Simcenter 3D

Release Highlights

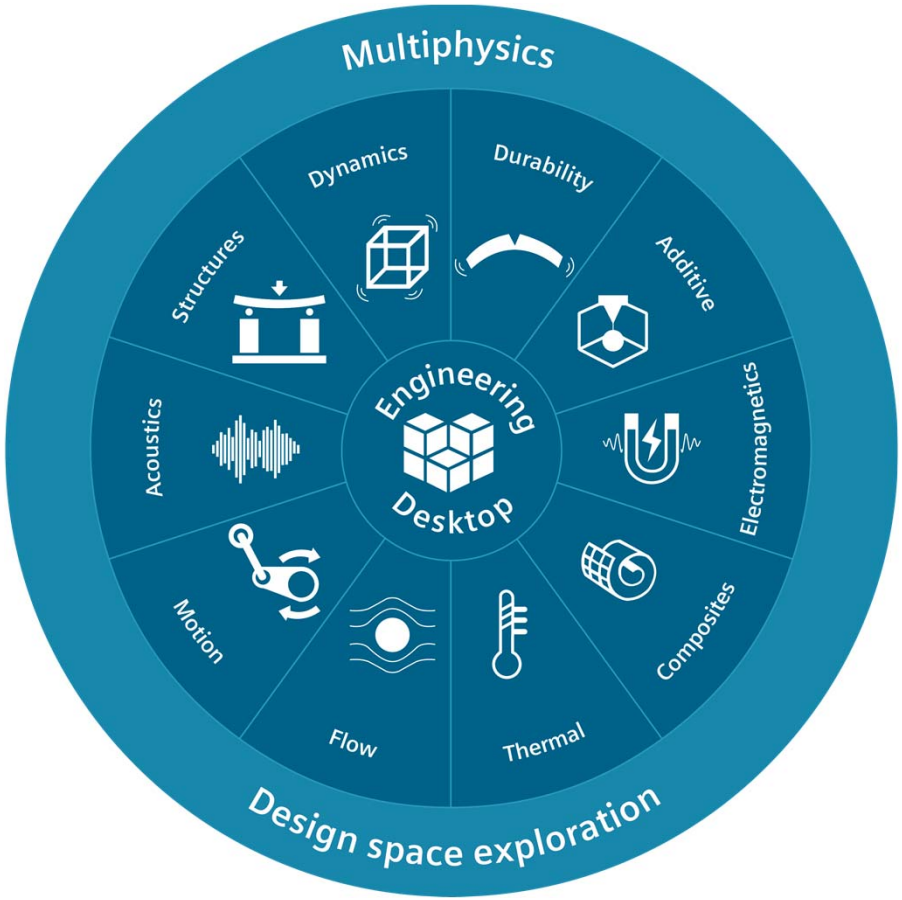
2019.2

Realize innovation.

