

# HPC from Desktop to Cloud

## An ISV point of view on deployment models

Wim Slagter, PhD

Director, HPC & cloud alliances

Presentation given at:



# / Many Misconceptions Surround HPC...



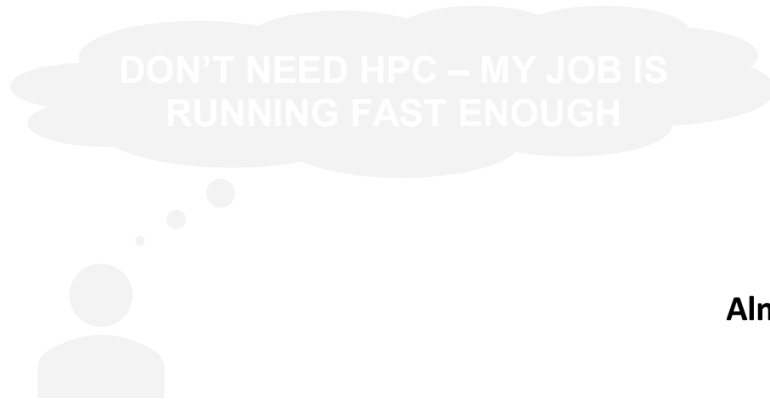
Goal of my presentation:

Dispell 12 common myths on HPC, cloud and licensing

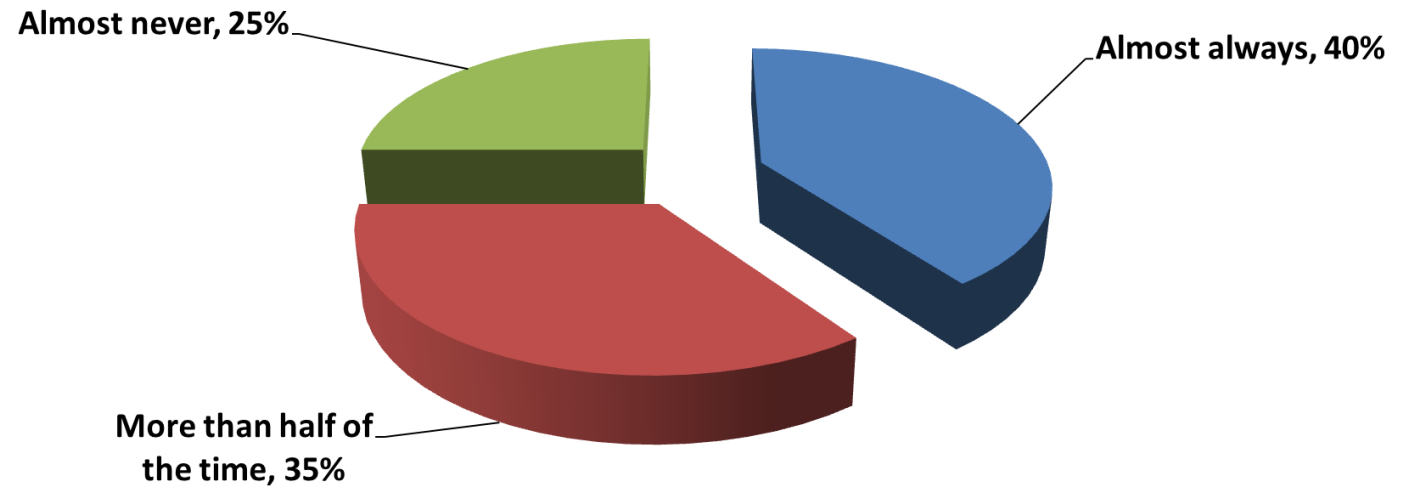
# Myth 1



# Engineers are constrained by compute capacity



**Frequency of limiting the size and amount of detail in simulation models due to turnaround time limitations**



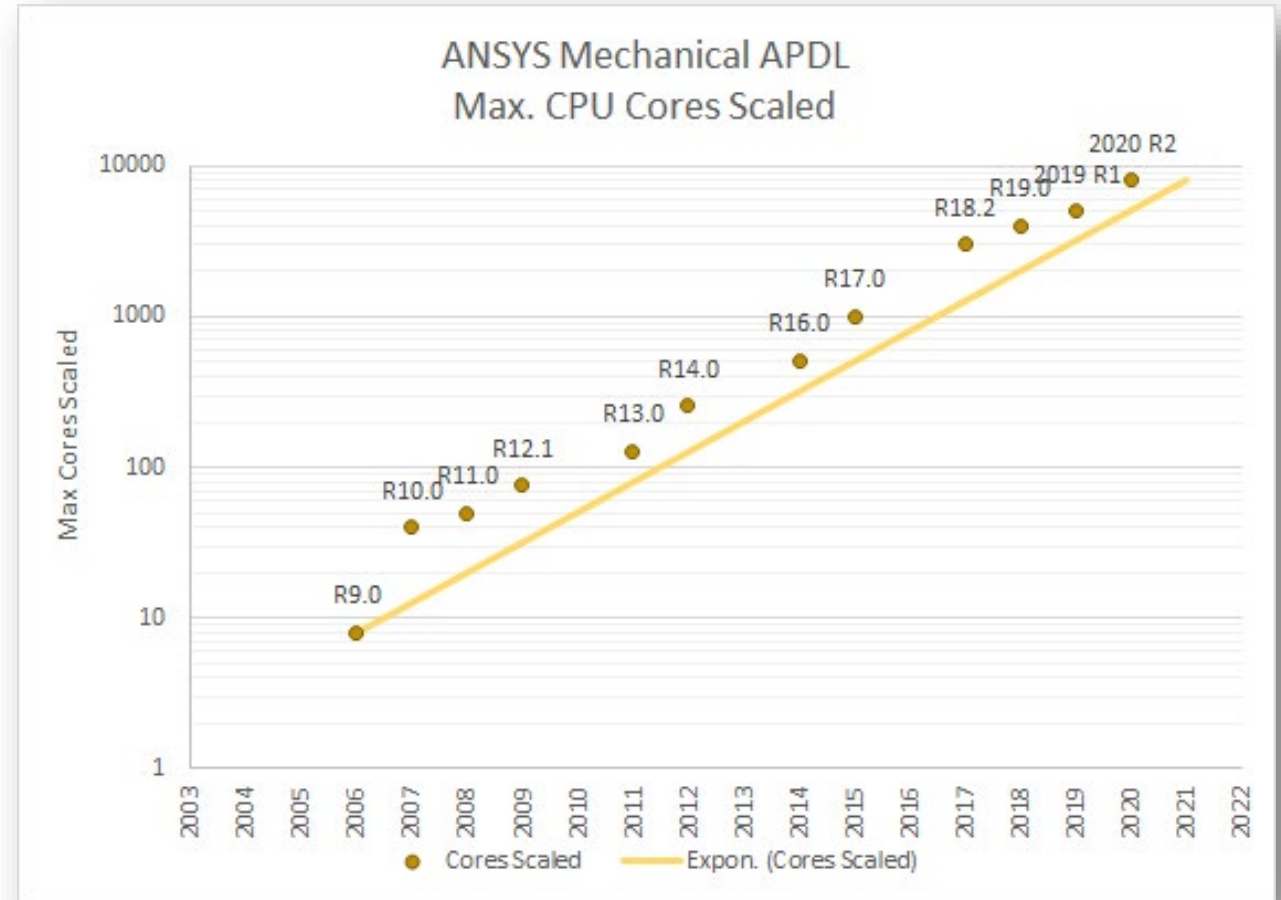
# Myth 2



HPC IS ONLY USEFUL FOR CFD  
SIMULATIONS

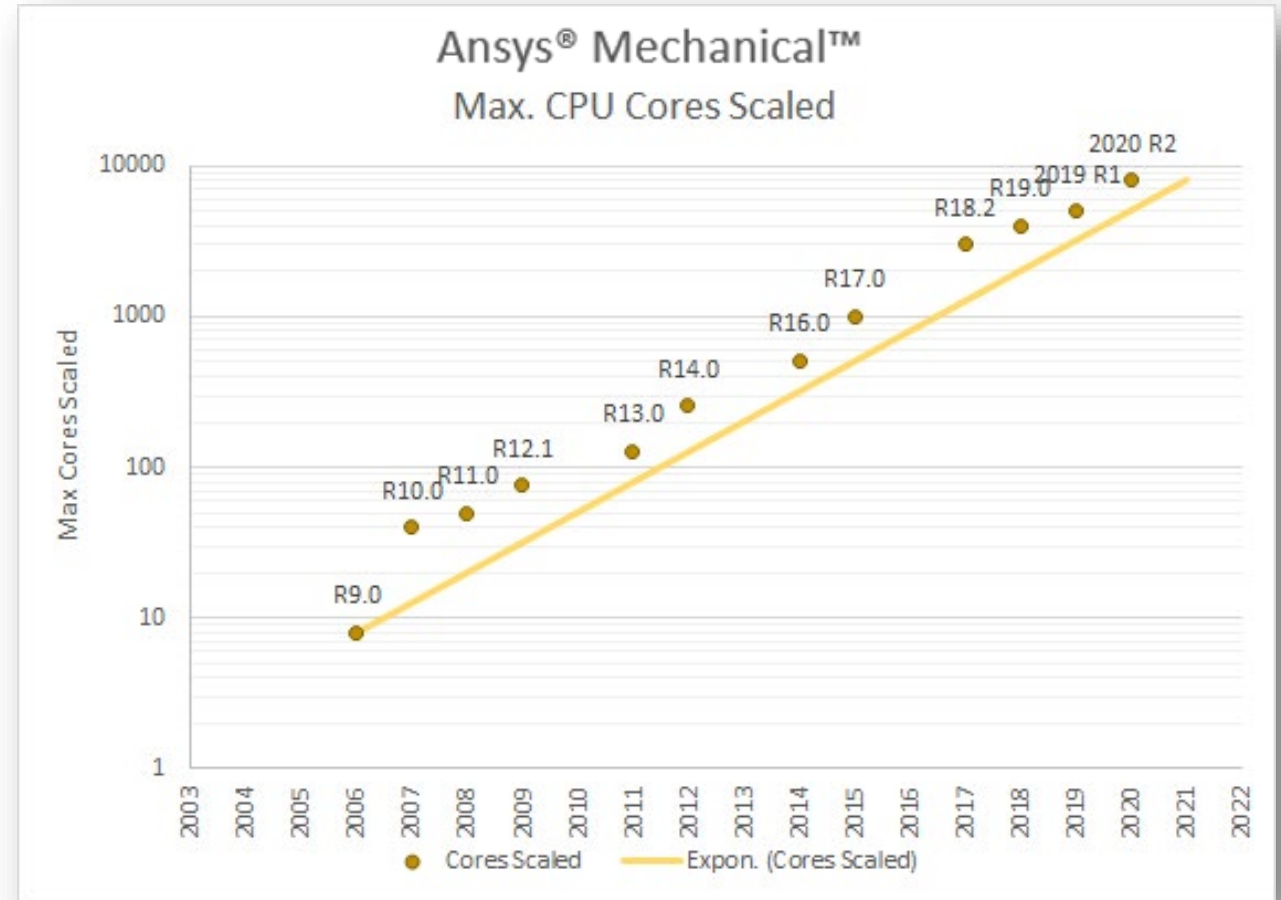
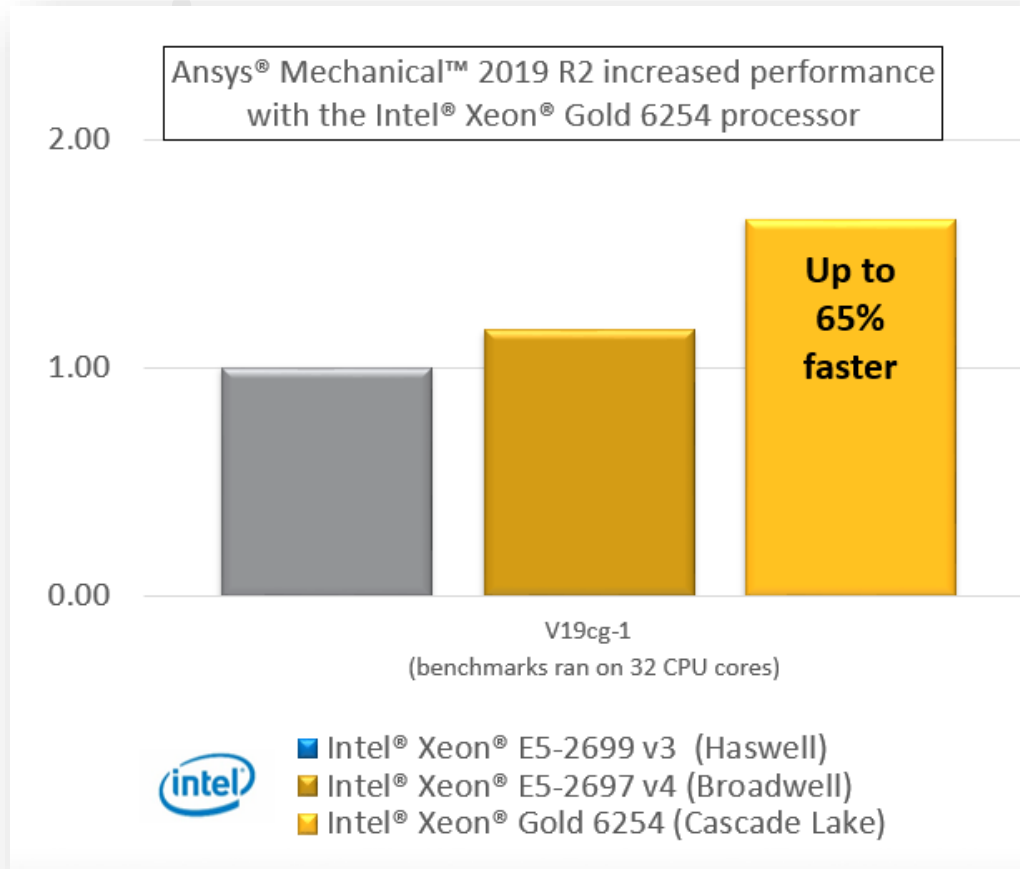
# Performance Improvements Release by Release

HPC IS ONLY USEFUL FOR CFD SIMULATIONS



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HPC IS ONLY USEFUL FOR CFD SIMULATIONS

WHITE PAPER

Computer-Aided Engineering  
ANSYS® Mechanical™ on Intel® Xeon® Processors



## Engineer Productivity Boosted by Higher-Core CPUs

Engineers can be significantly more productive when runs on CPUs with a high core count.

**Executive Summary**  
In an effort to save costs, some engineer with a small number of cores or select of cores processing in only two cores. At the same time, processor manufacturers continue to push core efficiency of ANSYS Mechanical has developments, new silicon to dramatically mechanical, making systems with higher takes advantage of those cores—enormous savings in the long run.

**Abstract**  
This Dell EMC technical white paper discusses performance benchmarking results and analysis for ANSYS® CAD, Fluent®, and Mechanical™ on the Dell EMC Ready Solution for HPC Digital Manufacturing.



