



**Groundbreaking  
Simulation Solutions**

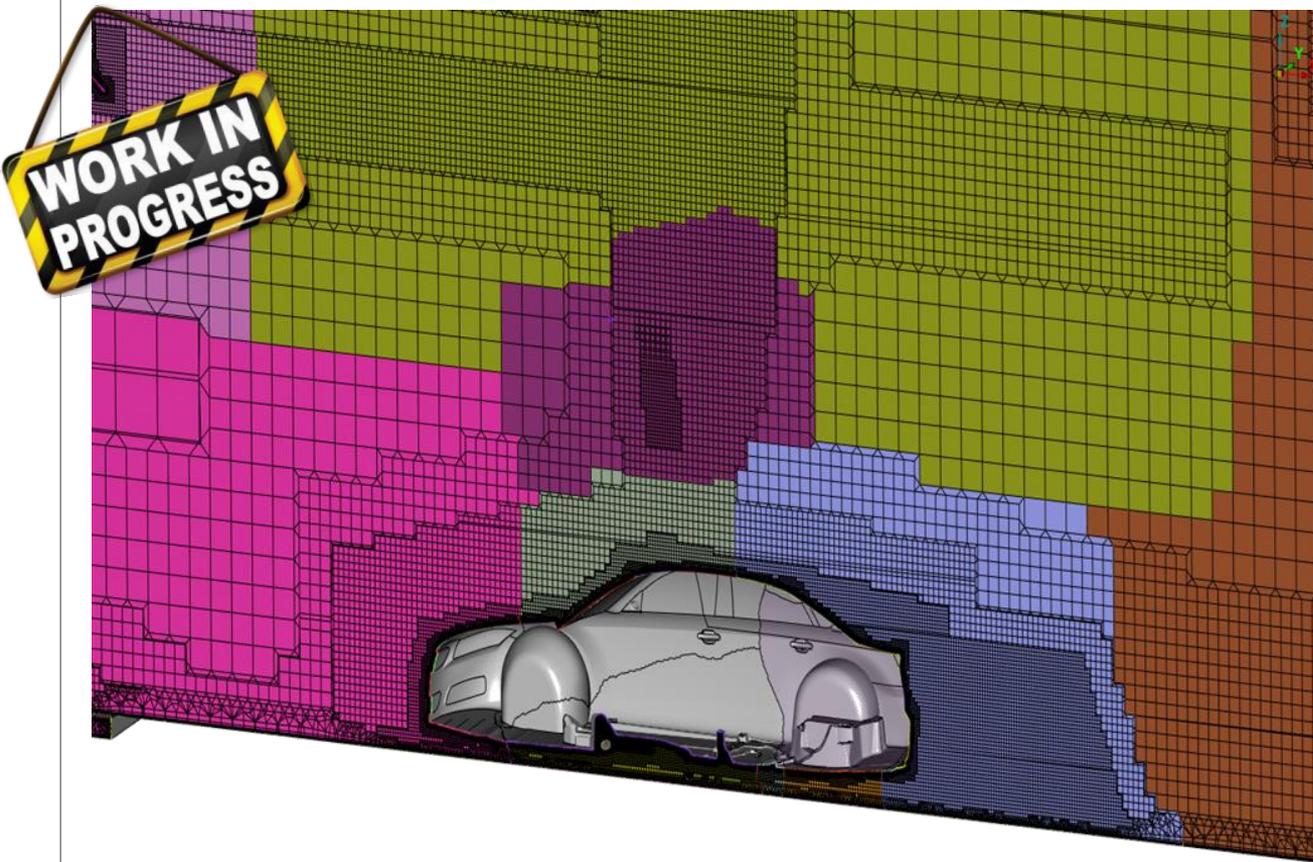
*physics on screen*

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**Are We Ready  
For Huge Models?**

- ANSA
  - CFD Light Representation
  - Smart Assembly
  - NVH Console
- Eptilysis
  - Super Elements
  - AMLS Method
  - MNF Display Model
- META
  - Parallel Reading
  - New Graphics Kernel
  - Read Specific Pids/Sets/Includes
  - Results' Compression



