Construction / Architecture / Engineering

Creating a world-class research institute

XCMG Research Institute

Accelerating R&D with an advanced HPC architecture based on Lenovo ThinkSystem servers, powered by 2nd Gen Intel® Xeon® Scalable processors.

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Lenovo

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Who is XCMG Research Institute?

Operating at the forefront of Chinese industry for many years, Xuzhou Construction Machinery Group Co., Ltd. (XCMG) is now the third largest manufacturer of construction equipment in the world. The state-owned company designs, builds, and distributes an extensive range of heavy machinery.

Headquartered in Jiangsu Province, XCMG has 14 factory sites and six research and development (R&D) centers, plus a distribution network stretching across more than 180 countries. Among them is Jiangsu XCMG Engineering Machinery Research Institute Co., Ltd. (XCMG Research Institute)—the company's primary R&D center, which is key in protecting its market-leading status. XCMG aims to make XCMG Research Institute a world-leading center for innovation, supporting R&D and the manufacture of advanced construction equipment that generates lasting value for clients.

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The Challenge

A central component in XCMG's growth has been its embrace of digitalization and smart manufacturing practices. The company has completed multiple digital transformation projects, with the latest phase focused on modernizing the systems supporting its R&D activities.

In the R&D environment, XCMG Research Institute aims to make continuous improvements to the design quality of its equipment. Using computer-aided engineering (CAE) software, teams run simulations to analyze the performance of new materials and configurations. To support these intensive, large-scale workloads, XCMG Research Institute relies on a high-performance computing (HPC) infrastructure.

However, with R&D teams running more simulations than ever, the current HPC environment was struggling to keep pace with demand. Insufficient compute and storage performance and capacity meant that application load times were slowing, hindering research and holding back the launch of new products on the market. To shorten development cycles, a new HPC infrastructure was essential.

“To keep up with more intense competition, we carry out extensive technology innovation and R&D into new equipment. We wanted to deploy a new HPC system to help the R&D team work faster and more efficiently, which ultimately will help us to gain competitive advantage.”

Huang Jianhua
Deputy Director, XCMG Research Institute

Why Lenovo?

To support its R&D simulations, XCMG Research Institute engaged Lenovo to design and deploy a new HPC environment, with a significant increase in compute and storage capacity. The Lenovo team analyzed the company's requirements, then planned a customized architecture combining new servers, all-flash storage and file systems, and network hardware.

Huang Jianhua, Deputy Director at XCMG Research Institute, explains: "We knew we were in safe hands with Lenovo, as so many enterprises rely on their servers and storage to support their mission-critical applications. The performance and scalability of their technologies was ideally suited to our demanding simulation tasks.

"We were also pleased with the level of after-sales support available from Lenovo. Rather than having to find another systems integrator to service and maintain the HPC system, we can simply contact Lenovo whenever required—helping to keep our operational costs low."

Strong partnership achieves seamless deployment

XCMG Research Institute worked hand-in-hand with Lenovo Services to build the advanced HPC cluster. The new R&D infrastructure features Lenovo ThinkSystem servers, powered by 2nd Gen Intel® Xeon® Scalable processors, to support the most demanding calculations and visual simulations.

Alongside the server environment, the company uses Lenovo Distributed Storage Solution for IBM Spectrum Scale, a block storage platform tailor-made for HPC setups, and state-of-the-art switches and cabling to optimize network throughput. A centralized administration suite from Lenovo simplifies management and monitoring of the HPC nodes.

Huang Jianhua continues: “The Lenovo team completed a very efficient deployment of the HPC cluster, and often went the extra mile for us. Not only did the Lenovo team configure the new cluster, but also upgraded our existing infrastructure, which will generate valuable maintenance savings.”

Hardware

Lenovo ThinkSystem servers powered by 2nd Gen Intel® Xeon® Scalable processors
Lenovo Distributed Storage Solution for IBM Spectrum Scale

Services

Lenovo Assessment Services
Lenovo Deployment Services – HPC
Lenovo Design Services
Lenovo Post Warranty Services

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Results

Using the Lenovo solutions, XCMG Research Institute has successfully modernized its HPC cluster. Research teams across the company and among its subsidiaries now have access to scalable, high-performance compute and storage resources ideally suited to running demanding simulations. Already, XCMG Research Institute has seen much faster application response times thanks to the Lenovo and Intel® technology.

Huang Jianhua continues: “The new HPC cluster ensures that our R&D teams enjoy a much better experience when performing simulation work, without the risk of lengthy computational times or application lag. As a result, they can complete testing and analysis sooner and work more much more productively, helping to shorten the development cycle for new components and equipment designs.”

Building on its positive experience working with Lenovo, XCMG Research Institute is already planning to scale its new server and storage infrastructure. For example, the company intends to expand the HPC cluster to more than 200 nodes as CAE workloads continue to grow.

Huang Jianhua concludes: “With support from Lenovo, our digital R&D capabilities are growing. Our R&D simulations and analysis now run faster than ever, helping us to stay ahead of competitors and bring next-generation construction machinery and equipment to the global market.”

- Provides high compute and storage capacity needed to run intensive simulation work
- Faster application response times help research teams to work more productively
- Accelerates time-to-market for new equipment thanks to shorter development cycles

> “Lenovo has been an immensely valuable partner to XCMG Research Institute. Despite the complexity and scale of the HPC project, Lenovo had the experience, know-how, and high-quality, resilient technologies to ensure a successful transition for us.”

Huang Jianhua
Deputy Director, XCMG Research Institute

How do you support researchers running more intensive simulation workloads than ever?

Accelerating research work with
Lenovo and Intel® technology.

Explore Lenovo HPC Solutions

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