EVIDEN

science + computing

IT consulting & services for **CAE HPC simulation**

utilizing HPC to the maximum

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Utilizing Computer Aided Engineering (CAE) simulation is key to creating innovative products and bringing them to the market fast while assuring highest product quality and safety. With its IT services for CAE HPC simulations, science + computing assures that the complex and fast-moving IT environment used for engineering and R&D utilizes expensive technologies, like HPC, to the maximum and manages the complexity, to create an engineer-focused product innovation platform.

Performing 1 million virtual car crash tests a year, developing more fuel-efficient wing-profiles for planes, boosting the creation of a COVID vaccine or reducing the number of failed silicon wafers during the production process – all these and many more use-cases benefit from advanced CAE simulations and HPC clusters.

Designing and running these highly specialized high-end IT environments implies making use of new technologies fast and integrating dozens of specialist software tools while providing a Linux based workplace, which empowers engineers to use these tools without becoming an IT expert on their own.

Accelerated product development

Customers challenge

While CAE simulation is a proven and established discipline in product development, the overall success depends on the capabilities of the dedicated IT environment and their most efficient use:

- Efficient use of expensive HPC clusters require performance tuning of low-latency networks and batch schedulers
- Vast amounts of data have to be managed in the fastest way possible while assuring data security and data continuity
- Hybrid Cloud resources need to be customized to provide a flexible cost-effective global compute platform
- Highly specialized applications need to be integrated and technical workflows automated

Suggested solution

Working closely with the customer, science + computing architects and streamlines CAE IT environments.

Starting from an in-depth analysis of the engineers' demand, we create use case optimized end-to-end solutions, based on our extensive expertise of operating production critical CAE IT environments in the industry. Our experts tune HPC and storage systems to maximum utilization, bringing insight to CAE software licenses usage and implementing standardized HPC solutions.

Experienced CAE Workflow Consultants create tailor made tools for web portals, submit frameworks as well as simulation data management software integration and automation of recurring tasks.

Business benefits

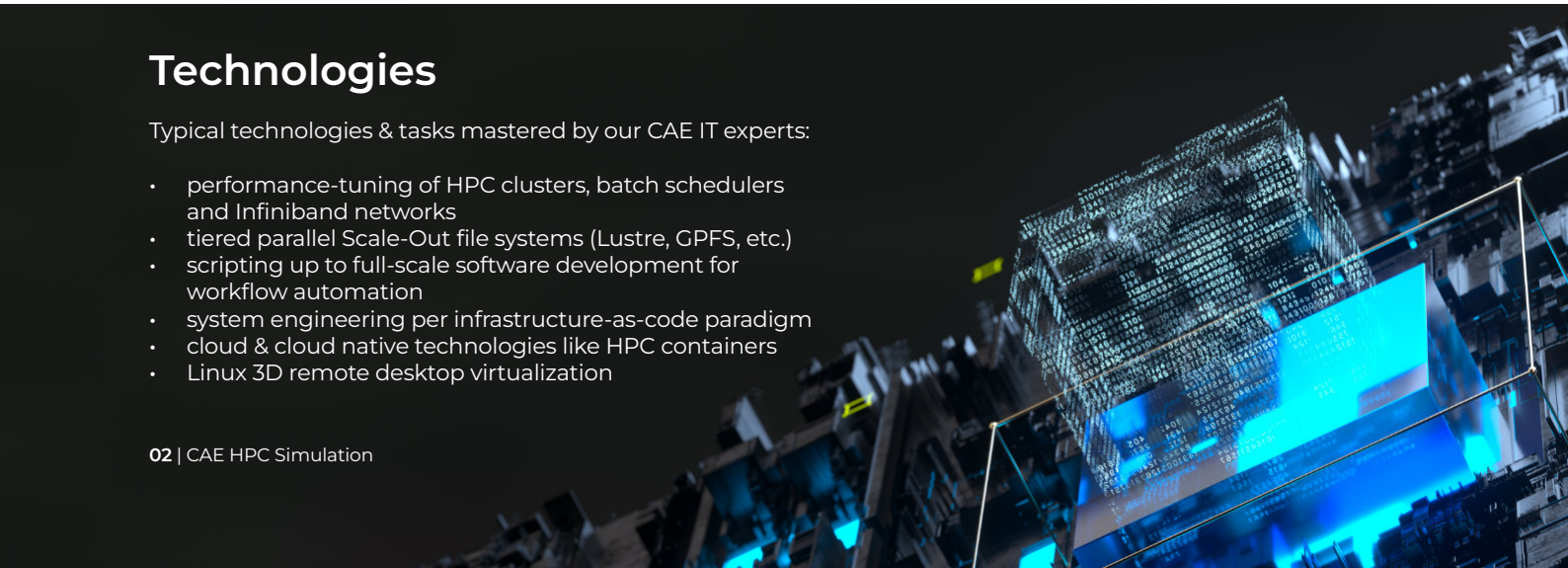
An optimized and agile CAE IT environment which uses on-premises and/or cloud resources more efficiently – run by experienced CAE IT experts.

- Clear insight to systems utilization and license usage for JIT capacity management
- HPC usage at ease for engineers and suppliers
- Fast implementation of service requests by CAE expert level service desk team as they speak the language of engineers
- Reduction of cost for local workstations by leveraging powerful Linux 3D remote visualizations
- Accelerated product development and faster capitalization of R&D investments

Technologies

Typical technologies & tasks mastered by our CAE IT experts:

- performance-tuning of HPC clusters, batch schedulers and Infiniband networks
- tiered parallel Scale-Out file systems (Lustre, GPFS, etc.)
- scripting up to full-scale software development for workflow automation
- system engineering per infrastructure-as-code paradigm
- cloud & cloud native technologies like HPC containers
- Linux 3D remote desktop virtualization



Solution overview & service models

Driven by use-case specific demands for disciplines like FEM, CFD and NVH, each CAE IT environment designed and run by science + computing is based on standardized CAE components and orchestrated for the bespoken workload.

