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Webinar:

Value-based Licensing in Siemens Simcenter 3D

Scott Thibault,
ATA Engineering, Inc.

June 5, 2020

13290 Evening Creek Drive S, San Diego, CA 92128

(858) 480-2000

www.ata-e.com

ata-engineering

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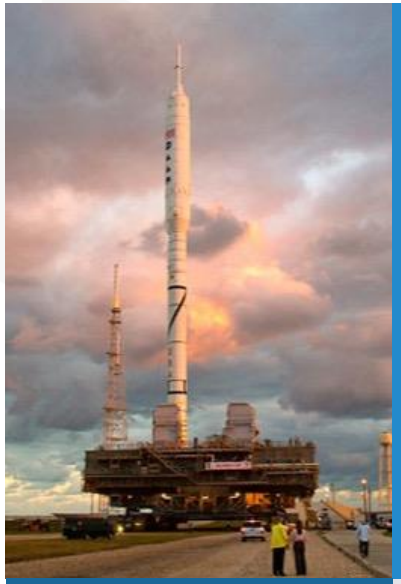

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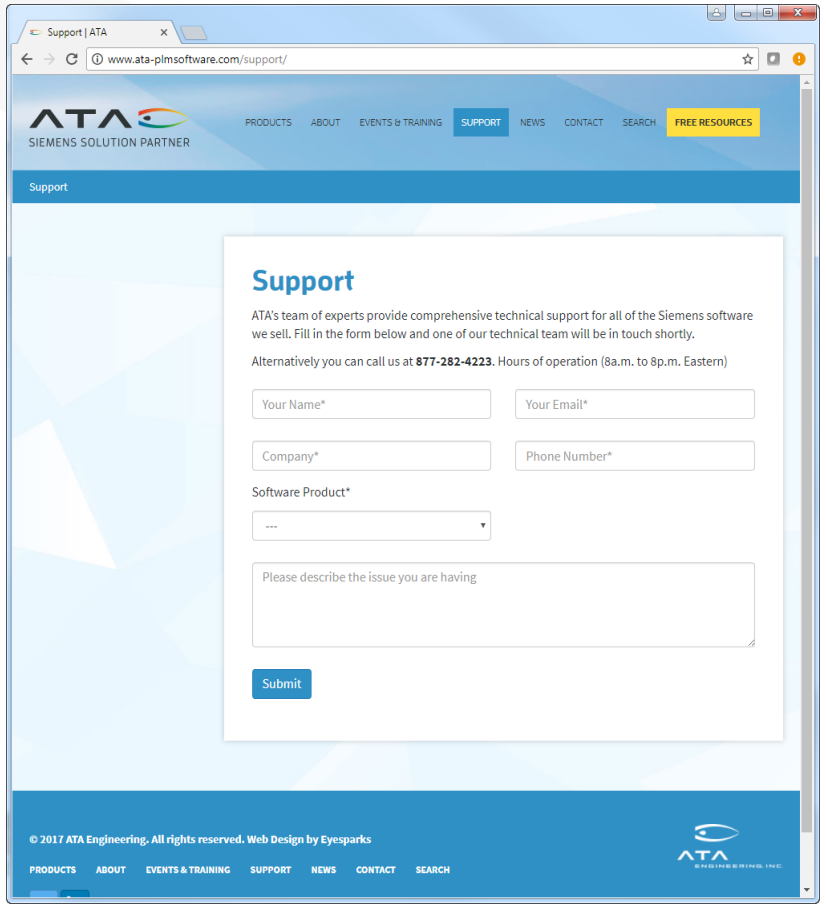
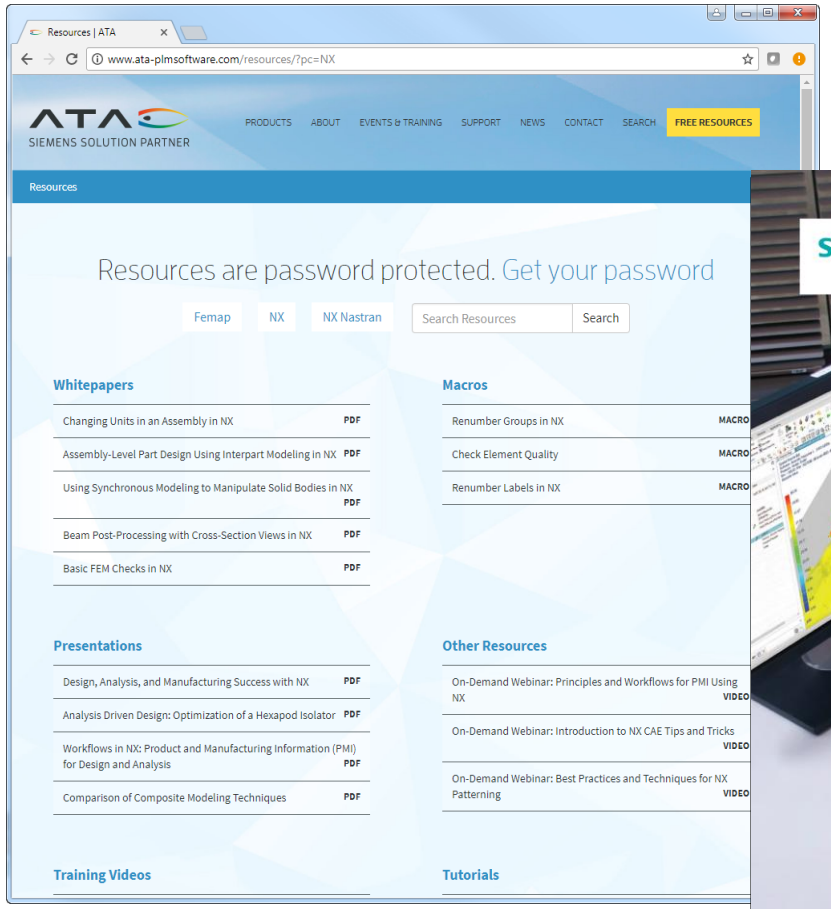
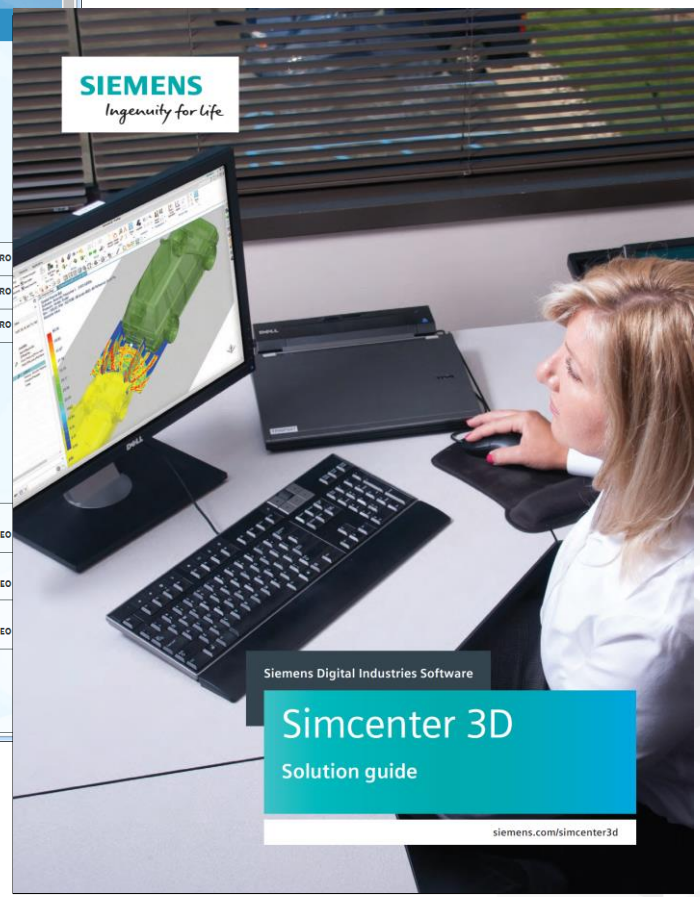






192 Pages!

ATA ENGINEERING, INC.

Webinar:
Introduction to Simcenter 3D Value-Based Licensing (Tokens)

Scott Thibault – ATA Engineering, Inc.
May Taylor – Siemens Digital Industries Software Inc.
Mike Senediak– Siemens Digital Industries Software Inc.

Simcenter 3D vs. Traditional CAE Tools

Traditional CAE Tools	Simcenter 3D
Disconnected & discipline-specific	Scalable, unified multi-discipline simulation environment
Poor geometry editing capabilities	▪ CAD-level geometry capabilities ▪ Synchronous Technology for fast, intuitive editing
Repeat modeling for each design iteration	▪ Associative to CAD model ▪ Automatically update analysis model when designs change
Usually tied to a single solver	Open, multi-vendor CAE solver support SIEMENS Ingenuity for life · ANSYS · SIMULIA · MSC Software Simulating Reality, Delivering Certainty
No data management	Seamlessly integrated with Teamcenter Simulation Process Management

Multi-CAE solver support

Simcenter Nastran

Simcenter Samcef

Abaqus

- Multi-CAD geometry editing
- Comprehensive meshing
- Assembly management

Simcenter 3D

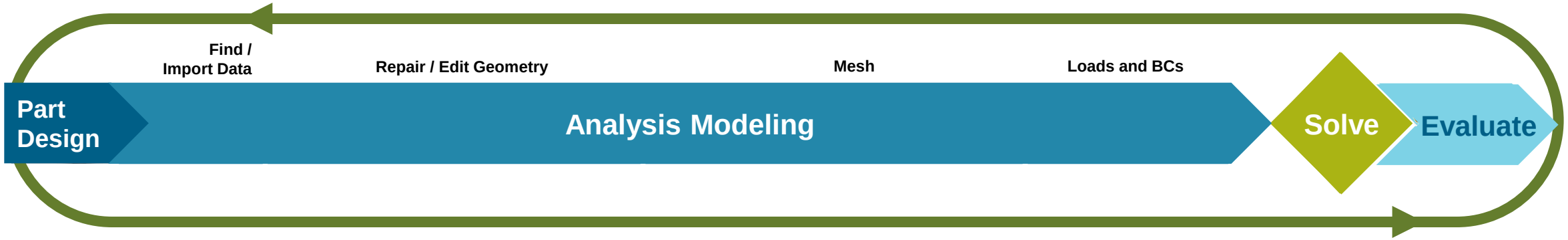
- Solution / subcase management
- Post-processing & reporting
- Associativity

ANSYS

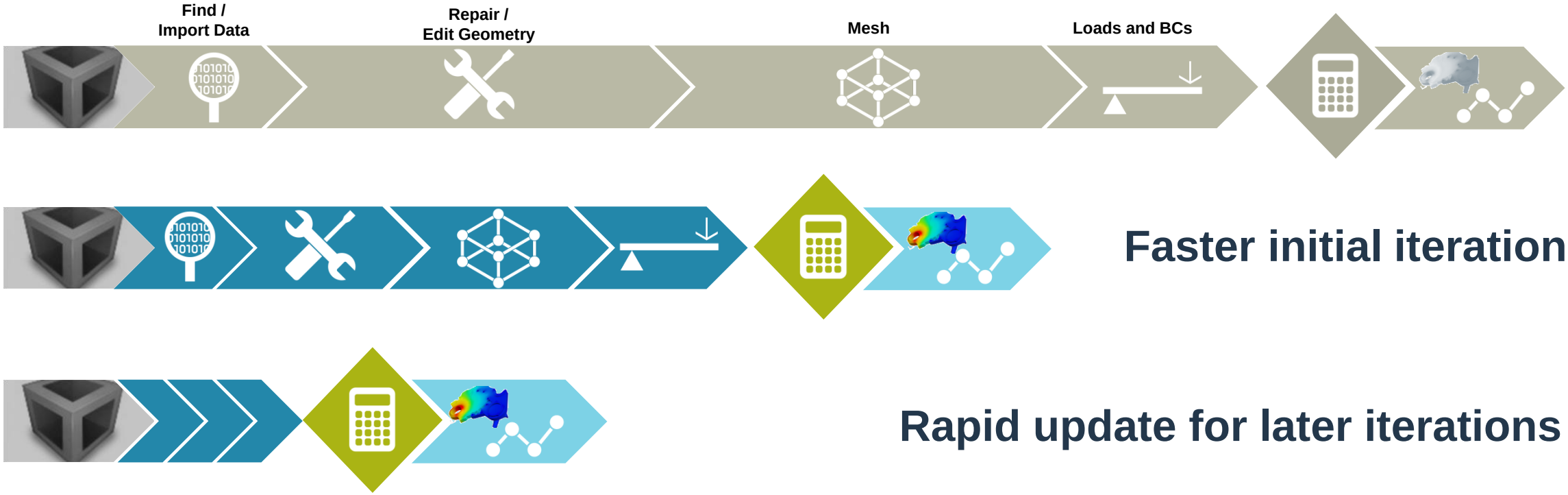
LS-Dyna

MSC Nastran

The Traditional CAE Process



Simcenter 3D vs. Traditional CAE



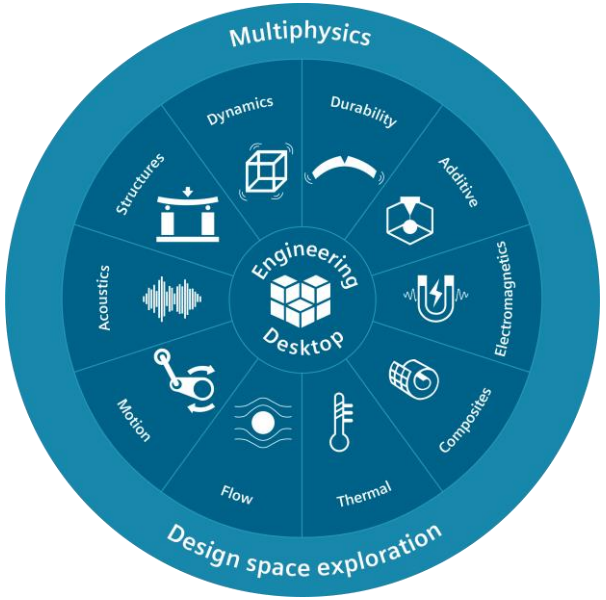
Faster initial iteration

Rapid update for later iterations

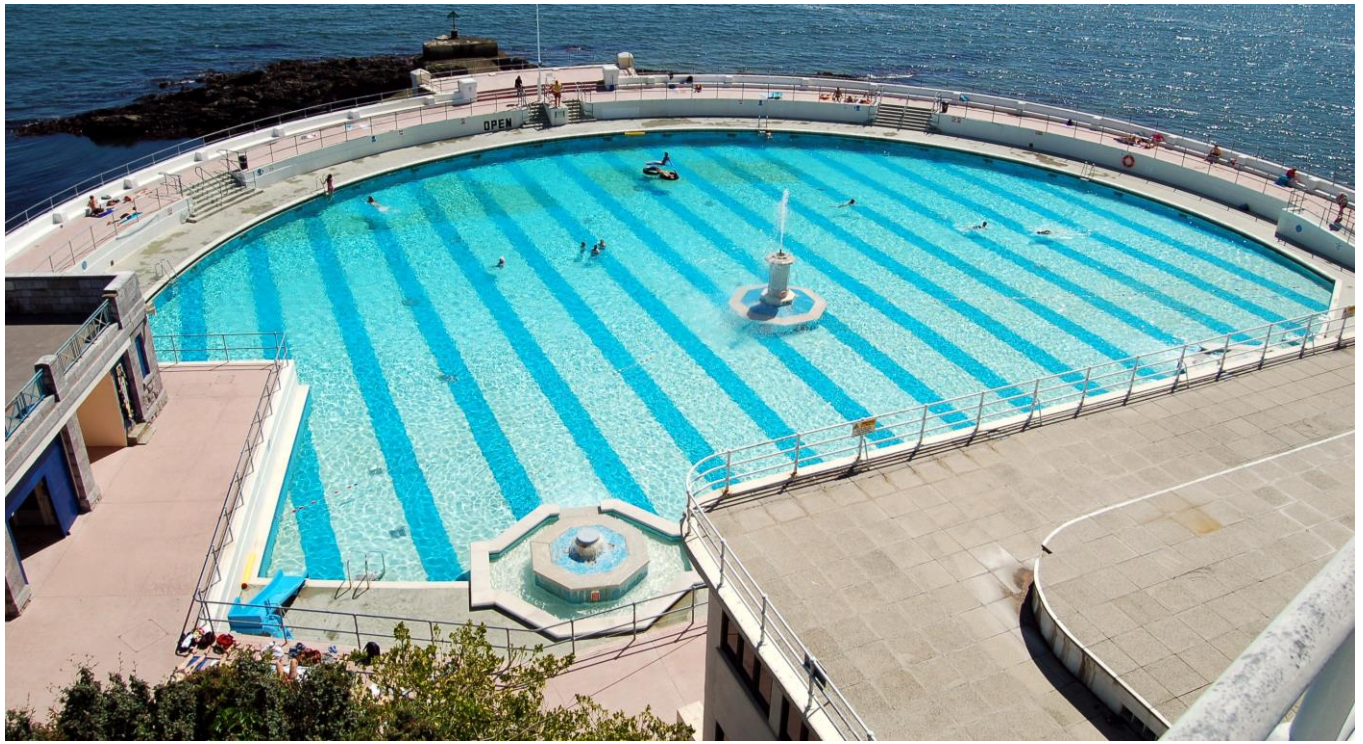
Simcenter 3D

Motivation for Value-Based Licensing

- Simcenter 3D offers a very wide range of capabilities to Siemens Customers
- Value-Based (token) licensing provides a cost effective way for users to access this full range of capabilities



Typical per-seat, floating license pool of products:
a few products from which to choose and run



Simcenter 3D token pool:
More than 84 products from which to choose and run!