## Dell EMC Ready Solution for HPC Digital Manufacturing—ANSYS® Performance

BENCHMARKING Report No. 2 in a Series

## FOCUS ON FASTER Mechanical Simulation

Studies show you can slash the time spent on simulation runs by 6x when you upgrade to the latest workstation technology and software.



## Beyond the desktop

Leveraging high-performance computing to turbocharge engineering productivity

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[www.ansys.com/hpc-partners](http://www.ansys.com/hpc-partners)

## ANSYS Mechanical APDL Max. CPU Cores Scaled





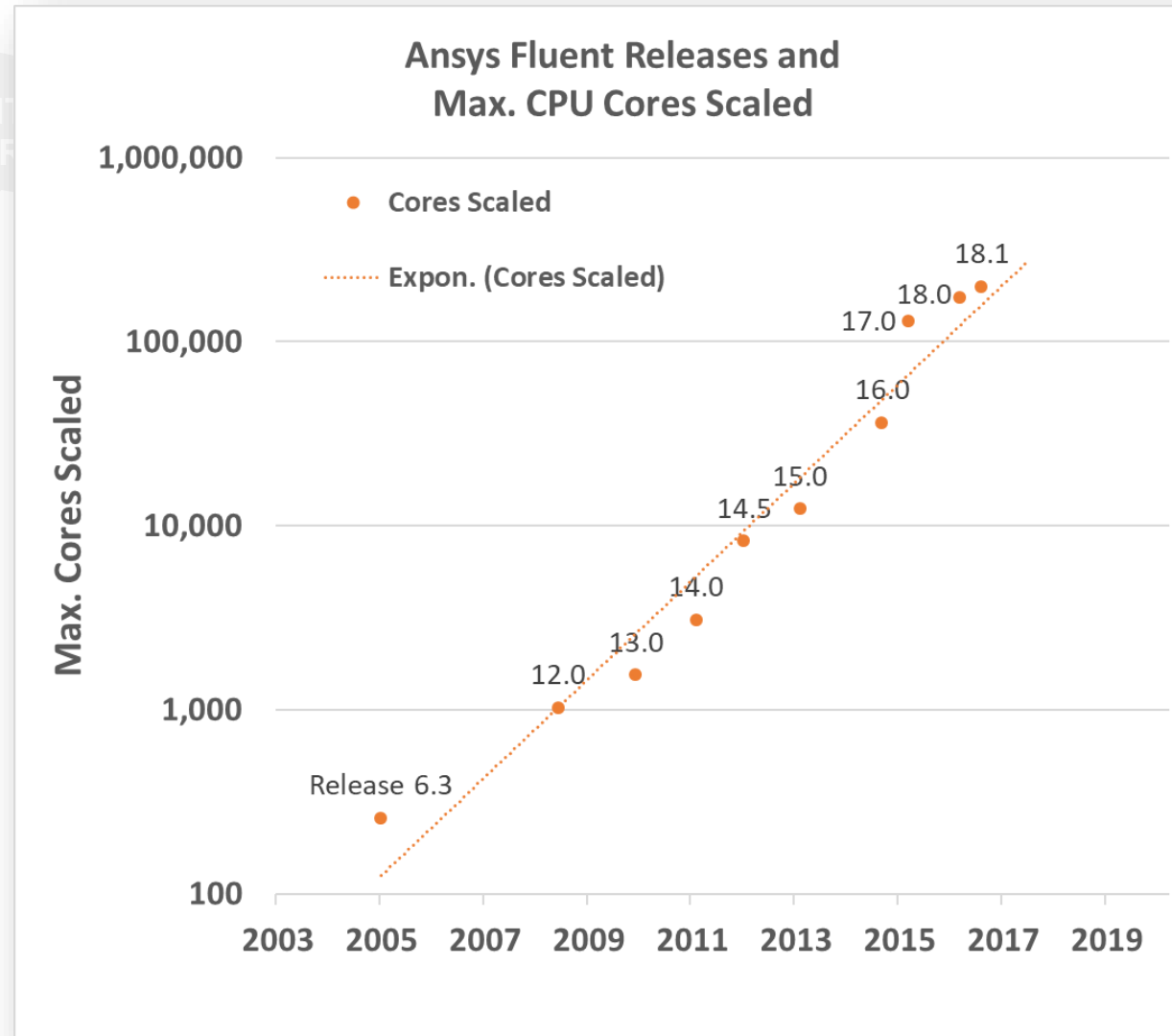
# / Myth 3



PARALLEL SCALABILITY IS ALL ABOUT THE SAME, RIGHT?

# Intense Focus on HPC Software Development

PARALLEL SCALABILITY  
ABOUT THE SAME, F



# Intense Focus on HPC Software Development

## HLRS – ANSYS Collaboration

- ANSYS, HLRS and Cray partnership achieves to set a new record (2015-2016)
- ANSYS Fluent is scaled to over 172,000 cores on the HLRS system
- 5x increase over the record set two years ago when it was 35,000 cores

*"This breakthrough in commercial software technology leverages the full capabilities of our high performance computing infrastructure."*

Prof. Michael M. Resch, Head of HLRS

The work leading to this result was supported within the framework of the Collaborative Project "High Performance Computing" of the Bundesministerium für Bildung und Forschung (BMBF) and the state of Baden-Württemberg.

H L R I S 

## ANSYS, Saudi Aramco and KAUST Shatter Supercomputing Record



Record exceeded by over 5x -- enabling oil and gas organizations to make critical and cost-effective decisions faster

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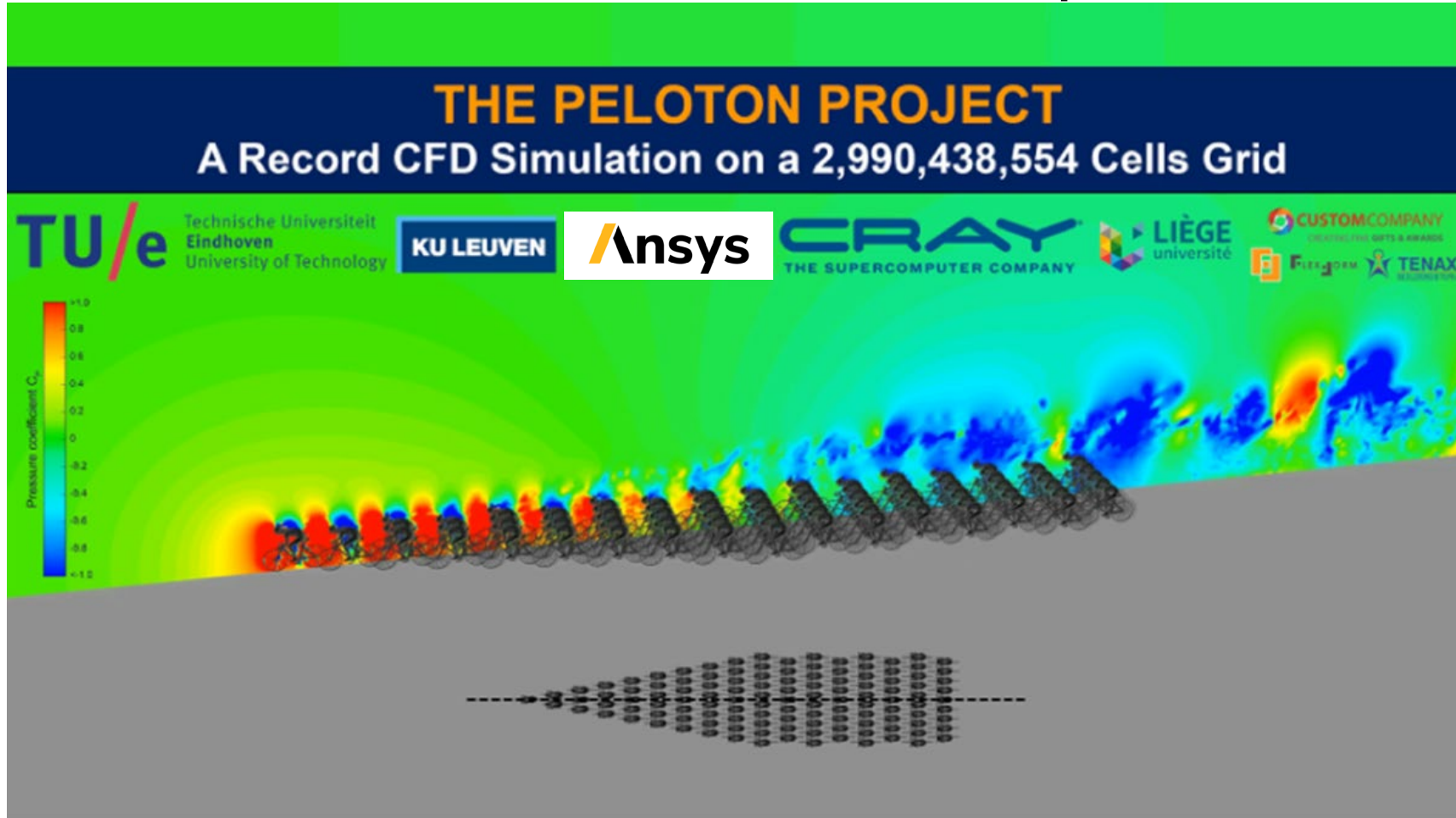
Jul 18, 2017, 07:10 ET