3D CAE for the digital twin

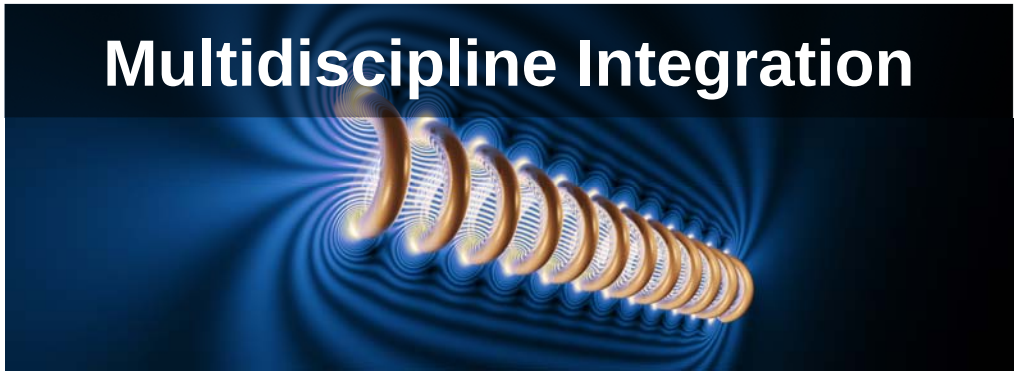
SIEMENS
Ingenuity for life

Simcenter 3D



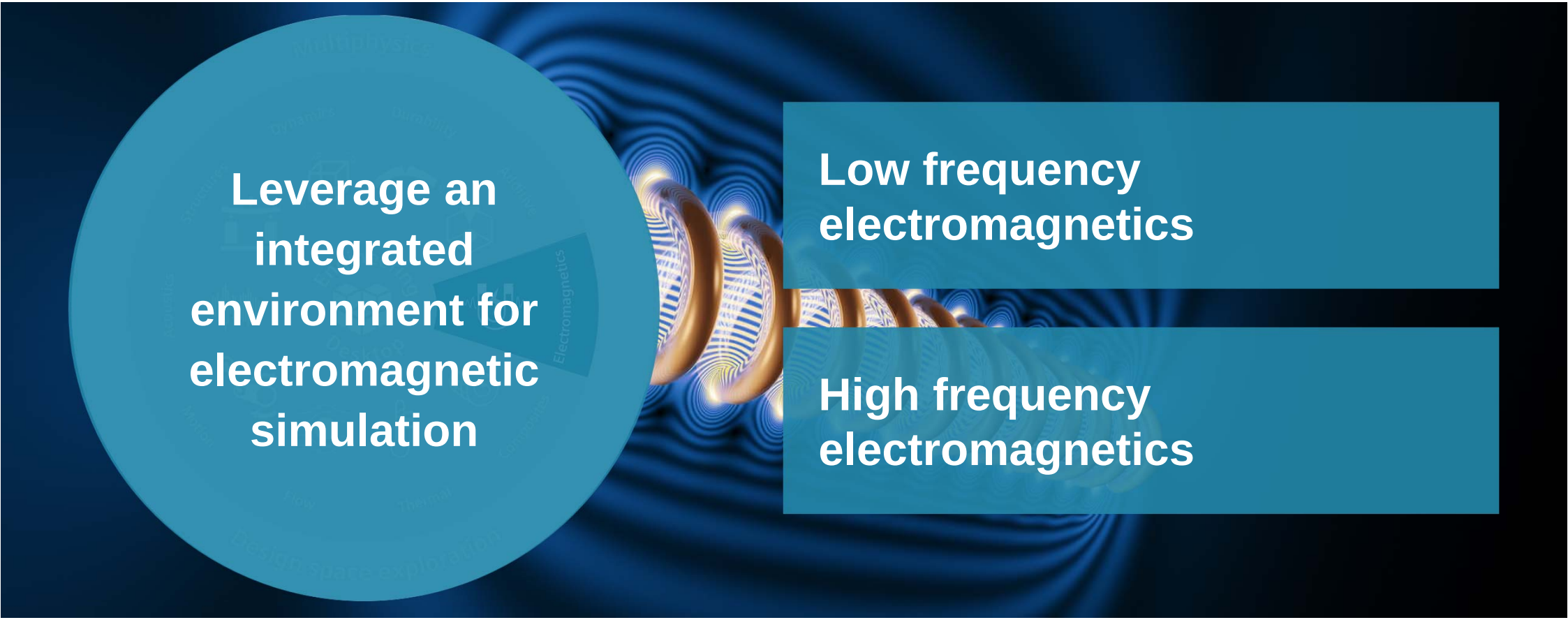
Simcenter 3D
Themes for 2019.2

SIEMENS
Ingenuity for life



Multidiscipline integration

SIEMENS
Ingenuity for life



Simcenter 3D Electromagnetics
Applications

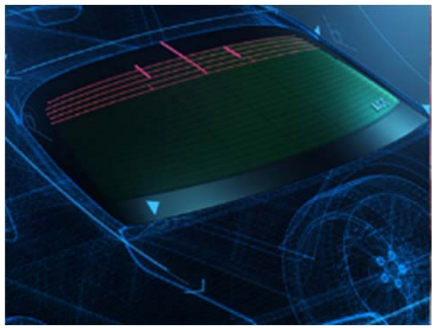
SIEMENS
Ingenuity for life

Electric and Electromechanical Devices

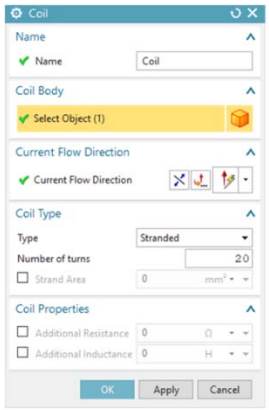


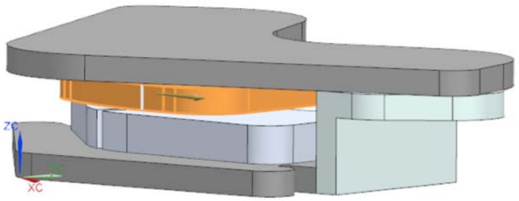

Compatibility and Interference (EMC/EMI)

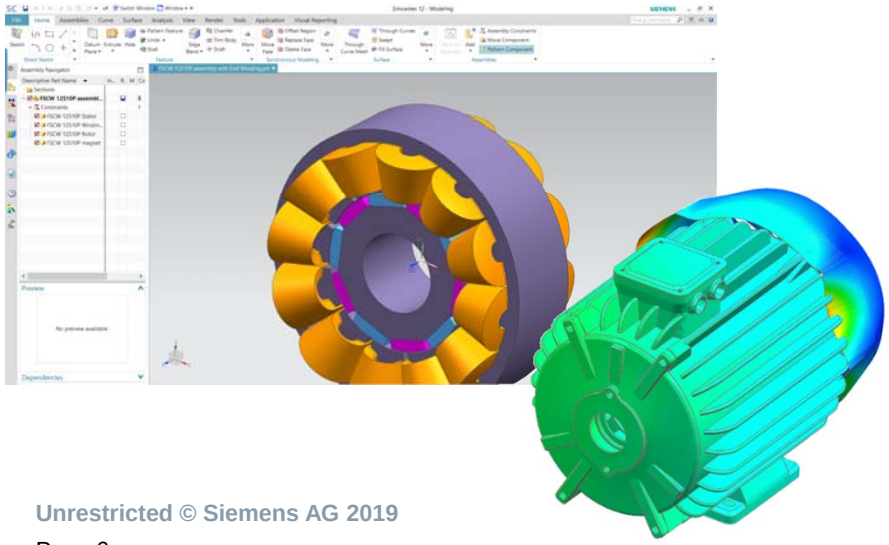

Antenna Design and Sensors (communication)




Simcenter 3D Low Frequency Electromagnetics
Simcenter MAGNET







Comprehensive high-fidelity solution for Electromagnetic field simulation

Benefits

- Efficiently simulate the operation of a device based on either electromagnetic or pure electric fields
- Capture realism through a rich set of capabilities

How?

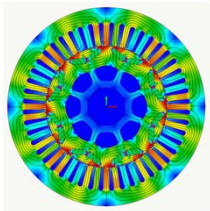
- Electromagnetic field simulations may be based on magnetostatic, time-harmonic or transient with or without motion field solvers
- Electric field simulations may be based on electrostatic, DC Current flow, time-harmonic or transient field solvers
- Rich EM material database, account any number of moving components (linear motors, magnetic gears)

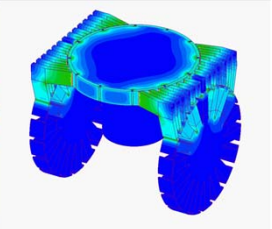
Simcenter 3D Low Frequency EM
Integration of Simcenter MAGNET

SIEMENS
Ingenuity for life

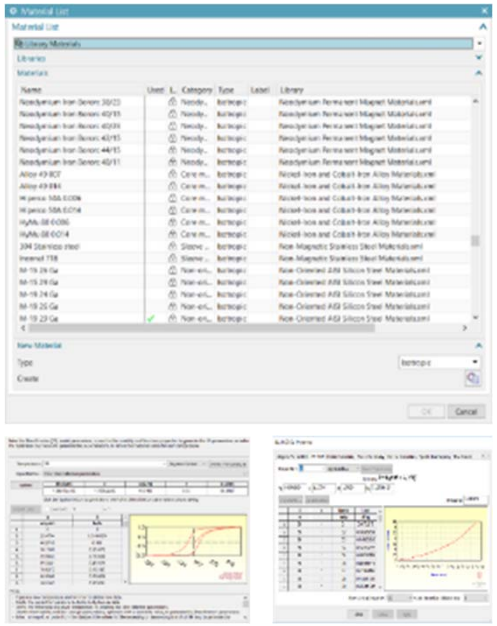
EM capability: **Dedicated**

By Electrical Engineers for Electrical Engineers: Thin structure modeling, thermal, coils & windings, skew, 6-DOF Motion, proven fastest solvers



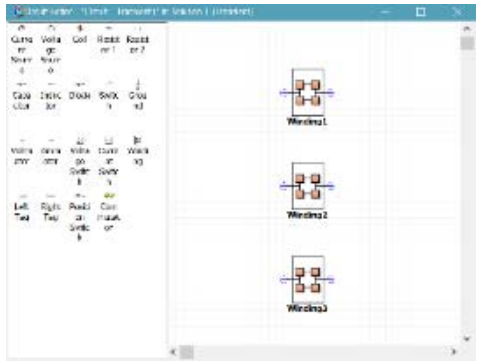


EM capability: **Materials**



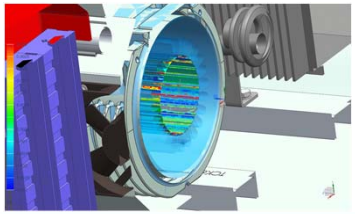
EM capability: **Circuit co-simulation**