What is Value Based Licensing?

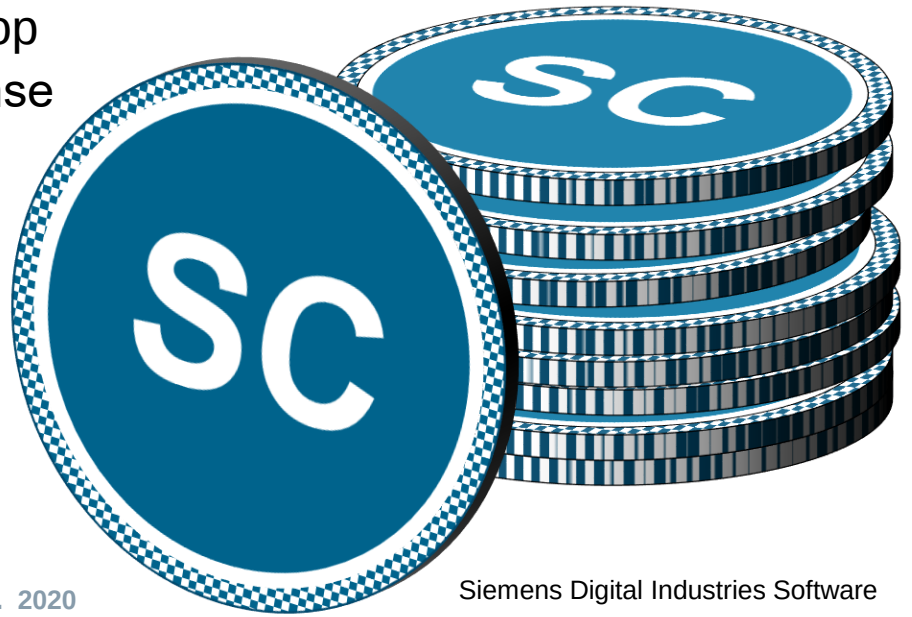
Value Based Licensing (VBL) is an additional licensing method accessed through the token packs.

VBL operates by the same Flex license server as used for module-based licenses

Users can have mix of token licenses and module-based licenses

Requires a “Base Application” to enable the use of tokens.

- Tokens apply only for additional Product Modules configured on top of the “Base Application” which is a module-based “Desktop” license
- Base Licenses can be either perpetual or subscription/lease
- Base Application can be any of the following
  - SC12500 Simcenter Engineering Desktop
  - SC12510 Simcenter Engineering Desktop Add-On
  - SC13500 Simcenter Structures
  - SC13510 Simcenter Structures Add-On



Why Value Based Licensing?

Value-based Licensing provides flexibility to customers

- Allows access to various applications without having to buy specific products
- Accommodates changes in customer capability usage over time
- Customers can try-out new capabilities without having to purchase a license
- Cost efficient licensing model for customers that need access to a wide variety of capabilities but not all at the same time.

How Does Value Based Licensing Work?

Users always need to run the Base Application that uses module-based licensing.

Additional Simcenter 3D applications can be run using:

- Module-based licensing or
- Value-Based (token) licensing

Licenses for additional Simcenter 3D applications are checked-out as follows:

- First a module-based license is checked-out if available. If not available …
- Tokens are checked out. If not available …
- License fault message is given

When tokens are used …

- Each application consumes a defined number of tokens
- The same number of tokens are checked back in when the application ends
- Total number of applications that can be checked out on top of the Base Application is limited only by the number of tokens that the user has available in the token pool.

Simcenter 3D Value-Based Licensing Products

Value-Based Licensing Packs

SC10100 Simcenter Value Based License 100 Pack

- Contains 100 tokens
- Requires at least one Base Product

SC10050 Simcenter Value Based License 50 Pack

- Requires prerequisite of SC10100
- Contains 50 tokens

These products are available on a perpetual, subscription, or rental basis.

Token Enabled Products
Most of Simcenter 3D and Simcenter Nastran

Simcenter Environments
- Environments for MSC Nastran, Ansys, Abaqus, LS-Dyna, Samcef, Simcenter BEM Acoustics, Simcenter Aerostructures

Simcenter Thermal/Flow
- Thermal, Flow, Advanced Thermal, Advanced Flow, Distributed Memory Processing, Space Systems Cooling, Electronic Systems Cooling

Simcenter Modeling Add-Ons
- Acoustic Meshing, Flow Modeling, Laminate Composites, Design Space Exploration

Simcenter Solutions
- BEM Acoustics, Durability, Response Dynamics, Correlation, Model Update

Simcenter Motion, Flexible Pipe, and Additive Manufacturing

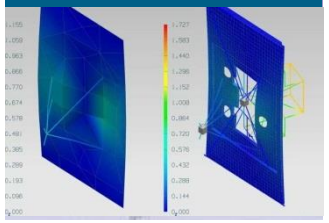
Linear and Non-linear Structure Solvers
- Simcenter Nastran, Simcenter Samcef, Distributed Memory Processing

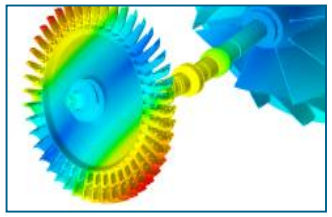
Most Simcenter 3D and Simcenter Nastran products can use token licensing

84+ Total Applications

Simcenter 3D
Multipurpose Simulation Environment

TEST-CAE Correlation





Structures

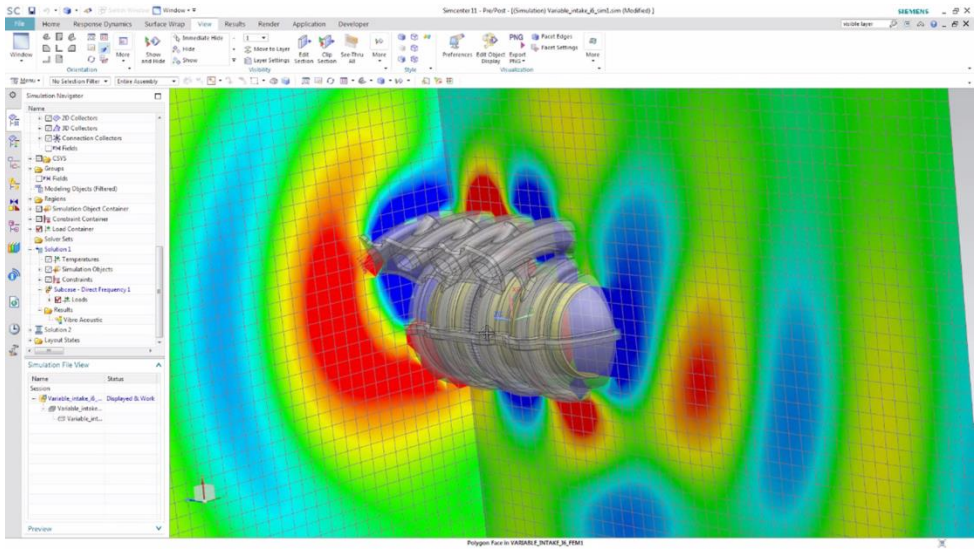
Dynamics

NVH & Acoustics

Thermal

Flow

Composites



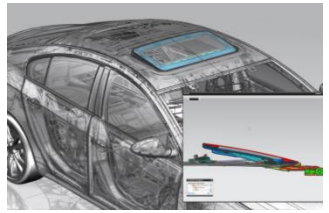
Motion

Rotor Dynamics

Durability

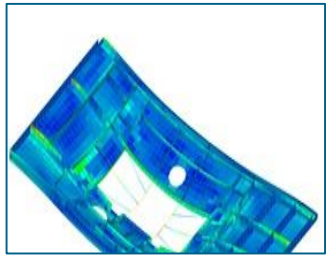
Optimization

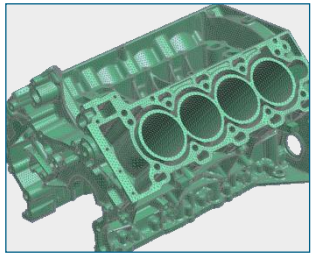
Electro-magentics

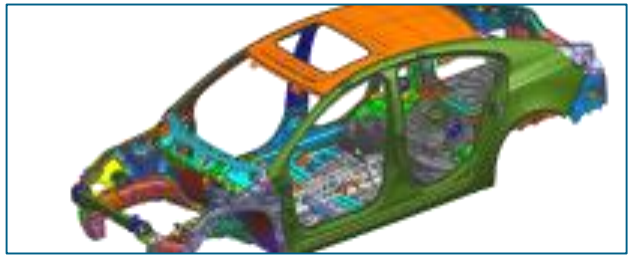


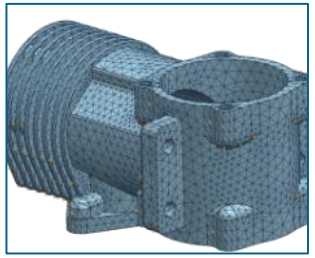
1D – 3D Co-Simulation

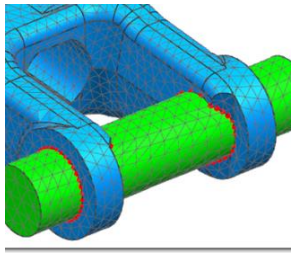
Multiphysics

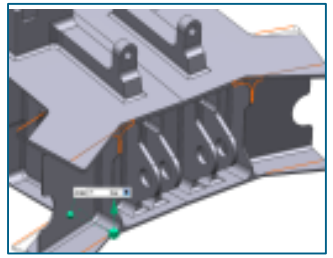








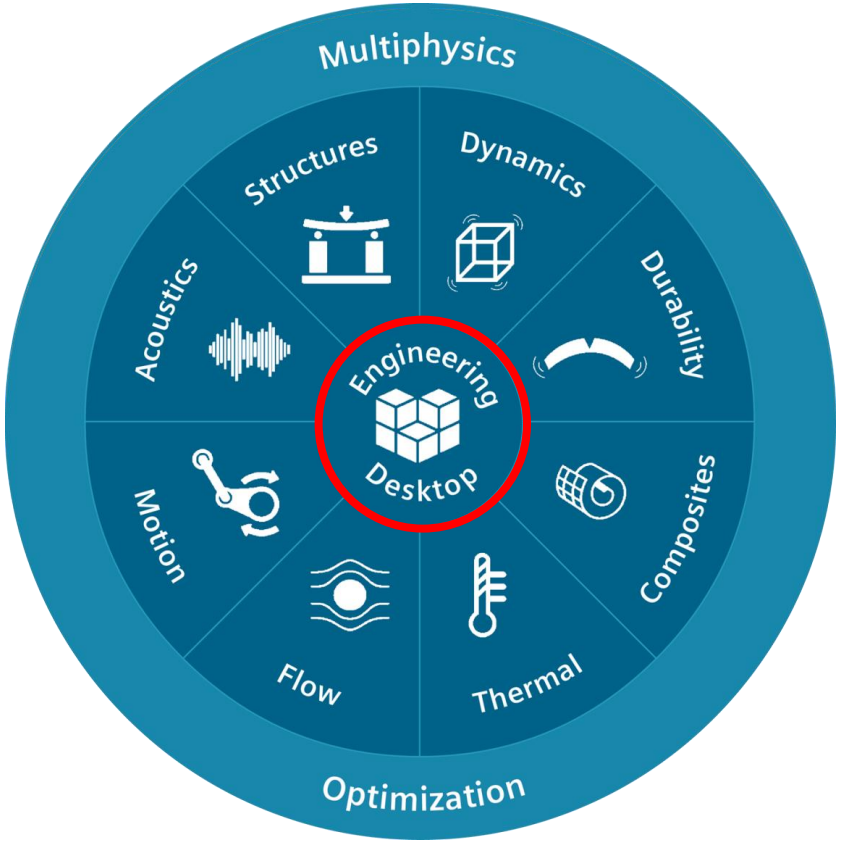




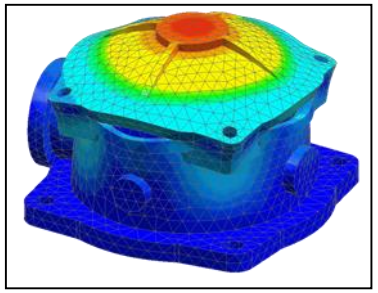
Linear FEM | **Non-Linear FEM** | **BEM** | **Multi-body** | **Fatigue** | **Thermal** | **CFD**

Engineering Desktop and CAE Environments

- Simcenter Engineering Desktop is the simulation environment for associative simulation modeling.
- Simcenter Engineering Desktop has the ability to clean and parametrize CAD geometry from almost any source “on the fly”.
- Simulation Environments are available not only for Siemens products but for a number of other popular commercial solvers.

