AMD FirePro™: high-performance professional 3D graphics for NX™
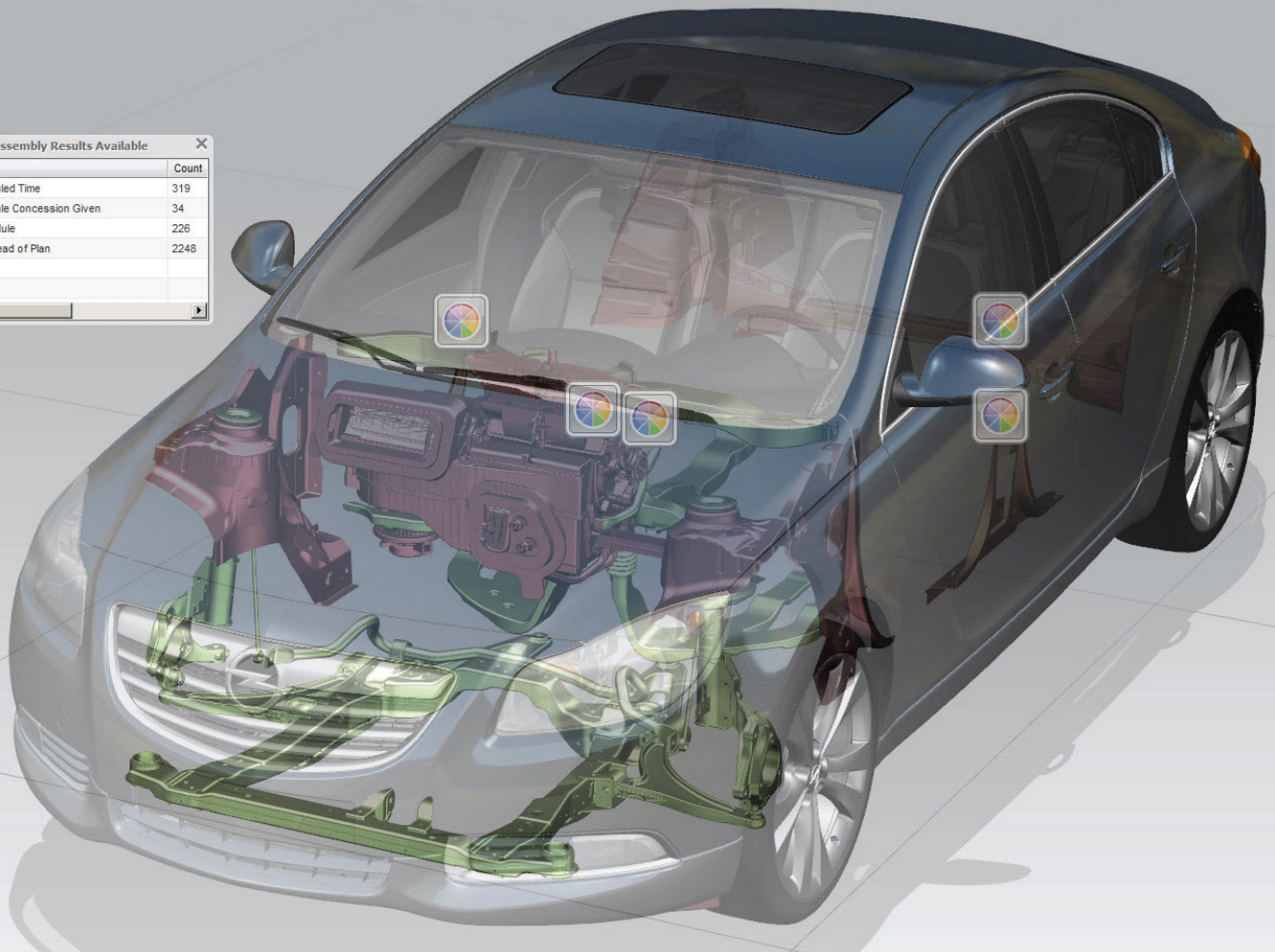
P roduct development used to be all about time to market and cost. Now there's the added challenge of delivering better quality products, optimizing for form and function and reducing risk.

Many companies are addressing these challenges with advanced product development tools, like NX™ software, Siemens PLM Software's solution for integrated computer-aided design, manufacturing and engineering (CAD/CAM/CAE). NX software is deployed in some of the most demanding industry sectors – including automotive and transportation, aerospace and defense, consumer products, industrial machinery, marine and medical devices – delivering advanced design, visualization and simulation on the desktop.

To support design engineers throughout the entire product development process professional quality real time 3D modeling is essential. AMD

FirePro™ professional graphics cards have been specifically designed for this purpose.

Whenever an NX session is launched, the AMD FirePro graphics driver settings automatically adjust, optimizing the system for performance. This helps ensure designers and engineers always work inside a high quality, interactive design environment.

In addition to performance, AMD FirePro places a big emphasis on stability. AMD's engineering team continually refines its graphics drivers so costly system crashes are minimized. Siemens PLM Software then tests, certifies and supports AMD FirePro graphics cards for use with NX to give users peace of mind.

DESIGN IN CONTEXT

Product development workflows have changed dramatically over the years and designers and engineers don't just model simple parts in

isolation anymore. With the rise of concurrent or collaborative design it has never been more important to understand how everything fits together within the context of an assembly.

For example, an electrical engineer working on a car needs to see the entire design – the chassis, the hydraulics, the fuel lines etc – and be able to understand all of the interactions.

