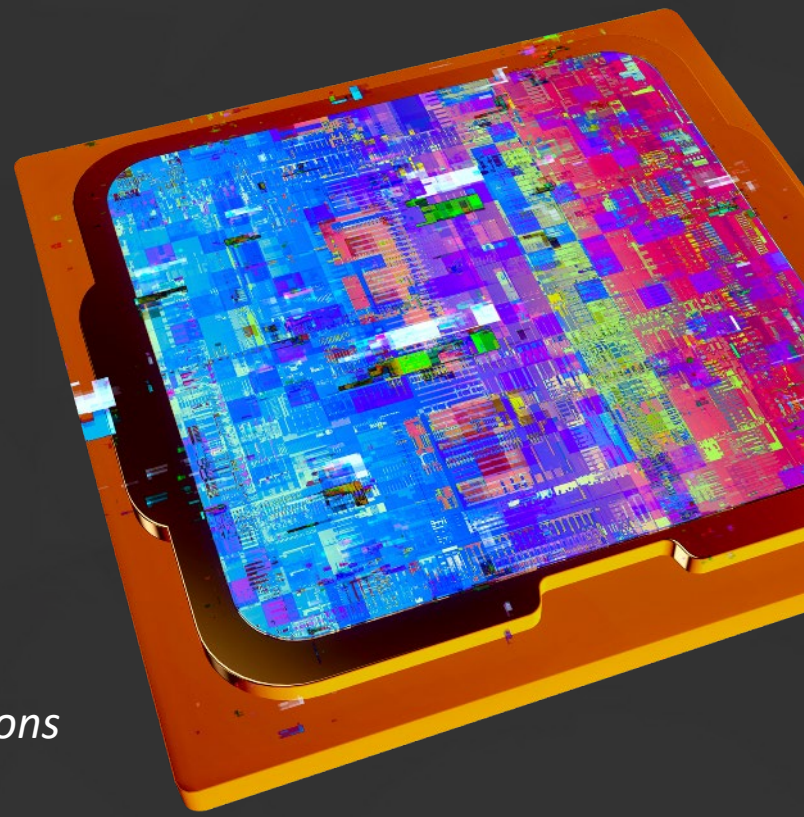
***On-prem or cloud-based** deployment, **scalability** though both CPU and GPU HPC*

*Embedding **artificial intelligence** and **machine learning** into our solutions*

Open and flexible architecture** support combined with a powerful **developer ecosystem

***Broadest**, **deepest**, and **most accurate** simulation portfolio*

***Technical experts** with deep engineering expertise to help successfully deploy simulation solutions*



Redefining "Simulation"

The unique **combination** of the Ansys product **portfolio, platform and ecosystem** is redefining simulation in ways that enable people in every industry to **change the world**.

Product Portfolio

Industry leading simulation products across physics, systems, safety and missions

Platform

Intelligent, open, agile platform that enhances, extends and amplifies the value of the Ansys portfolio

Ecosystem

Broad ecosystem of developers and partners enabling unprecedented innovation

Boost your compute power in the cloud

Ansys.com/products/cloud

Increased Flexibility and Productivity

Faster time-to-market

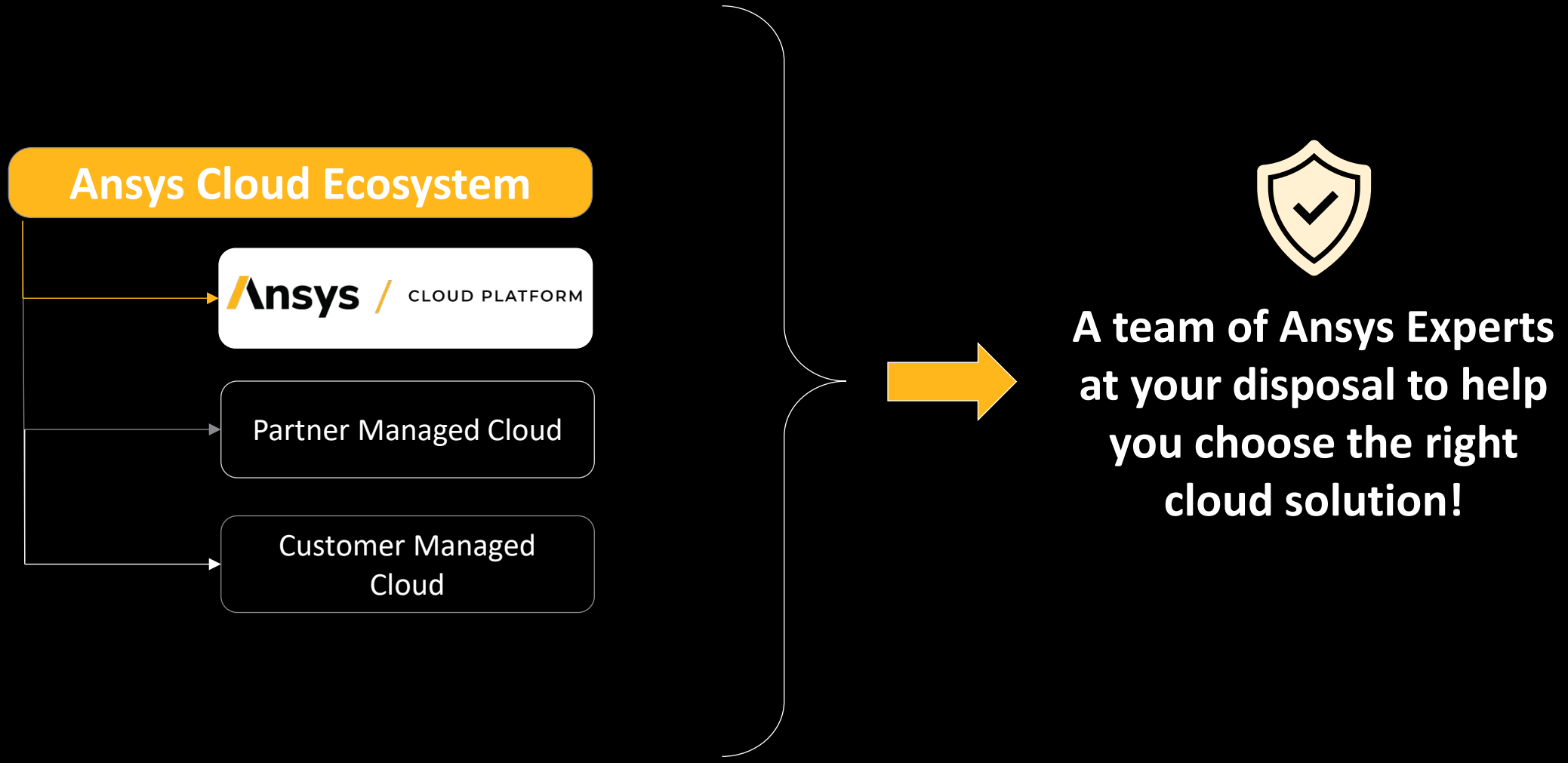
Enhanced Simulation Performance.