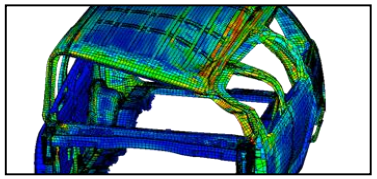


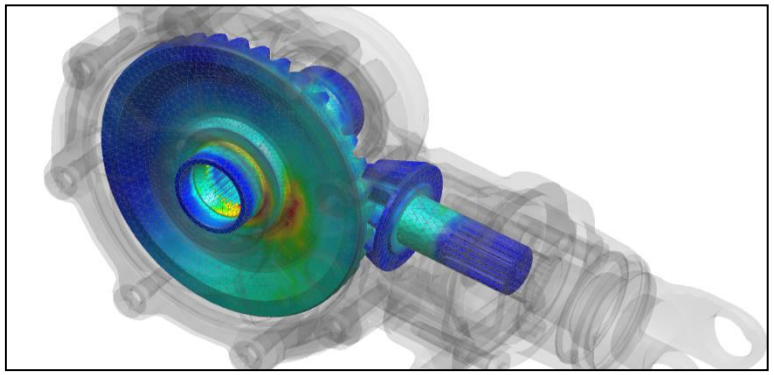
Structural Analysis

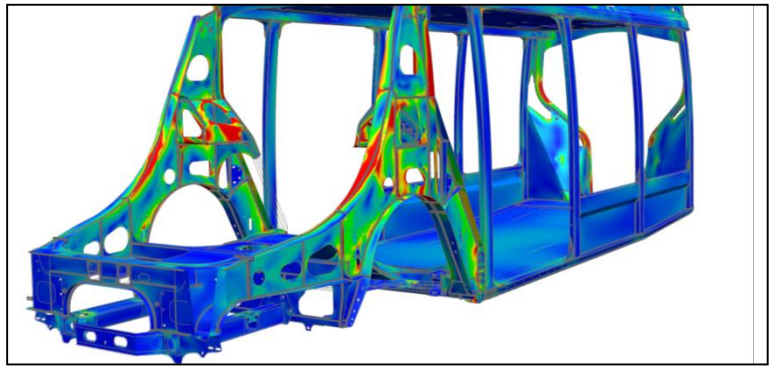


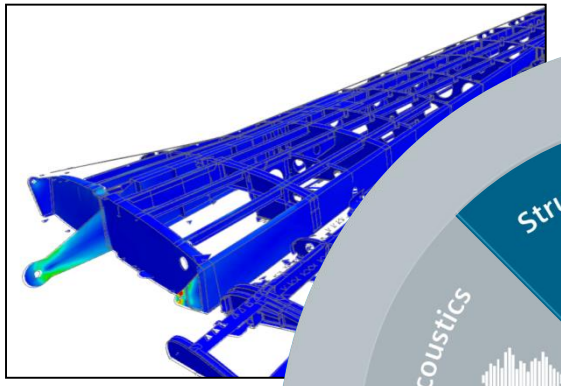
Linear
Nonlinear
Modal
Buckling
Rotor dynamics

