

PowerDELTA[®] with PowerCLAY

PowerDELTA enables you to streamline and automate your entire simulation model preparation process from CAD to case.

REDUCES MESH PREPARATION TIME

Feature-based templates enable fast, automated simulation model preparation

RAPID DESIGN ITERATIONS

Perform real-time, studio-quality morphing of models to quickly and easily optimize designs

ENABLES FAST RESPONSE TO DESIGN CHANGES

Parametric feature-based tool simplifies modifications and change propagation through the model

HANDLES DESIGN DATA OF VARYING QUALITY & SIZE

Perfect quality models are no longer required to prepare a high quality simulation; multiple capabilities to heal and easily prepare even incomplete models for simulation

COMPREHENSIVE TOOL

PowerCLAY morphing features are now integrated into PowerDELTA — offering a single software solution for sophisticated simulation model preparation to speed the design iteration process

AN AUTOMATED, COMPLETE SIMULATION PREPARATION SOLUTION

Since its introduction, PowerDELTA[®] has helped leading companies gain an advantage with better performing products, reduced costs, and accelerated time-to-market by front-loading product performance analysis in the design process where critical and costly design decisions are made. A rapid and accurate analysis process becomes critical when front-loading, since many more design variations need to be analyzed compared with traditional late stage design verification analysis.

PowerDELTA with integrated PowerCLAY[®] morphing technology further streamlines the simulation preparation process and enables rapid creation of design alternatives for design space exploration.

Simulation Preparation Challenges :

- ✓ *Long mesh baseline preparation time*
- ✓ *Difficult to quickly create design alternatives for iterative testing*
- ✓ *Poor quality design/early-stage data*
- ✓ *Redundant simulation model builds*
- ✓ *Responding rapidly to design changes*
- ✓ *Capturing & reusing best practices*

EFFICIENT ANALYSIS RELIES ON SIMULATION MODEL PREPARATION

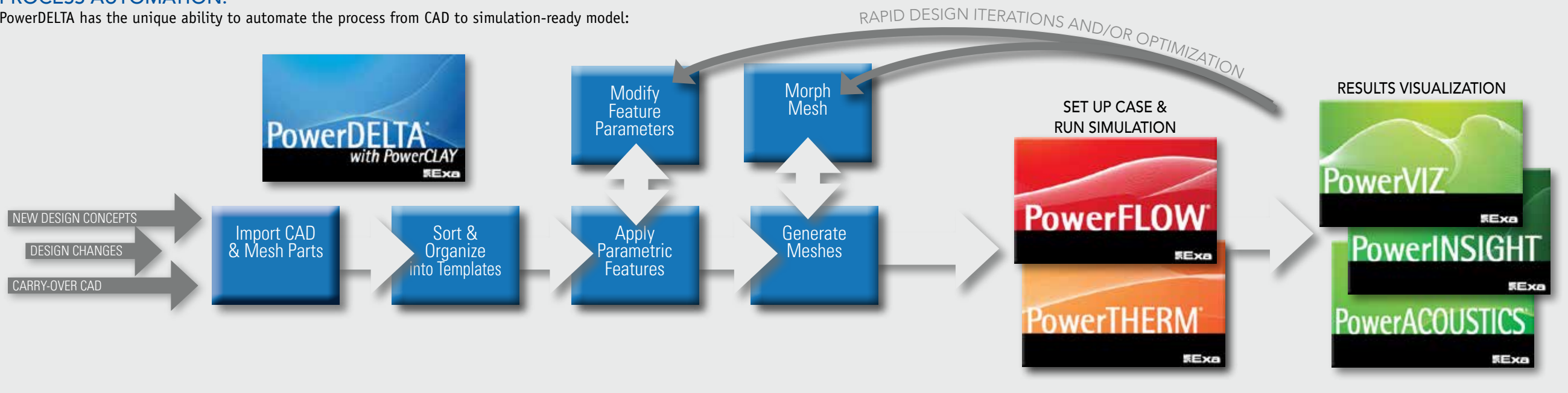
A key activity within the analysis process is preparing models for simulation and in most organizations it's a significant barrier to an efficient process. Typically, mesh preparation time is very long — taking many days or even weeks. This is further complicated by the need to handle conceptual geometry and poor quality carry-over CAD data.

Exa Corporation, known for its innovative products that enable real-world engineering processes to become more efficient, offers PowerDELTA to streamline and automate the simulation model preparation process. PowerDELTA applies proven concepts of parametric feature modeling, direct mesh morphing and history tree model management to the process of simulation model creation and update. Design data in most major CAD and mesh formats are supported—even at varying levels of quality.



