CINECA
Providing the intelligence to solve our biggest challenges

Artificial Intelligence. Machine learning. Automation. Researchers from CINECA are pushing the boundaries of science and technology, supported by a cutting-edge supercomputer from Lenovo.
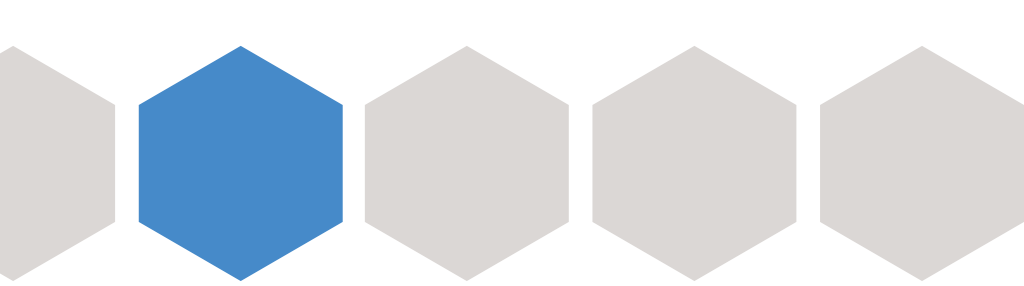
What was once purely the realm of science fiction is fast becoming reality. For example, driverless cars, advanced robotics and increasing automation look set to transform society in the coming decades. It's an exciting time for scientists working with these technologies.

Sanzio Bassini, HPC Director at CINECA, a non-profit consortium of Italian universities and research institution, notes: "Interest in artificial intelligence is at an all-time high. For instance, we currently have researchers working with major automotive companies, including Ferrari, Lamborghini and Bugatti, that are looking to harness these emerging technologies to bring self-driving cars to the market in the coming years."

CINECA, one of the world's most renowned scientific computing centers, is proud to bridge the gap between academic research and industry. Scientists from all over Europe turn to CINECA for the HPC resources and data processing capabilities they need to further research on everything from artificial intelligence and automation to nuclear physics and nanotechnology.

To meet growing demand from scientists for compute resources, CINECA partnered with Lenovo to design, build and deploy a new supercomputing environment. Named Marconi, the cluster is made up of 1,500 Lenovo ThinkSystem SD530 servers, which are equipped with next-generation Intel® Xeon® E5, Intel Xeon Phi™, and Intel Xeon Scalable System Family Platinum processors.
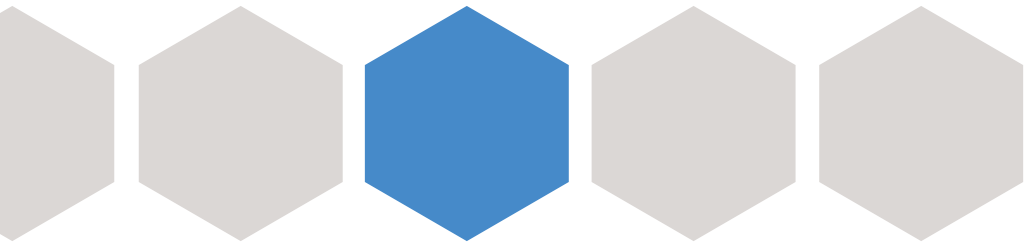
Marconi was carefully co-designed by CINECA and Lenovo to include three different microprocessor architectures, ensuring that the organization can support a diverse range of research workloads. Rapid data transfer between nodes is delivered through Intel Omni-Path Architecture, boosting overall system and application performance.

Sanzio Bassini recalls: "We worked very closely with the Lenovo team during the design process, and it was a real collaborative effort. The Marconi environment is an extension of our existing Lenovo NeXtScale platform. Combined, we now have over 7,000 servers in our data center, delivering 20 PFLOPS peak performance. This means that researchers can run extremely compute-intensive workloads without our supercomputing environment even breaking a sweat."

"Support from the Lenovo team during the implementation was invaluable," he adds. "They helped us to tune and optimize the systems to meet all of our requirements. So, when physicists from the Italian National Institute of Nuclear Physics [INFN] working at CERN to conduct their experiements come and ask us for a certain amount of compute power and a certain amount of bandwidth to process experimental data from the Large Hadron Collider, for example, we can provide them with the resources they need very quickly."

Being able to process and visualize extremely large data sets can provide key insights on the phenomena that researchers are studying. With the Lenovo solutions, CINECA is supporting revolutionary research that has the potential to change the world.