Realistic driving of the device: Inverter, AC harmonic, any transient. Co-simulation or integrated



Multi-discipline capability

NVH, Structures, Durability, rotor dynamics…



Simcenter 3D High Frequency Electromagnetics

SIEMENS
Ingenuity for life

Maximize antenna and sensor performance and address EMC/EMI

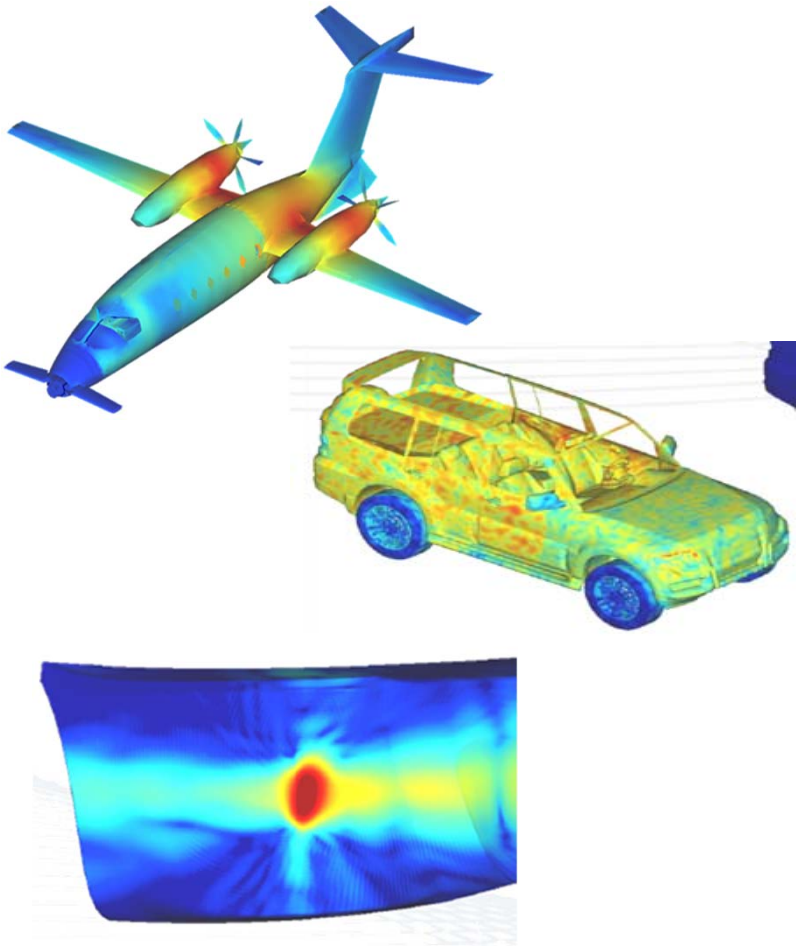
Benefits

- Maximize performance of antenna's, radars, and sensors holistically and at any scale; miniature (microstrip antenna) to full platform (ship, car, airplane,..).

- Efficiently simulate and address compatibility and interference (EMC/EMI) concerns of electrical and electronic systems.

How

- Validated state-of-the-art solution to specific problems; smart material design, radiated emission and radiated susceptibility.

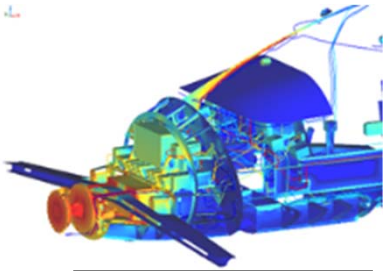


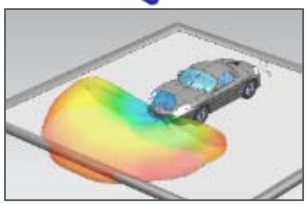
Simcenter 3D High Frequency EM

SIEMENS
Ingenuity for life

Solver performance

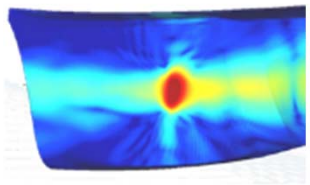
Focus: High fidelity and High Speed at system-level

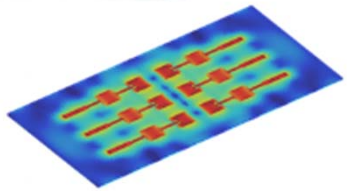




Suite of solvers

Integral methods (MoM, MLFMA) ➔ **Full Wave.**
Asymptotic: UTD (Ray-Tracing) , Iterative PO



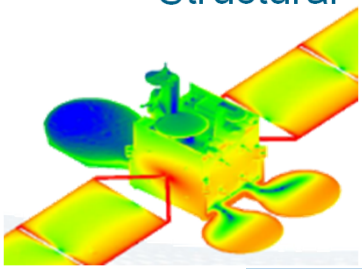


EM capability

By electrical engineers, for electrical engineers: complex materials, dedicated antenna models, ALL validated by measurements