Improve the overall quality of the final product

Streamlined Workflow and Cost Efficiency

More design improvements - More Innovation

Ansys Cloud Ecosystem – *enabling customer choice and maximum flexibility*



Ansys Cloud Solution

Ansys / CLOUD PLATFORM

CLOUD OFFERS

Cloud Marketplace – BYOC

- Ansys Gateway powered by AWS™
- Ansys Access on Microsoft Azure™

Software as a Service (SaaS)

- Ansys SimAI™
- Ansys ConceptEV®
- Ansys Notebook

PRODUCT CAPABILITIES

Cloud Connected

- Storage
- Burst Compute
- Collaboration

Introducing: Ansys “Bring your own Cloud” Marketplace offerings

Bring Your Own Cloud (BYOC) and Use Existing Ansys Licenses (BYOL)

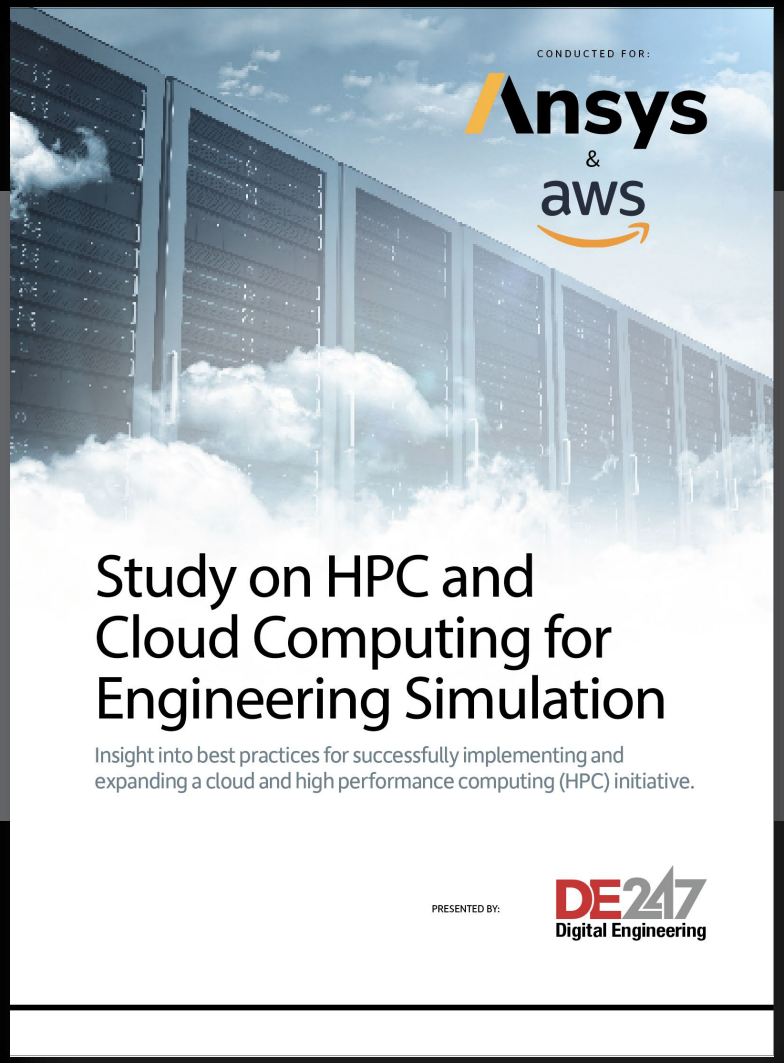
Ansys / GATEWAY

powered by aws

Ansys / ACCESS

Microsoft Azure

Supporting engineers driving to reduce time to market



Ansys Surveys with 750+ IT Managers and Engineers & C-Levels

54%

Said their top business challenge in design activities **is pressure to reduce design cycle times**

50%

Using 12 or > cores for parallel processing, compared to 44% in 2020.

