ANSYS Releases New Version Of Flagship Products

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PITTSBURGH, Dec. 3, 2013 /PRNewswire/ -- ANSYS (NASDAQ: ANSS) today announced the availability of its leading engineering simulation solution, ANSYS® 15.0, providing new, unique capabilities and enhancements that offer the most advanced approach to guide and optimize product designs.

(Logo: http://photos.prnewswire.com/prnh/20130430/NE03388LOGO)

ANSYS 15.0 delivers major advancements across the entire portfolio, including structures, fluids and electromagnetics. In addition, this enhanced version enables complete multiphysics workflows for leading simulation practices.

Highlights for structures in this release include giving users greater insight into simulating composites. Enhancements to the fluids portfolio features the capability for studying turbomachinery flow paths with greater fidelity than ever, while in electromagnetics, ANSYS 15.0 offers the most comprehensive electric motor design process.

The release enhances ANSYS' industry-leading pre-processing capabilities, enabling users to quickly and accurately mesh the widest range of model size and complexity regardless of type of physics simulated. ANSYS 15.0 also builds on the company's global leadership in high-performance computing (HPC), speeding up already best-in-class performance by a factor of five.

"ANSYS 15.0 builds upon our four decades of leadership in engineering simulation software," said Walid Abu-Hadba, ANSYS chief product officer. "We've made dramatic upgrades in each of the key physics areas through performance improvements and the introduction of new solver capabilities. We continue to extend our leadership in simulation through such innovations as our adjoint solver, HPC scalability and efficient simulation modeling from the micron to the full system."

Structural Analysis: Advanced Materials Systems Design

The release extends ANSYS' advanced solution for evaluating product performance of composites materials, which are often used to improve fuel efficiency by reducing weight. Simulating composites can require large mathematical solutions. To reduce overall computation time, ANSYS 15.0 facilitates submodeling techniques in the pre-processing workflow so users can create high-fidelity local results while employing a coarser model globally.

ANSYS 15.0 also introduces a new multiphysics approach to composites simulation to optimize wireless design and thermal management. Users define spatially dependent material properties for electromagnetic simulation and then couple those results to the structural analysis.

Other new features in the structural suite include:

- Improved performance through innovative developments of completely new solvers, such as the subspace eigensolver for faster computation of eigenmodes and eigenfrequencies in structural analysis
- Bolt thread modeling as a contact, rather than detailed geometry, when the user defines thread properties over a given cylindrical area
- Multiple finite element models that can be assembled, leveraging all the setup details of individual models

Fluid Dynamics: Turbomachinery Flow Path Solutions

Turbomachinery developers are under tremendous pressure to improve efficiency and reliability. ANSYS 15.0 delivers the ideal high-fidelity solution for flow, thermal, stress and dynamics across a broad range of conditions and physical phenomena. Some of the enhancements include:

- For forced-response analysis, the capability to directly export time-varying pressure loads determined in a transient flow simulation, in a form that can be immediately applied as a load in ANSYS Mechanical ™ modal analysis
- An exit-corrected mass flow boundary condition in ANSYS CFX® that produces fast and robust simulation along the entire compressor speed line, from deep choke to stall
- Built-in aero-elastic damping calculation and monitoring

"With ANSYS CFX moving mesh capabilities, a certain range of geometric variants of the hydroturbine we design could be simulated easier and faster by morphing the computational mesh. This saves us pre-processing time when evaluating different designs because we do not have to fully remesh each design variant," said Alexander Jung of Voith Hydro.

Additional examples of fluids enhancements include:

- The adjoint solver supports problems with up to 30 million cells. Because of the adjoint energy equation's core functionality, observables can be defined as various integrals of heat flux and temperature — including averages and variances
- The multiphase volume of fluid (VOF) model is up to 36 percent faster. Multiphase transient simulation is also faster thanks to new compatibility with adaptive time stepping
- Heat transfer between fluid and fabricated solid structure components has been improved due to the introduction of

multilayer shell conduction and anisotropic heat conduction simulation capabilities

Electromagnetics: Electric Motor and Drive Design Methodology

- ANSYS 15.0 advances the already-leading motor and drive design solution offered through ANSYS Maxwell® and ANSYS Simplorer® by extending integration into other physics. This advanced solution enables engineers to quickly explore design alternatives, detect fault conditions, integrate electric machines with power electronic drives and validate control software. This end-to-end solution ensures optimized, power efficient motor and drive designs. New highlights include: A new force-coupling capability between low-frequency electromagnetics (Maxwell) and structural (Mechanical) tools for acoustics analysis, delivering the insight to minimize noise in electric motors and other machines
- A connection between circuit simulator Simplorer and automatic embedded code generator SCADE Suite®, creating a collaborative design environment for optimizing interactions between control system software and hardware. This design flow eliminates the silos between hardware and software development allowing users to validate the integration of a machine and the control software early in the design process

"ANSYS 15.0's advanced motor design capabilities are phenomenal," said Dr. Dan Ionel, chief engineer at Regal Beloit. "The combination of magnetic vector hysteresis, NVH analysis and embedded software provides a comprehensive methodology for the design of efficient, reliable and optimized electrical machines working with the electric drive and digital control system."