Multi-discipline capability

Thermal, Electromagnetics, Structural

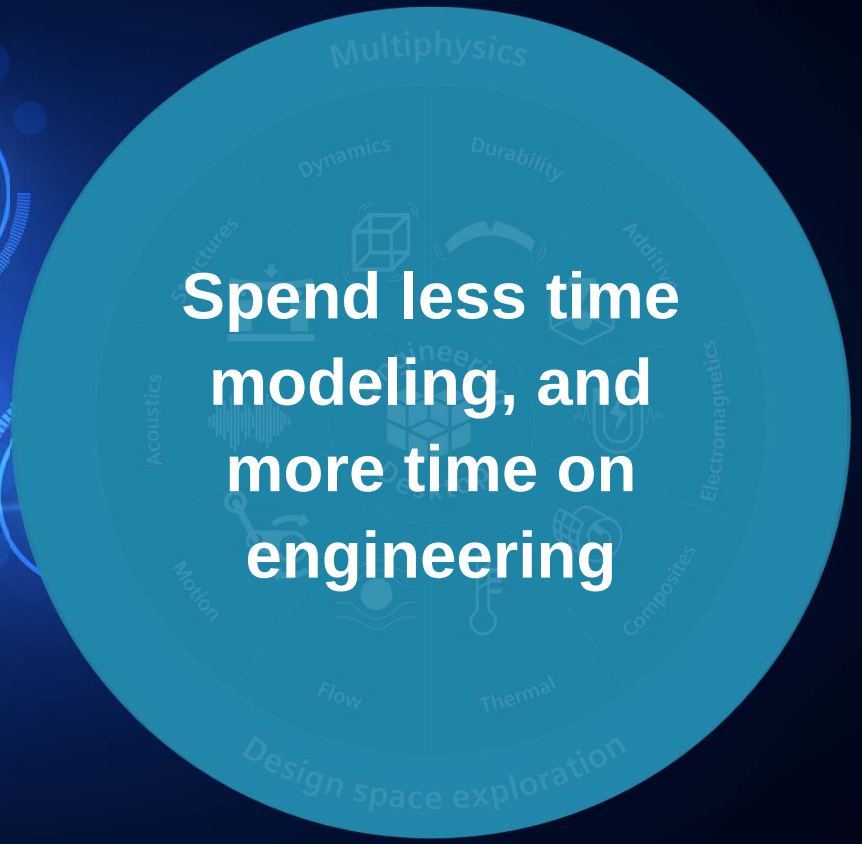


Faster CAE Processes

SIEMENS
Ingenuity for life

Instant model update for Simcenter 3D Flexible Pipe

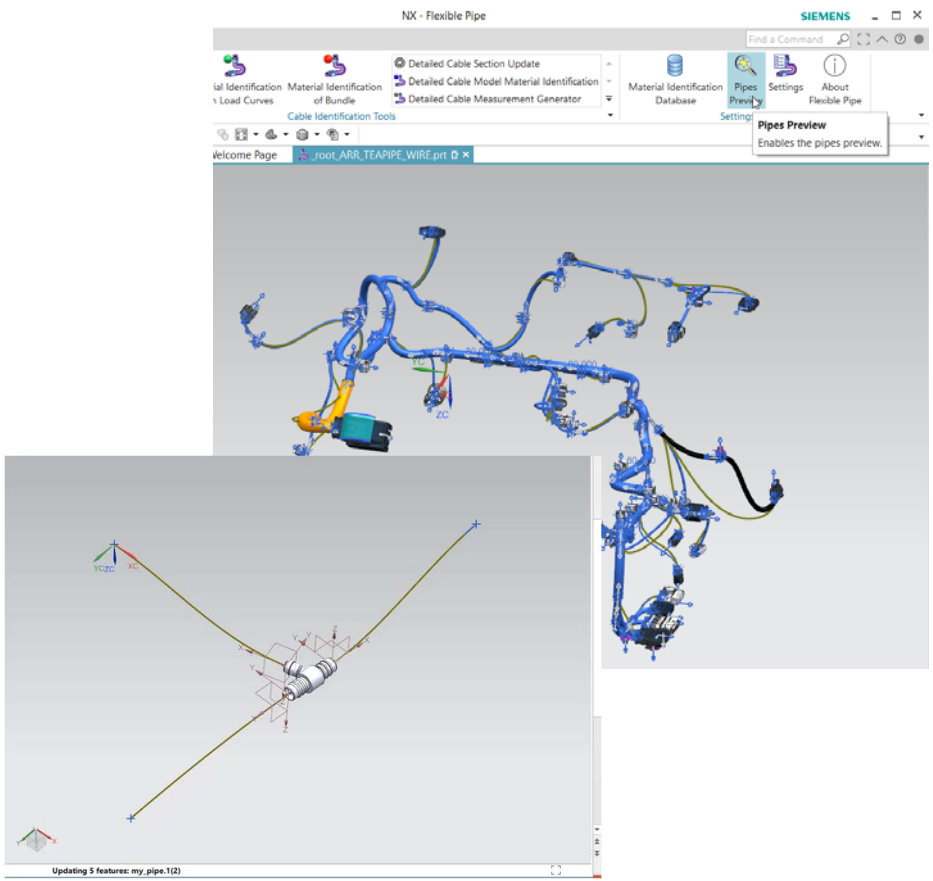
Immersed boundary method support for Simcenter 3D Flow



Spend less time modeling, and more time on engineering

Instant model update for Simcenter 3D Flexible Pipe

SIEMENS
Ingenuity for life



Instantly update pipe configurations after a design change

Benefits

- Rapidly compute different flexible pipe configurations based on design changes

How?

- Instantly computes and displays a solid shape for each pipe in an assembly.
- Move a component in the assembly, and Simcenter 3D automatically updates the pipe shape in the assembly.

Immersed boundary method support for Simcenter 3D Flow

SIEMENS
Ingenuity for life

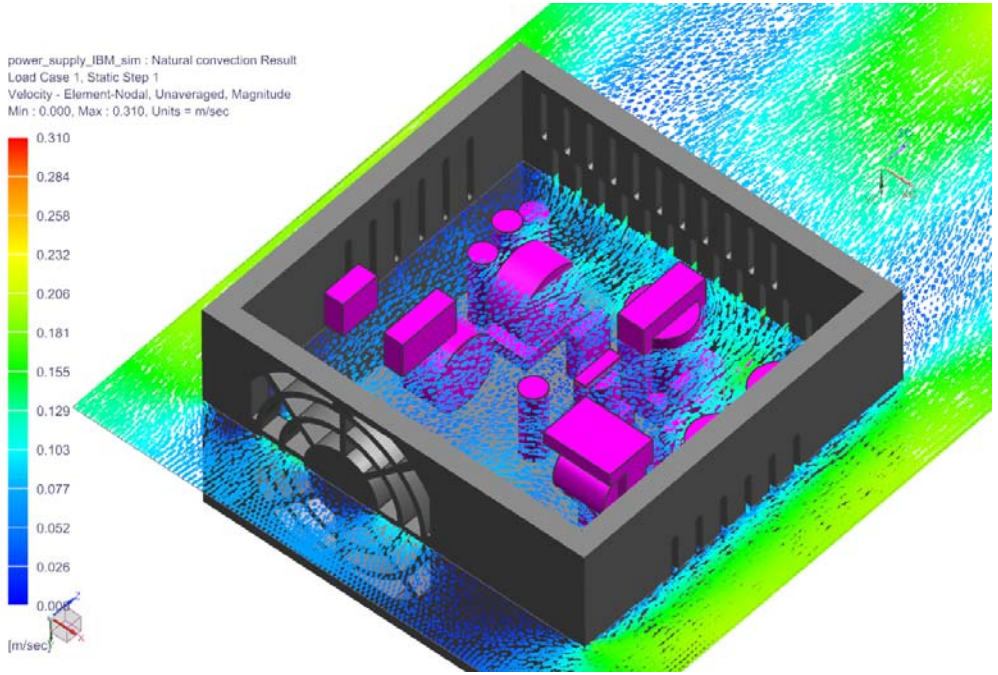
Accelerate CFD model build time

Benefits

- A faster, more convenient workflow for fluid mesh generation
- Focus on problem setup, rather than geometry clean-up

How?