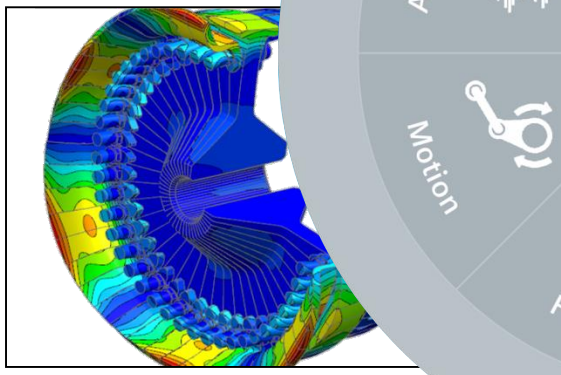
LMS Samcef

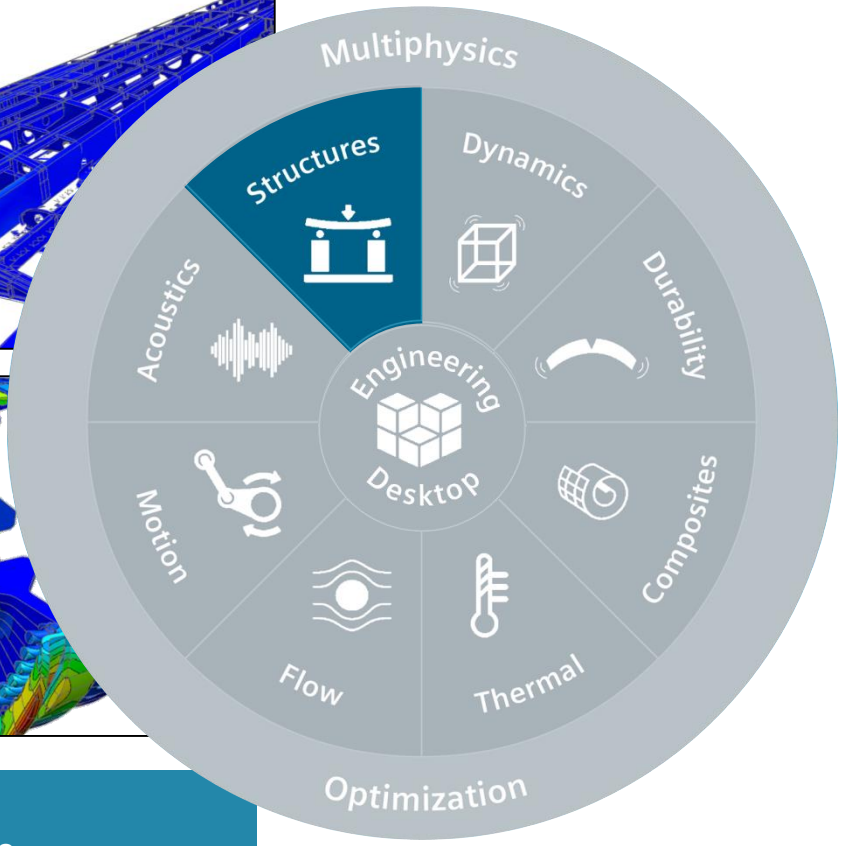






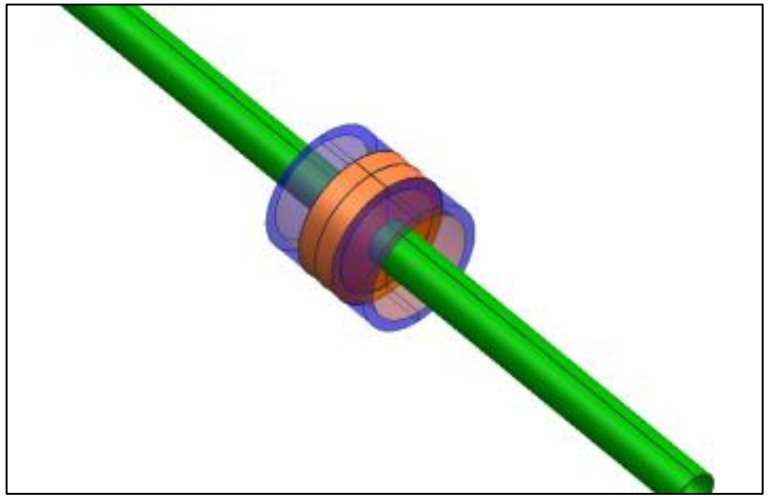


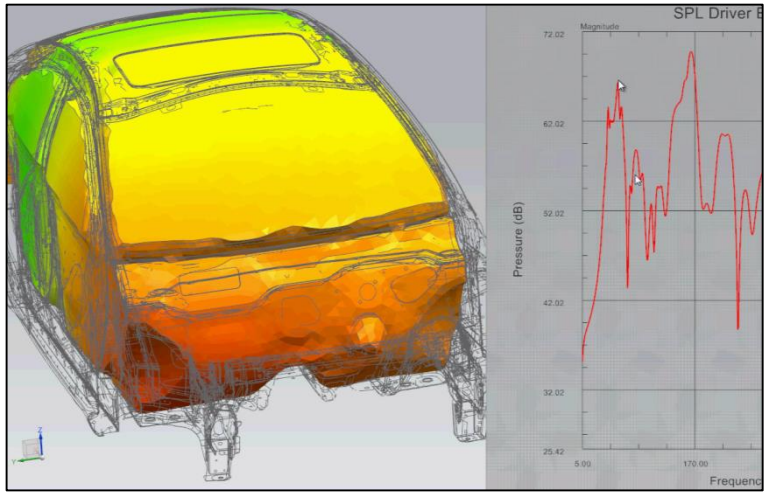




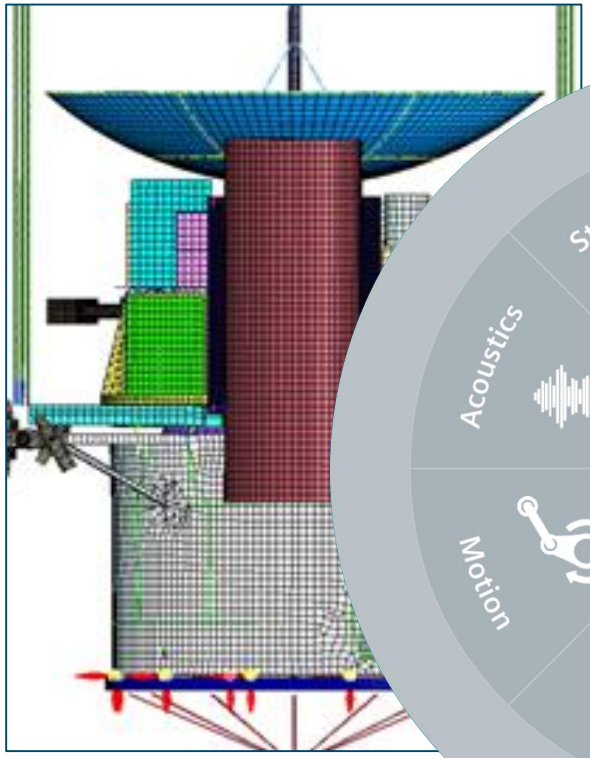
NX Nastran

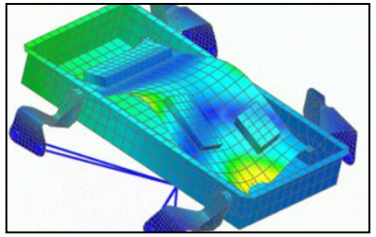
Structural Dynamics

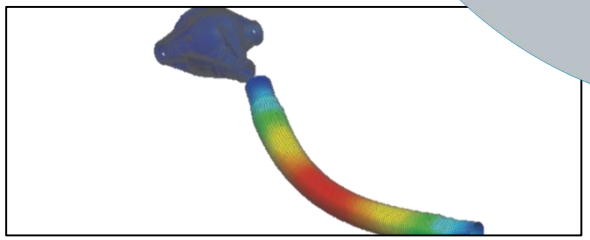


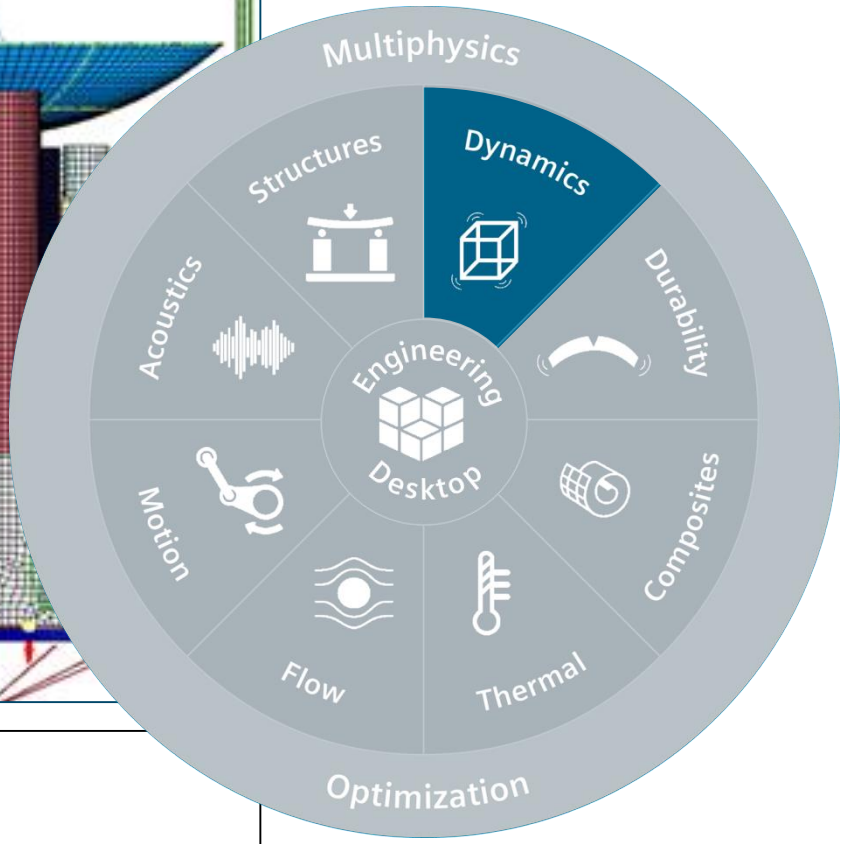


- Dynamics
- Response dynamics
- NVH
- Rotor dynamics
- Aeroelasticity

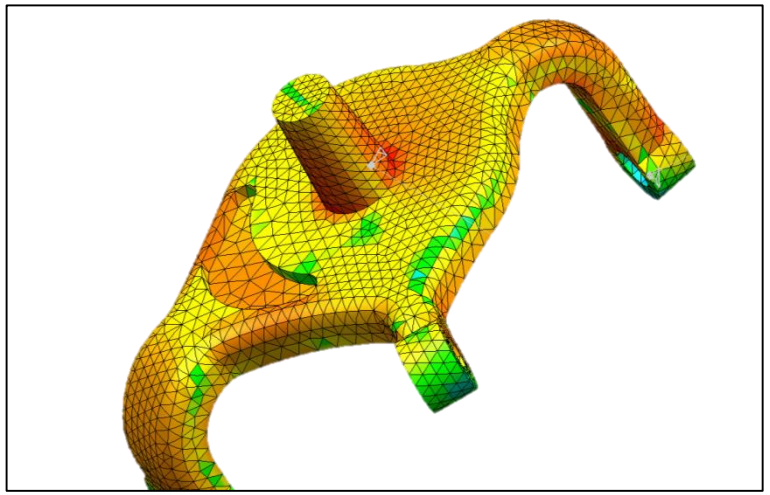








Durability

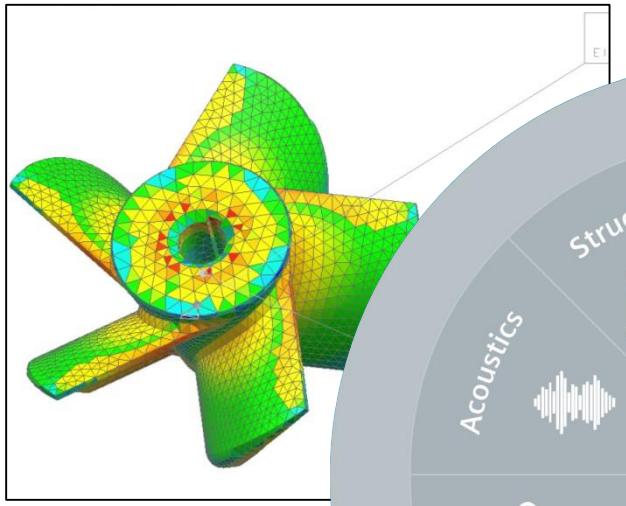


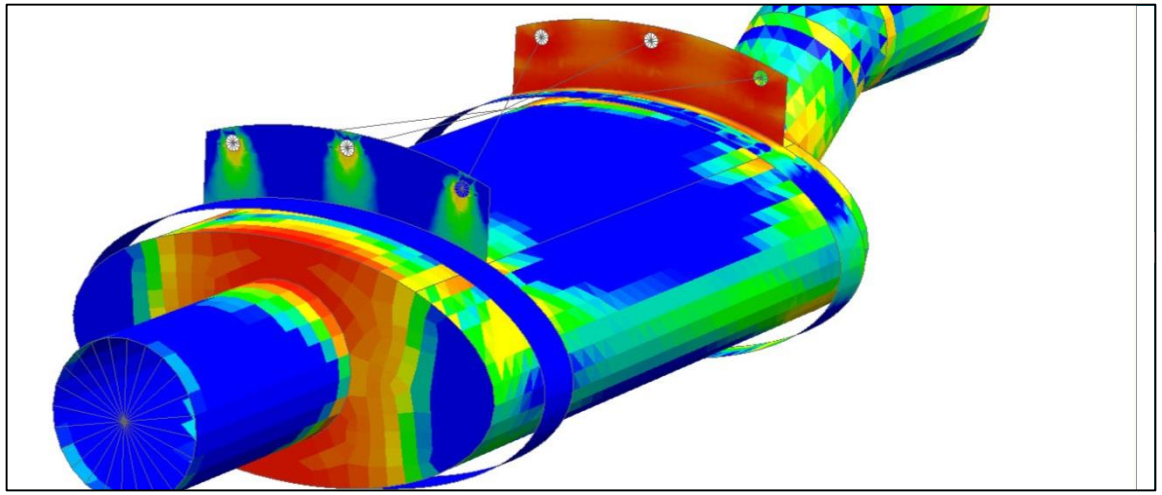
Static

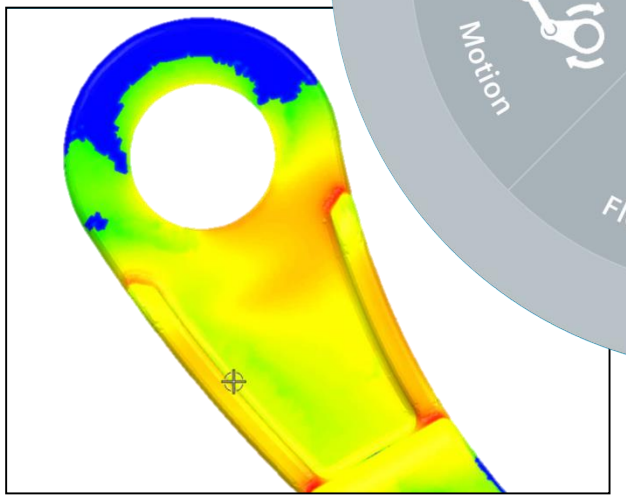
Transient

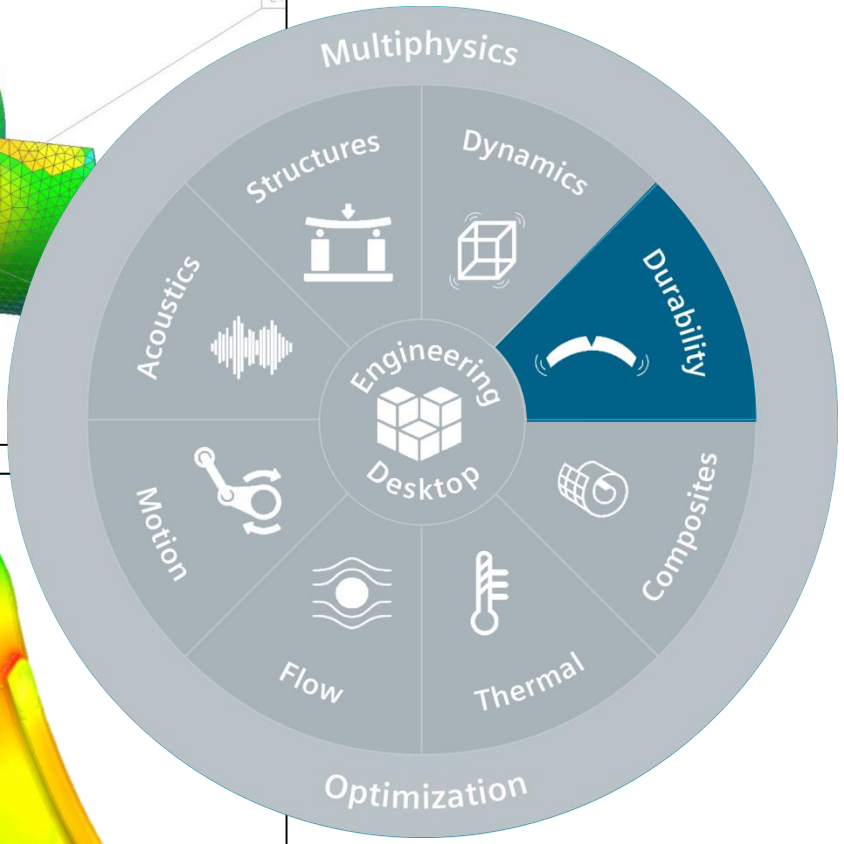
Random

Strain gauge durability

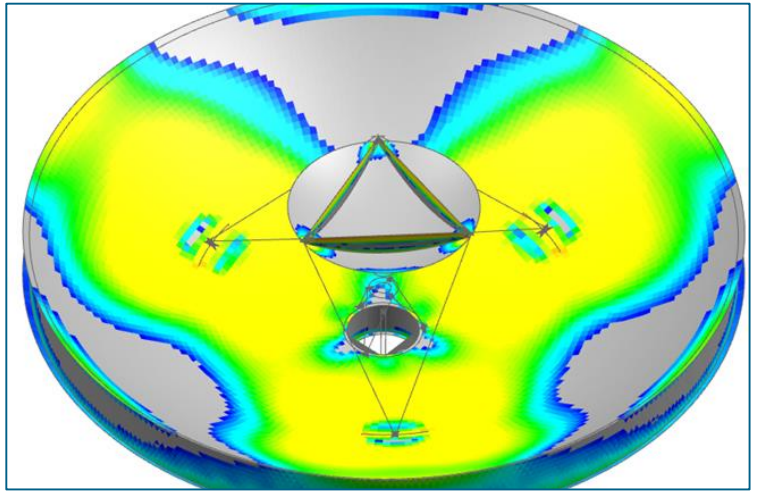


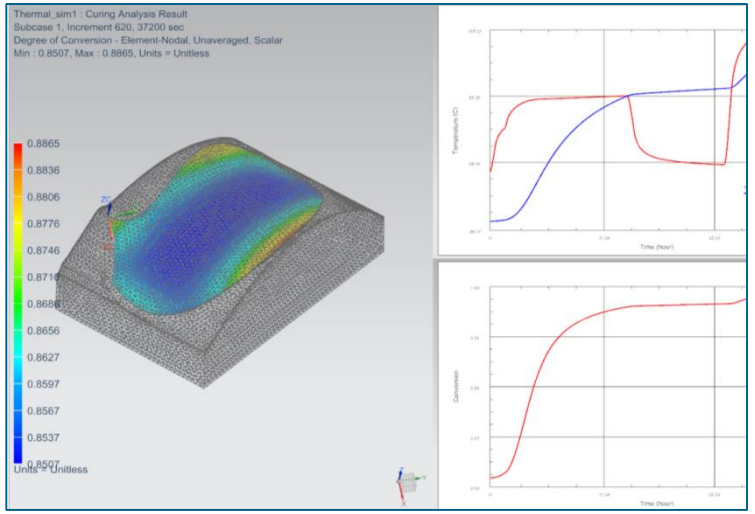


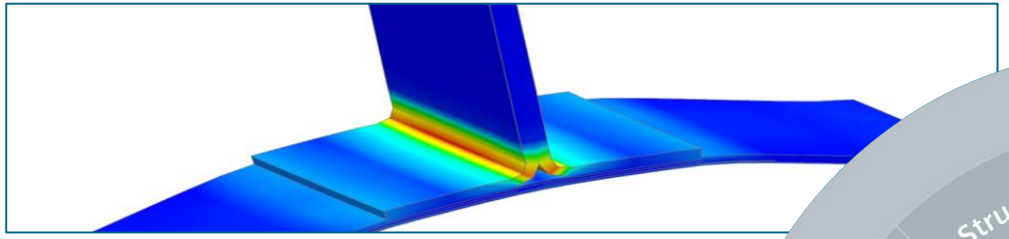




Composites Analysis







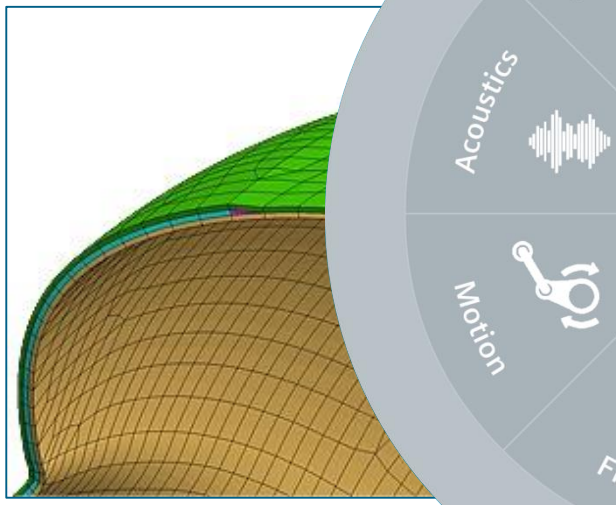
Strength/Stiffness

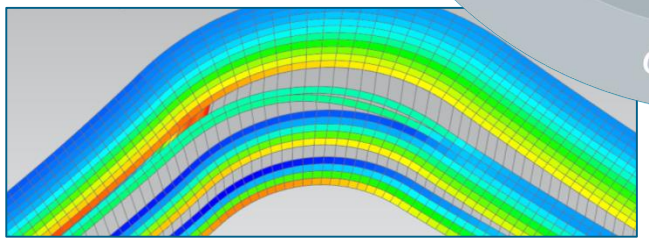
Buckling and Post-Buckling Analysis

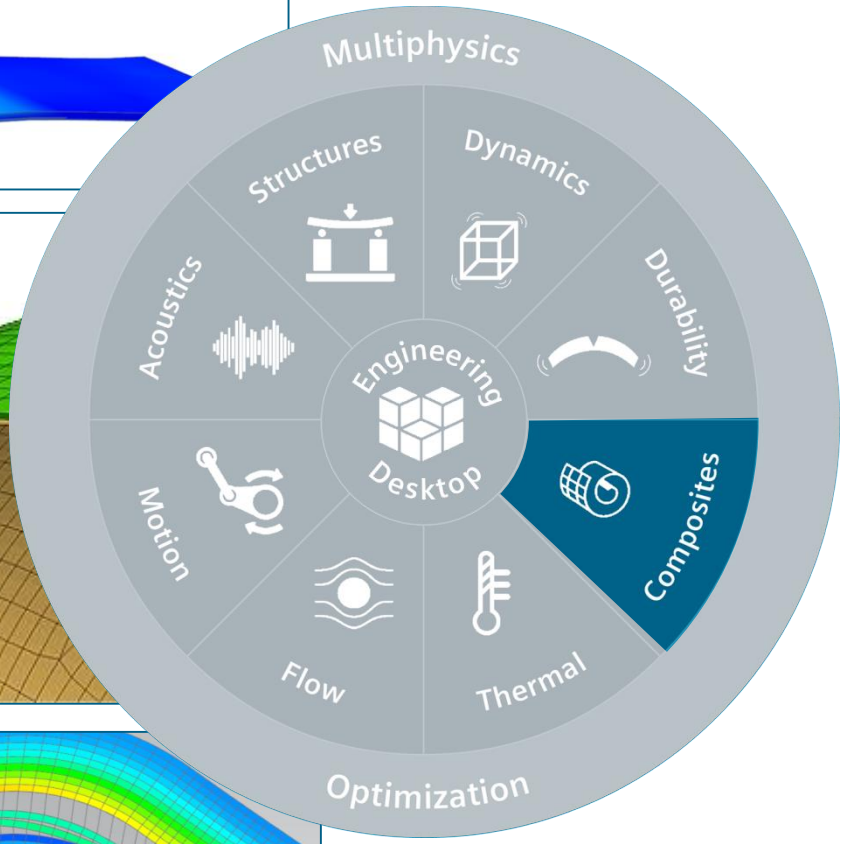
Linear / nonlinear

Progressive Damage Simulation

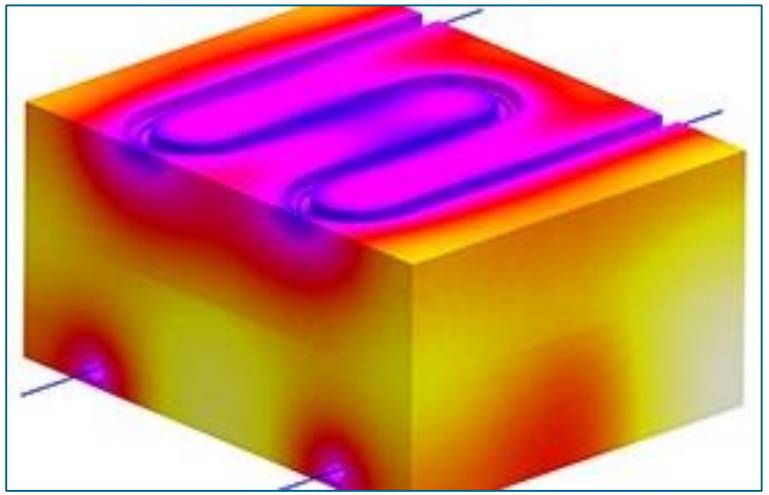
Manufacturing simulation

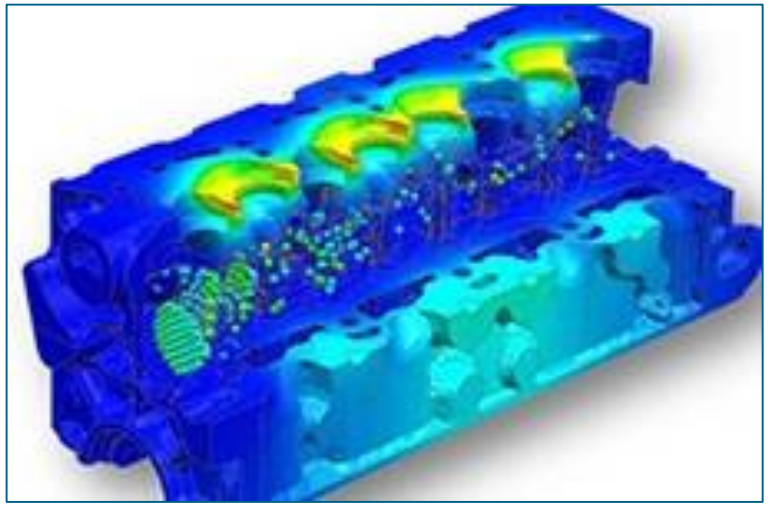




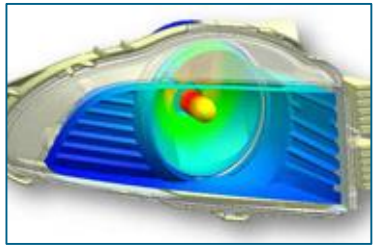


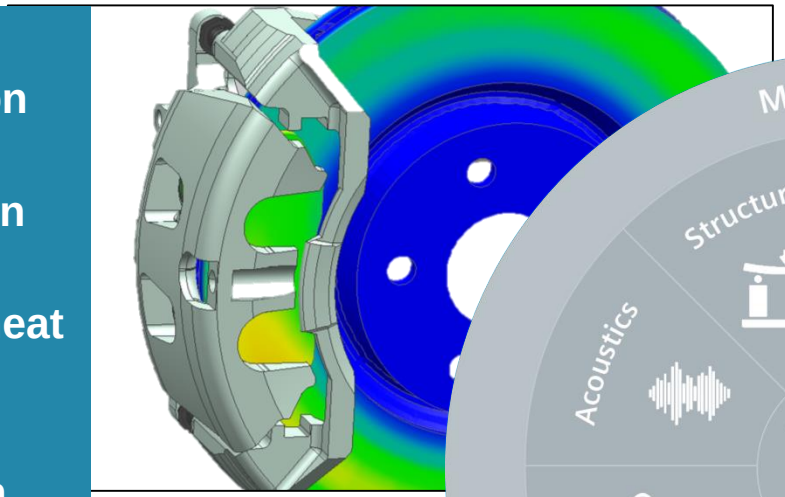
Thermal Analysis

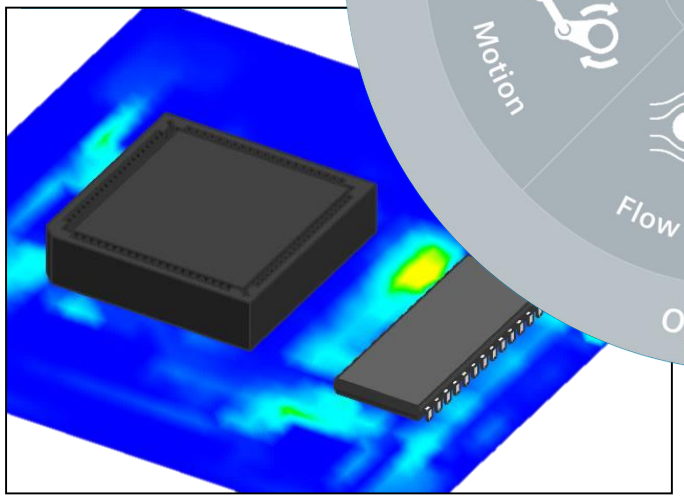


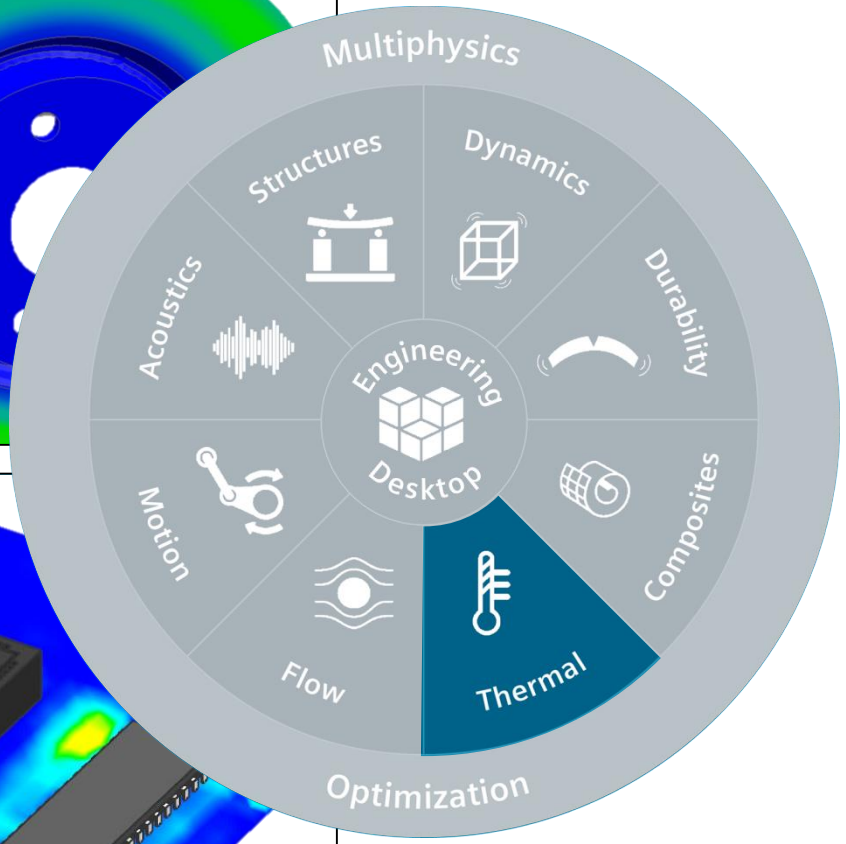


- Conduction
- Convection
- Conjugate heat transfer
- Radiation
- Couples with SC Flow