30%

Reported that most of their simulations run overnight and take 9 hours or more to complete, 21% in 2020

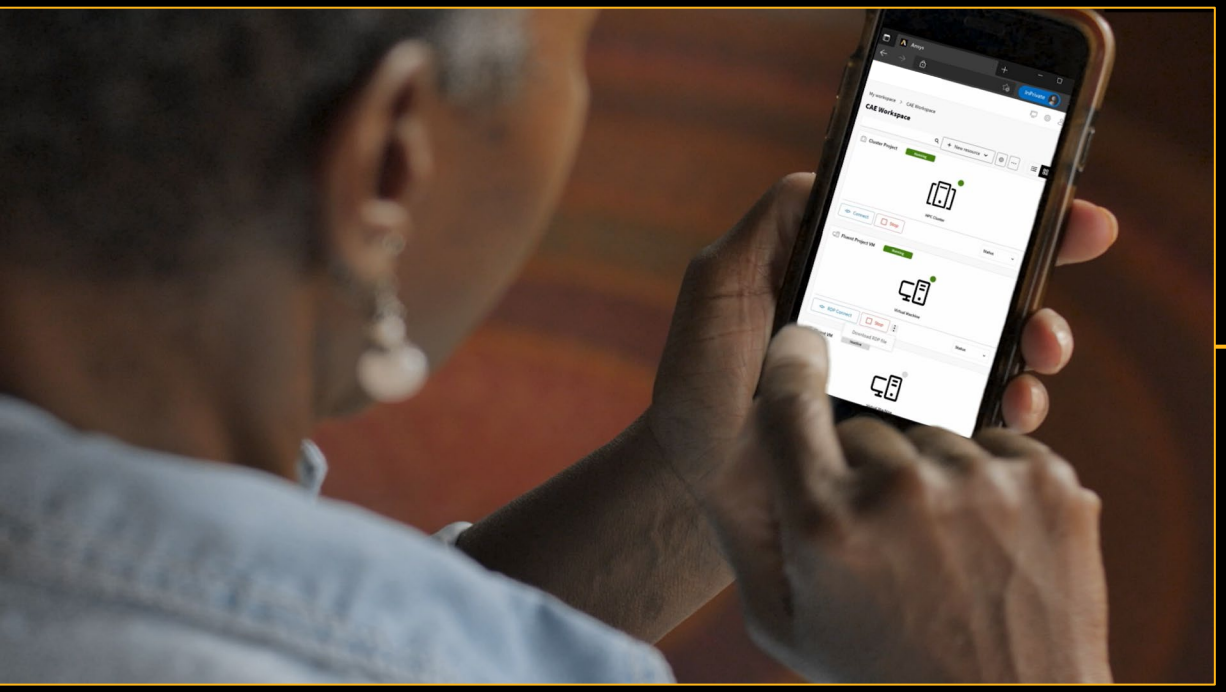
***Based on 2023 Ansys study on HPC and Cloud Computing for Engineering Simulation with the participation of +740 IT Managers, Engineers & C-Levels**

Study on HPC and Cloud Computing for Engineering Simulation - Digital Engineering 24/7 Download (digitalengineering247.com)

Location-Independent And Unconstrained Computing

The unique **combination** of the Ansys Cloud offers give customers the **flexibility to choose** how cloud is leveraged to create **maximum value** for their organizations.

Why Ansys “Bring your own Cloud (BYOC)” Marketplace offerings ?



www.ansys.com/products/cloud

WE MAKE IT FAST

WE MAKE IT EASY

WE GIVE YOU CONTROL

WE MAKE IT COST EFFECTIVE

Customer Transactions with BYOC Marketplace:

Cloud Hardware → CSP

Via existing/new contract with CSP

Ansys Software Licenses → Ansys

with :
Existing Ansys Licenses
(Bring your Own License – BYOL)

Ansys BYOC Marketplace Offers → CSP

Installation and user access are free!
$0.25 per Running Virtual Machine per Hour

CSP = Cloud Service Provider

HPS – Workflows on Ansys Access on Microsoft Azure

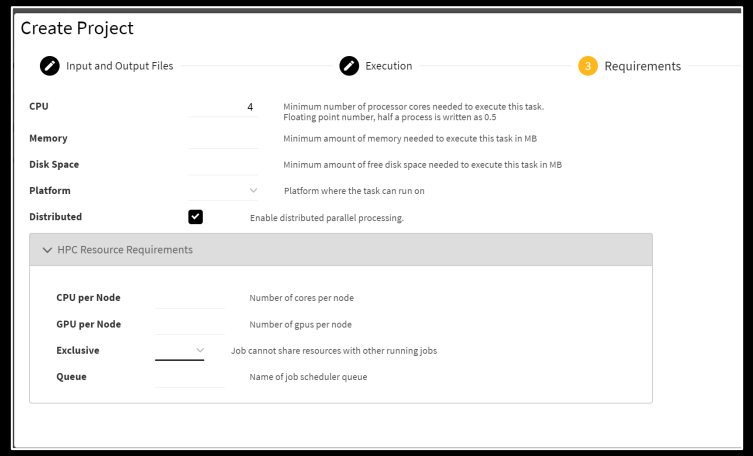
PYTHON

```
class REPJob:...


def submit_job(args, use_exec_script=False) -> REPJob:
    inputfile = args.input_file
    ncpu = args.ncpu
    mem = args.mem
    misc_cmds = args.misc

    log.info("=== Connect to the REP server")
    client = Client(rep_url=REP_URL, username=USERNAME, password=PASSWORD)
    jms_api = JmsApi(client)

    log.info("=== Create an empty project")
```