- Only fluid modeling needed is a bounding volume with through-mesh
- Solver resolves solid-fluid interfaces automatically during solve time
- Structured and unstructured element support

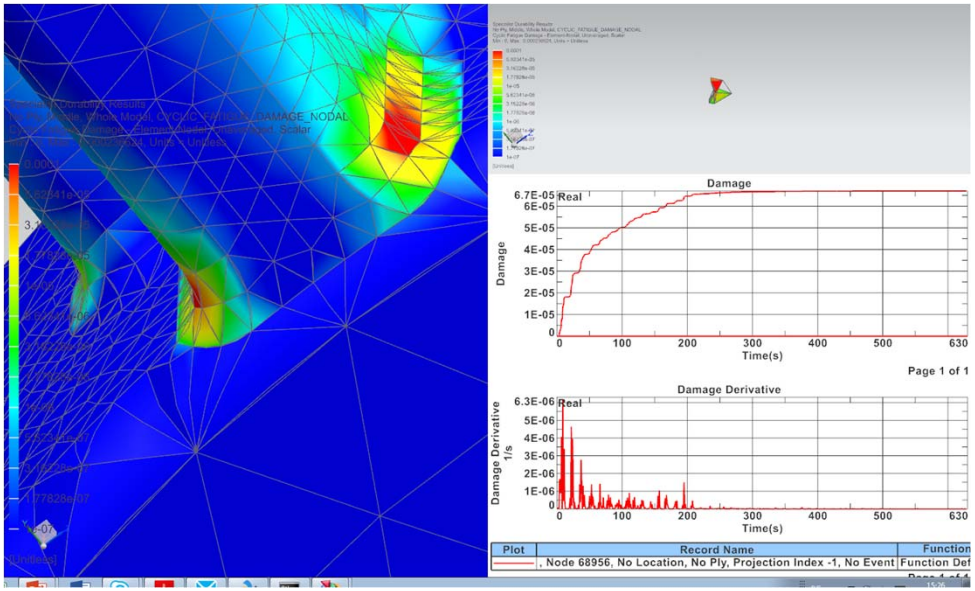


Open and scalable

SIEMENS
Ingenuity for life

Parallel computation for Simcenter 3D Specialist Durability

SIEMENS
Ingenuity for life



Solve large analysis problems in hours instead of days

Benefits

- Analyze several to hundreds of events
- Hundreds of load cases or modes
- Utilize long time histories

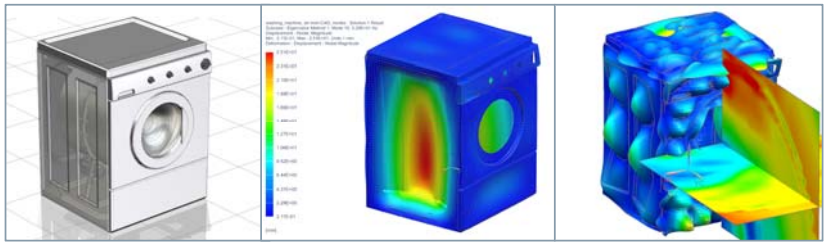
How?

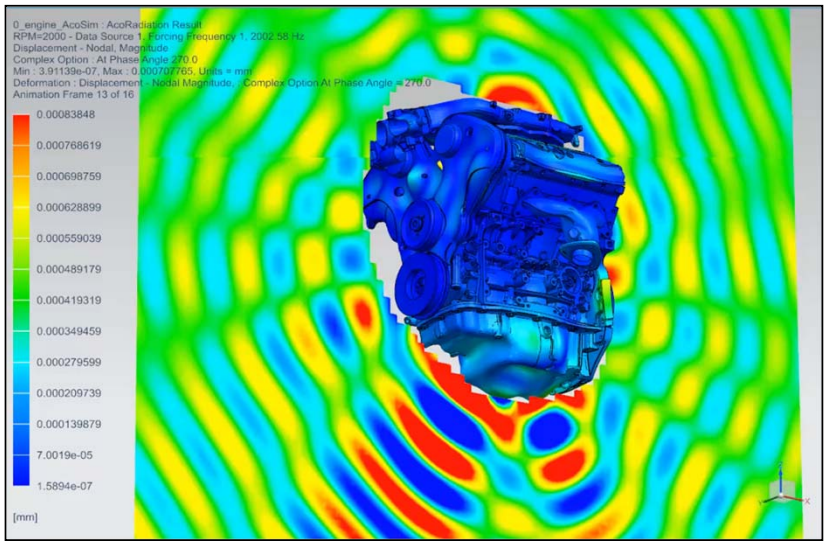
- Distribute computational tasks over multiple cores on one machine.
- Uses a unique reduction technique

Extended support for Ansys and Abaqus for Simcenter 3D Acoustics & Durability

SIEMENS
Ingenuity for life

Leverage structural vibrations and modes from popular solvers for Acoustics & Durability