ANSYS 15.0 offers additional capabilities in the electromagnetics suite that drive high-speed wireless communication design including:

- Specialized meshing technology for silicon substrates, redistribution layers, packages and printed circuit boards that creates 3-D meshes up to 30 times faster than previous releases. This new meshing technology appeals to a broad class of electrical engineers that previously relied on design rules or electromagnetic specialists to validate their designs. The speed and ease of use advancements allow 3-D electromagnetic analysis to be included earlier in the design process thus eliminating costly downstream errors.
- Design flow customization that supports specialized workflows, such as cable modeling and transmission line modeling, using ANSYS HFSS ™, ANSYS Q3D Extractor® and ANSYS DesignerSI ™

Streamlined Pre-processing

ANSYS delivers pre-processing capabilities in each new release that automate simulation model setup while still providing flexibility to address application-specific requirements through manual methods. Much of this is enabled through the most complete set of meshing technologies, ensuring that users can robustly mesh the widest range of engineering applications. Incorporating the ANSYS Workbench platform, which provides an integrated workflow modeling paradigm across all physics, enables almost any problem to be set up in a single environment for achieving the best application-specific mesh possible.

Extensive setup time can be a deterrent to applying simulation technology and fully realizing its benefits. ANSYS 15.0 includes many solutions for pre-processing automation and robustness, helping users perform simulation more efficiently, follow best practices, and, ultimately, arrive at results and engineering decisions significantly faster. Enhancements provide:

- Dramatically enhanced performance through a parallel part-by-part meshing engine that delivers up to a 27 times reduction in meshing large assemblies
- Fast creation of high-quality hexahedral meshes. ANSYS 15.0 creates such meshes automatically, even when multiple bodies or geometry orientations are present.
- A dramatic reduction in meshing time. Fluent 15.0 meshing leverages its unmatched HPC capabilities and scalability to quickly deliver parallel meshing. For example, using eight cores, a 42 million cell mesh can be meshed more than seven times faster than if a single CPU were used.

"Thanks to the progress in Fluent meshing technology and workflow, pre-processing for an entire vehicle for an underhood air flow study really became a breeze. Starting from dirty CAD geometries and setting up a list of parameters in a template by the end of the day, you can get a good-quality volume mesh the next morning," said Qin Yang, aerothermal-fluid simulation and analysis engineer of Navistar, Inc.

HPC Scalability

ANSYS continues the tradition of HPC leadership with this latest release, reaffirming a commitment to software development that leverages the latest hardware computing technologies, no matter the physics discipline. ANSYS 15.0 delivers important new capabilities for HPC job management and remote access to simulation, supporting the trend toward scaled-up data center-based deployment of simulation.

The latest release leverages the power of modern high-performance computing hardware and software technologies to provide solutions for large models in a compressed timeframe:

- While delivering groundbreaking scale-up performance at 15,000 cores for large (100 M+ cells) models, Fluent features significantly improved solver and parallel efficiency at lower core counts. CFX scalability is improved on larger core counts. For example, an industrial six-stage axial compressor case showed a five-times speed-up
- Maxwell delivers an HPC performance increase of five times due to advanced multithreading enhancements
- New multi-level HPC technology introduced in ANSYS HFSS enables users to leverage more nodes of a compute cluster or cloud environment to accelerate their design efforts through combined distribution of design parameters, frequencies

and multi-core solvers, an industry first

ANSYS 15.0 contains many more new capabilities, which are detailed at www.ansys.com/ansys15.0. Current customers can also download the latest version on the ANSYS Customer Portal.

The media may download related images at: http://www.ansys.com/newsimages.

About ANSYS, Inc.
ANSYS brings clarity and insight to customers' most complex design challenges through fast, accurate and reliable engineering simulation. Our technology enables organizations — no matter their industry — to predict with confidence that their products will thrive in the real world. Customers trust our software to help ensure product integrity and drive business success through innovation. Founded in 1970, ANSYS employs more than 2,500 professionals, many of them expert in engineering fields such as finite element analysis, computational fluid dynamics, electronics and electromagnetics, and design optimization. Headquartered south of Pittsburgh, U.S.A., ANSYS has more than 75 strategic sales locations throughout the world with a network of channel partners in 40+ countries. Visit www.ansys.com for more information.

ANSYS also has a strong presence on the major social channels. To join the simulation conversation, please visit: www.ansys.com/Social@ANSYS

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