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PITTSBURGH, July 18, 2017 /PRNewswire/ -- ANSYS (NASDAQ: ANSS), Saudi Aramco and King Abdullah University of Science and Technology (KAUST) have set a new supercomputing milestone by scaling ANSYS® Fluent® to nearly **200,000 processor cores** - enabling organizations to make critical and cost-effective decisions faster and increase the overall efficiency of oil and gas production facilities.

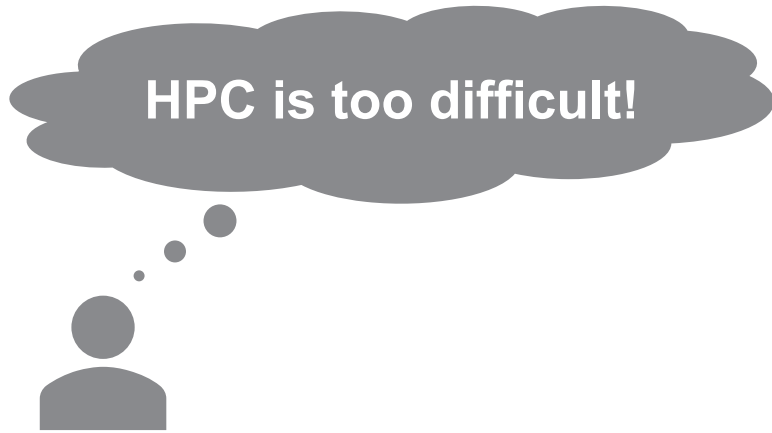
# Intense Focus on HPC Software Development



While biking at the core of the peloton, the drag, or air resistance, is **20 times less** than for an isolated cyclist.

Courtesy Prof. Dr. Ir. Bert Blocken

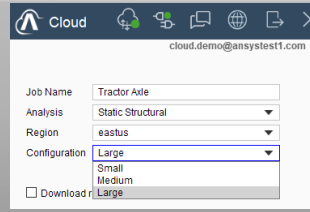
# Myth 4



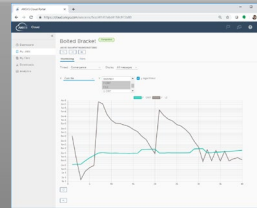
# ANSYS Cloud

HPC as easy as it should be

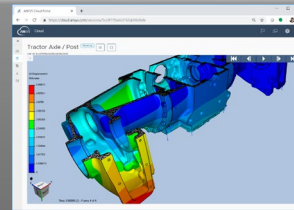
Submit to cloud directly from desktop



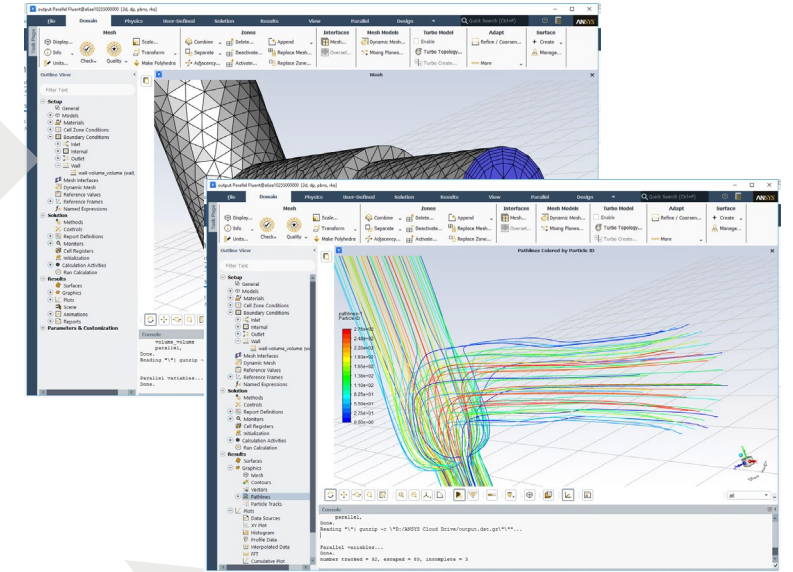
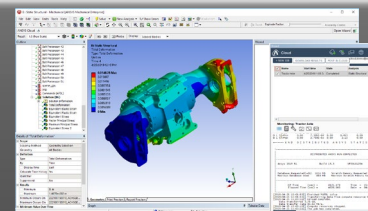
Monitor from app or cloud portal



Visualize results in the cloud



Download to workstation



Newly added!  
VDI option for interactive cloud-based workflows

# / Myth 5



# / Cloud Solutions

CLOUD DEPLOYMENT IS  
UNDOABLE WITHOUT IT

## *Ansys Cloud*



- ✓ Easy access to on-demand HPC on Azure from within Fluent, Mechanical, Electronics Desktop
- ✓ HPC configurations tuned for Ansys simulation
- ✓ Backed by Ansys Customer Excellence support team

[www.ansys.com/cloud](http://www.ansys.com/cloud)



# Cloud Solutions

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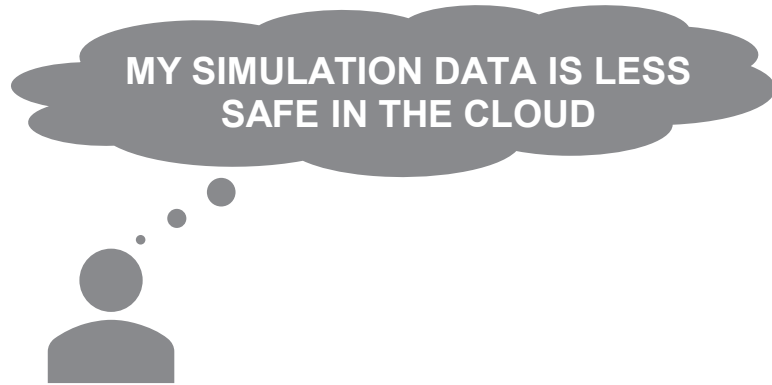
## *Partner Managed Cloud*