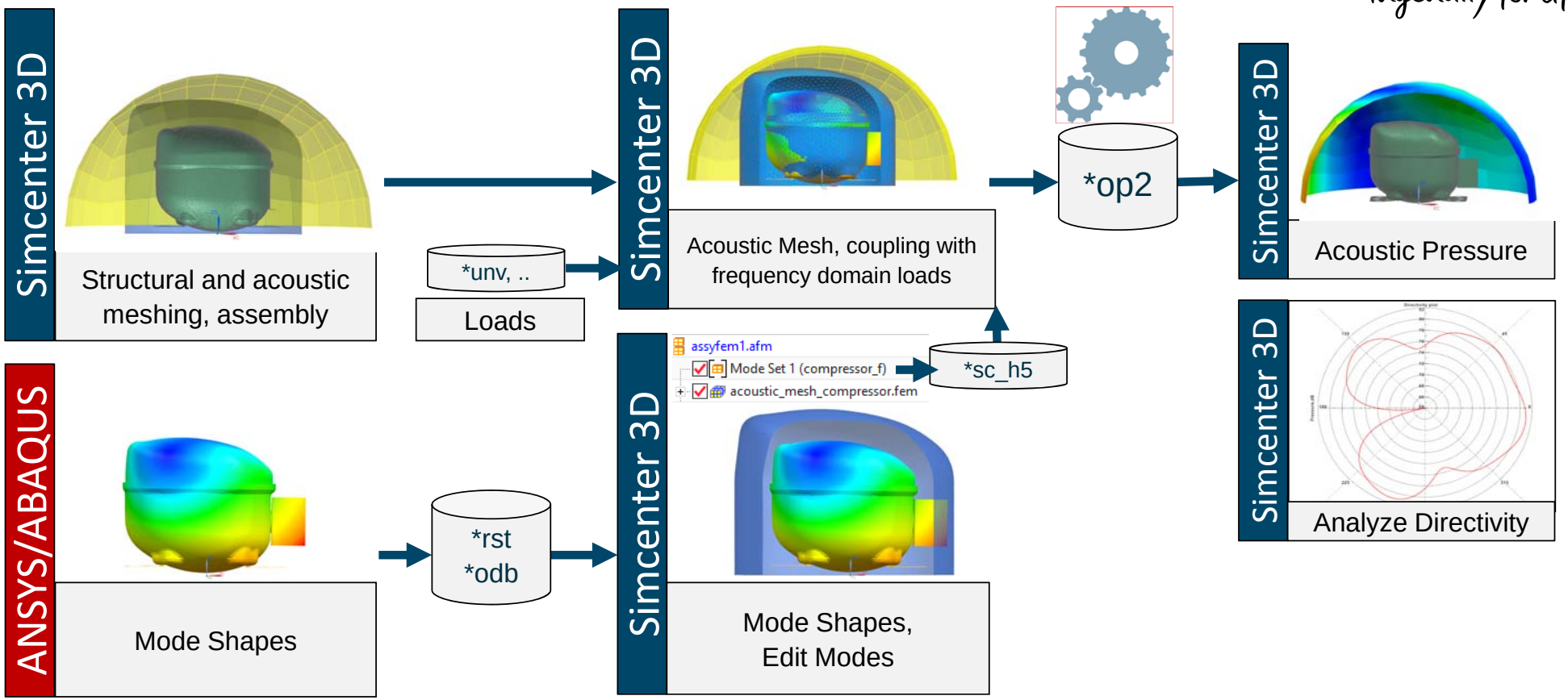
Benefits

- Easily use results from your structural solver of choice for use in more advanced vibro-acoustics and durability simulations

How?

- Re-use of precomputed structural vibrations or modes ANSYS “.rst” , ABAQUS “.odb” for vibro-acoustic analysis.
- Use ANSYS results in simple block load events, complex superposition events, and transient events in Simcenter 3D Specialist Durability

Workflow



Tied to the digital thread

SIEMENS
Ingenuity for life

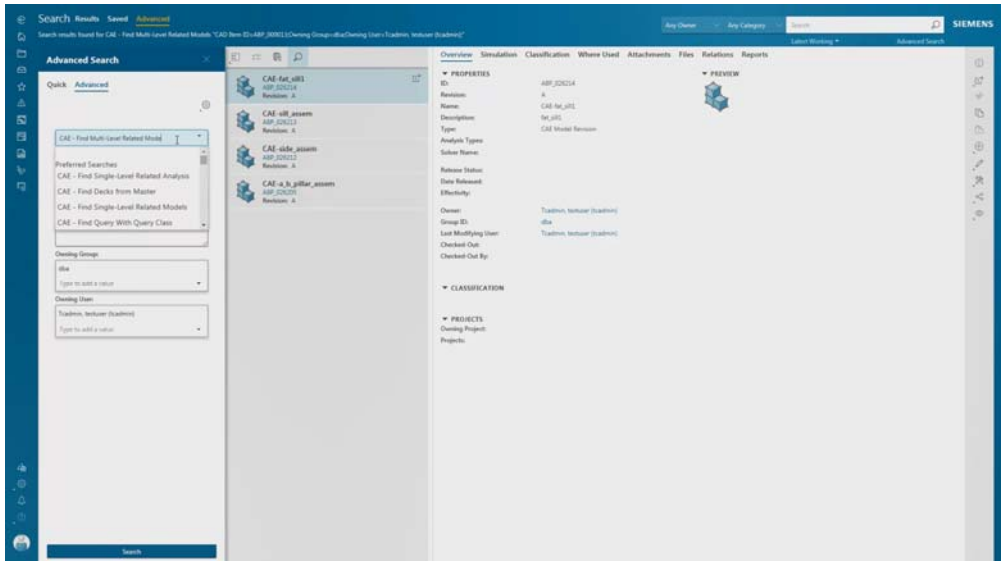
Delivering unique value through integration

Quickly identify impacted analyses after a change in CAD in TC Simulation

Enhanced interface with Simcenter Testlab

Quickly identify impacted analyses due to a change in CAD in Teamcenter Simulation

SIEMENS
Ingenuity for life



Eliminates the tedious task of determining which models need to be updated

Benefits

- Easily find analyses and models that will need to be re-run or updated after a design change

How?

- Using Teamcenter Simulation
- ***Query all impacted models*** finds all parent sub-assemblies and parent assemblies for a changed part
- ***Query all impacted analyses*** finds all analyses in parent sub-assemblies and parent assemblies for a particular part

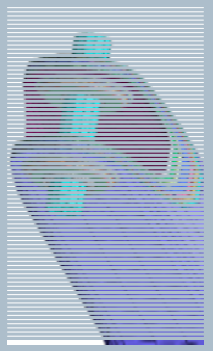
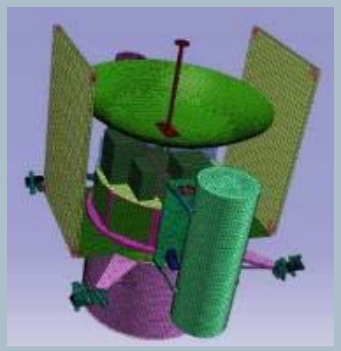
Using Simcenter 3D and Simcenter Testlab to Validate Designs

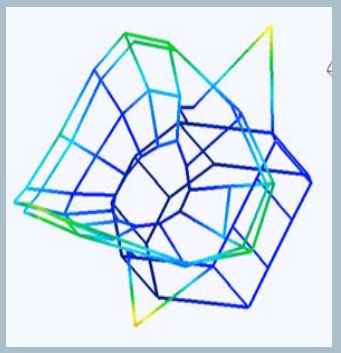
SIEMENS
Ingenuity for life

Courtesy of CSA DFL

Correlation, Updating & Virtual testing

Reducing Risk with CAE



Component Design → Assembly Design → Dynamic Analysis → Correlation & Updating → Virtual Test Analysis → Certification

- Standardize on Simcenter 3D and Simcenter Nastran for dynamic simulation
- Correlate analysis results with physical testing using Simcenter Testlab and Simcenter 3D FE Model Correlation
- Update the simulation using Simcenter 3D FE Model Updating
- Perform virtual testing using validated simulation
- Promotes faster development with reduced risk