PROCESS AUTOMATION:

PowerDELTA has the unique ability to automate the process from CAD to simulation-ready model:



DATA IMPORT & EXPORT

PowerDELTA imports all major MCAD and mesh formats directly including:

MCAD		MESH
CAITIA (4 & 5)	ACIS	STL
Pro/ENGINEER	VDA	MSC Nastran
ParaSolid	IGES	CGR
Unigraphics	STEP	JT
SolidWorks	Inventor	

Easily export to the following MCAD and mesh formats including:

MCAD		MESH
VDA	ACIS	STL
IGES	STEB	MSC Nastran

CAPABILITIES OVERVIEW:

PowerDELTA with PowerCLAY simplifies and streamlines the laborious and time consuming process of model preparation and model modification. Some unique features illustrated below:

RE-PLAYABLE FEATURE TEMPLATES

Unique model/feature history tree creates audit trail, enables change propagation and speeds setup through templates.



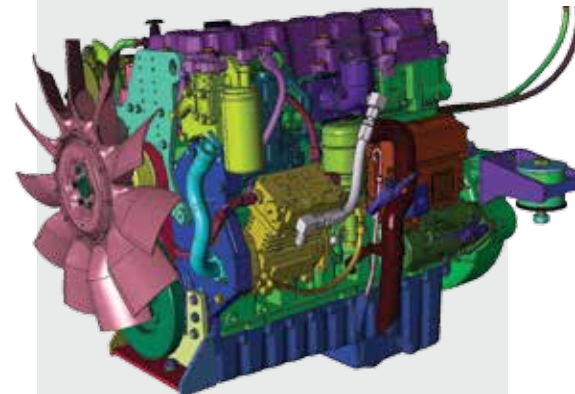
SIMULATION MODEL MANAGEMENT

Easily import your CAD data directly and interactively sort and organize using an intuitive, visual drag and drop process.



DESIGN DATA MANAGEMENT

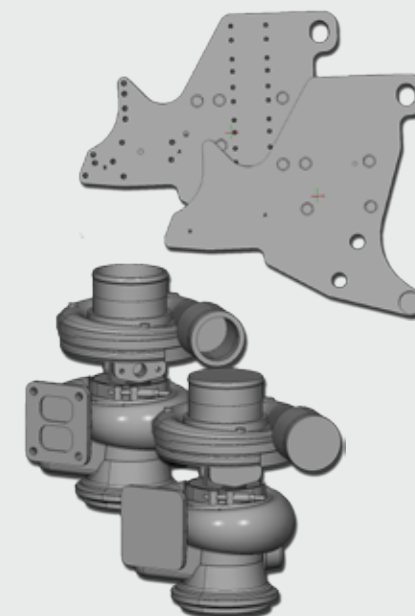
Diagnose and heal poor quality geometry...then simply make simulation ready meshes using PowerDELTA's tessellation and wrapping technology.



Final Wrapped Mesh (above example shows high level of detail captured)

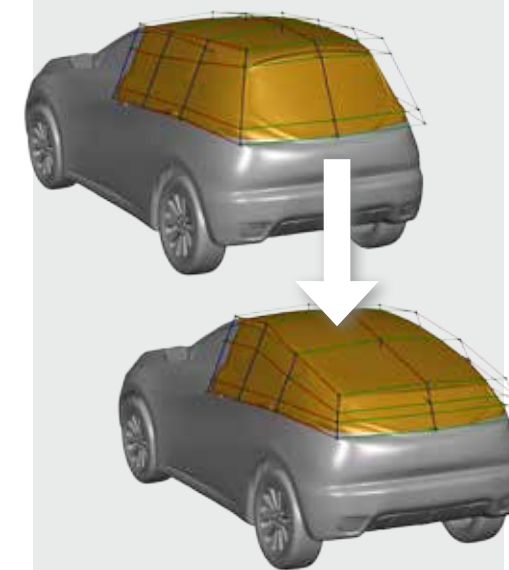
PARAMETRIC MESH MODELING

Parametric features for tessellation, wrapping, hole filling, decimation, mesh editing and more. Simply change parameters and regenerate to produce updated meshes.



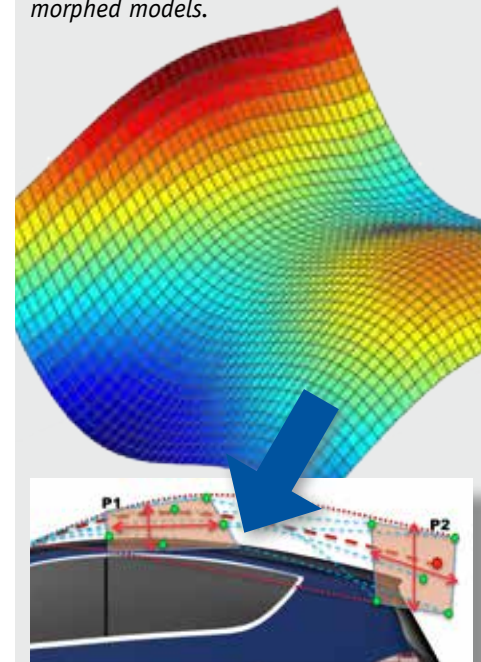
REAL-TIME, STUDIO-QUALITY LATTICE MORPHING

Isolate and precisely modify regions of the model's surface in real-time to rapidly prepare iterations for simulation.



