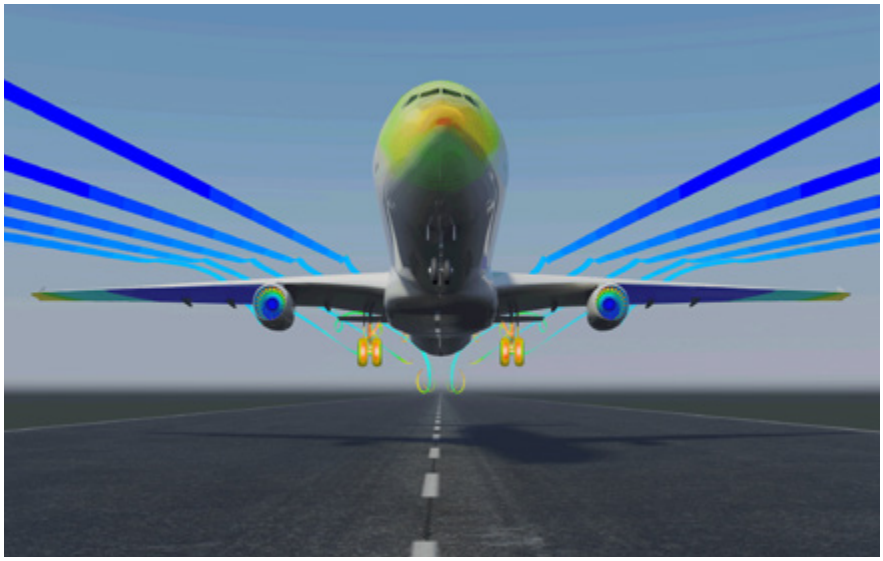
ANSYS and Lenovo: Essential engineering analysis solution

Improve product development through integrated systems and software



Highlights

- Trusted ANSYS family software solves complex structural analysis and fluid dynamics problems faster
- High-performance Lenovo systems, storage and software help run ANSYS software more efficiently
- Lenovo Solution for ANSYS simplifies deployment and accelerates time to results

Manufacturers face enormous pressures to make products that are more durable and last longer—while simultaneously reducing costs, increasing innovation and shortening the time frame for development. To address these demands, manufacturers and their suppliers need engineering simulation solutions that allow users to design and verify components and products in a virtual, risk-free environment, minimizing the need for physical prototypes and tests.

ANSYS and Lenovo meet this need with an essential solution to run your engineering analysis computing environment. The Lenovo Solution for ANSYS provides organizations with an optimal high-performance infrastructure to run advanced structural analysis and computational fluid dynamics (CFD) modeling, simulation and analysis.

Simulation-driven product development solutions

ANSYS simulation software enables organizations to confidently predict how their products will operate in the real world. The ANSYS structural analysis software suite is trusted by organizations around the world to rapidly solve complex structural engineering problems, including linear static analysis that provides stresses or deformations, modal analysis that determines vibration characteristics, and advanced transient nonlinear phenomena involving dynamic effects and complex behaviors.

"The combined solution should enable a greater number of high-fidelity simulations conducted more rapidly and help customers ensure that their products perform as expected in the real world."

—**Wim Slagter,**
Lead Product Manager,
ANSYS

"While ANSYS is optimized for HPC performance, selecting the appropriate hardware for specific workloads remains a bottleneck for customers. The Lenovo Solution for ANSYS should make hardware selection much easier."

—**Wim Slagter,**
Lead Product Manager,
ANSYS

The flagship ANSYS Fluent solution contains the broad physical modeling capabilities needed to model flow, turbulence, heat transfer and reactions for industrial applications ranging from air flow over an aircraft wing to combustion in a furnace, and from clean-room design to wastewater treatment plants. Advanced solver technology provides fast, accurate CFD results, flexible moving and deforming meshes, and superior parallel scalability. Engineering simulation tools from ANSYS help engineering teams understand product performance during conceptual studies of new designs, product development, troubleshooting and redesign.