Enhanced interface with Simcenter Testlab for Simcenter 3D Correlation

SIEMENS
Ingenuity for life

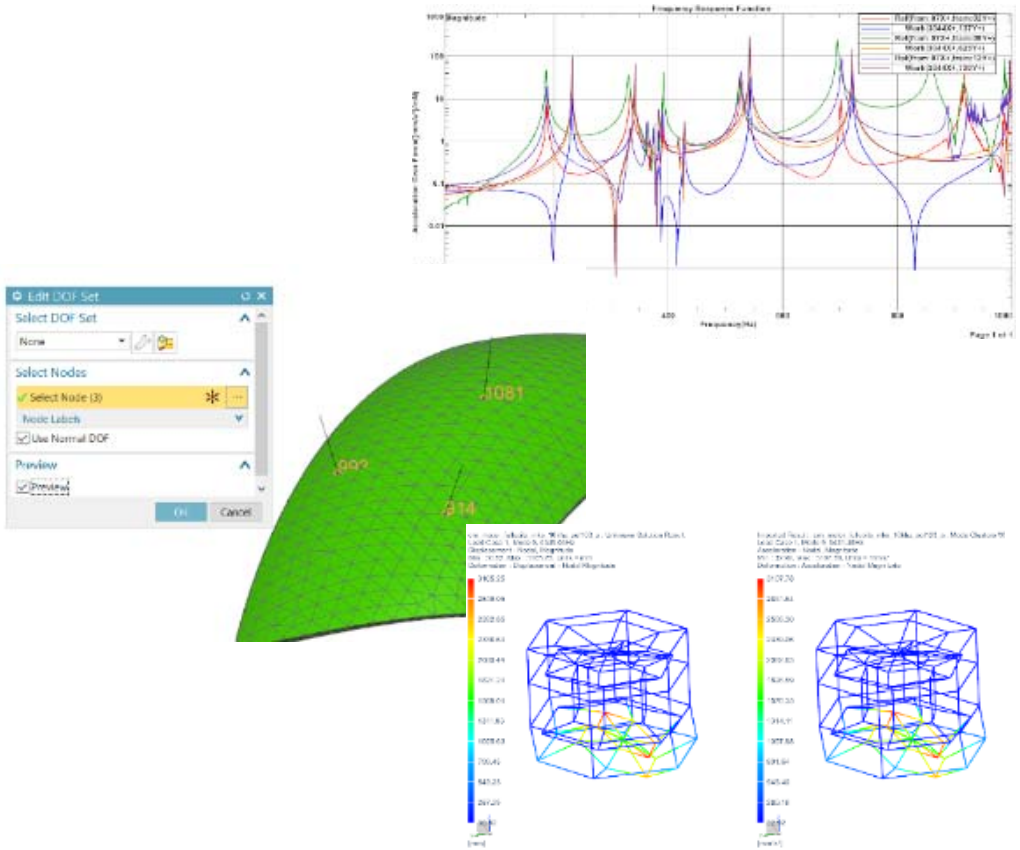
Enable tighter collaboration between simulation and test engineers

Benefits

- Enhance test setup clarity and promotes easier downstream test-analysis correlation

How?

- Test analysis reference Solution can be exported to Simcenter Testlab using new SC2TL format
- Structural component identification via named nodes
- Instrumentation categorization
- Use of local coordinate systems/Euler angles



Additional changes

SIEMENS
Ingenuity for life

Gain access to Simcenter 3D in new ways

Simcenter 3D SaaS

Simcenter 3D SaaS

SIEMENS
Ingenuity for life

On-demand, subscription-based access to Simcenter 3D

Benefits

- Cost-friendly access to high-end simulation software

How?

- Available through the Rescale platform
- Simcenter 3D Engineering Desktop plus most Simcenter 3D modules
- Cost-friendly product bundles

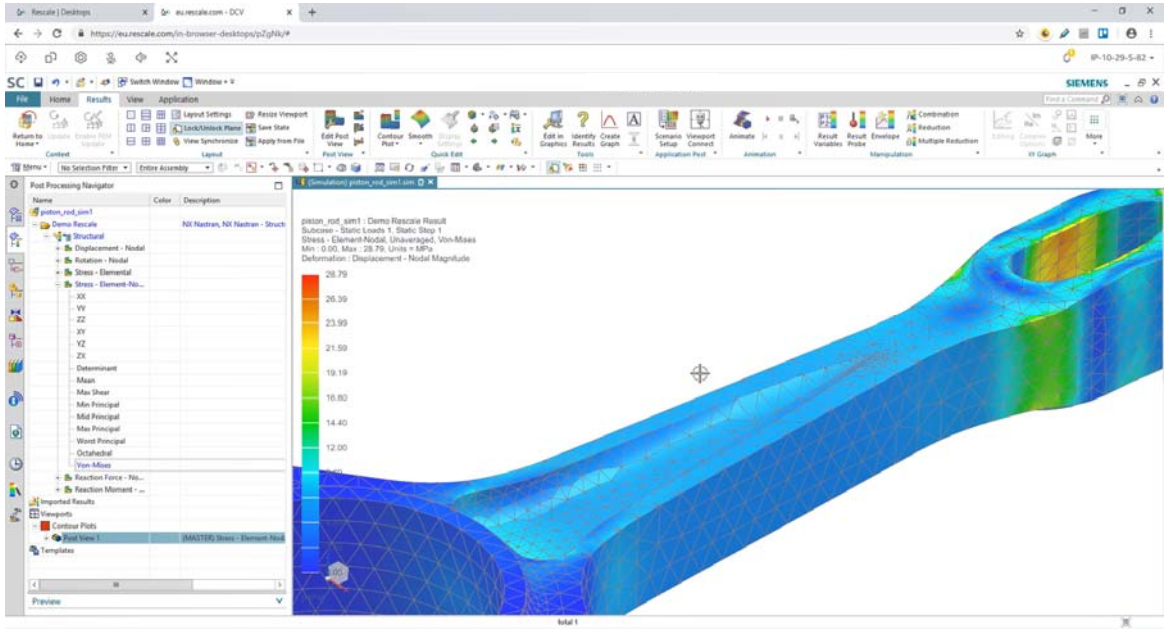
Simcenter 3D deployment in the Cloud

SIEMENS
Ingenuity for life

The **user experience** is the same as with the desktop version:

- Workflows
- Software features, pre- and post-processing
- Look and feel

But it appears in a **web browser**



Simcenter 3D on the cloud
SaaS product bundles

SIEMENS
Ingenuity for life

Basic	Advanced	Premium
Engineering Desktop	Engineering Desktop	Engineering Desktop
Basic Structures	Advanced Structures	Advanced Structures
	Response Dynamics	Advanced Dynamics
	Basic Motion	Advanced Motion
	Basic Flow	Advanced Flow
	Basic Thermal	Advanced Thermal
		Durability
		Composites
		Acoustics