**ANSA**

**CFD**

**Light Representation**

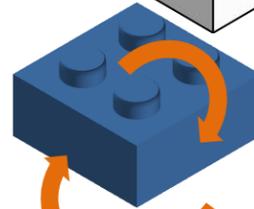
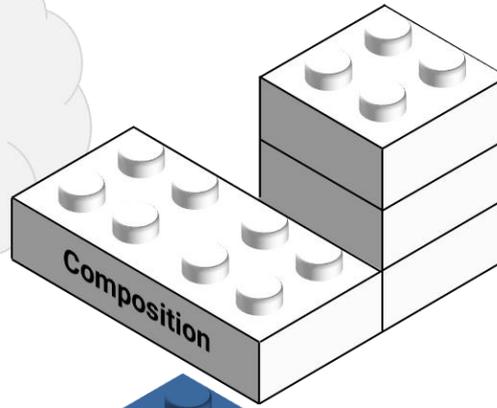
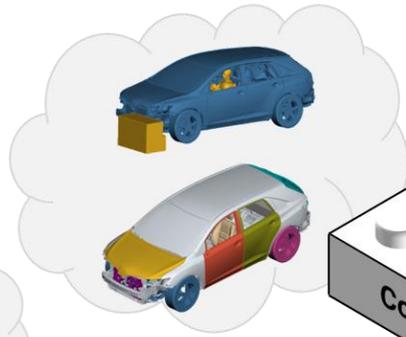
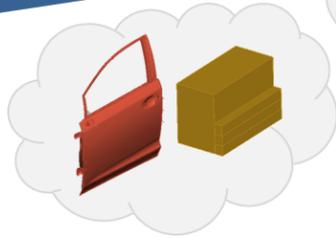
Shared Memory Parallel  
(SMP – multi CPU)  
meshing