DESIGN SPACE MANAGEMENT FOR OPTIMIZATION

Speed the design optimization process by automatically generating new design surfaces using parametrically modifiable morphed models.



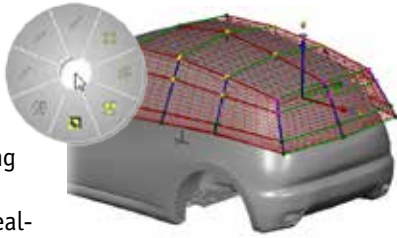
RAPID DESIGN ITERATIONS WITH PowerDELTA:

Patented, real time studio-quality lattice morphing

The patented lattice morphing capability, previously only available in PowerCLAY, has been implemented in PowerDELTA. With lattice morphing, individual lattice points give precise control of the surface shape without having to introduce additional constraints. Various controls ensure smooth transitions between morphed regions and the original surface. The resulting surfaces are at a quality level expected by the design studio, resulting in a higher likelihood that the modified designs may be acceptable to the studio. Each lattice is a feature on PowerDELTA's history-based feature tree and so can be modified at any time and can be included in standard, reusable, meshing templates that dramatically streamline the meshing process. PowerDELTA with PowerCLAY morphing can now manage the whole design space.

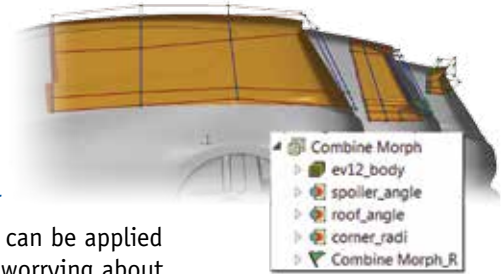
Interactive, 3D Morphing

With the patented lattice morphing capability, creating design alternatives is easier than ever. Morph surfaces real-time for rapid and precise shape change.



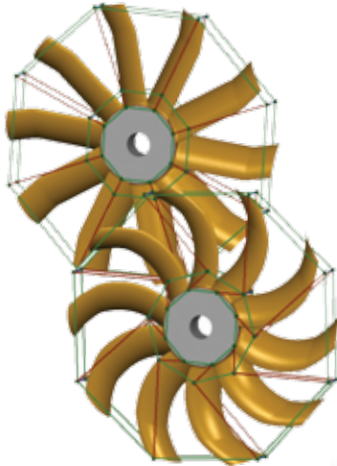
Multi Lattice Management

Multiple overlapping morphs can be applied to the same region, without worrying about interaction between morphs. The system takes the care of combining the effect of all morphs together.



Axis Symmetric Morph

Specialized cylindrical lattice morphing maintains axis symmetry, speeds up the process of modifying fans and wheels.



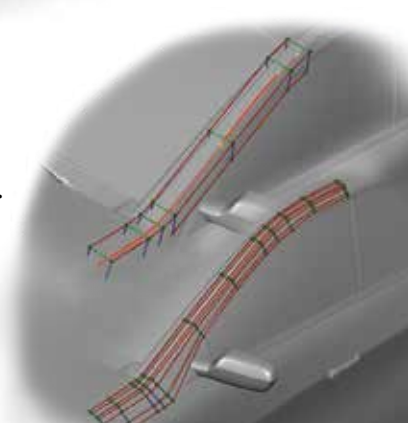
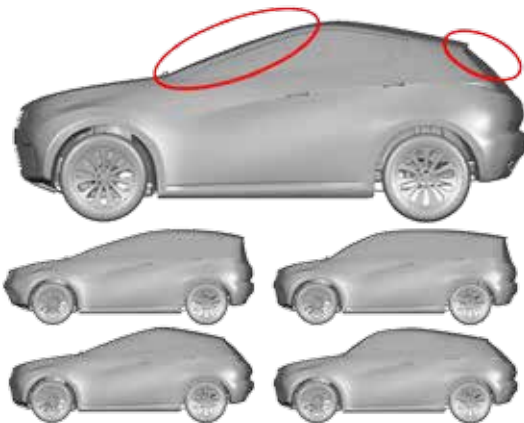
Design Space Management

The design space can include morphs, translate or rotate operations and part variants. Easily manage the design space from a single table.



Assisted Lattice Creation

Morphing of long, narrow features such as an A-pillar section, is often a bottleneck to the design alternative creation process. PowerDELTA's sweep lattice dramatically cuts the time for morphing these types of complex curved shapes.



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