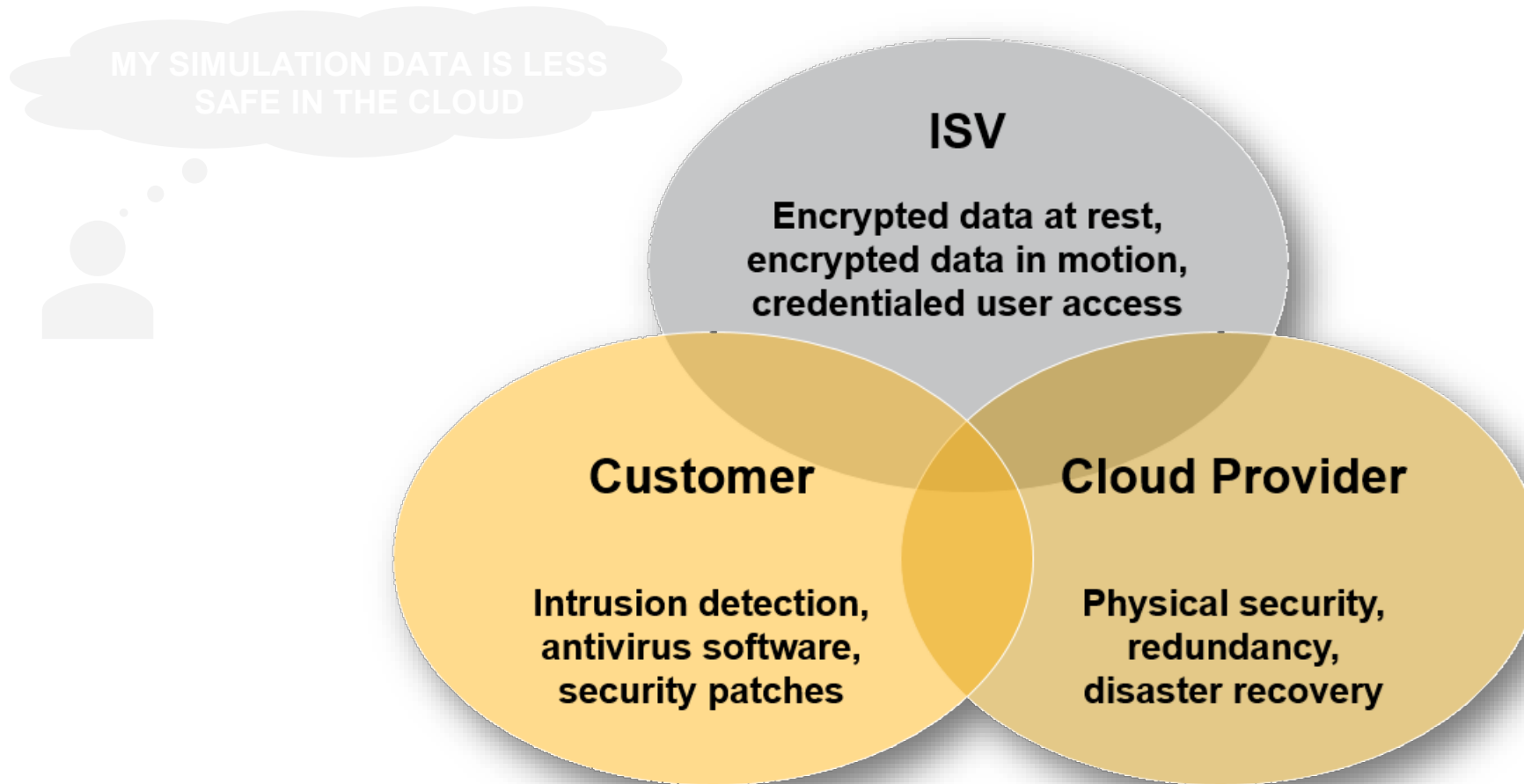
- ✓ Meet unique custom hosting requirements (incl. ITAR)
- ✓ Usually backed by containerized resources with no shared tenancy
- ✓ Have custom workflows and tools from multiple ISVs

[www.ansys.com/cloud-partners](http://www.ansys.com/cloud-partners)