With NX assemblies modeled down to the finest detail it is not uncommon for them to include tens of thousands of parts. Handling such large models in an interactive 3D environment requires a powerful professional graphics card.
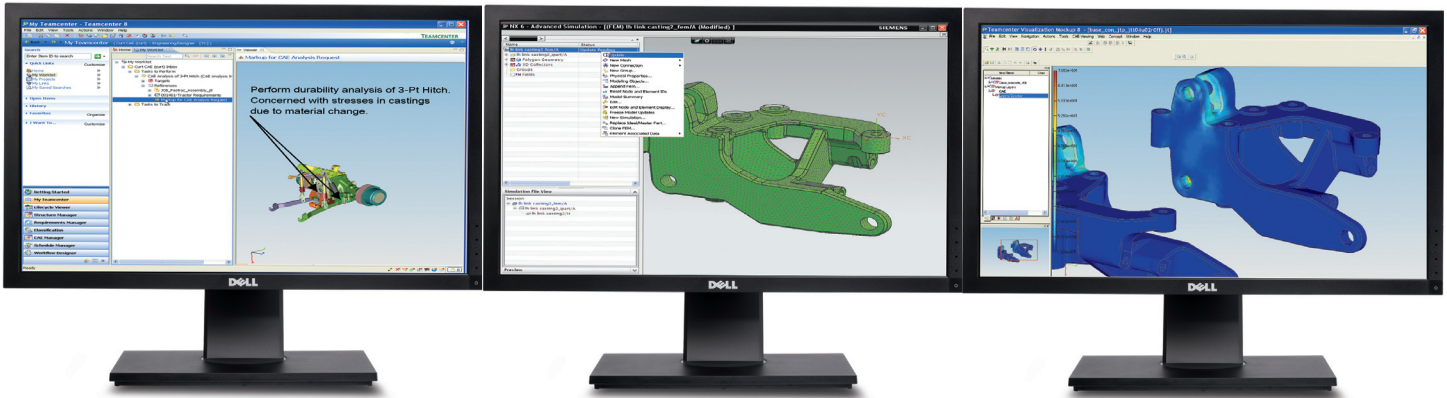
A high-end card like the AMD FirePro W7000 (4GB) enables design engineers to handle entire models inside a single workstation. In the past, compromises had to be made, such as breaking down a model into more manageable sections or simplifying geometry.

While a high performance Graphics Processing

1 Simulation tasks are assigned and managed inside Teamcenter Simulation Process Management

2 Simulation models are prepared using NX CAE and simulations are executed by the solvers (e.g. NX Nastran)

3 Simulation results are visually verified using NX CAE or Teamcenter Lifecycle Visualization

Unit (GPU) is a must, GPU memory also plays an important role.

For example, a 6,000 part car assembly modeled in NX might take up 1.2GB of GPU memory. This doesn't take into account other models being open or other applications running, such as Teamcenter® software for digital lifecycle management or NX CAE, which will use more GPU memory. As a result it is important that your graphics card has sufficient capacity. If it doesn't, models will be shared between CPU and GPU memory, which will slow things down.

With this in mind the AMD FirePro V3900 (1GB) and V4900 (1GB) are better suited to entry-level NX workflows for small to medium assembly modeling, while the AMD FirePro W5000 (2GB) or W7000 (4GB) have the additional capacity to handle more demanding workflows.

MODEL IN THE REAL WORLD
Industrial design has never played a more important role in product development. This increases the value of design visualization, which is now used throughout the entire design process.

"Design is a key differentiator in many industries," said Jerry Sarfati, NX product marketing, Siemens PLM Software. "Consumer packaged goods, medical devices, high tech electronics, automobiles and many other industries rely on design and styling to make a significant difference as companies compete for increased market share."

True Studio mode in NX offers an ideal interactive environment to visualize early stage design. Realistic shadows and reflections give real time feedback on how a product might look without having to commit to time-consuming off line renders.

Viewing assemblies with this increased level of realism however, can put higher demands on a graphics card and here cards like the AMD FirePro W5000 (2GB) and AMD FirePro W7000 (4GB) really shine. Powerful GPUs and large memory capacity mean they are able to increase the visual quality inside the NX modeling environment while maintaining full interactivity with the model.

DATA AT YOUR FINGERTIPS
Working with multiple applications is now common in many product development workflows with design, simulation, rendering, data management and collaboration often happening at the same time. Using multiple displays to visualize a complete workflow and having all of this critical information at your fingertips can offer massive productivity benefits.

"The days of an engineer having one screen and getting a paper change order that says 'make this part three inches longer' are over," said Sarfati. "You now have engineers working on multi-screen workstations with Teamcenter running to manage work orders on one display, an NX design session on second display and collaboration tools and email to connect with team members on a third."

AMD FirePro graphics cards are specifically designed to support multiple displays. With AMD Eyefinity technology the AMD FirePro V4900 and AMD FirePro W5000 can be used to drive up to three displays for one extended desktop.

The AMD FirePro W7000 takes things up a notch, supporting up to four HD displays from a single card. When arranged in an immersive 2 x 2 array, this is ideal for group design review sessions or visualizing the progress of projects through High-Definition 3D visual reports

THE FUTURE
GPUs already play a very important role in NX workflows, but they could have an even bigger impact in the future.

One cannot ignore the broad industry trend to increase the realism of interactive CAD models. Momentum is also growing for GPUs to perform non-graphical calculations (GPU compute). In 2012, for example, a prototype of the NX Nastran Finite Element Analysis (FEA) solver was demonstrated using OpenCL (the open standard for GPU compute) on an AMD FirePro GPU.

As a result, in the future those serious about visualization and simulation may find additional benefits from the ultra high-end AMD FirePro W8000 and W9000 GPUs, which are specifically tuned for both 3D graphics and GPU compute.

MORE INFORMATION
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