Comet
the performance engineering workspace

INDUSTRY BENEFITS

- Capture engineering IP and reuse best practices in Intelligent Templates

- Enable product design innovation via multi-disciplinary concept trade studies

- Ensure accuracy and consistency of simulation results over the life of the project

- Maintain audit trail of project models, processes used and results vs requirements

- Enable collaborative decision-making within the project team via the Project Dashboard
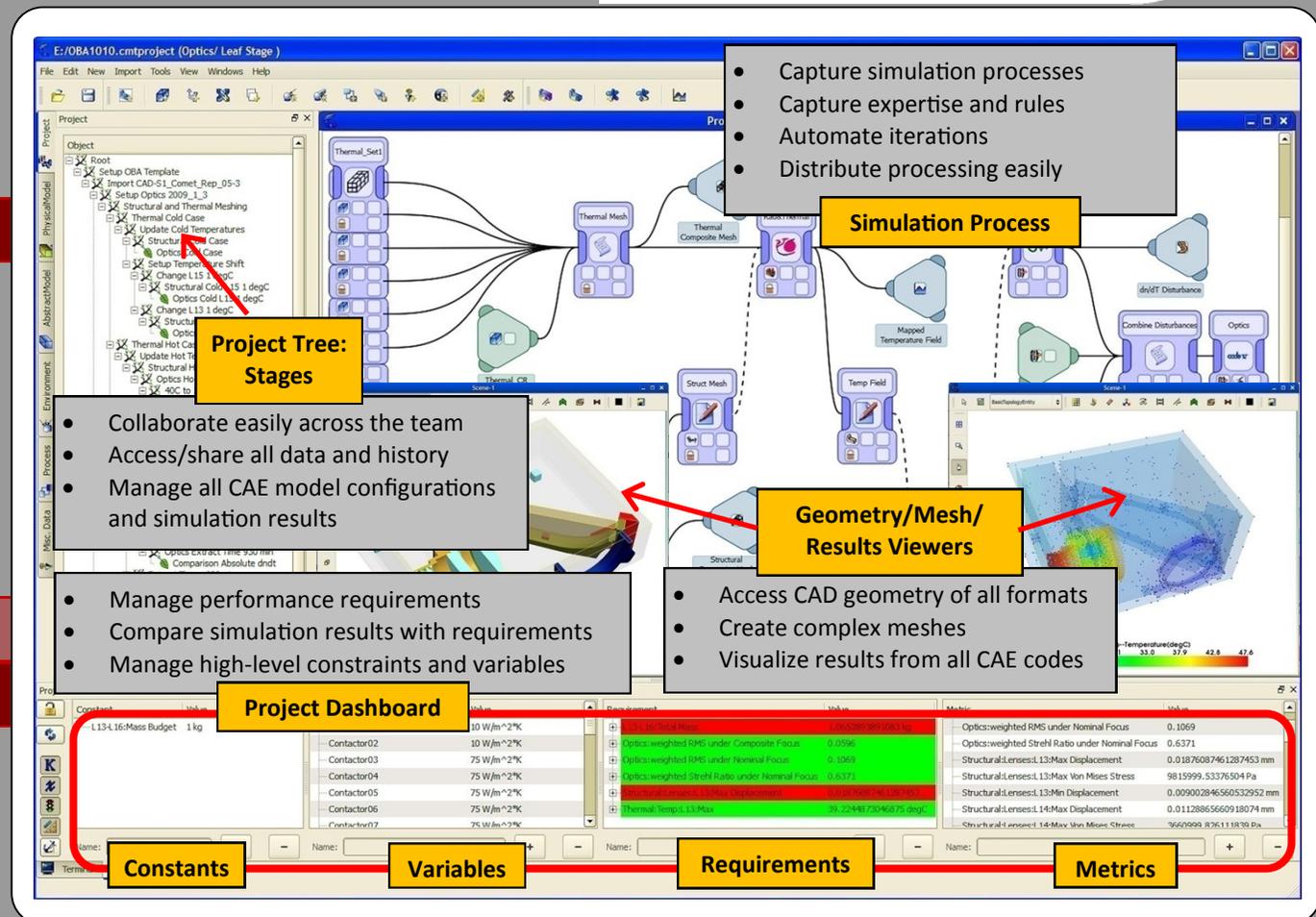
COMET IS A COLLABORATIVE, MODEL-BASED ENGINEERING ENVIRONMENT that captures your current simulation best practices and enhances associated design and engineering software tools (both COTS and in-house.) Comet Intelligent Templates enable geometry-independent, multi-physics modeling and simulation process automation for standard as well as complex design analysis activities.