Distributed Memory  
Parallel (DMP – cluster)  
meshing

Domain decomposition

Producer

Consumer



Indexing



Adaptation



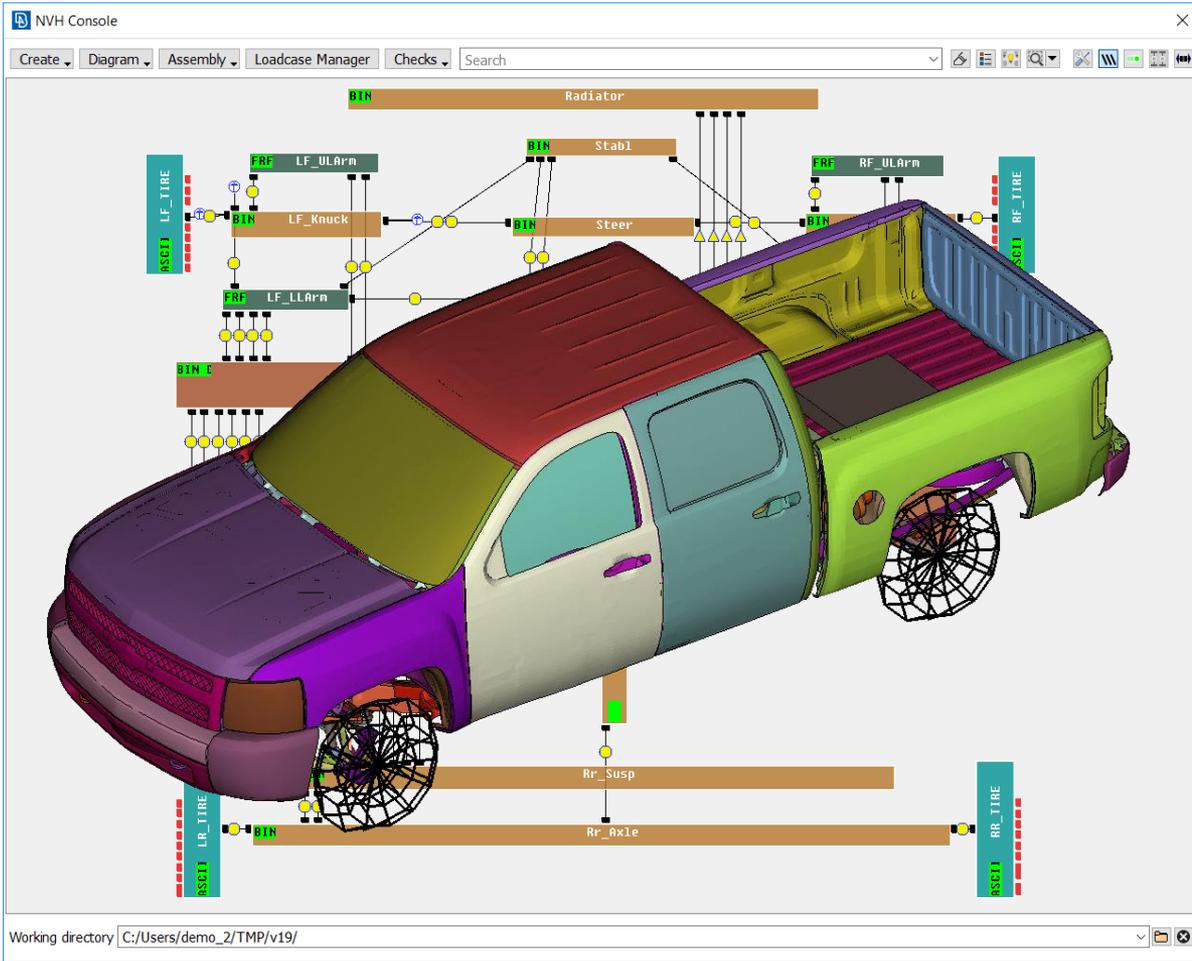
**ANSA**

## Smart Assembly

Handle efficiently multiple :