# / Myth 6

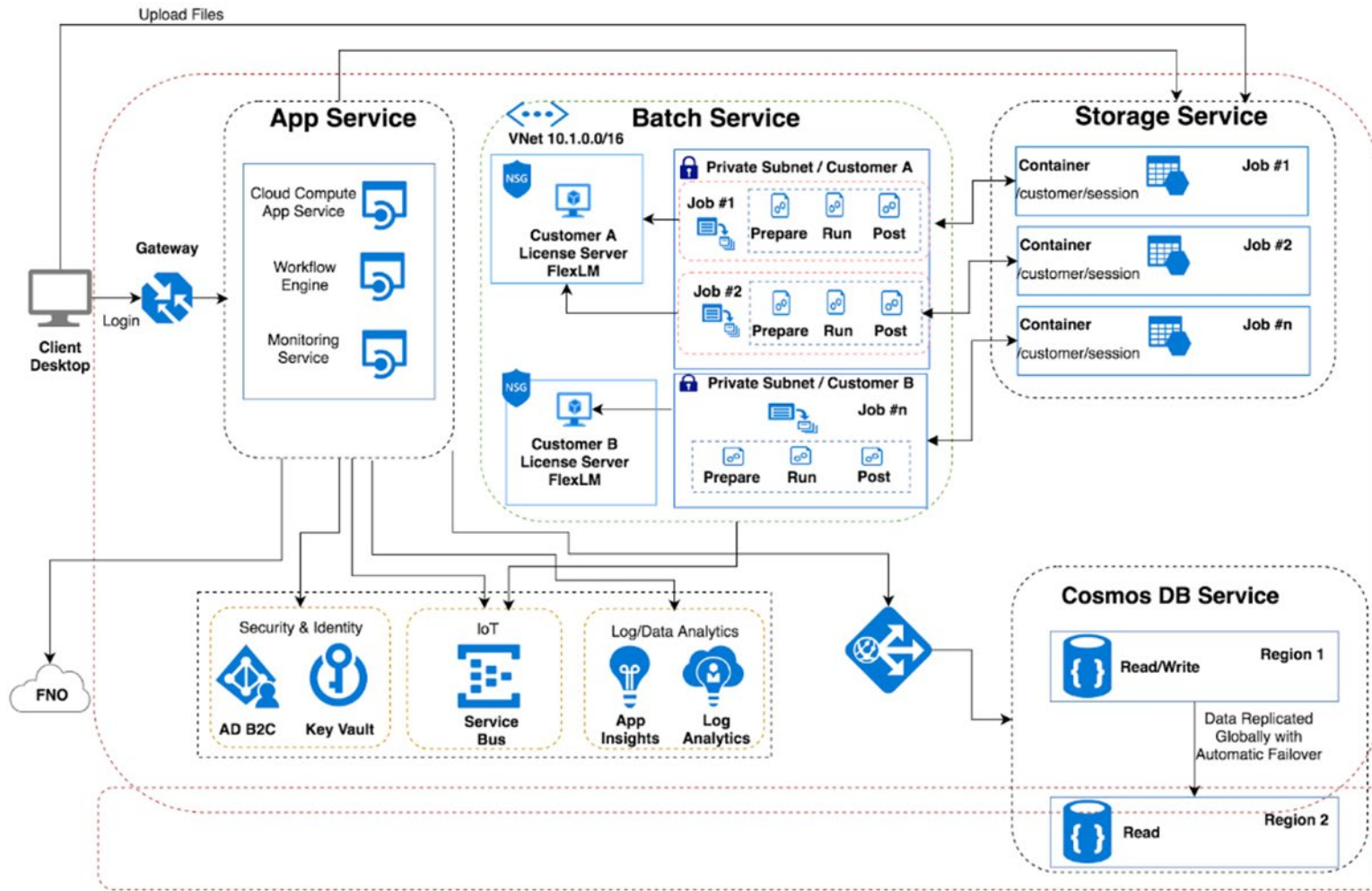


# Cloud Security – Divided Responsibility



# ANSYS Cloud

## SOA model based on Azure services and designed for maximum security



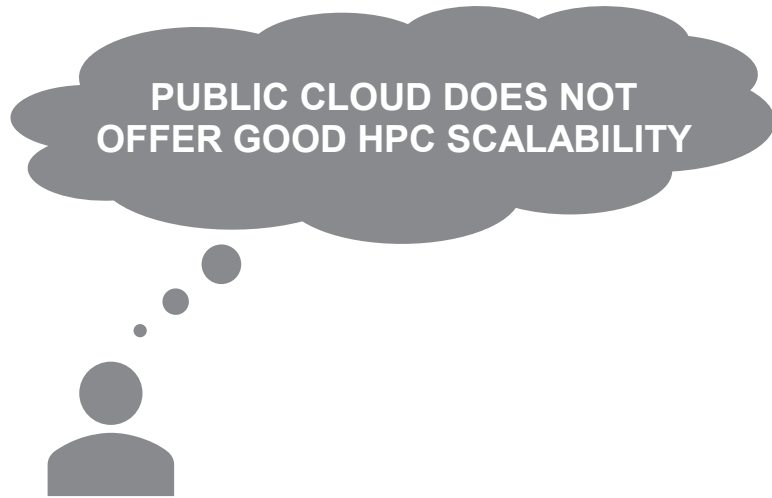
### Investments in security

- ✓ Developed with Azure experts using Azure best-in-class services
- ✓ Regular penetration testing performed
- ✓ Third party threat modeling assessment performed
- ✓ SOC 2 audit in progress



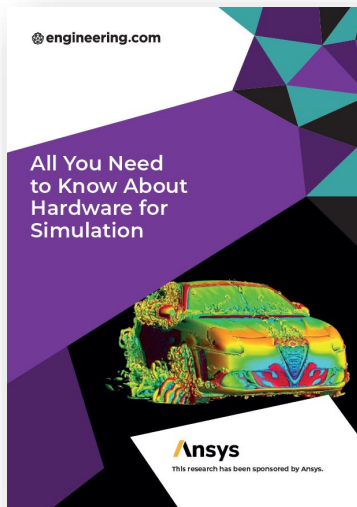
[www.ansys.com/cloud](http://www.ansys.com/cloud)

# Myth 7

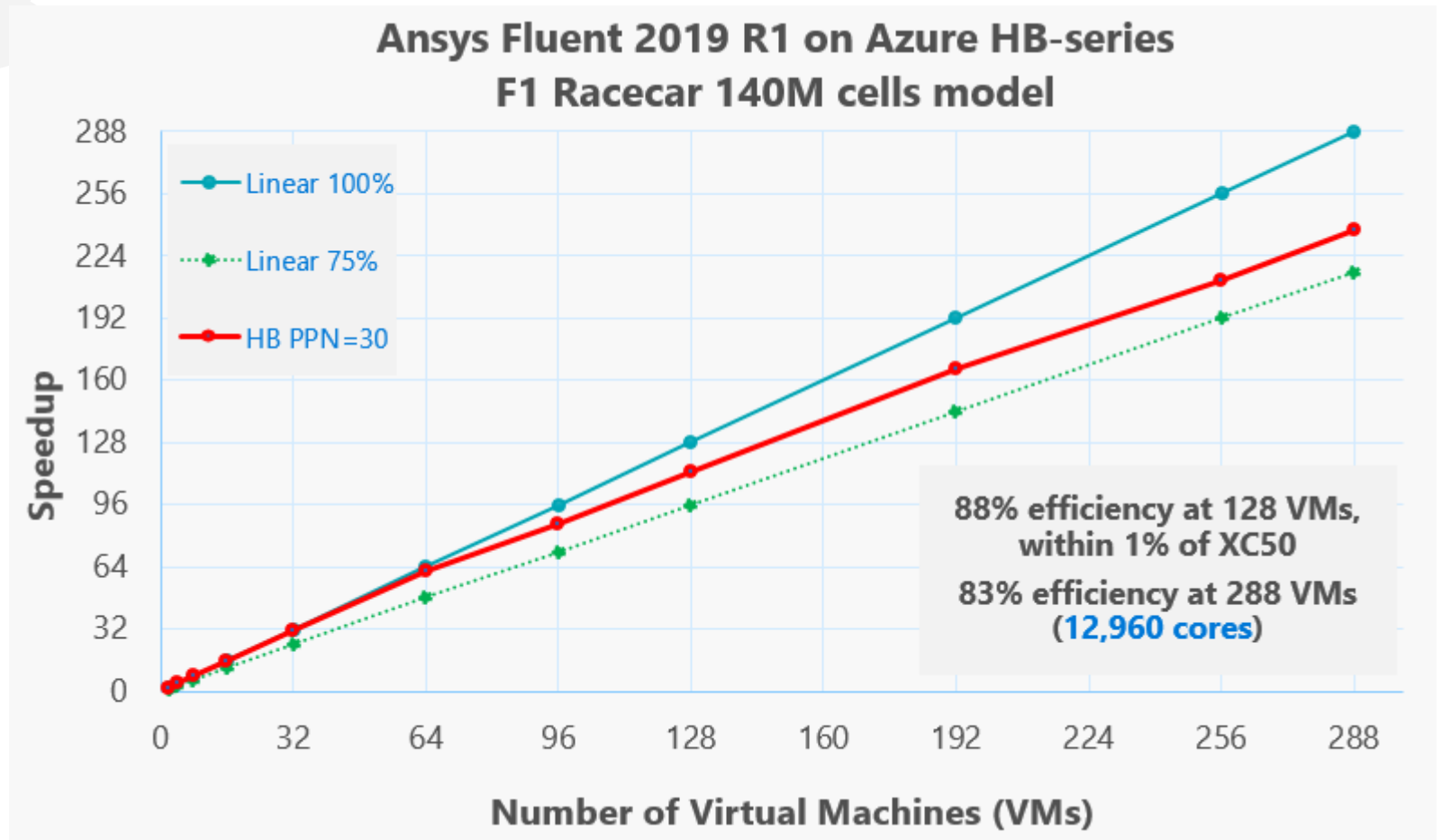


# Scalability on Azure Cloud

PUBLIC CLOUD DOES NOT OFFER GOOD HPC SCALABILITY



www.engineering.com



# Myth 8

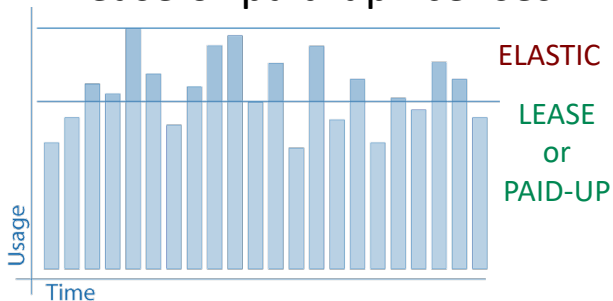


# Elastic Licensing

WE CANNOT PAY FOR WHAT WE USE

**Pay-per-use solution that enables usage-based licensing of virtually every Ansys product through a single license product, Ansys Elastic Units Pack**

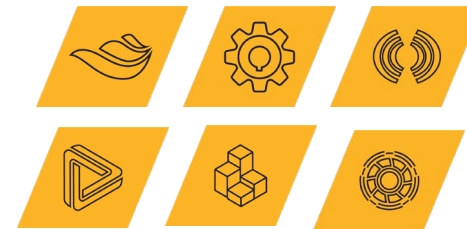
**Complementary to your lease or paid-up licenses**