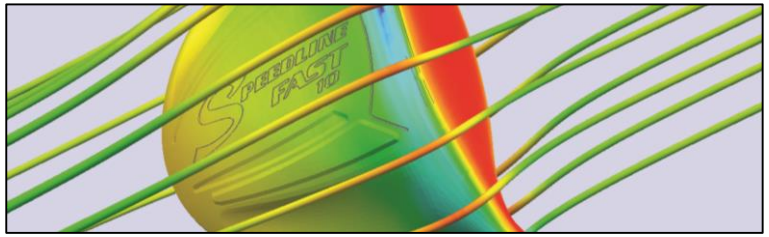




Specialty Modules for:

- Space Systems Cooling
- Electronic Systems Cooling

Fluid Dynamics Analysis



Compressible

Incompressible

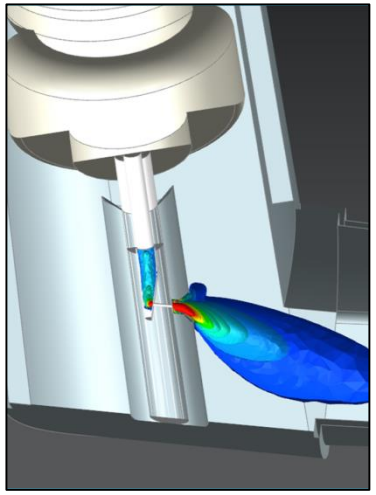
Non-Newtonian

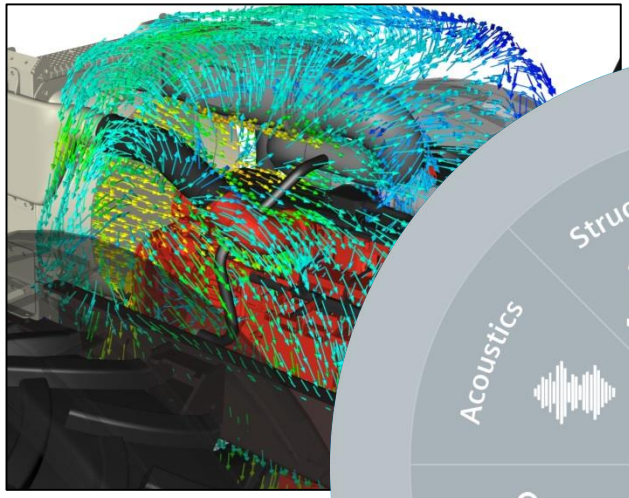
Mixing Planes

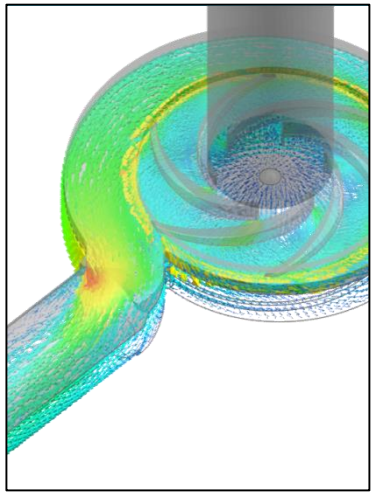
Multiple RFRs

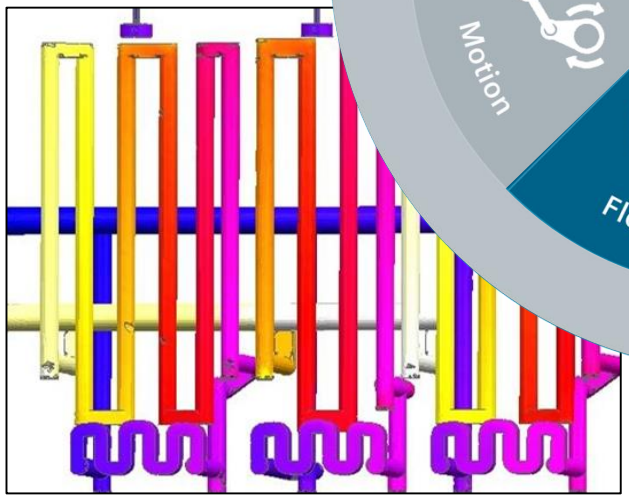
2-Phase, Mixtures, Particles

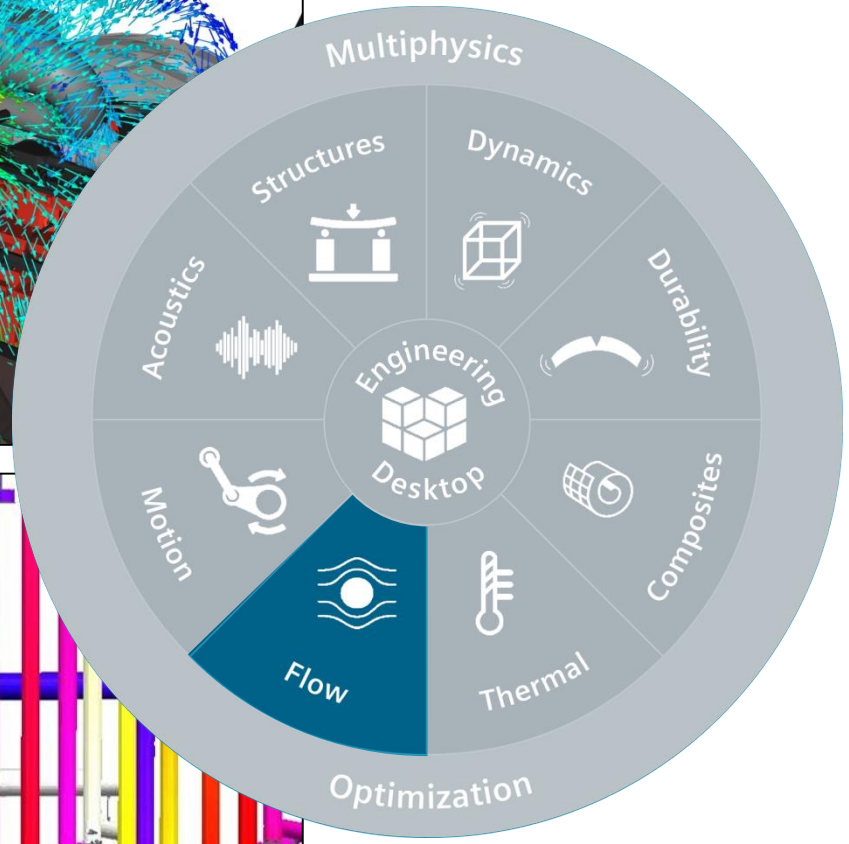
Couples w/SC Thermal



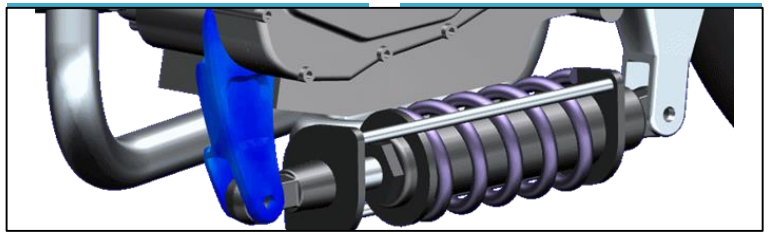


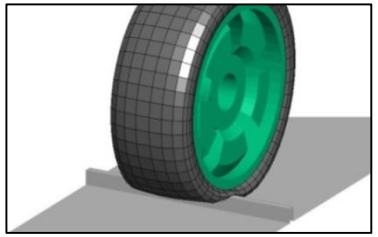


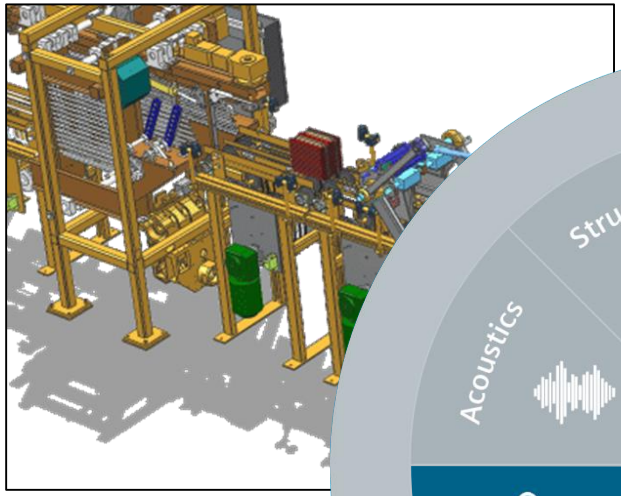


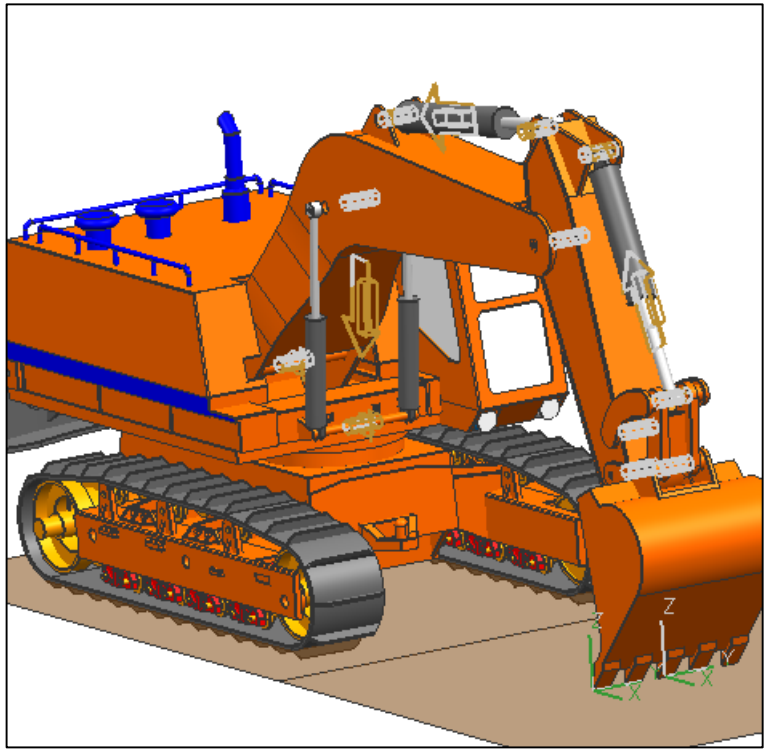


Motion Analysis

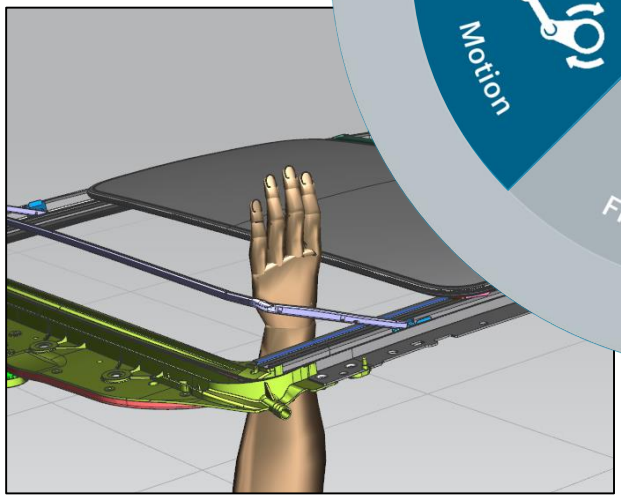


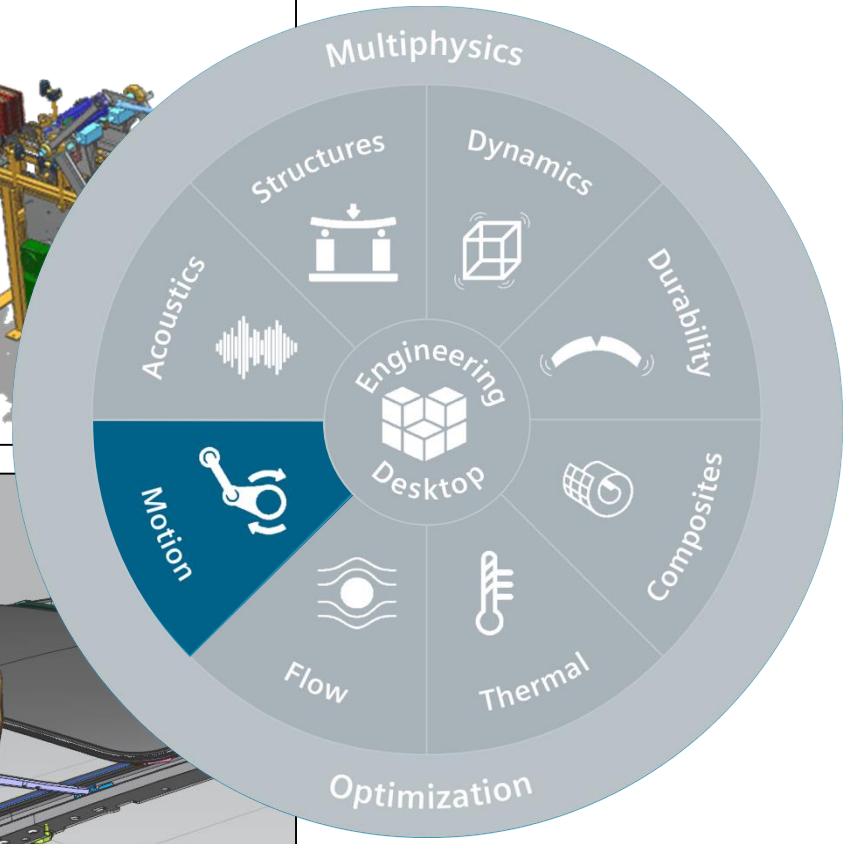




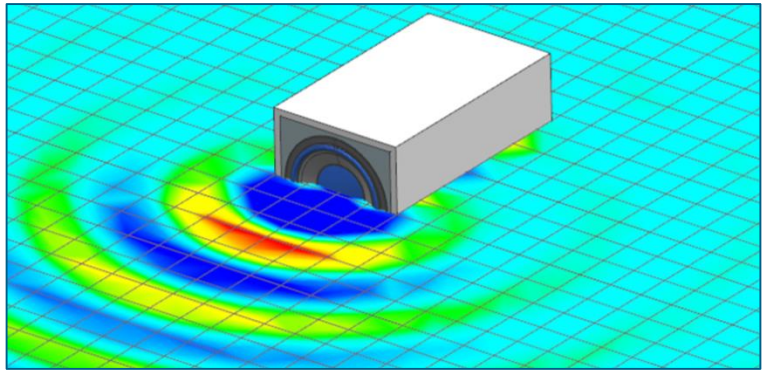


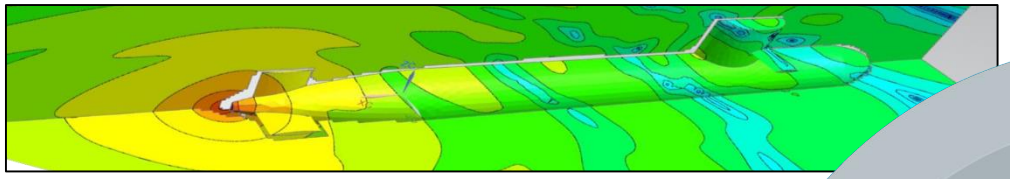
- Rigid body
- Flexible body
- Tire models
- Co-simulation with controls
- Interference checking
- Transmissions