- Variants
- Loadcases
- Parts & CAD versions

... across different disciplines



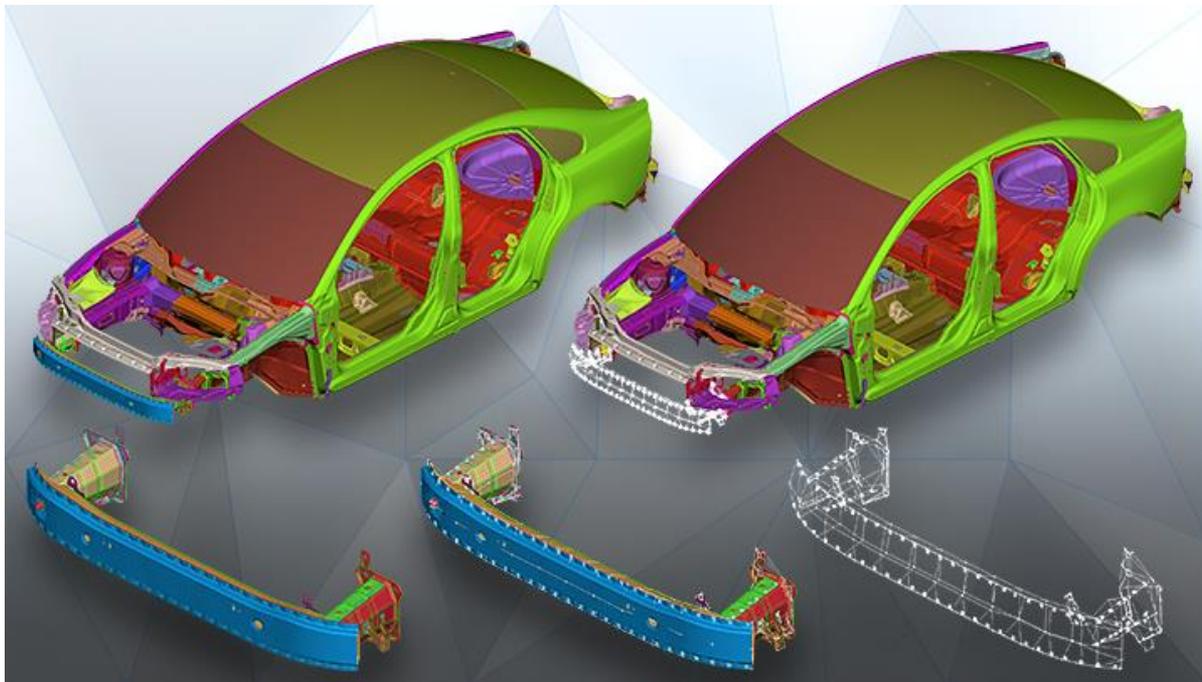
**ANSA**

## NVH Console

Fast calculation of full vehicle system modes from component modes

Fast calculation of full vehicle response with FRF assembly

Create reduced model (Modal, FRF & External Superelements) representations



## Enalysis

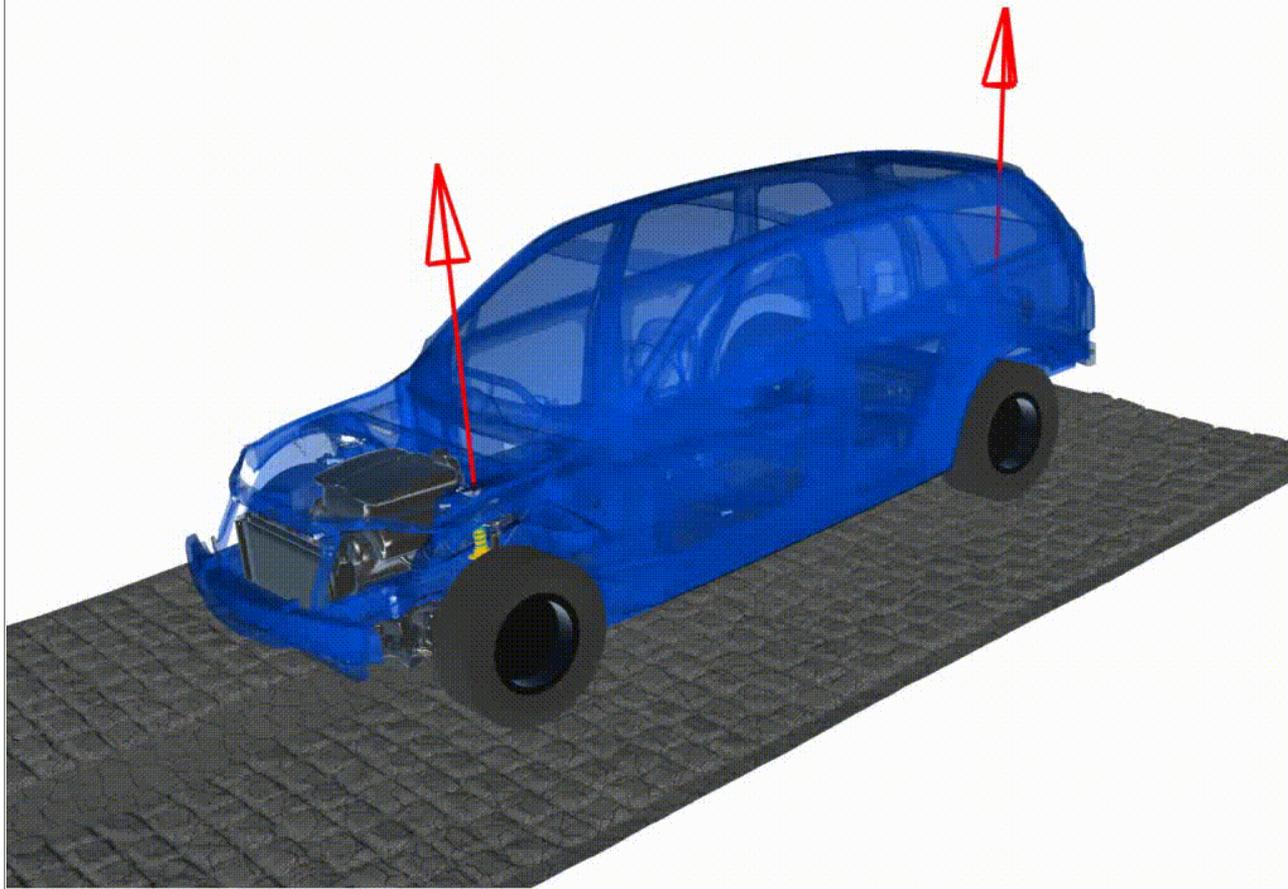
### Super Elements

Compatible with  
NASTRAN-based solvers