Simcenter 3D
3D CAE for the digital twin

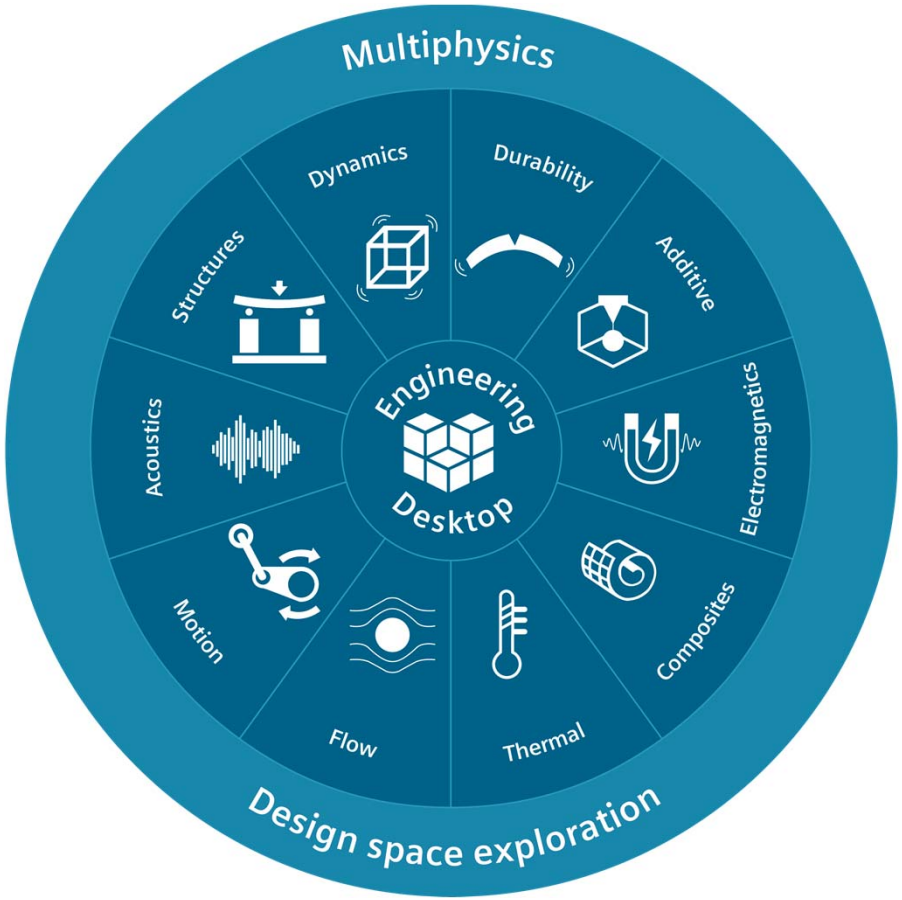
SIEMENS
Ingenuity for life

Faster CAE processes

Multidiscipline integration

Open and scalable

Tied into the digital thread



Join us now @ Simcenter Community

SIEMENS
Ingenuity for life

Explore

Browse among our different **blogs** dedicated to each solution, read our articles and hear about the latest news.

Share

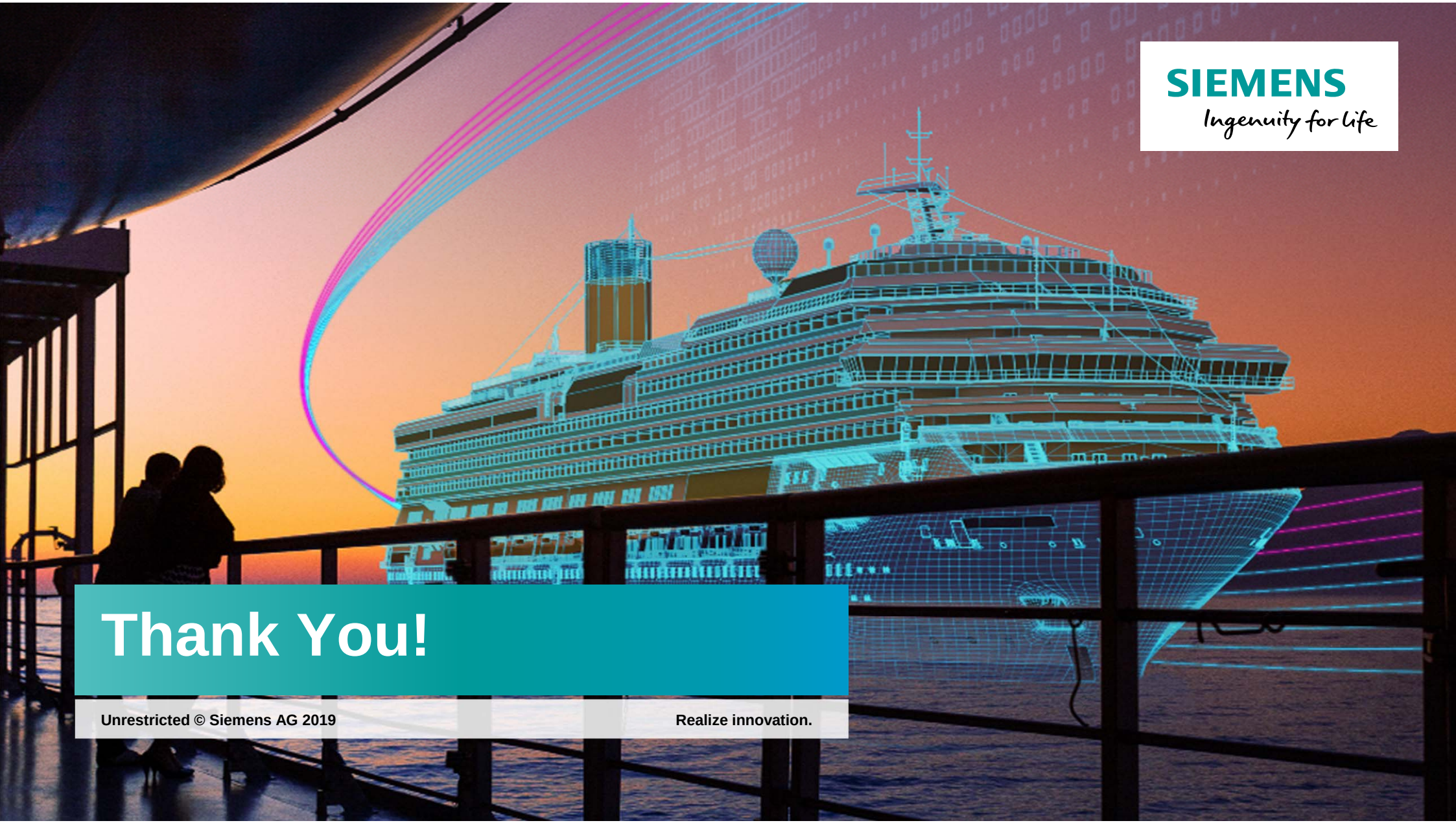
Expose your question in our **forum**, obtain answers, exchange with other users and benefit from their experience.

Learn

Find the information you need in the **knowledge base** and increase your skills.

Click to join us on the Simcenter Community

www.siemens.com/plm/community/simcenter



Thank You!

Realize innovation.