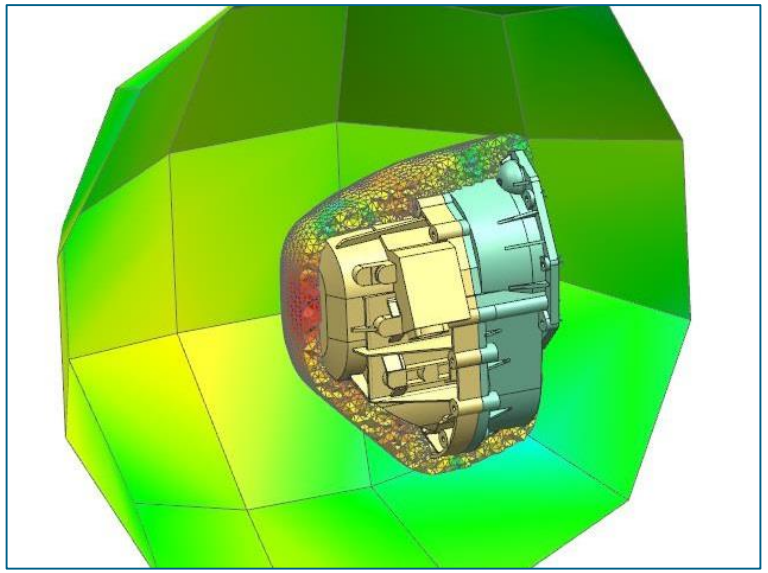




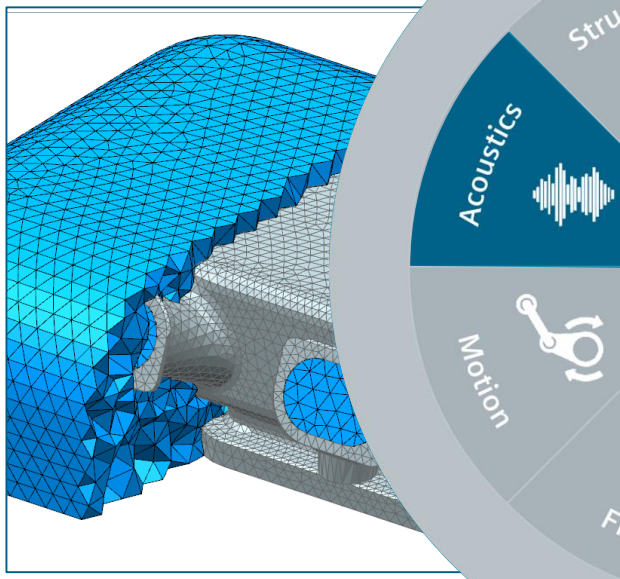
Acoustic Analysis

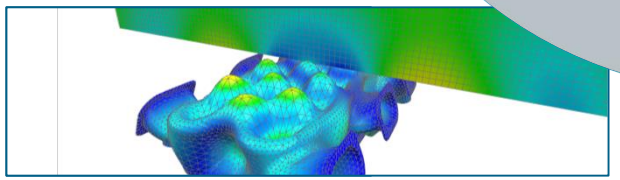


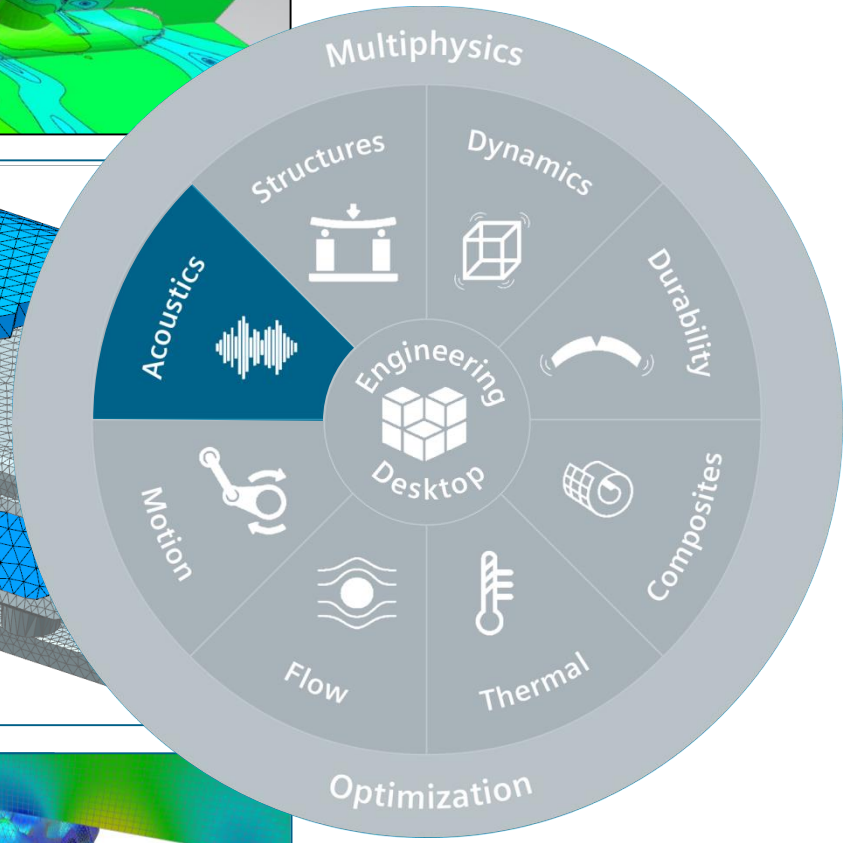




- Noise radiation
- Transmission loss
- Enclosures
- Acoustic scattering
- Acoustics modeling