Generate & assemble  
1000s of Super Elements

Seamless adaptation to  
existing workflows

Output in op2, hdf & mnf  
format

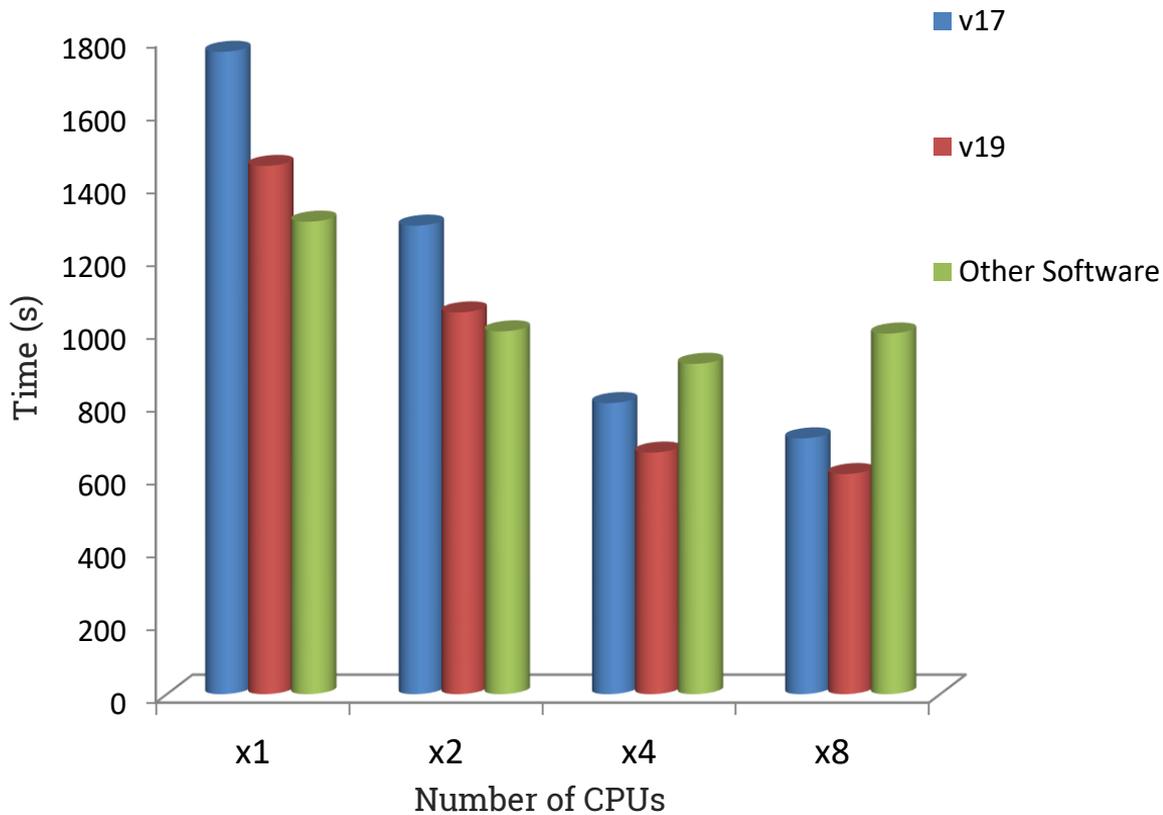


## Epilysis

### MNF Display Model

Simulate flex body  
in kinetics efficiently

Time & storage reductions



## Enilysis

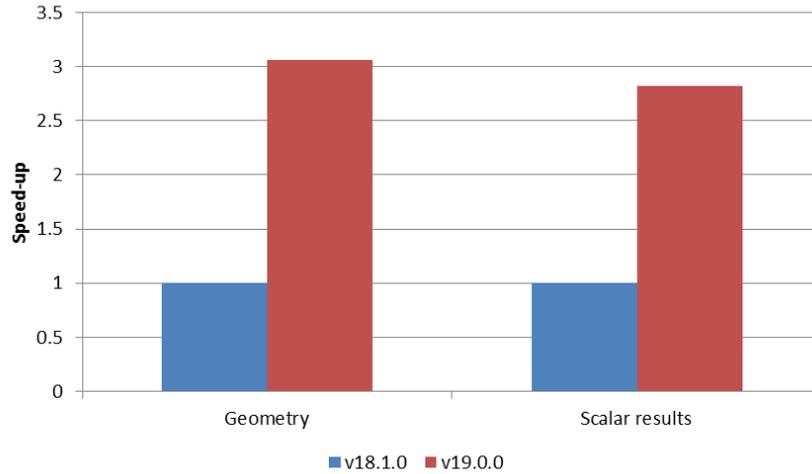
### AMLS Method

Automated Multi-Level Substructuring

Significant time reduction of frequency response & eigenvalue analysis of large models