Customer enagagement

Our solutions cover consulting, out-tasking and up to full end-to-end as-a-Service models:

- IT consulting for optimizing a partial aspect of the full CAE environment, e.g. reducing ISV software licenses or tuning the HPC batch system for higher utilization.
- Our experts will perform an in-depth analysis and document clear recommendations for potential savings and on how to improve the existing IT architecture.
- T&M or fixed price-based IT Operations for selected critical layers like HPC cluster & CAE workflows or container based application management.
- Full end-to-end responsibility for the complete CAE IT stack including an optional as-a-Service model where the customer can reduce its IT coordination effort to the minimum.

Delivery model

Having detailed knowledge about the customer engineering processes, HPC workloads as well as CAE applications is key for being a trusted advisor and innovation partner.

- science + computing uses a customer specific team to assure customer intimacy: Our experts are close to or at customer sites for expert workshops, design meetings, etc.
- This model can be extended to a full on-site operation or to a cost optimized model with near-shore resources.
- Close cooperation of the customer specific expert Service Desk and IT operations team assures an end-user-centric service mentality with fixed personal contacts.

Orchestrated global HPC grid

science + computing empowers customers to create dynamic hybrid HPC grids as an internal shared resource for CAE workloads as well as AI and Data Analytics based HPC use-cases. This platform includes:

- globally distributed on-premises as well as cloud HPC resources
- easy-to-use entry point for the engineer and suppliers
- orchestration layer, assuring data security, auditing and reporting
- interface for integration of e.g. simulation data management software or digital twin infrastructures

Our insights: end-to-end CAE IT services

For a leading German car manufacturer, science + computing provides design / plan / build / run CAE services covering the full CAE stack – from data center services to tailor made software development for CAE workflows: > 6.000 servers, about 1.000 engineers, dozens of PBytes of storage, hundreds of ISC / in-house applications.

The delivery is fulfilled by a mixed-shore team with local experts on-site as well as on-shore and near-shore system engineers and consultants.

For more information please contact:
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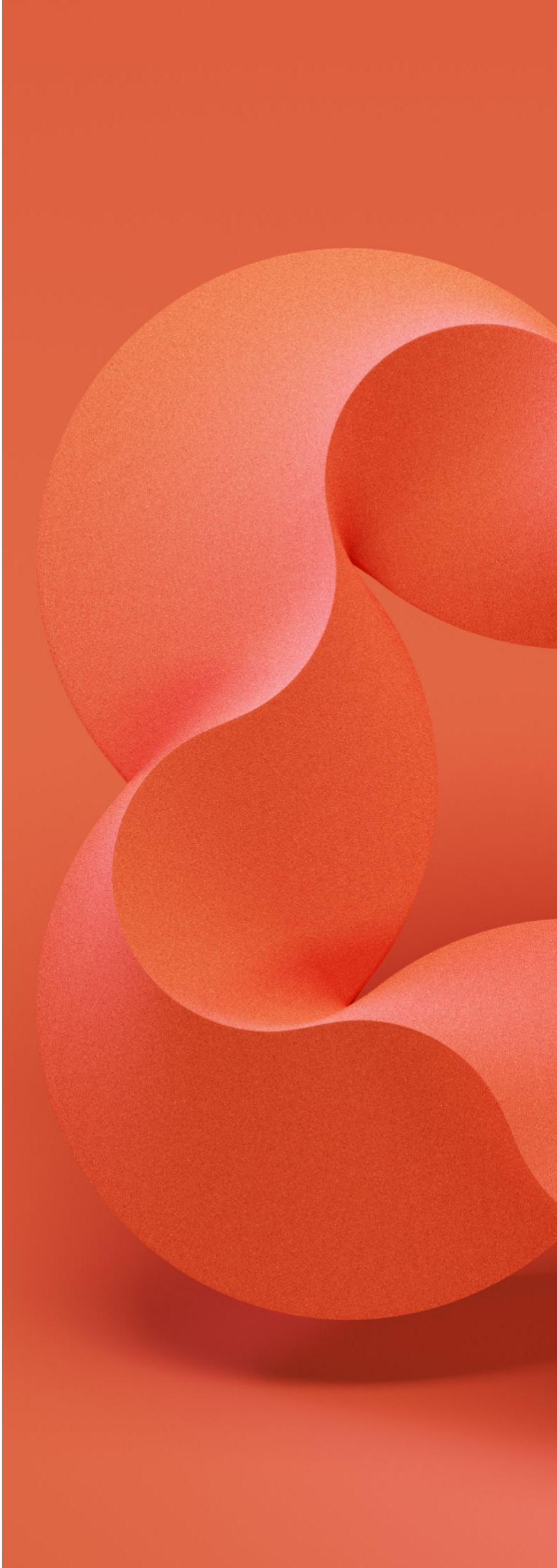
Visit our website:
science + computing
HPC Consulting



science + computing

science + computing ag, a 100% subsidiary of Eviden, offers IT services, solutions and software for the efficient use of complex computer environments in research, development and computation. Our long term customers include manufacturers and suppliers in the automotive, microelectronics, aerospace and pharmaceutics sectors as well as scientific research institutes. We help our customers focus on their core business objectives by providing an efficient, cost-effective and resilient IT infrastructure.

EVIDEN

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