Webinar: Simcenter STAR-CCM+ Version 2020.1 update

Q&A

Q1

regarding importing cad, is star ccm opening up in import cad standards without having to pay additionally, now .stl is free but .sat .3ds not for example limiting the workflow

A1

All neutral CAD-formats can be imported into 3D-CAD or by importing surface mesh in Simcenter STAR-CCM+:

(https://documentation.thesteveportal.plm.automation.siemens.com/starccmplus_latest_en/index.html?param=UZWcw&authLoc=https://thesteveportal.plm.automation.siemens.com/AuthoriseRedirect#page/STARCCMP%2FGUID-B136575B-4971-45EF-BE83-4883997CA600.html)

Format Name	File Extension	Binary/ASCII	Part Surface Names
IGES	.igs, .iges	ASCII	No
STEP	.stp, .step	ASCII	Yes
VDA Surface Data Exchange	.vda	ASCII	Yes
Parasolid Transmit	.x_t, .x_b	ASCII (.x_t), Binary (x_b)	Yes
ACIS	.sat, .sab	ASCII (.sat) , Binary (.sab),	No

Furthermore, when importing surface mesh these formats are supported: But for native CAD, like Creo, CATIA V4/V5, NX, Solid Edge, Inventor, SolidWorks, and JTOpen B-rep, Medina you will need a CAD-client that renders an additional cost.

According to Siemens price book there is no reader available for Rhino or Felisa as far as we can see. We interpret this as these formats can be read without having any additional CAD-client license, but we have not verified that.

(https://documentation.thesteveportal.plm.automation.siemens.com/starccmplus_latest_en/index.html?param=UZWcw&authLoc=https://thesteveportal.plm.automation.siemens.com/AuthoriseRedirect#page/STARCCMP%2FGUID-B60389A8-312C-4B91-A8F5-6C7DF8F201B7.html%23)

Format Name	File Extension	Binary/ASCII	Feature Curves	Part Surface Names
pro-STAR Database	.dbs	Binary	Yes	Yes
pro-STAR Cell/Vertex/Shell Input	.cell/.vrt/.inp	Both	Yes	Yes
NASTRAN	.nas, .bdf, .dat	ASCII	No	Yes
PATRAN	.pat, .ntl, .neu	ASCII	No	Yes
STL	.stl, .STL	Both	No	No
FELISA Front Surface	.fro	Both	No	Yes
JT Open	.jt	Binary	No	Yes
MEDINA Binary Input	.bif	Binary	No	Yes
Rhino 3D Model	.3dm	Binary	No	No
CATIA Graphics	.cgr	Binary	Yes	Yes

Q2

What is the benefit of a quad instead of triangle mesh?

A2

Hex are often, at least historically, better at capturing boundary layers.

Q3

Can we play a java macro in a simulation operation?

A3

Java macro is not part of the simulation. I do not believe that is possible. The sim op is implemented to remove the use of java. There might be some type of workaround for this however.

But in general: you can do simulation operation in java but not java in simulation operation.

Q4

Simulation operation are compatible with design manager, can we export tables and data periodically when used this method in design manager?

A4

Yes, simulation operation is compatible with design manager. This is the same as for running Simulation Operation in batch mode:

To run a simulation sequence in batch mode:
  a. Set one simulation sequence to active using Set Active Simulation Operations or include the simulation sequence in Selected within the Simulation Operations node.
  b. Save and close the simulation.
  c. Relaunch the simulation from the command line using the -batch option. For example:
   ```
      % starccm+ -batch file.sim
      ```
      If you include a subcommand after the -batch option, (that is, mesh, run, step, or <macro>.java, the simulation operations are <u>not</u> executed even though one is active. Or in your case from design manager.

Generally, you have the same functionality when you run a simulation from Design manager, as you have in the simulation itself. In case you intend to run the **Solve Continua** operation in Simulation operation, you can export your table, for instance from a report:
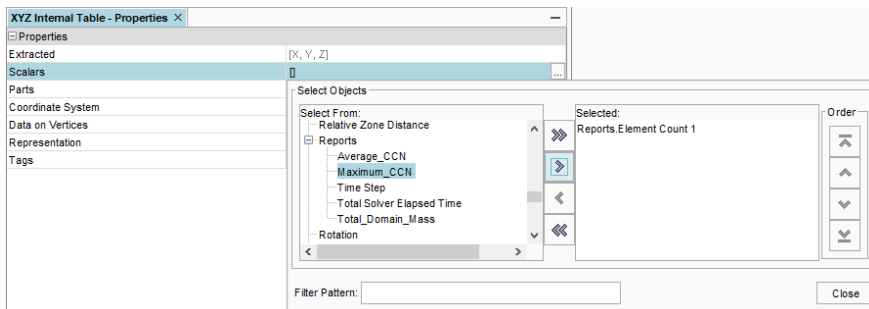


Then you can specify a **Trigger** and **Save To File** to export you table:
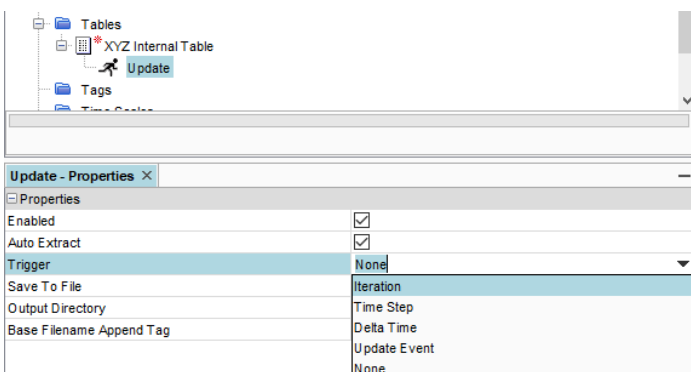
## Q5

How did you create the animation, for example on slide 67

## A5

This can be done using the tool screenplay with the simulation history framework (.simh). The rendering uses Advanced Rendering option.

## Q6

is the AMR simulation time slow at start as small converging (iterations take long) and get faster in time, for small simulations AMR might not be faster, or in general it works fast?

## A6

The AMR reduces the overall computational time since you can have much more specific refinements only where needed and recover coarse cells elsewhere. In other words, your mesh will have less cells in total.

At the beginning you will have to refine more cells which might take some extra time. Later in a steady state simulation, you will converge to a refined mesh which has more cells as before but is more suitable to solve the flow.

## Q7

Is prism cell refinement supported in AMR?

## A7

In the current release, AMR can either skip prism cell refinement or only refine the prism cells isotropically, that is, by the same refinement in all directions.

## Q8

What does isotropic cell refinement for prism layers mean?

## A8

The same refinement in all directions

## Q9

For colleagues whose invitation ended up in the spam folder, will the presentation be available after? And for us forgetful?

## A9

Yes, a link to the recording will be available

## Q10

While replacing geometry, what are the requirements for associativity?

## A9

You would need target part.

| Target Part | Specifies the part to replace in the pipeline. Typically this is a leaf-level part that you create to contain the replaceable part in the pipeline. |
|---|---|

Most cases work with  Surface Mesh Parts—parts that are imported into Simcenter STAR-CCM+ and contain surface mesh data (discretized surfaces). The tessellation density of these parts cannot be modified after import, although you can modify the part manually using the surface repair tool.

The target part should be similar in terms of **surfaces** such that the pipeline works through meshing and boundary setting. The replace part operation will still work if the surface don´t match. However, you might end up with additional/empty surfaces. In the figure to the right, I replaced a default block with a default cylinder. The block surfaces don´t match the Cylinder Surfaces. Hence, the Block surfaces are empty