**Use it Anywhere on-premise or in the cloud!**



**Use it Across ALL+ Ansys Products!**



**Use it for pay-per-use hardware**

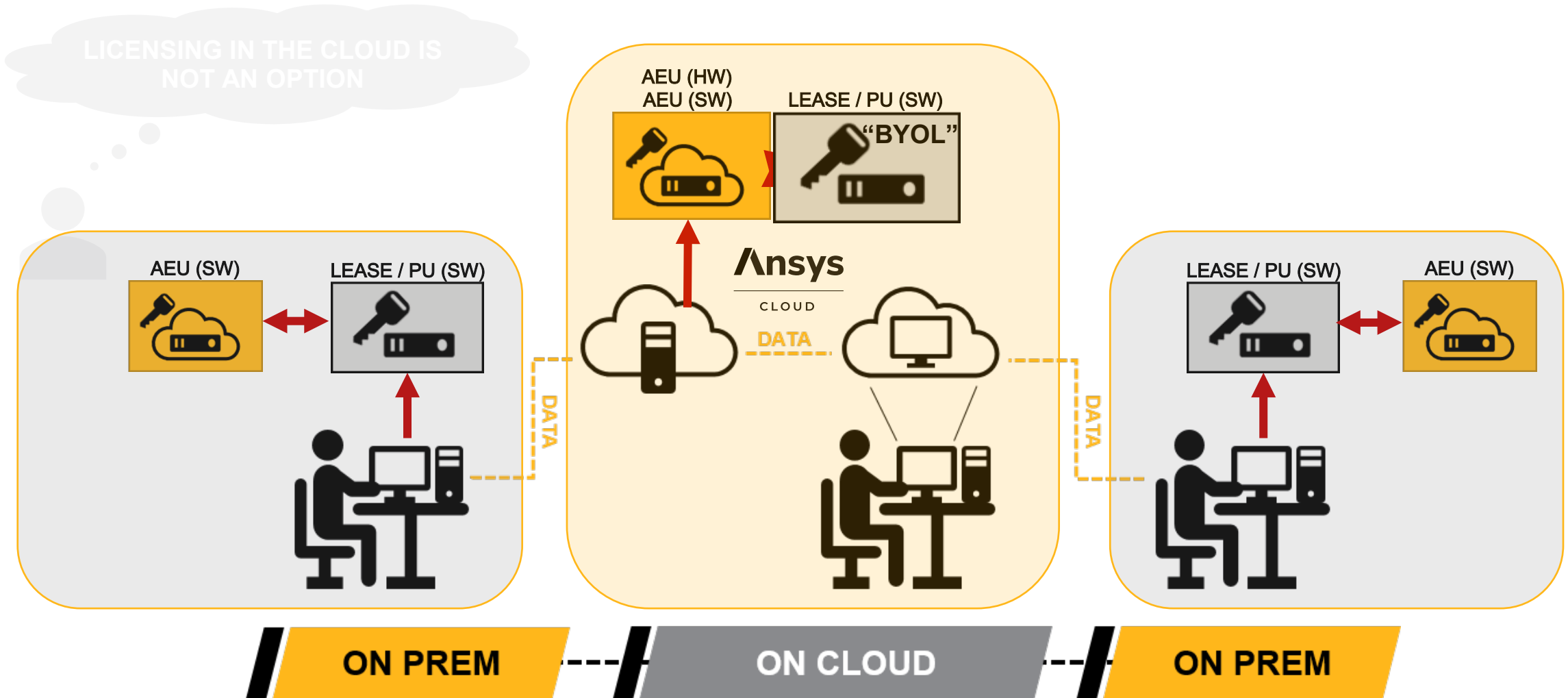




# Myth 9



# Licensing Options for Cloud Computing



[www.ansys.com/cloud-licensing](http://www.ansys.com/cloud-licensing)

# / Myth 10






# Competitive Cloud Pricing



## TCO/Performance Comparison

(source: Microsoft)

	On-premises	Cloud
	<p>Dell PowerEdge R740</p>  <p>HPE ProLiant DL380</p> 	<p>Azure HBv2</p> 
TCO (5 yrs.)	~ \$ 50 000	~ \$ 50 000
Performance	1x	1.4-2.2x

# / Myth 11



CLOUD ISN'T A VIABLE OPTION  
IF WE DON'T SAVE MONEY

# / Look Beyond Potential Cost Saving Benefits

CLOUD ISN'T A VIABLE OPTION  
IF WE DON'T SAVE MONEY



*"LPI, Inc. provides advanced engineering services to a wide range of industries and our team is often tasked with creating sophisticated, non-linear structural models that are computationally intense. Ansys Cloud provides us the flexibility to take on projects with compressed timetables and complicated models that would be otherwise impossible."*