Potential Use Cases

- Custom workflows (end-to-end)
- Automatic Job Submission

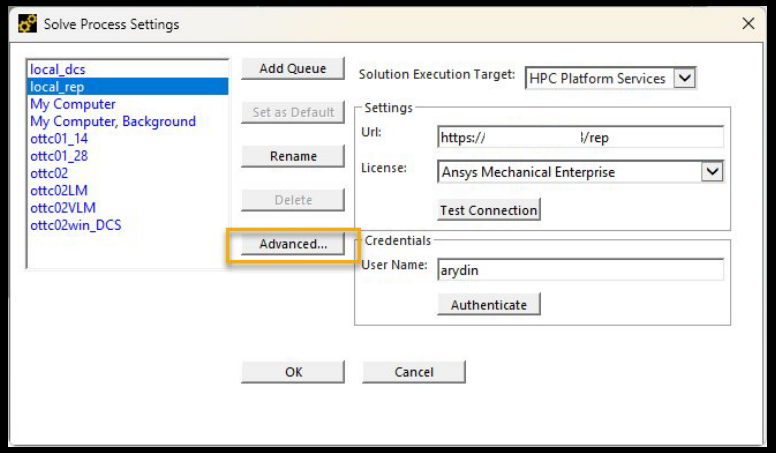
WEB PORTAL



Potential Use Cases

- Manual submissions of jobs
- Monitor projects/simulations

FLAGSHIP SOFTWARE



Potential Use Cases

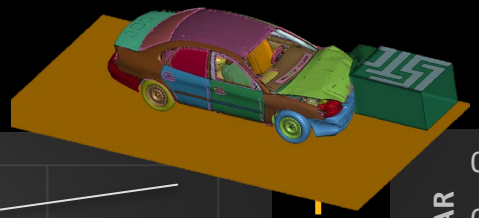
- Solve from Flagship software

Cloud Cost-Performance: Ansys Expertise in Benchmarking and Hardware Recommendations

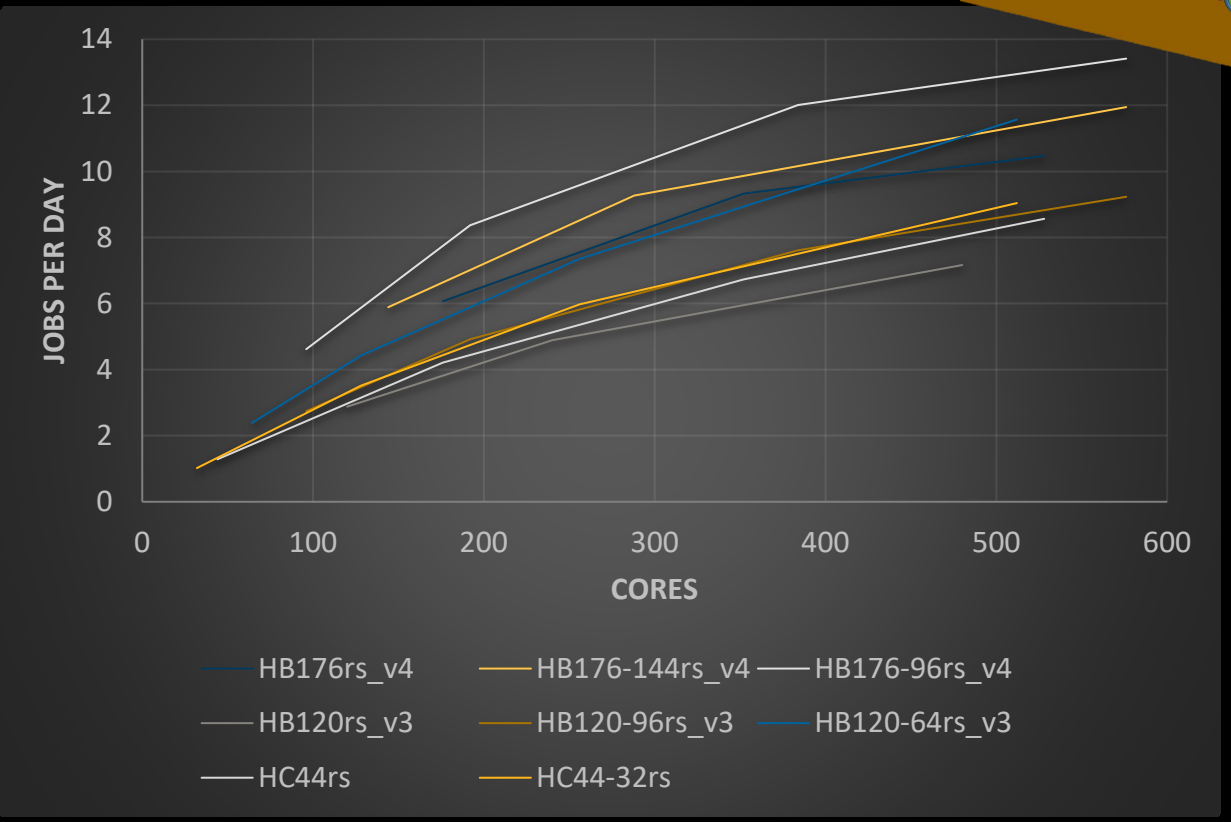
- Achieve higher solver performance, improving the quality and speed of your simulations.
- Identify the most cost-efficient AWS hardware configurations for Ansys applications.
- Benefit from data-driven insights to make informed solver + AWS hardware choices