Comet enables individual engineers as well as cross-functional product engineering teams to rapidly develop more innovative and reliable products—starting from early concept design exploration through detailed design validation. The key is linking product simulation activities to important product performance requirements via Comet Intelligent Templates.

- Capture simulation processes
- Capture expertise and rules
- Automate iterations
- Distribute processing easily

Simulation Process

Project Tree: Stages

- Collaborate easily across the team
- Access/share all data and history
- Manage all CAE model configurations and simulation results

Geometry/Mesh/ Results Viewers

- Manage performance requirements
- Compare simulation results with requirements
- Manage high-level constraints and variables

- Access CAD geometry of all formats
- Create complex meshes
- Visualize results from all CAE codes

Project Dashboard

Constants   **Variables**   **Requirements**   **Metrics**

Comet: *the performance engineering workspace*

Based on the unique and highly extensible **Abstract Engineering Model**®**,** the Comet model-based engineering environment can be applied to a wide range of industries and simulation requirements.

IN CONTRAST to "file-based" process integration and design optimization (PIDO) tools available in the market today, a Comet Intelligent Template based on our proprietary Abstract Engineering Model can explore a much wider range of changes to the design topology and alternative configurations/ variants. Comet is a graphical, drag-and-drop based interaction model so that expert engineers who "author" a Comet Intelligent Template do not have to be experts in C++ or other advanced scripting languages.

In a Comet process, the underlying design and simulation models are regenerated real time using the new design parameters which can be modified interactively from within the Comet Project Dashboard. Comet also captures and archives all of the native input and output files for each of the external software tools executed within a process for every unique variation of the model captured within the Comet Project Tree.

Comet supports an evolving design and analysis process that can easily mature throughout a design project's lifecycle.

Multiple engineers and analysis disciplines can work simultaneously within the same Comet project. The workspace allows analyses where models are at mixed levels of fidelity (0D-3D), as well as evaluations with complex cross-domain effects and interdisciplinary interactions (e.g., structural, thermal, optics, durability, multi-body dynamics, costing, controls, etc.).

COMET SOFTWARE is available for either purchase or lease. Comet Multi-Physics/Core is the base application that enables access to all of the integrated modeling and Intelligent Template authoring capabilities. It is also a pre-requisite for executing any simulation process in addition to any third-party CAD and CAE adaptors used in that process. Comet is also packaged for vertical applications in:

- Multi–body Dynamics
- Optics (Structural/Thermal/Optical Perfomance)
- Structural Dynamics
- Structural Analysis
- Thermal Analysis

INDUSTRY APPLICATIONS

DESIGN ANALYSIS OF ADVANCED OPTO-MECHANICAL SENSORS

Comet space systems customers have successfully modeled and automated the complex multidisciplinary, multi-physics process known as STOP (Structural/Thermal/Optical Performance) to predict and refine the on-orbit image performance and pointing accuracy of electro-optical sensors.

Similarly, aircraft-based sensors and laser weapons systems must also be able to operate effectively despite a range of demanding mission profiles and optics disturbances due to temperature and in-flight structural loads/vibrations (e.g., jitter and optics distortions).

SIMULATION-DRIVEN DESIGN PROCESS FOR A FAMILY OF PRODUCTS

Off-Highway vehicles and industrial equipment are often configured to meet site-specific operating requirements resulting in a large number of design variants that must be evaluated to validate the machine's digging capacity, cycle times, operational stability vs. contractual performance specifications. A single Comet Intelligent Template enables rapid design analysis iterations to be performed on a wide range of vehicle geometry and subsystem configurations, even by non-experts.

MODEL-BASED SYSTEMS ENGINEERING

A leading U.S. military vehicle manufacturer uses Comet to rapidly evaluate vehicle design alternatives from the conceptual design phase of a new program. The Comet-based process reduces simulation iteration time from several weeks to a matter of hours.