



Business challenge

Increasing numbers of companies are waking up to the benefits of high-performance computing as a service, and they want continual improvements in performance and value—how can providers deliver?

Transformation

French engineering school MINES ParisTech and software development firm Transvalor partner to offer HPC services to internal and external users, driving forward research across a range of industries. With demand for services booming, the two organizations looked to IBM and CARRI Systems for a more powerful infrastructure solution.

Business benefits

Attracts

new students to the school by enhancing its reputation as a leader in research

Wins

new external clients by meeting demands for performance, scalability and low cost

Advances

industry and innovation in France and beyond

MINES ParisTech and Transvalor

Creating future industry leaders by providing access to enterprise-class HPC services

Established over 230 years ago, [MINES ParisTech](#) is a leading French graduate school that houses 18 research centers in five fields: earth sciences and environment, energy and process engineering, mechanical and materials engineering, mathematics and systems, and economics, management and society. It has more than 1,280 students and locations in Paris, Évry, Fontainebleau and Sophia Antipolis.

“Our IBM solutions play an essential role in helping us to fulfil our goal of advancing industry and innovation within France, and eventually Europe.”

—Elie Hachem, Head of the Computing and Fluids Research Group at MINES ParisTech



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Driving progress forward

As companies across diverse industries recognize the huge benefits that high-performance computing (HPC) can unleash, the appetite for HPC services shows no sign of slowing. Universities, so often on the boundaries of innovation, are uniquely positioned to uncover and drive forward new applications for these solutions.

MINES ParisTech, a leading French engineering school, has long been aware of this unmissable opportunity, partnering with software development firm Transvalor to create and deliver HPC services to both internal and external users.

Elie Hachem, Head of the Computing and Fluids Research Group at MINES ParisTech, elaborates: “Our goal is to create future leaders of industry by helping our students solve real-world problems. Teaming up with Transvalor, we can develop the HPC solutions that enable cutting-edge research, both inside and outside the university.”



This joint enterprise has proven successful, with demand for the organizations’ HPC services rising steadily. In response, MINES ParisTech and Transvalor wanted more from their infrastructure.

Romain Klein, Cloud Architect at Transvalor, explains: “Our users run simulations that require many cores, lots of memory and low inter-node latency so that resources can communicate quickly. User requirements change very quickly and with little warning, and we wanted to be able to respond to new requests with greater speed and effectiveness.”

Elie Hachem adds: “Clients expect us to embrace the latest advances in technology, so that we continually increase the levels of performance and cost-efficiency that we offer them. Ultimately, we have ambitions to extend our offering outside of France, across Europe. So, we began looking for a new approach to managing our HPC workloads to ensure we could meet rising client demands and make our growth plans a reality.”

“The IBM solution enables us to provide competitively-priced HPC services that deliver exceptional performance and flexibility. As a result, we boost our appeal to future applicants to the school, and industry clients.”

—Elie Hachem, Head of the Computing and Fluids Research Group at MINES ParisTech

Building a next-level computing cluster

For advice on how best to transform its HPC capabilities, MINES ParisTech and Transvalor approached IBM Business Partner CARRI Systems.

Franck Darmon, CEO of CARRI Systems comments: “We proposed an XLR® computing cluster based on IBM Spectrum LSF Suite for Workgroups. This XLR solution, coupled with IBM Spectrum LSF, provides everything MINES ParisTech and Transvalor need for HPC workload management within a single package. At first, they thought that the solution might be out of their price range, but we were able to demonstrate that IBM has developed a bundle targeted at enterprises of their size, offering advanced functionality and stellar support, all at an extremely affordable fee. Better still, IBM Spectrum LSF is extremely easy to install and configure using only basic Linux skills—so the barriers to entry are very low.”

Elie Hachem continues: “We found natural partners in CARRI Systems and IBM. We have worked with CARRI Systems before; they knew our specific needs and offered the flexibility we were looking for. IBM continues to impress us with their commitment to pushing forward innovation within the HPC space, matching our own goals and ambitions. We feel that IBM solutions give us that enterprise-class edge that helps us meet industry client requirements.”

To accelerate deployment and minimize risk, CARRI Systems configured and set up the XLR computing cluster on its own premises before delivering the solution to MINES ParisTech and Transvalor. The organizations have now gained much greater control and flexibility around the management and scheduling of shared HPC resources.

Romain Klein comments: “IBM Spectrum LSF Suite for Workgroups is designed to be set up rapidly, so with help from CARRI Systems we were able to get it installed and running within a very short time. Before, our workload scheduling tool was unreliable, and simply could not cope at enterprise level. Now, we rely on the easy-to-use web portal that is part of the IBM solution to optimize workload scheduling with ease and efficiency.

“Our new XLR cluster also supports hybrid cloud capabilities better than our previous approach. Specifically, the IBM technology helps us better handle ‘cloud bursting’, whereby we access additional compute capacity in public clouds to meet short-term requirements. As this is something that we now do frequently, it is a great advantage that it is a virtually seamless process.”

Making waves in France and beyond

By enabling MINES ParisTech and Transvalor to provide enterprise-class HPC services that push the boundaries of research, the IBM solution helps the two organizations to reinforce their reputations as leaders in innovation.

Elie Hachem says: “Supported by IBM technology, we are succeeding in breaking the mold for simulations, giving users within the university and external users the tools they need to achieve ground-breaking results in research. The IBM solution enables us to provide competitively-priced HPC services that deliver exceptional performance and flexibility. As a result, we boost our appeal to future applicants to the school, and industry clients—a win-win situation for MINES ParisTech and Transvalor.”

Already, the organizations' HPC services are being utilized by researchers across a range of industries. One of the exciting projects supported by MINES ParisTech and Transvalor is Stratobus, an autonomous stratospheric airship funded by the French government.

Elie Hachem explains: "The Stratobus research and development team are running simulations on our cluster to decide on the perfect shape for the airship, which must remain stationary 20 kilometers above the ground, at very low temperatures and high winds. Even tiny variations in the shape can have huge consequences for the electric propulsion system that will be used to keep it still."

Romain Klein continues: "Researchers within the petroleum and oil extraction sectors are using our services to investigate the resonant frequencies that cause pipes to crack due to air bubbles, helping them to avoid delays and costs. In the future, we hope to facilitate better, faster decision-making for doctors by supporting biomechanics research with high-speed computations. Really, the applications are endless."

As a result of the project, MINES ParisTech and Transvalor are taking another step forwards in their joint mission, as Elie Hachem concludes: "Our IBM solutions play an essential role in helping us to fulfil our goal of advancing industry and innovation within France, hopefully across Europe in the future, and perhaps even further afield. With ultra-scalable, high-performance, cost-effective IBM technology on our side, the possibilities are infinite."

Solution components

- IBM® Spectrum LSF Suite for Workgroups

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To learn more about IBM Spectrum Computing, please contact your IBM representative or IBM Business Partner, or visit the following website: ibm.com/systems/spectrum-computing

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