*Evan Schickel, Senior Engineer*

# / Myth 12



MUST USE CLOUD FOR EVERY  
SIMULATION PROJECT

# Step-by-Step Approach to Adoption

MUST USE CLOUD FOR EVERY  
SIMULATION PROJECT



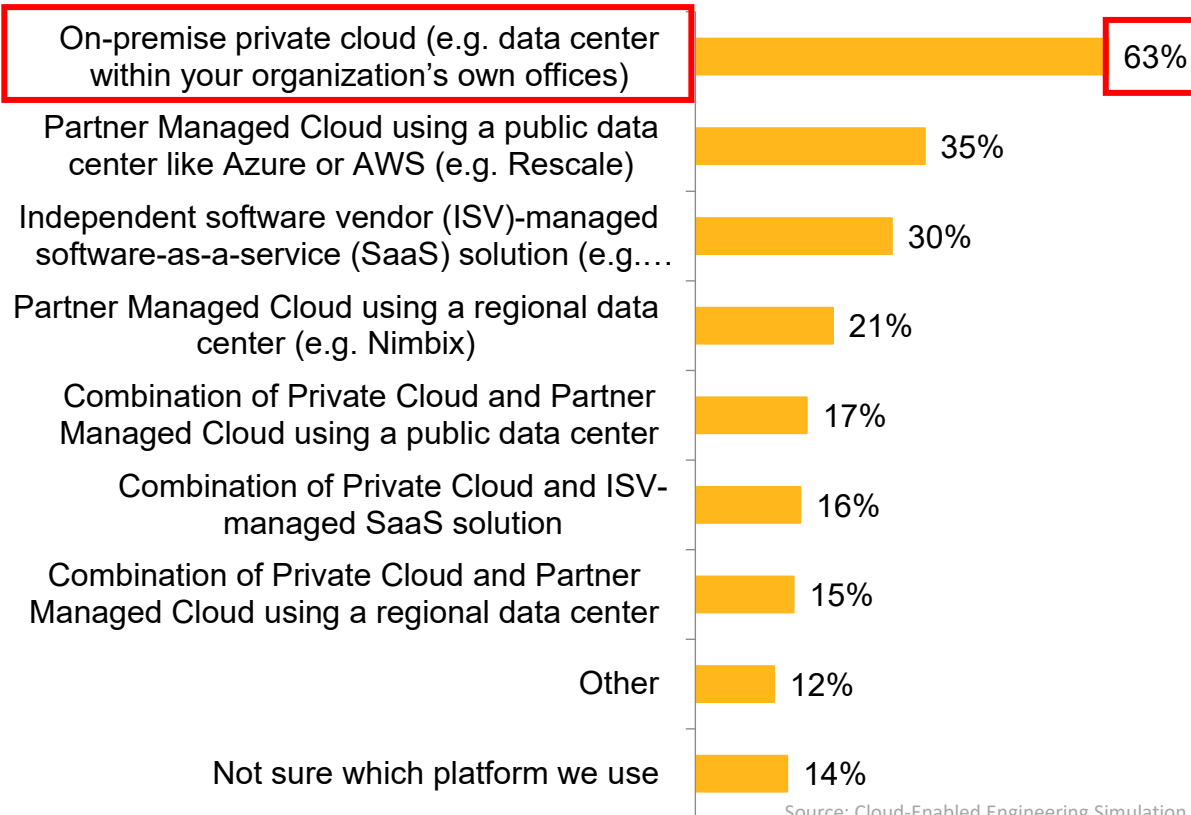


# Today, on-premise is the primary deployment model



## What cloud platform is your company considering for engineering simulation?

### NOW



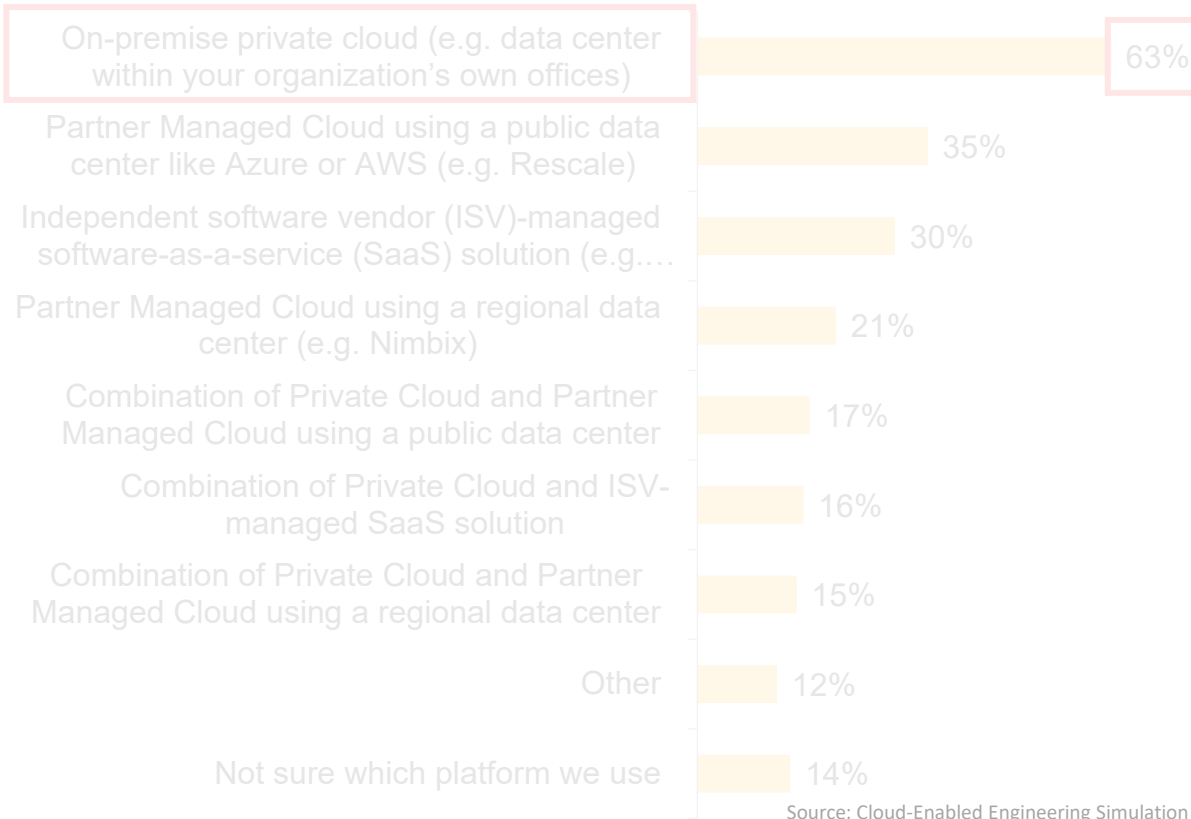
Source: Cloud-Enabled Engineering Simulation Study conducted by Digital Engineering in 2019 on behalf of Ansys.

# Tomorrow, ISV-managed SaaS solutions will be preferred

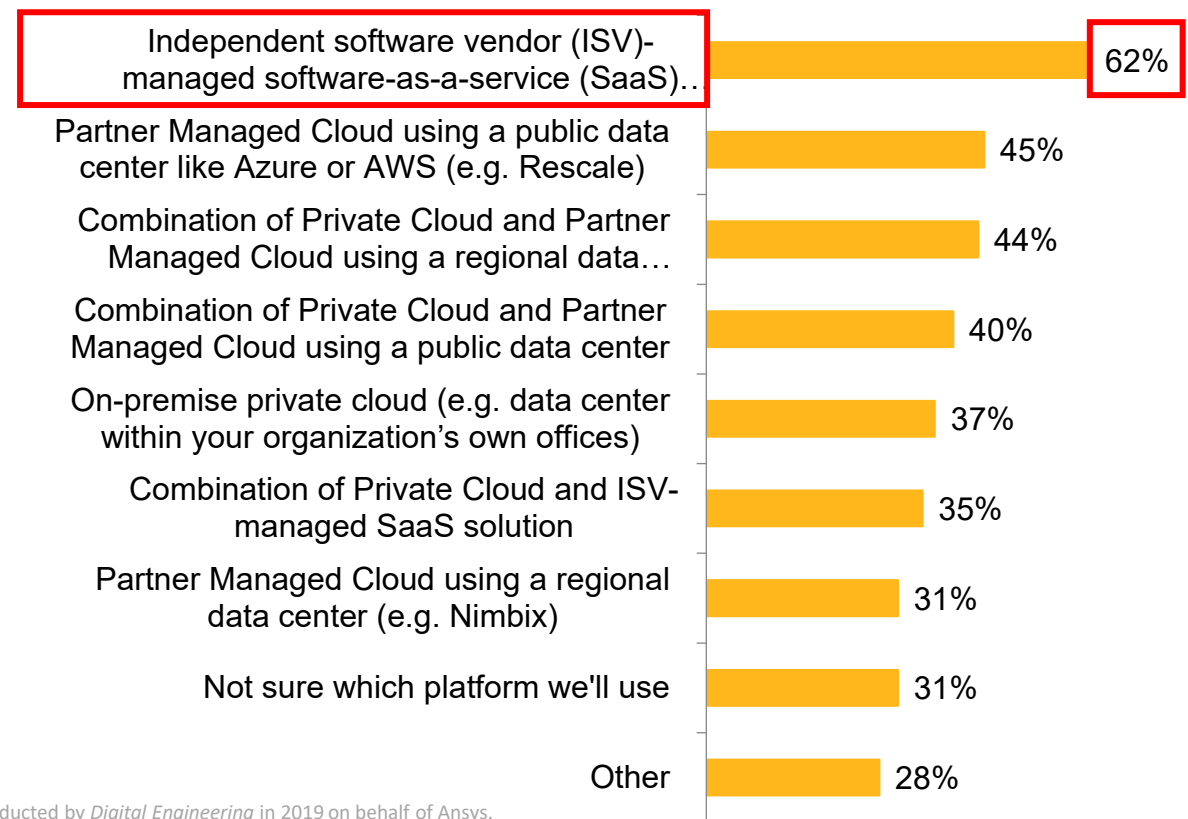


## What cloud platform is your company considering for engineering simulation?

### NOW



### IN 12 MONTHS



Source: Cloud-Enabled Engineering Simulation Study conducted by Digital Engineering in 2019 on behalf of Ansys.

THANK YOU!

 **Ansys**

