How to leverage Simcenter STAR-CCM+ for multiphysical simulations Today's presenters



Frouke Kruijssen Frouke@femto.nl



Christophe Vandevelde christophe.vandevelde@siemens.com



Simcenter STAR-CCM+ Your next breakthrough is closer than you think!

Unrestricted @ Siemens AG 2021

Your next breakthrough is closer than you think!

SOLUTION

Use simulation to design energy savings devices in under 6 weeks

1000t ANNUAL CO₂ REDUCTION ANNUAL SAVINGS **500**k PER SHIP ANNUAL FUEL 6%

SAVINGS



Simulation is a fast and low-cost approach to consider hundreds of trade-offs in design

Companies say top actions to improve product designs are:



(Source: Aberdeen Group, Simulation-integrated product development: achieving more with less)



Technip develops "new concept" subsea heat exchanger in just two weeks





Addressing bottlenecks in the simulation process

A recent study by the Tech-Clarity research firm analyzed the time spent in the simulation process: **25**%

Postprocessing

23% Waiting for solver

6%

Other

8% Sending models to solver

38%

Preprocessing

(Source: Tech-Clarity, Bottlenecks of Simulation, 2016)



Workflow Automation

- Integrated CAD-to-solution in a single platform
- Single user interface and simulation file
- Robust & re-playable workflow enabling exploration

Reduce engineering time by 90%



mixer - STAR-CCM+

File Edit Mesh Solution Tools Window Help

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Design Exploration

- Built-in design exploration and optimization
- Intelligent approach with multiple search strategies
- No tuning of parameters or expertise required

Save \$\$\$ by analyzing 1000s of design trade-offs









High Fidelity Simulations



Complex Model Handling

- Easily import, create, modify and prepare geometry
- State-of-the art meshing technologies
- Robust and automated process from CAD to mesh

5x speedup when modeling geometries with 1000s of parts



File Edit Mesh Solution Tools Window Help



Customer Success:

Commercial Regional Jet, increased simulation throughput of complex geometry

SIEMENS Ingenuity for life



- Increased meshing through put time by 428% for a typical model
- Improved solution accuracy through modeling true geometry

Thermal management issues with engine
integration are due to complex environments.• No need to reduce model fidelity• Accurately predict metal temperatures• Model cooling strategies without costly testing• Model cooling strategies• Mod

"STAR-CCM+ increased our modeling throughput for by more than we could have imagined. We can now look at design candidates in just a few days rather than several weeks"

Sr. Propulsion Engineer at Large Commercial Airframer



Simcenter STAR-CCM+ Integrated Multiphysics

- Built on the backbone of industry-leading CFD
- Broad range of validated physics models
- Combine multiple physics & motion in one simulation

Simulate reality no matter how complex the physics































Decisions in days instead of weeks



Parallel Efficiency

- Parallelized across the complete simulation pipeline: pre-processing, solution and post-processing
- Solvers that scale to 100,000 cores

Use all your available compute resources to get results faster





Flexible Licensing

Software costs don't limit hardware utilization:

- Core count independent Power Sessions
- Affordable design exploration using Power Tokens
- Usage-based Power-on-Demand in the cloud

Allocate your software budget when & where it matters most





"Being able to use the Power-on-Demand licensing scheme and run simulations in the cloud has been of tremendous help for us in terms of productivity"

> Mio Suzuki Trek Bicycle Corporation

Trek Bicycle deploys Simcenter STAR-CCM+ in the cloud to quickly optimize bicycle aerodynamics and ride quality

From 30 to **1,000**

design variants in less time







"Thank you very much for all the help!" L. Van Tienhoven Hyperloop

Better Together



Dedicated support

Collaboration with customers to satisfy immediate simulation needs

- Individualized Support Model
- Engineering service experts
- Three major releases per year

Responsiveness with cuttingedge technologies



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Thank you.

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