Ansys LS-DYNA®, Benchmarks

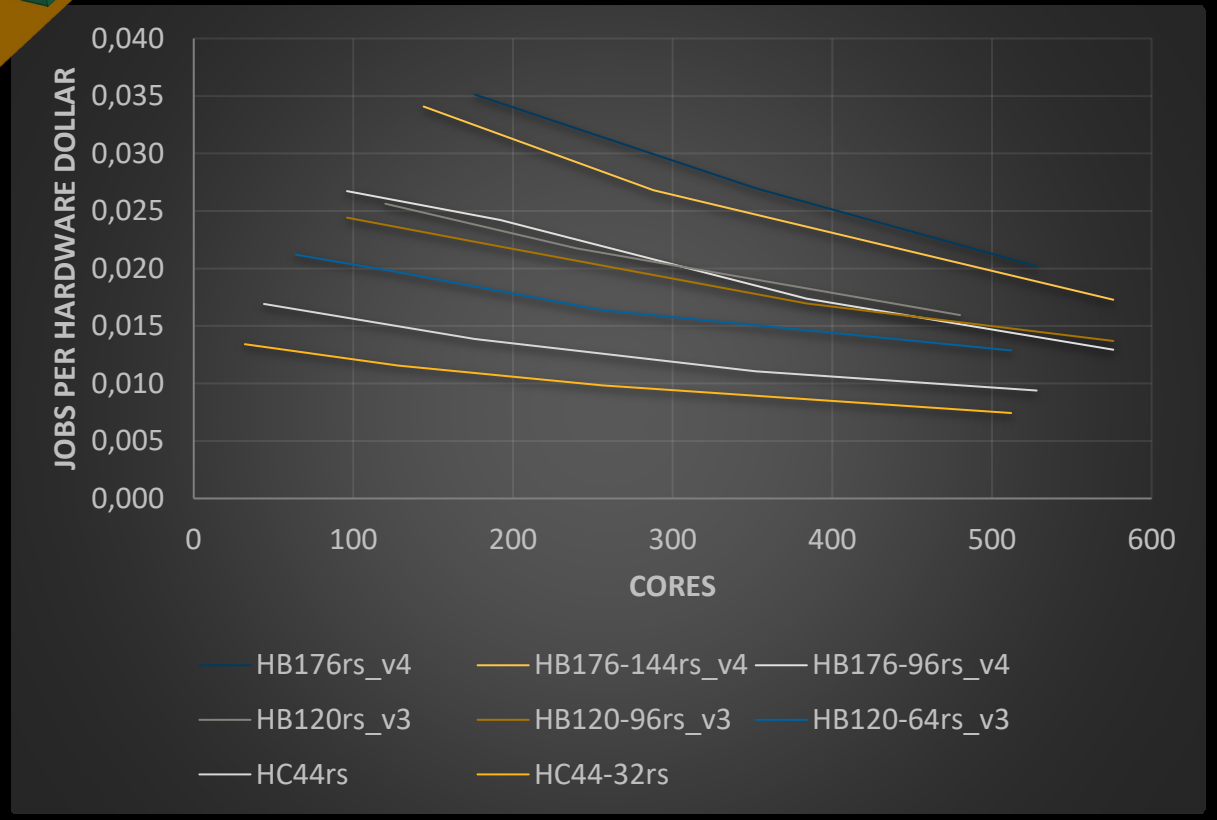
- Version : Ansys 24R1 – LST R14.1.0
- Benchmark Model : Odb 10M