Sanzio Bassini concludes: "Our HPC services underpin vital scientific, technological, industrial and medical research, helping researchers get that much closer to uncovering the scientific breakthroughs and innovations that will shape the world in the 21st century and beyond."

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– Sanzio Bassini, HPC Director, CINECA

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CINECA
Helping to solve our biggest challenges

Solution components

Hardware

Marconi system: 1,500 Lenovo ThinkSystem SD530 nodes with Intel® Xeon® E5, Intel Xeon Phi™ and Intel Xeon Scalable System Family Platinum processors

Intel Omni-Path Architecture

Additional systems: Lenovo NeXtScale System nx360 M5 with Intel Xeon E5 processor family
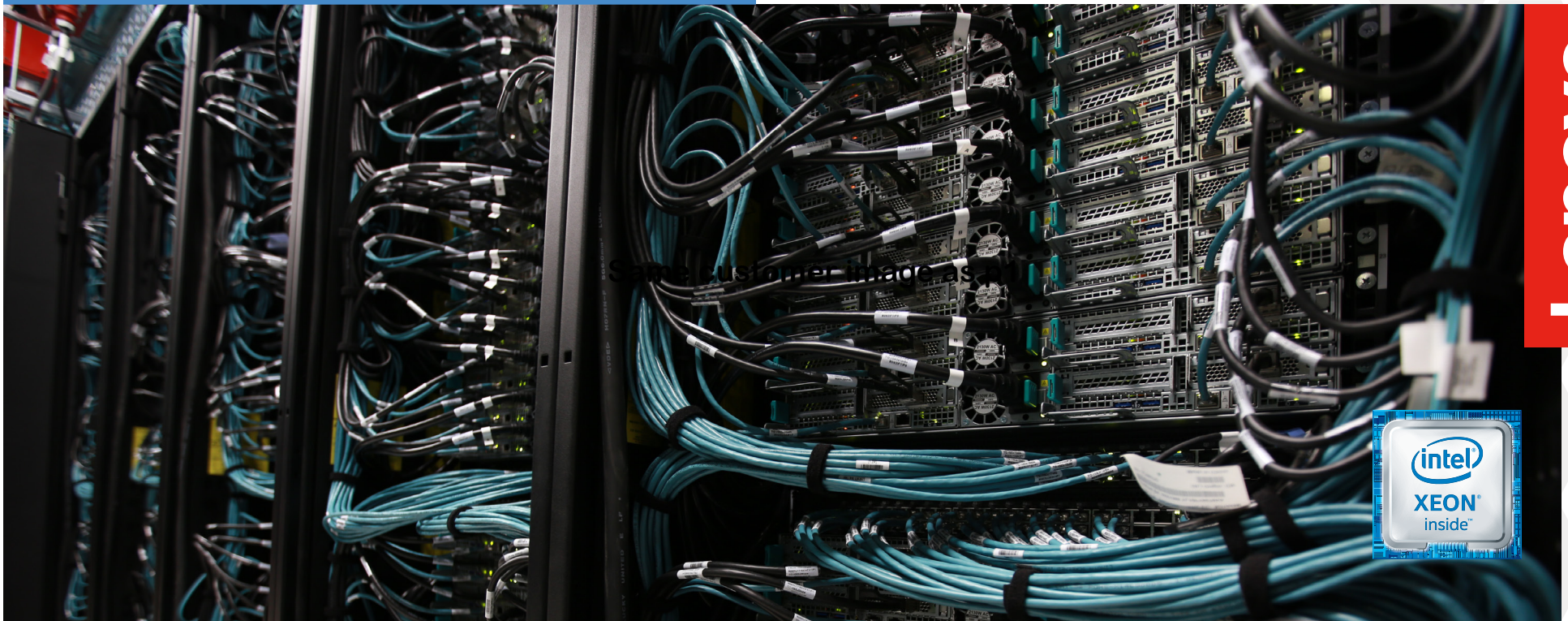
Services

Lenovo Professional Services

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—Sanzio Bassini, HPC Director, CINECA

With a new HPC environment based on Lenovo ThinkSystem SD530 servers with powerful Intel® Xeon® processors and Xeon Phi™ accelerators, CINECA offers researchers easy access to state-of-the-art scientific computing resources to support ground-breaking research into emerging technologies, nuclear physics and more.