Included in solver with multiple CPUs usage at no additional cost

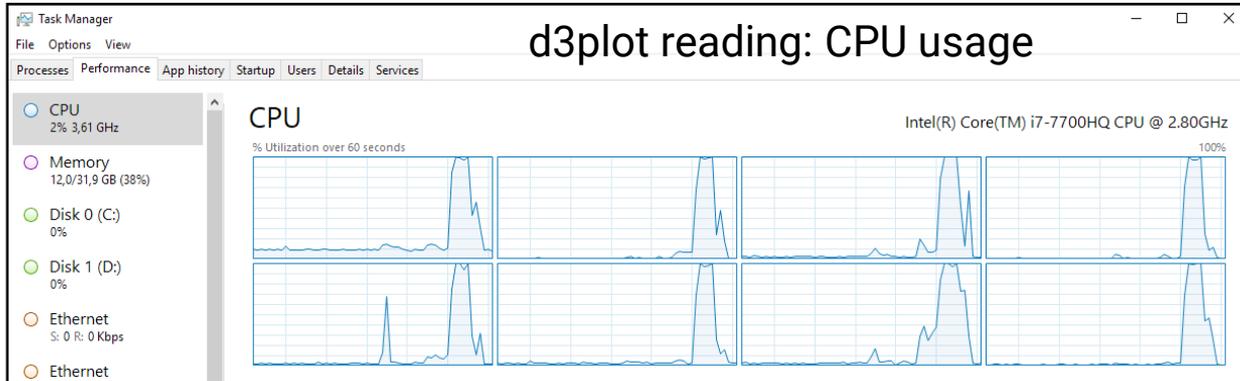
## OpenFOAM reading performance improvements

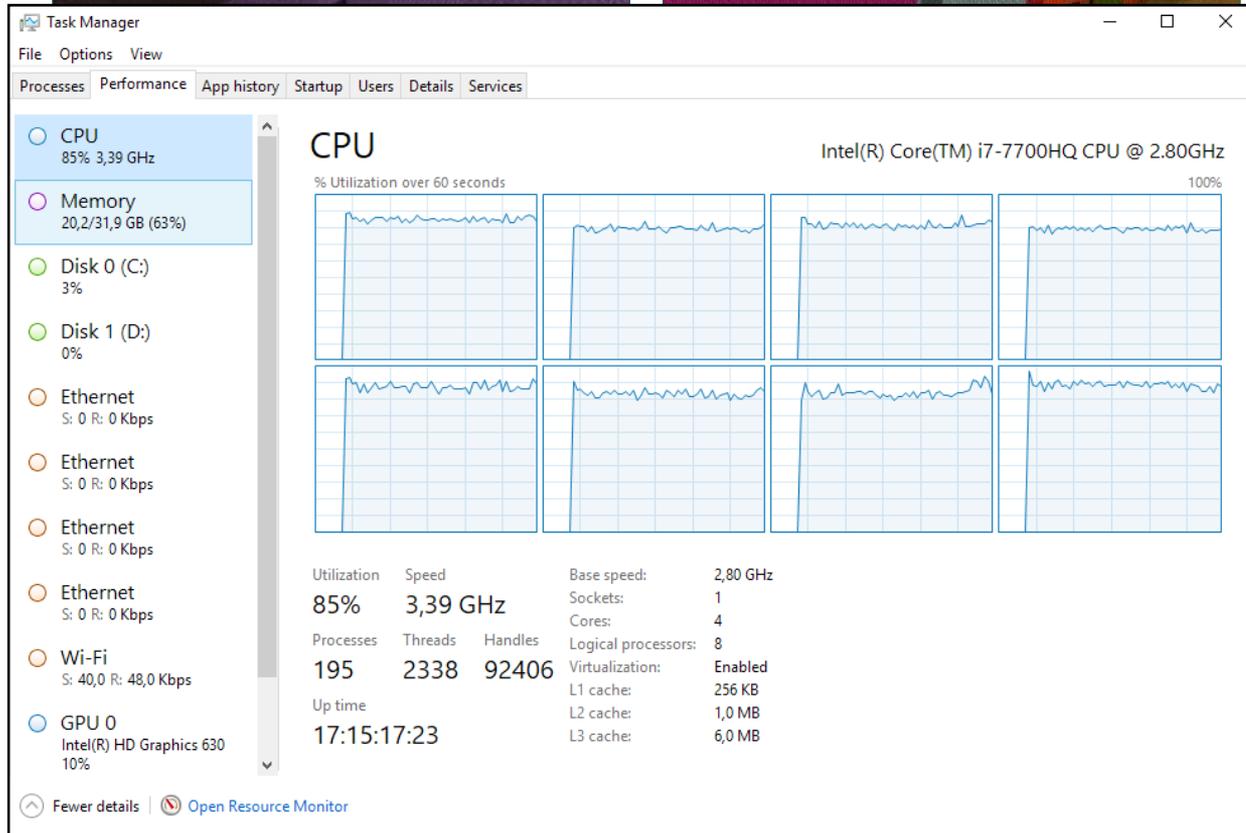


## META

## Parallel Reading

- OpenFOAM
- LS-DYNA





# META

## New Graphics Kernel

Example:

50 million crash model

Reading time < 2min  
(geometry + results)

Rotation ~ 30 fps

Animation (parallel  
CPU) ~ 15 fps

Efficient CPU utilization

# META

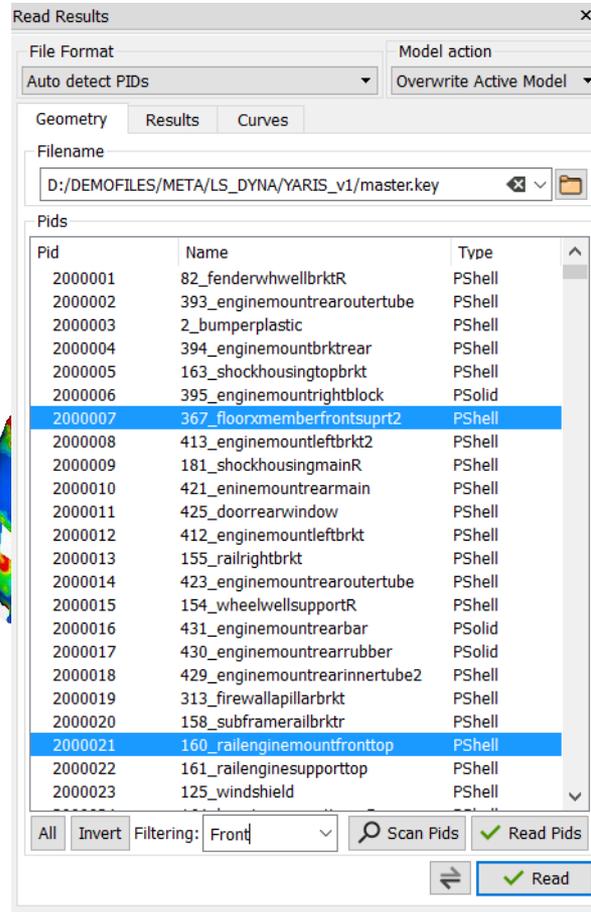
## Read Specific Pids

Available for all major solvers

Scan & select Pids to read

Improved time & memory

Under development:  
Read specific Sets & Includes ...



Read Results

File Format: Auto detect PIDs | Model action: Overwrite Active Model

Geometry | Results | Curves

Filename: D:/DEMOFILES/META/LS\_DYNA/YARIS\_v1/master.key

Pid	Name	Type
2000001	82_fenderwhwellbrktr	PShell
2000002	393_enginemountrearoutertube	PShell
2000003	2_bumperplastic	PShell
2000004	394_enginemountbrktrrear	PShell
2000005	163_shockhousingtopbrkt	PShell
2000006	395_enginemountrightblock	PSolid
2000007	367_floorxmemberfrontsuprt2	PShell
2000008	413_enginemountleftbrkt2	PShell
2000009	181_shockhousingmainR	PShell
2000010	421_eninemountrearmain	PShell
2000011	425_doorrearwindow	PShell
2000012	412_enginemountleftbrkt	PShell
2000013	155_railrightbrkt	PShell
2000014	423_enginemountrearoutertube	PShell
2000015	154_wheelwellsupportR	PShell
2000016	431_enginemountrearbar	PSolid
2000017	430_enginemountrearrubber	PSolid
2000018	429_enginemountrearinertube2	PShell
2000019	313_firewallpillarbrkt	PShell
2000020	158_subframerailbrktr	PShell
2000021	160_railenginemountfronttop	PShell
2000022	161_railenginesupporttop	PShell
2000023	125_windshield	PShell