Performance



Value



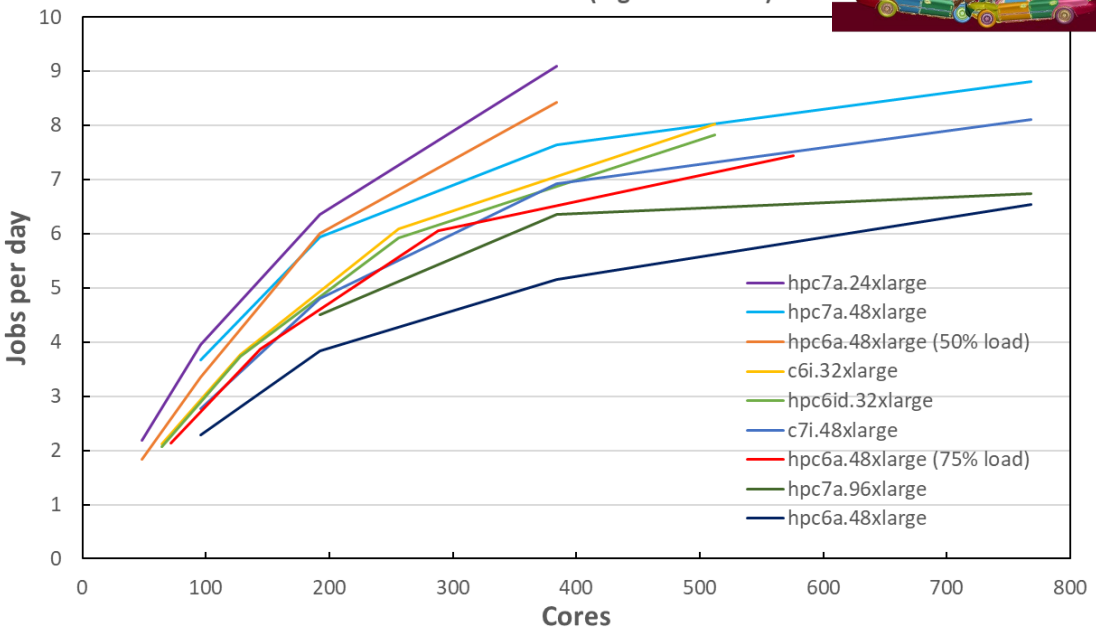
Key Takeaway

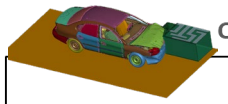
✓ **For best performance per core, consider using :** HB176-96rs_v4

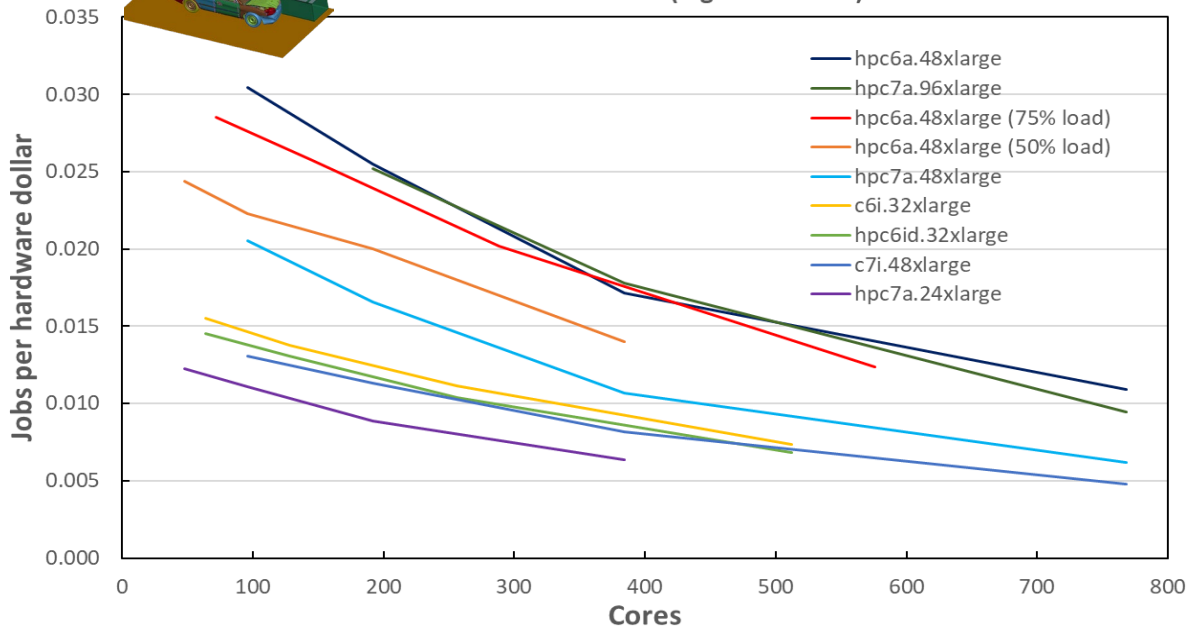
✓ **The best value per core (performance/price) is found with the following instance :** HB176rs_v4

Ansys LS-DYNA performs best on Amazon EC2 hpc6a and hpc7a for the ODB-10m benchmark model

A high price-performance instance provides the greatest computational capacity for every dollar invested







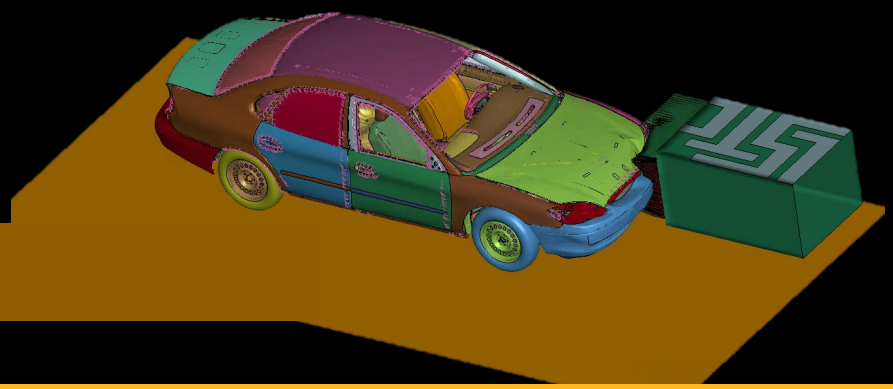
Hpc6a and Hpc7a have the greatest price-performance for the ODB-10M benchmark model. Undersubscribing these instances can improve performance and reduce licensing costs with clusters sized 4 or more nodes.