Multiphysics Analysis

Thermal-mechanical

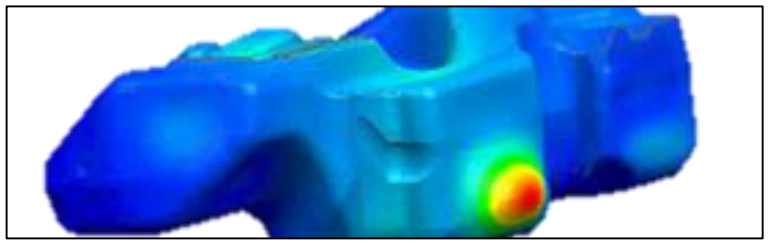
Thermal-fluid

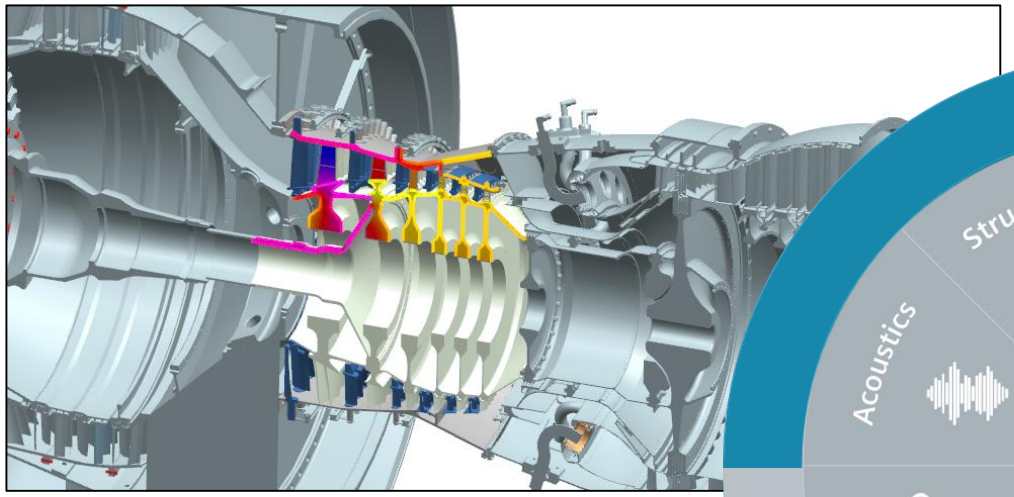
Fluid-structural

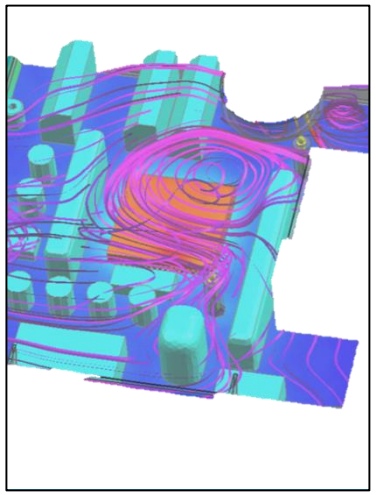
Vibro-acoustic

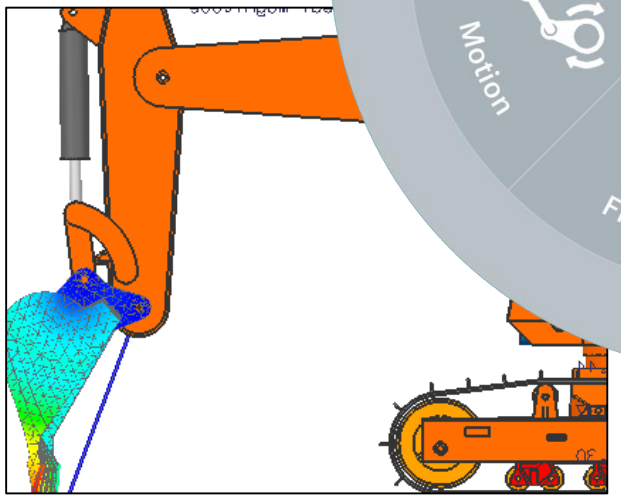
Aero-vibro-acoustic

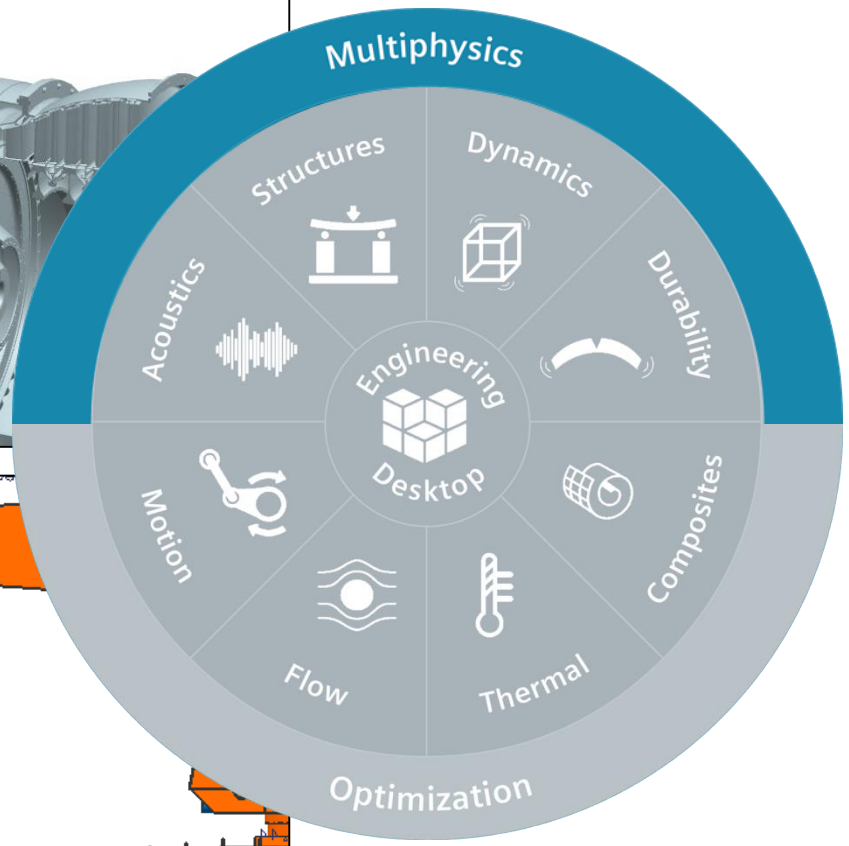
Motion-structural



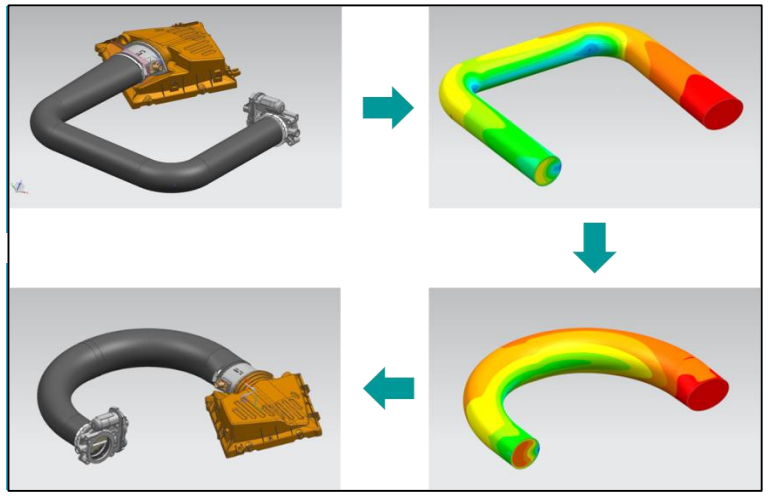


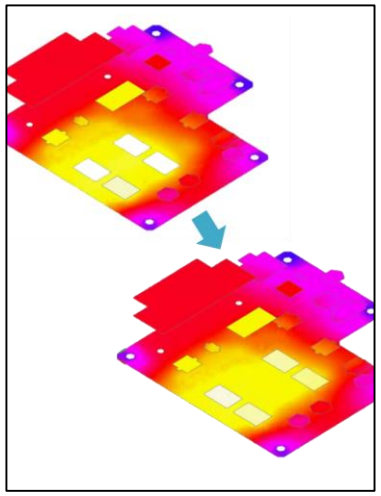


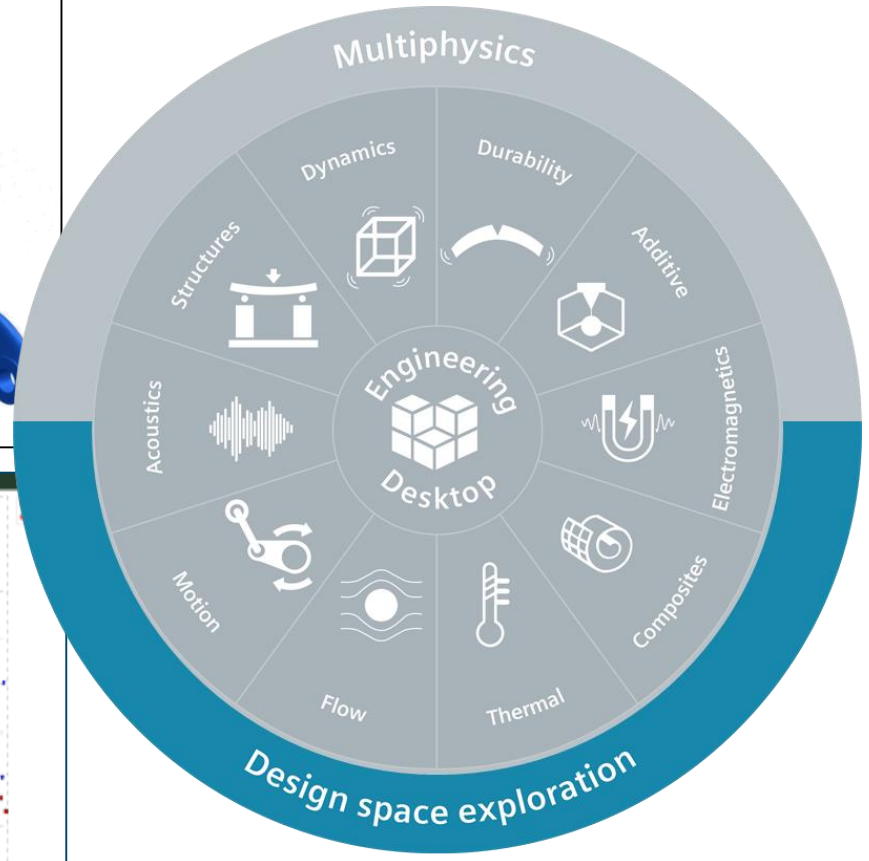




Design Space Exploration





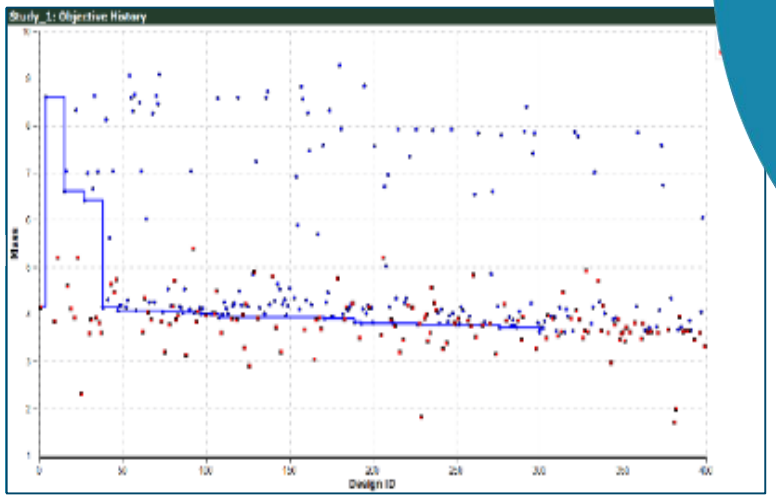


Design Space Exploration

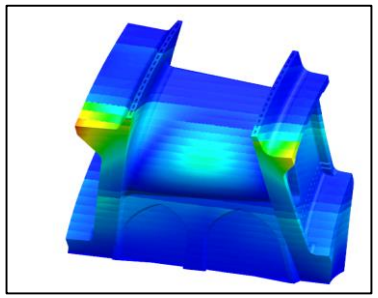
Topology Optimization

Geometry Optimization

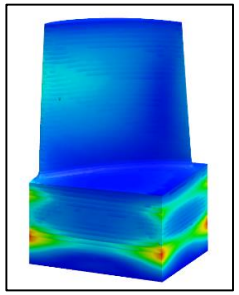
FE parameter Optimization



Additive Manufacturing



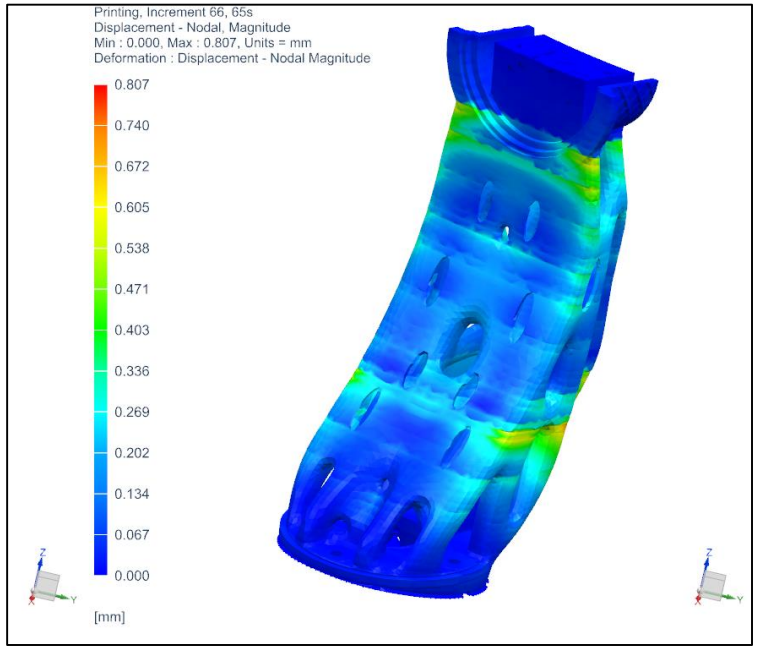
NX AM integrated solution

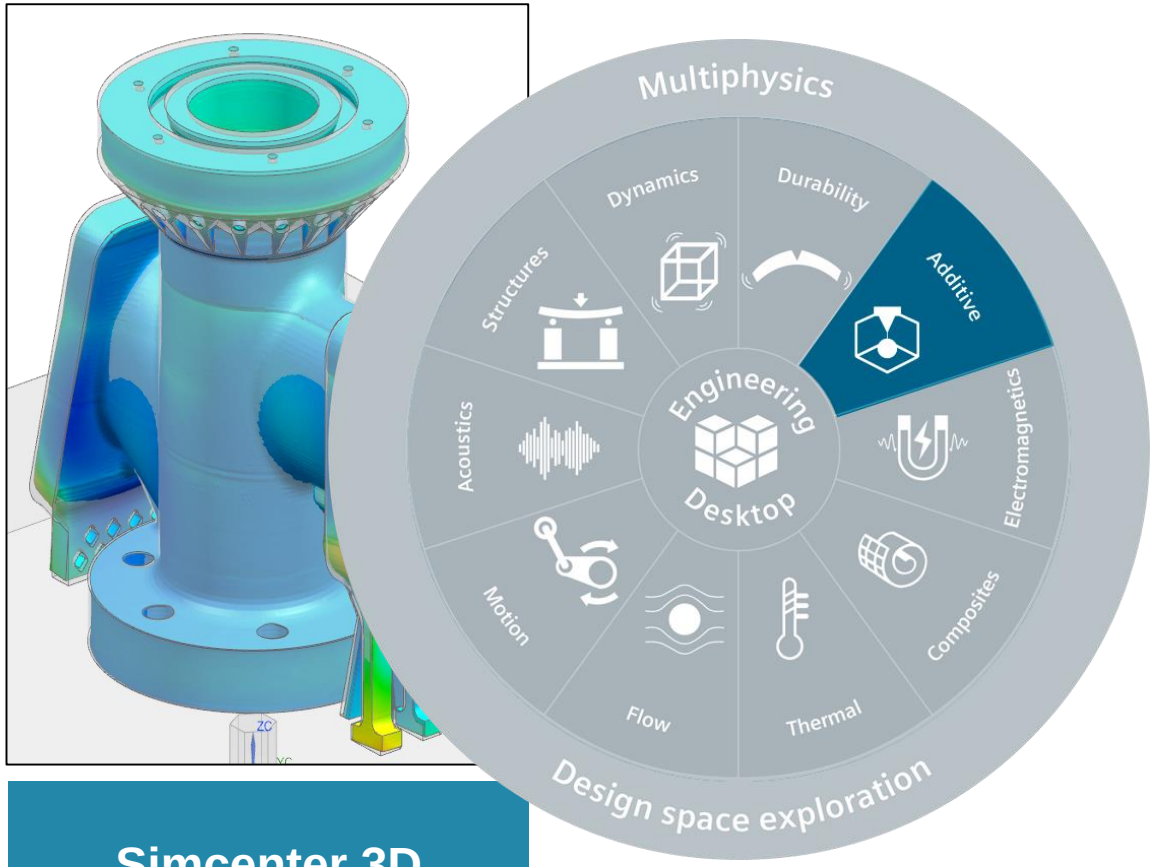


Simulate printing process

Predict thermal distortion

Allow compensation and print right first time





Simcenter 3D

Simcenter 3D Token Supported Applications

Product ID	Product Name
Pre/Post	
SC30536	Simcenter 3D Environment for Simcenter Samcef
SC30523	Simcenter 3D Environment for LS-Dyna
SC30549	Simcenter 3D Environment for MSC Nastran
SC30550	Simcenter 3D Environment for Ansys
SC30551	Simcenter 3D Environment for ABAQUS
SC30570	Simcenter 3D BEM Acoustics Environment
SC30601	Simcenter 3D Aerostructure Environment
SC30522	Simcenter 3D Laminate Composites
SC30560	Simcenter 3D Advanced Fluid Modeling
SC30620	Simcenter 3D Meshing for Acoustics
SC30504	Simcenter 3D Rotor Modeling
SC30604	Simcenter 3D Environment for Ray Acoustics
Design Space Exploration	
SC30610	Simcenter 3D Design Space Exploration
Additive Manufacturing	
SC40110	Simcenter 3D AM Solver Add-On

Product ID	Product Name
Thermal/Flow	
SC30507	Simcenter 3D Thermal
SC30508	Simcenter 3D Flow
SC30515	Simcenter 3D Advanced Thermal
SC30516	Simcenter 3D Advanced Flow
SC30537	Simcenter 3D Thermal/Flow DMP
SC30517	Simcenter 3D Space Systems Thermal
SC30519	Simcenter 3D Electronic Systems Cooling
Acoustics	
SC30580	Simcenter 3D BEM Acoustics Solver
SC30593	Simcenter 3D ATV
SC30594	Simcenter 3D Acoustics HPC
SC30595	Simcenter 3D Aero-Vibro-Acoustics
Dynamics	
SC30521	Simcenter 3D Response Dynamics
SC30596	Simcenter 3D Noise & Vibration Modeling
SC30501	Simcenter 3D Load Identification
Correlation	
SC30527	Simcenter 3D FE Model Correlation
SC30528	Simcenter 3D FE Model Update
Durability	
SC30531	Simcenter 3D Advanced Durability
SC30532	Simcenter 3D Specialist Durability Modelling
SC30533	Simcenter 3D Specialist Durability for Connections
SC30540	Simcenter 3D Specialist Durability Solver
SC30541	Simcenter 3D Specialist Durability Composite Fatigue
Aerostructures	
SC30602	Simcenter 3D Margin of Safety

Product ID	Product Name
Nastran	
NXN001	Simcenter Nastran Basic
NXN002	Simcenter Nastran Advanced Bundle
NXN004	Simcenter Nastran Dynamic Response
NXN010	Simcenter Nastran DMP
	Simcenter Nastran Superelement
	Simcenter Nastran DMAP
	Simcenter Nastran Aero- Elastic
	Simcenter Nastran RDMODES
	Simcenter Nastran Reduced Representations
NXN015	Simcenter Nastran Advanced Acoustics
NXN016	Simcenter Nastran Topology Optimization
NXN030	Simcenter Nastran Multistep Nonlinear
NXN040	Simcenter Nastran Rotor
Samcef	
SCSCF0151	Simcenter Samcef Bacon
SCSCF0152	Simcenter Samcef Asef Solver
SCSCF0156	Simcenter Samcef Stabi Solver
SCSCF0154	Simcenter Samcef Dynam Solver
SCSCF0155	Simcenter Samcef Repdyn Solver
SCSCF0158	Simcenter Samcef Spectral Solver
SCMEC0181	Simcenter Samcef Mecano Non-Linear Mechanical Solver
SCMEC0191	Simcenter Samcef Mecano Thermal Solver
SCSCF1152	Simcenter Samcef Asef Parallel Solver
SCSCF1154	Simcenter Samcef Dynam Parallel Solver
SCSCF1156	Simcenter Samcef Stabi Parallel Solver
SCMEC1160	Simcenter Samcef Mecano Parallel Solver
SCMEC0111	Simcenter Samcef Mecano Supervisor

Product ID	Product Name
Motion	
SC30571	Simcenter 3D Motion Modeling
SC30572	Simcenter 3D Motion Solver
SC30581	Simcenter 3D Motion Systems and Controls
SC30582	Simcenter 3D Motion Flexible Body
SC30585	Simcenter 3D Motion Standard Tire
SC30590	Simcenter 3D Motion Drivetrain
SC30579	Simcenter 3D Motion TWR
SC30583	Simcenter 3D Motion Flexible Body Advanced
SC30599	Simcenter 3D Motion Driving Dynamics
SC30575	Simcenter 3D Motion C-code export
SC30574	Simcenter 3D Motion Real-Time Desktop Solver
Flexible Pipe	
SC40510	Simcenter 3D Flexible Pipe Standard Beam
SC40570	Simcenter 3D Flexible Pipe Standard Shell
SC40500	Simcenter 3D Flexible Pipe Standard Beam + Shell
SC40520	Simcenter 3D Flexible Pipe Linear Dynamic
SC40530	Simcenter 3D Flexible Pipe Non-Linear Dynamic
SC40540	Simcenter 3D Flexible Pipe Optimization
SC40550	Simcenter 3D Flexible Pipe Advanced Beam
SC40580	Simcenter 3D Flexible Pipe EC&WH Option
SC40590	Simcenter 3D Flexible Pipe Simulation for EC&WH
SC40580	Simcenter 3D Flexible Pipe EC&WH option
SC40590	Simcenter 3D Flexible Pipe Simulation for EC&WH

MOST but not yet ALL Products are Token Enabled

Simcenter 3D Motion Add-Ons

- SC30586 Simcenter Motion CD Tire – Royalty
- SC30587 Simcenter Motion TNO MF Tire – Royalty
- SC30588 Simcenter Motion TNO MF Swift Tire – Royalty
- SC30592 Simcenter Acoustics ABEM – Royalty
- SC30573 Simcenter Motion Solver 4-Node – Royalty
- SC30591 Simcenter 3D Motion Hydrodynamic Bearing – Royalty
- NX30557 NX Motion – CAD (Instead … Use Simcenter Motion)

Simcenter 3D Acoustics Add-Ons

- SC30592 Simcenter 3D Acoustics ABEM – Royalty
- SC30597 Simcenter 3D Ray Acoustics Solver – Royalty
- SC30598 Simcenter 3D Acoustics Time Domain BEM Solver – Royalty

Simcenter Nastran Add-Ons

- NXN007 Simcenter Nastran Optimization – Royalty
- NXN014 Simcenter Nastran Rotor Dynamics – Royalty

Simcenter Low-Frequency and High-Frequency Electromagnetics (Planned late 2020)

- SC30710 Simcenter 3D Low-Frequency Electromagnetic Solver
- SC30711 Simcenter MAGNET Solver
- SC30712 Simcenter MAGNET Thermal Solver
- SC30720 Simcenter 3D High Frequency Electromagnetics Pre-/Post-
- SC30721 Simcenter 3D High Frequency Electromagnetic Solver

All Simcenter Multimech Products (Planned late 2020)