Across all industries, simulations now require increasingly large models. To this end, ANSYS solutions incorporate parallel algorithms for faster computation. ANSYS also offers solutions that can leverage graphics processing unit (GPU) technology for further acceleration. As a result, IT requirements for ANSYS structural mechanics and CFD software are considerable. ANSYS users need a high-performance infrastructure that makes optimal use of available IT resources.

Lenovo Solution for ANSYS

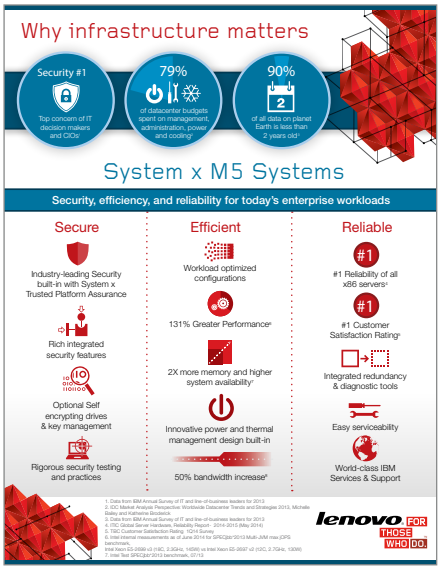
The Lenovo Solution for ANSYS is a powerful, integrated offering that simplifies building a high-performance cluster environment optimized for engineering analysis. The solution is based on a building-block approach with reference configurations validated by Lenovo and ANSYS. It gives clients the infrastructure needed to quickly and easily deploy, run and manage an optimal high-performance ANSYS computing environment. The solutions consist of recommended high-performance systems, storage, workload and cluster management. Featured components include both server and workstation options:

- **System x® 3650 M5:** Offers a combination of power, efficiency and reliability in a 2u, two-socket rack server system supporting the Intel Xeon processor E5-2600 V3. This server is recommended as the head or cluster management node given its low cost and robust integrated storage—up to 26 drives can be used for scratch I/O. The x3650 is also a good system for graphics acceleration or when remote 3-D visualization is required.

- **System x 3550 M5:** Delivers an ideal platform to perform ANSYS mechanical structural analysis modeling and fluid dynamics jobs with ANSYS Fluent or ANSYS CFX. Designed in a compact 1U two-socket rack server, the System x3550 M5 rack server is low-cost and highly versatile. Integrated with up to two Intel Xeon processor E5-2600 v3 processors per server with fast, energy-efficient memory, the x3550 M5 delivers exceptional performance with up to 12 storage drives.
- **NeXtScale System™ M5:** Provides a modular, high-performance, scale-out environment. NeXtScale is the system of choice for running large ANSYS Fluent or ANSYS CFX fluid dynamics modeling jobs typically requiring more than 30 servers. Based on a dense chassis design with the ability to pack up to 84 high-performance servers in a 42-inch rack, NeXtScale offers high density and energy-efficiency. With the ability mix and match compute nodes based on the Intel Xeon processor E5-2600 v3 with a variety of graphics accelerators and storage options, NeXtScale provides required flexibility and cost-efficiencies for larger simulation environments.
- **Lenovo® ThinkStation P900 workstation:** Provides the highest-performance desktop solution available for ANSYS applications, with dual Intel Xeon processors, up to 1 TB of memory and up to 14 disk drives. It has the capacity to hold up to three dual high cards, such as NVIDIA Tesla cards, or two Intel Xeon Phi coprocessors. With a 92 percent efficient power supply, it delivers 1,300 watts internally, the highest in the industry. A key feature is the flex connector that allows the fastest Peripheral Component Interconnect Express (PCIe) storage options. This product is designed for those who need to take full advantage of their workstation.

Pre-integrated software (optional)

Lenovo offers industry-leading IBM Platform Computing workload and resource management software to help simplify the management of your cluster and optimize resources. IBM Platform HPC software is a complete workload management solution in a single, low-cost product. It includes IBM Platform Cluster Manager, IBM Platform LSF scheduler and IBM Platform Application Center in an integrated offering, delivering out-of-the-box features designed to help reduce the complexity of deploying and managing an HPC cluster environment. For example, Platform HPC can direct jobs to the best-available servers and ensure resources are fully utilized to help drive down costs and speed performance.