If Amazon EC2 Hpc6a or Hpc7a is not available in your region, Amazon EC2 C6i and C7i offer good alternatives

Cost Analysis of Benchmark

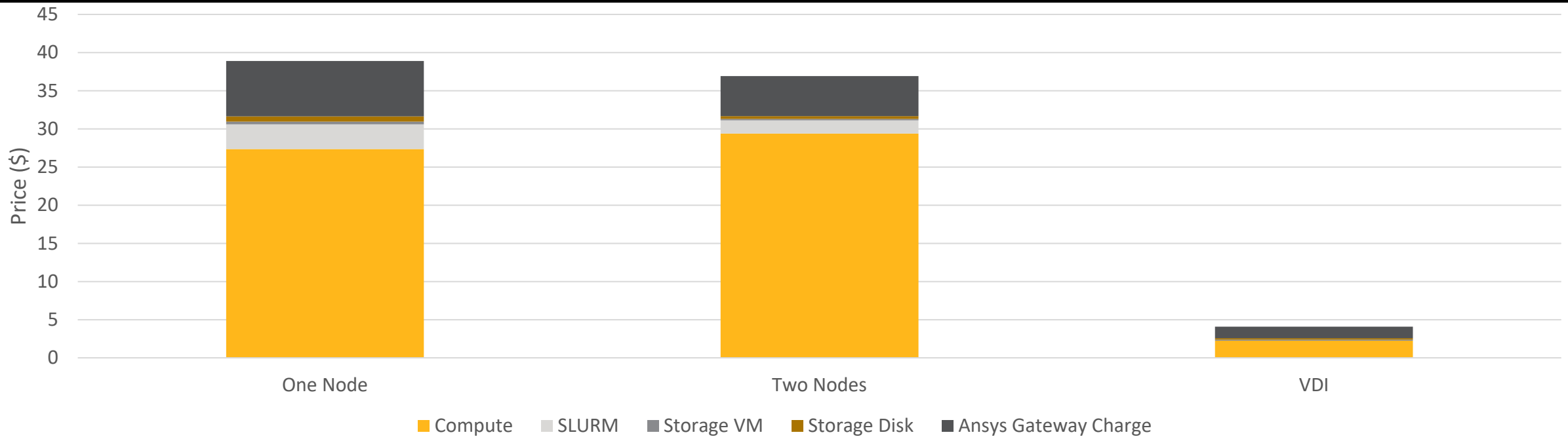
Ansys / GATEWAY

powered by aws



Ansys LS-DYNA ODB 10M, 60ms, AWS EC2 hpc6a

1 NODE = 9.5 hrs	2 NODES = 5.1 hrs	PRE/POST PROCESS
TOTAL Cost $38.89	TOTAL Cost $36.92	TOTAL Cost $4.08



*Example based on US East Server configuration

Ansys

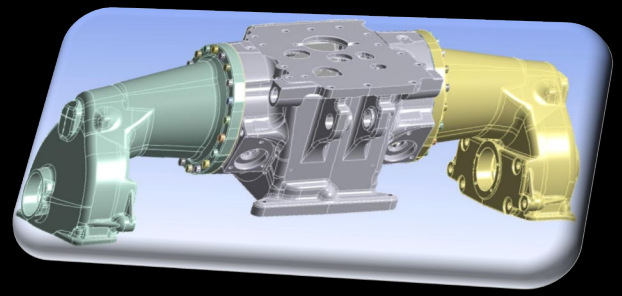
Ansys Mechanical™ Benchmarks

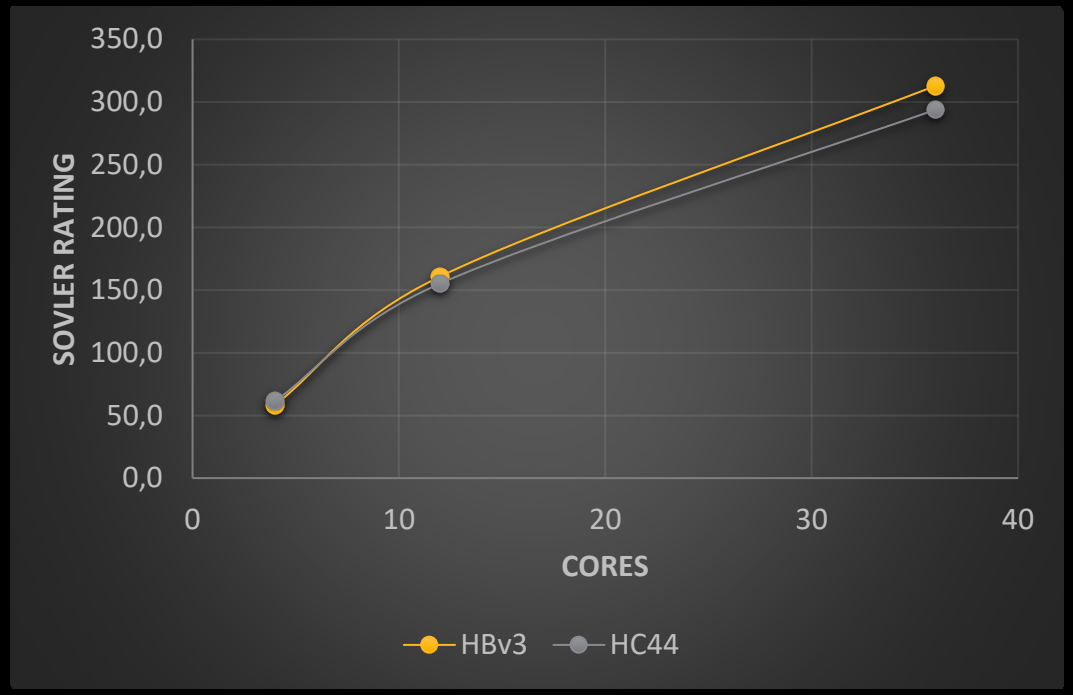
Ansys / ACCESS

Microsoft Azure

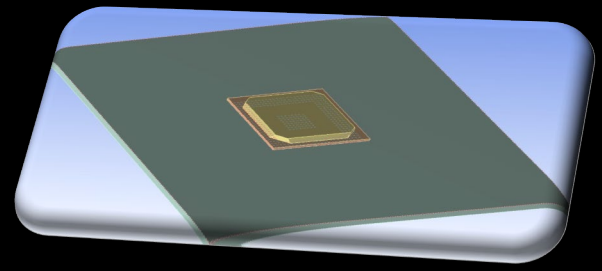
CPUs

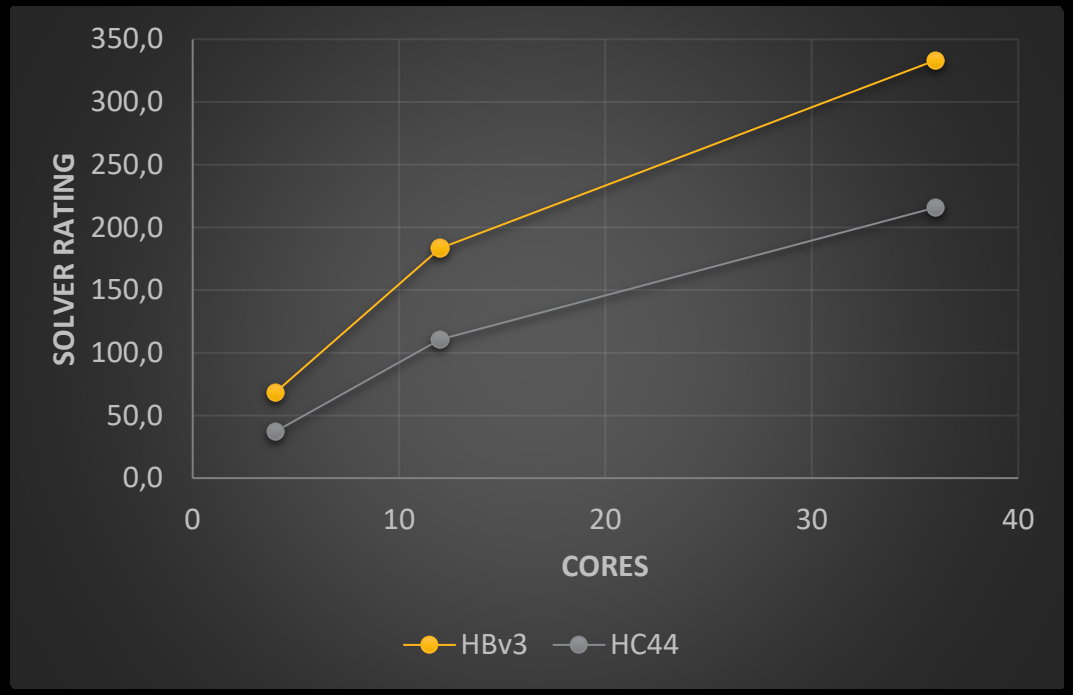
PCG Lanczos eigensolver,symmetric matrix, 25m DOFs, modal, linear, structural analysis requesting 10 modes





Sparse solver, symmetric matrix, 16.1m DOFs, transient, nonlinear, structural analysis with 1 iteration





Increasing Simulation Possibilities

Customers have seen significant benefits*:

/ 17x faster simulations
on cloud versus on premises

/ 2–3x more simulations
run per day

/ 4–5 prototypes
tested simultaneously

/ 26 hours reduced to 1.5 hours
for a single global simulation

*based on one existing customer success – Groupama FDJ

Ansys.com/products/cloud

Innovating Professional Cycling Design on AWS with Équipe cycliste Groupama-FDJ

"A single global simulation would take around 26 hours. Now, on AWS, that same simulation takes just an hour and a half."

/ Victor Simonin

Research and Development Engineer,

Équipe cycliste Groupama-FDJ

Groupama · FDJ ÉQUIPE CYCLISTE

Ansys | aws

How Equipe Cycliste Groupama-FDJ Can Save up to 2 Seconds per Kilometer with Aerodynamic Simulation (youtube.com)

Ansys + Movares : Success Story

*"At Movares we use Ansys Mechanical™ for extensive fatigue calculations on steel bridges, and Ansys LS-Dyna™ for detailed vibration predictions in buildings and constructions. With **Ansys Access on Microsoft Azure™**, we can further explore industry-leading solutions and optimal infrastructure to run our complex, critical calculations in the **most efficient way**. In addition to the **user-friendly setup** environment, the Ansys Elite Channel Partner Infinite and Ansys support teams are **quick to respond and resolve any issues.**"*

Roelof Oppenhuis, Project Manager at Movares Europe.

Book your demo!

Book your demo

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