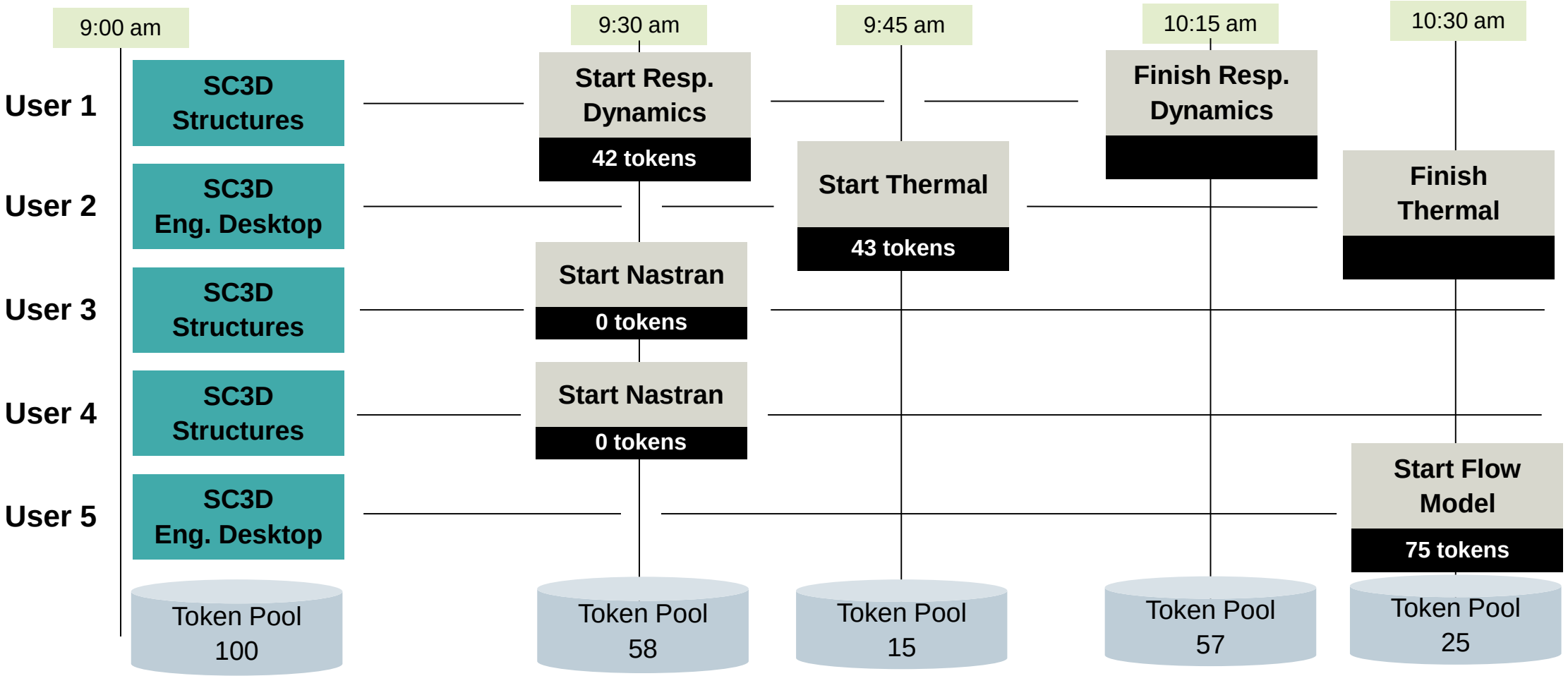
All LMS SEA+ (Statistical Energy Analysis) Products - Royalty

Third-party capabilities integrated into Simcenter 3D often have Royalties associated with their use that make support of Value-based Licensing challenging. Some of these may eventually be supported but most will not.

Any such modules are **still available** through traditional module-based licensing by perpetual license, subscription, or rental.

Other products not yet supported are the results of recent acquisition by Siemens. In these cases, support is planned but has simply not yet been implemented in the software.

SC3D Token Licensing Example



Customer Usage Example
Scenario: Medium # Users, Many Applications

Aerospace Customer
- Has 12 licenses of Simcenter Engineering Desktop or Simcenter Structures
- Has varying need for add-ons

Each may have the the need to run Simcenter 3D Add-on Products
- Thermal
- Flow
- Space System Thermal
- Electronic Systems Cooling
- Response Simulation
- Laminate Composites
- Advanced Fluid Modeling

Are tokens or individual licenses more cost effective?

Customer Usage - for a typical week		Monday	Tuesday	Wednesday	Thursday-Friday	Total # Licenses Needed	Total # Tokens Needed
ID	Product Name	# Licenses	# Licenses	# Licenses	# Licenses		
SC30507	Simcenter Thermal	8	3	0	4	8	
SC30508	Simcenter Flow	4	3	0	2	4	
SC30515	Simcenter Advanced Thermal	0	0	0	4	4	
SC30516	Simcenter Advanced Flow	0	0	0	2	2	
SC30517	Simcenter Space Systems Thermal	0	1	0	0	1	
SC30519	Simcenter Electronic Systems Cooling	0	1	0	0	1	
SC30521	Simcenter Response Dynamics	0	0	5	0	5	
SC30522	Simcenter Laminate Composites	0	0	5	0	5	
SC30560	Simcenter Advanced Fluid Modeling	0	2	0	0	2	
						32	500

Cost Ratio Tokens/Modules= 43%

Analysis:

9 Applications used throughout the week

Module-based Licensing
- 32 separate licenses would be required

Value-Based Licensing
- 500 tokens would cover usage

Almost 60% Cost Savings using Value Based Licensing

Customer Usage Example
Scenario: Medium # Users, Few Applications

Aerospace Customer
- Has 12 licenses of Simcenter Engineering Desktop

Each may have the the need to run Simcenter Nastran Products
- Simcenter Nastran Basic
- Simcenter Nastran Dynamic Response

Are tokens or individual licenses more cost effective?

Customer Usage - for a typical week		Monday	Tuesday	Wednesday	Thursday-Friday	Total # Licenses Needed	Total # Tokens Needed
ID	Product Name	# Licenses	# Licenses	# Licenses	# Licenses		
NXN001	Simcenter Nastran Basic	8	6	10	9	10	
NXN004	Simcenter Nastran Dynamic Response	2	3	6	2	6	
						16	1300

Cost Ratio Tokens/Modules= 159%

Analysis:

2 Applications used throughout the week

Module-based Licensing
- 16 separate licenses would be required

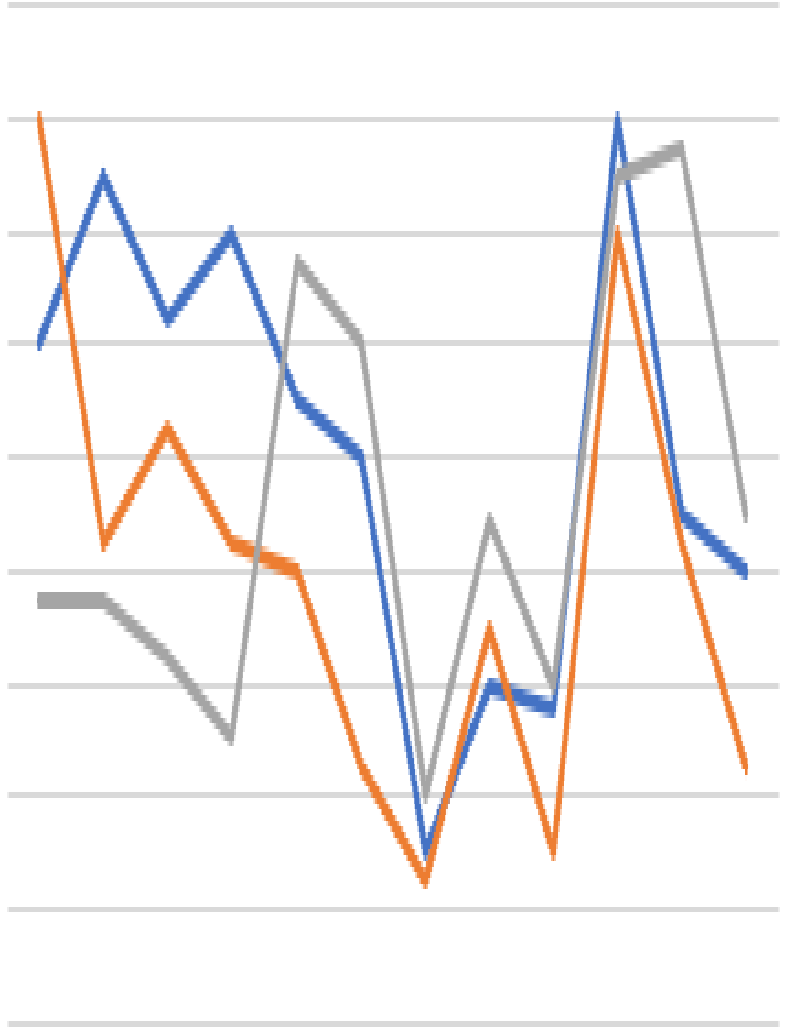
Value-Based Licensing
- 1300 tokens would cover usage

Module-based Licensing is 60% more cost effective

Estimating Number the Number of Tokens You Need

Process:

1. Estimate your peak usage requirements – number of products that may be in use at one time
2. Provide this information to ATA Engineering
3. We can work up an analysis like in previous slides and tell you whether token licensing is a good fit for your company
4. Don’t forget to consider what your future requirements may be, i.e., potential changes to the types and numbers of modules needed.



FAQ – Value Based Licensing

Which Simcenter 3D versions use Value Based Licensing?

- VBL is supported with Simcenter 11 and subsequent

Can Simcenter 3D tokens combine with tokens in other portfolio products, such as NX, Amesim or STAR-CCM+?

- No, Simcenter 3D Tokens can only be used for Simcenter 3D, Simcenter Nastran, and Simcenter Samcef applications.

Can tokens be used with license borrowing?

- No

When are tokens more cost efficient then module-based licensing?

- There is no hard-and-fast rule. Each customer's situation needs to be evaluated.
- In general, customers wishing to use a larger range of products will be a good candidate for VBL.

FAQ – Value Based Licensing

Can users control whether a module-based license or token license is consumed?

- No. Simcenter 3D will always try to check-out the module-based license first. Only if not available will it then try to check-out token licenses

Is it possible use Simcenter Nastran via token with Femap?

- Simcenter 3D base products are a mandatory pre-requisite to use Simcenter Nastran via tokens. If you have a mix of Femap with Simcenter 3D, Simcenter Nastran could be run with tokens.
- Simcenter 3D Structures, one of the base products, includes Engineering Desktop and Nastran Basic and is a very cost-effective way to access Nastran Basic and would consume no tokens when doing so.

How can users get training for capabilities they may want to use with tokens?

- We recommend that users sign up for Learning Advantage where they can do self-training very cost-effectively.

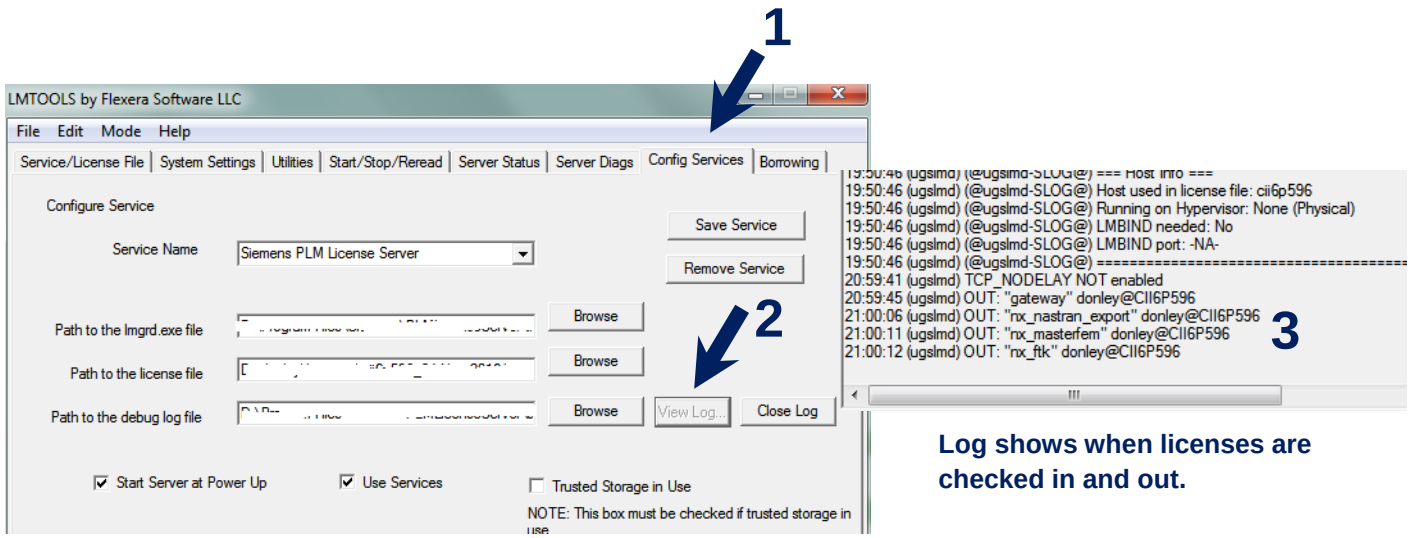
FAQ – Value Based Licensing

How do customers track their token usage?

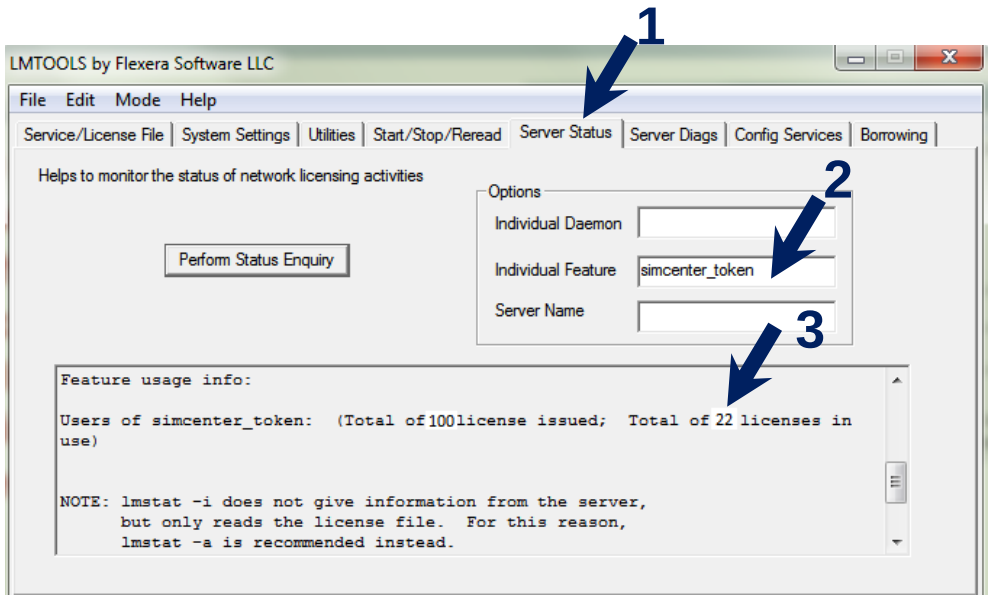
Customers can use the lmtools application to track their license feature usage

- Option 1: From the Config Services tab, users can view the log file. This will give a listing of license features (including for tokens) as they are checked in and out.

- Option 2: From the Server Status tab, users can enter simcenter_token in the Individual Feature entry and get a report of total tokens that are licensed and in use at any moment



Log shows when licenses are checked in and out.



Example shows 100 tokens in the license file and 22 in use

Contact

Scott Thibault
Manager, Business Development

ATA Engineering Inc.
Southeast Regional Office
1500 Perimeter Parkway NE
Huntsville, AL 35806
Phone: (256) 850-3856
Mobile: (802) 296-1617

E-mail:
scott.thibault@ata-e.com

Smarter decisions, better products, faster.

Contact Us

13290 Evening Creek Drive S
San Diego, CA 92128

(858) 480-2000

plm_sales@ata-e.com

www.ata-e.com
www.ata-plmsoftware.com

@ATAEngineering

ata-engineering

THANK YOU!