All | Invert | Filtering: Front | Scan Pids | Read Pids

Read



# META

## Results' Compression

Lossless or lossy

All analysis types

Accuracy per resultset

Draft or fine geometry

MetaDB translator

No extra software  
& license

**Von Mises Compression**  
Absolute Difference

Compressed metadata of translated solver results file

Displacements 0.01 roundoff

Scalar

Stresses, Plastic Strain, Max of In Out Mid 0.01 roundoff

Stresses, Von Mises, Max of In Out Mid 0.01 roundoff

Simplify solids 30 %

Overwrite global settings per group

OK Cancel

OK Cancel

OK Cancel

# Load Meta results from metadata file based on filtering

- Variable + entity id / name similar to original deck
- Page / window / attributes

The image shows two side-by-side software windows for filtering simulation results. The left window is titled 'Entity - Variable' and the right window is titled 'Page - Window - Curve'. Both windows have a 'Results' tab selected.

**Left Window: Entity - Variable**

Entity type	Entity id	Entity name
node	5000564	Left B-pillar Middle
node	2128226	A Pillar Left
node	2143100	B Pillar Left
node	5000554	Left B-pillar Lower

Filter: \*illar\* [all] [inv]

Variable name	Entity dof
translational acceleration x	x
translational acceleration y	y
translational acceleration z	z
translational displacement x	x

Filter: [ ] [all] [inv]

**Right Window: Page - Window - Curve**

Page: 0:Page 0 [ ] [ ]

Window: SectionForces [ ] [ ]

Entity name	Entity dof
B_Pillar_R	z
A_Pillar_L_1	x
A_Pillar_L_2	x
A_Pillar_R_1	x
A_Pillar_R_2	x
B_Pillar_L	x
B_Pillar_R	x
A_Pillar_L_1	y
A_Pillar_L_2	y
A_Pillar_R_1	y
A_Pillar_R_2	y
B_Pillar_L	y
B_Pillar_R	y
A_Pillar_L_1	z
A_Pillar_L_2	z
A_Pillar_R_1	z
A_Pillar_R_2	z
B_Pillar_L	z

Filter: [ ] [all] [inv]

The background shows a 3D model of a car's interior pillars with green dots representing nodes. A coordinate system (x, y, z) is visible in the top right corner of the 3D view.

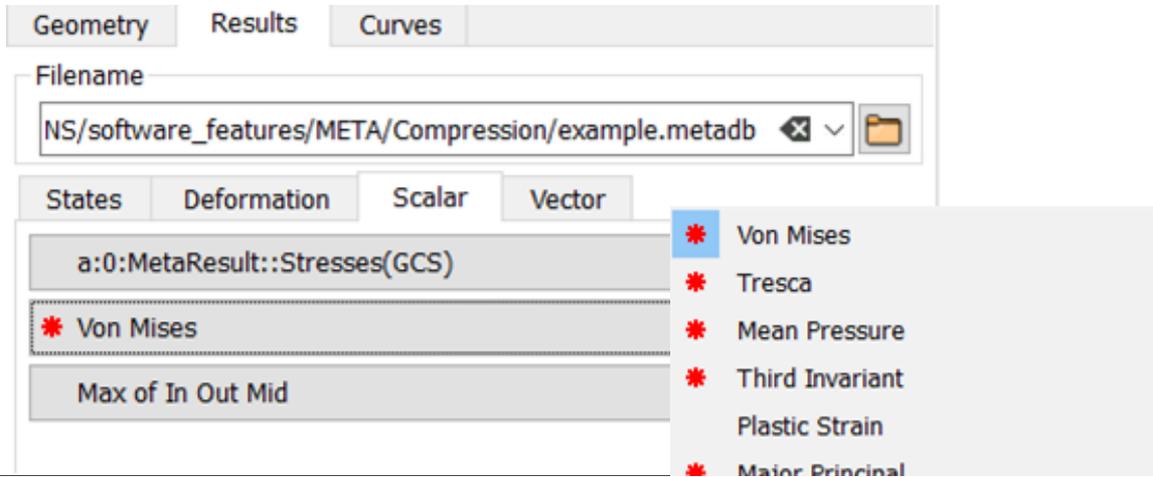
## META

### Results' Compression

Read 3d results faster

Read 2d curves

- MetaDB used as a direct solver results file replacement
- Read draft or fine model geometry
- META-calculated results from primary datasets also available
- Results grouped in the same way as solver results of original deck



## META

### Results' Compression

Read 3d results faster

Read 2d curves



**Stay connected**