Learn more: www.lenovoserverhub.co.uk/media/7600/why-infrastructure-matters.pdf

Reduce complexity and save time

Lenovo Solution for ANSYS can be deployed as individual parts or as a complete Intelligent Cluster™ solution with a single part number. The Intelligent Cluster solution significantly reduces complexity by delivering a preassembled, pretested, integrated cluster comprised of best-in-industry Lenovo and third-party components. Lenovo—or one of our Lenovo business partners specializing in HPC solutions—provides on-site setup of an Intelligent Cluster and support as a single solution instead of as hundreds of individual components. Lenovo also serves as a single point of contact for solution-level support that includes both Lenovo and third-party components to deliver maximum system availability throughout the life of the system. As a result, engineering companies can spend less time deploying and maintaining systems and more time delivering faster, higher-quality results.

Faster time to results

Lenovo Solution for ANSYS can help engineering companies transform and integrate their engineering analysis infrastructure to develop products better, earlier and at less expense (see Figure 1). Key benefits of this solution:

- **Faster time to value:** Pre-integrated, tested and installed Intelligent Cluster solutions help ensure engineering environments are rapidly deployed with greater reliability
- **Improved performance:** Applications run more quickly because they are running on clusters optimized for ANSYS
- **Reduced costs and complexity:** Resource and workload management software improves IT resource utilization and manageability, while the right hardware lowers costs
- **Lower IT risks:** End-to-end support of the complete cluster reduces deployment and operational issues

With innovative ANSYS software powered by the Lenovo Solution for ANSYS, the value of this sophisticated, yet easy-to-use solution is considerable. It brings together a leader in engineering analysis with a proven provider of high-performance systems and captures this expertise in a jointly developed solution optimized for price, performance and simplicity. The architecture is extremely flexible and can easily be customized to meet business and technical needs—saving you time and lowering costs.

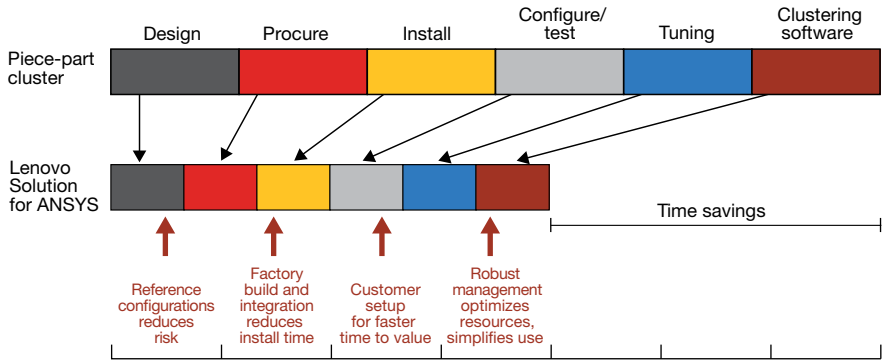


Figure 1. *Save time and lower risk with Lenovo Solution for ANSYS.*

Platform HPC can direct jobs to the best-available servers and ensure resources are fully utilized to help drive down costs and speed performance.

Why Lenovo?

A well-established platform

Lenovo is a global personal and enterprise technology company—the largest PC and systems company in the world—serving customers in more than 160 countries. Dedicated to building exceptionally engineered PCs, mobile internet devices and servers spanning entry through supercomputers, Lenovo has built its business on product innovation, a highly efficient global supply chain and strong strategic execution. The company develops, manufactures and markets reliable, high-quality, secure and easy-to-use technology products and services. Lenovo acquired IBM's x86 server business in 2014. With this acquisition, Lenovo added award-winning System x enterprise server portfolio along with HPC and CAE expertise.

Lenovo is uniquely positioned to deliver high-performance systems with integrated cluster and workload management to meet your product development and high-performance computing needs. Lenovo and Lenovo's large network of Business Partners are ready to assist.

For more information

To learn more about **Lenovo solutions**, please contact your Lenovo sales representative or Lenovo Business Partner, or visit: www.lenovo.com

To learn more about **ANSYS**, visit: www.ansys.com

LDS12346-USEN-00

SRN#: HPCANSX0052