

**Q extreme factory**

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# Innovation at your fingertips



**Bull**  
atos technologies

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# extreme factory, HPC-as-a-service from Bull

Long reserved for major research laboratories, computer simulation has become an essential tool for innovation. But a lack of resources or expertise means many companies and organizations do not have access to an HPC infrastructure. For these businesses extreme factory proposes a set of HPC-as-a-service solutions combined with HPC expertise to help organizations implement their computer simulation applications. Born out of Bull's unique experience in HPC, extreme factory gives businesses of all sizes, in all sectors, access to made-to-measure supercomputing resources.

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## **Flexibility, performance, security, service**

To meet the wide range of needs, extreme factory is available in four configurations: shared public, reserved public, private on-site and private hosted. It's also possible to combine these configurations into hybrid solutions. Whatever arrangement you choose, it is implemented and operated by experts from Atos. extreme factory offers superior levels of performance, reliability, availability and security. Using exclusive tools like the 'extreme factory computing studio' portal and 'extreme factory remote visualizer' 3D visualizer, users can access a complete work environment and personalized service that allow them to conveniently manage every stage of their project: from data loading to visualizing

the results. The flexibility and elasticity of the Cloud means everyone can have the resources they need; simply, cost-effectively and securely. System administrators also benefit from greater usability, because the portal lets them manage resources, tasks and users centrally.

## **Keeping the cost of innovation under control**

As well as the advantages of sharing infrastructures, optimizing how they are used and rationalizing of licenses, extreme factory boosts productivity and gives you total visibility of expenditure by project, department or resource. It's easy to establish usage indicators and detailed reporting, for accurate cost allocation. With extreme factory, you can keep the cost

of innovation under control. Developed in partnership with numerous ISVs and enriched by Atos' wealth of technological and scientific experience, extreme factory is compatible with most commercial and Open Source applications. So extreme factory meets the demands of all sectors from aerospace, automotive, engineering and chemical industries to animation, video, games and financial services. An integrated service offering a unique combination of technology and expertise, extreme factory puts innovation at everyone's fingertips.

# What users say

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**A major European aerospace** company rationalized its visualization tools, improved security and access control; and reduced commercial license usage costs.

The customer needed to rationalize all the visualization tools and components it had been using, including various scientific visualization applications on heterogeneous workstations, resulting in inappropriate configurations, sub-optimal licensing options for ISV software, local data availability issues, and weak global access control. Adopting extreme factory computing studio instantly solved day-to-day problems and allowed users to achieve their post-processing tasks much more smoothly and efficiently. Users were impressed by the performance and fluidity of extreme factory remote visualizer (XRV) compared to other Open Source and commercial solutions.

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**Exa**, a leading provider of simulation-driven design solutions and a pioneer of HPC Software-as-a-Service, chose extreme factory as one of its HPC on-demand solutions for PowerFLOW.

*“Close co-operation between the teams from Exa and Bull, as well as the flexibility of the Bull on-demand infrastructure, enabled the design of a very effective solution for running complex and highly demanding CPU simulations at an unmatched ROI for our customers.”*

*Hundreds of CFD simulations run on hundreds or thousands cores each month on extreme factory in a completely streamlined, scalable and flexible operational workflow.”*

**Jean-Paul ROUX,**  
**President European Operations**  
**Senior Vice President Aerospace**

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**STX France** is renowned as the builder of the most famous cruise ships in the world. To expand its leadership in cruise ship design, STX France decided to invest in the use of Computational Fluid Dynamics to study the aerodynamics of ship superstructures.

The aim of their research was to optimize airflow, to reduce fuel consumption and improve passenger comfort on external decks. Wind force data, which is important when it comes to manipulating simulations, is also provided by these calculations. extreme factory was used to run these highly complex simulations, and was able to solve the analysis on 264 cores with a near linear scalability.

The model that incorporates the balconies and separators is made up of 164 million cells. The simulations were run by STX in steady-state mode, using the simpleFOAM solver from OpenFOAM®. Post-processing was performed on the fly, in parallel, and enabled pictures including cutting planes and streamlines to be generated.

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**GeonX** is a high-tech start-up company specializing in virtual manufacturing. GeonX develops and markets its VIRTUAL FACTORY, Virfac®.

*“At GeonX, welding simulation in the Cloud is not a dream, it is real! Virfac® in the Cloud, powered by extreme factory, gives each user the power to set up his own model remotely in his local Web browser, launch his analysis on the Bull supercomputer and only pay per use. Be one of the pioneers, join us on extreme factory!”*

**Dr. Laurent D’Alvise,**  
**GeonX CEO & co-founder**

# extreme factory, four packages for a made-to-measure solution

## on demand

### extreme factory on demand

#### All the simplicity of pay-per-use

extreme factory on demand gives you access to pooled computing resources, hosted and operated by Atos, and billed in real time as you use them.

Users connect to their customized work environments on the Internet via a secure portal, where they can launch their simulations on demand. The processing cores are shared between different customers, so task scheduling is on a 'first come, first served' basis. This simple, cost-effective and flexible option is ideal for impromptu needs or where there is no great urgency, such as POCs...

As part of a hybrid Cloud, it can also provide additional computing power if necessary.

### extreme factory on demand reserved

#### Guaranteed resources at optimum cost

Project imperatives often mean it's hard to accommodate the uncertainties that come from using shared resources. But given that periods of intense demand (bursts) can usually be anticipated, Atos offers extreme factory on demand in reserved mode. This service allows users to pre-book a processing time-slot. No more risks associated with having to wait: resources are guaranteed and freely available during this time. The reserved time-slot is paid for, regardless of the use you make of it. This formula means you get all the benefits of pooling and the flexibility of the public Cloud, while enjoying guaranteed resources.

Use on its own or in addition to a private Cloud in a hybrid configuration, it is particularly suitable for one-off, CPU-hungry projects.



## **extreme factory private on premises**

### **Your infrastructure, Atos' expertise**

Do you want to keep your computing and visualization resources within your business, while letting your users benefit from the flexibility and power of the Cloud? With extreme factory private on premises, the Cloud infrastructure stays within your walls and under your operational responsibility.

Atos experts are responsible upstream for its definition and implementation: deploying new infrastructures and optimizing existing ones, consolidating and upgrading resources, harmonizing processes, structuring internal offering... Located on your premises, the extreme factory computing studio portal becomes the sole gateway to your private HPC Cloud, facilitating how the computing or visualization environment is used by the business and how it is managed by your system administrators. Your HPC resources are totally integrated, streamlined and secure, to take full advantage from the elasticity of the Cloud.

## **extreme factory private hosted**

### **Innovate with total peace of mind**

Atos offers extreme factory private hosted, where your HPC Cloud infrastructure is designed, implemented, hosted and operated by Atos experts in a secure Data Center. The connection is via secure Internet gateway (at a custom bandwidth) or VPN supported by your operator or Atos itself. This approach allows for full customization to provide you with the computing environment that best suits your patterns of usage and your applications, while retaining the flexibility of the public Cloud.

You get defined service levels and maximum performance without the need for your teams to get involved, so they can focus on other tasks. This model is particularly well suited to companies and organizations that need longterm access to computing resources: extreme factory private hosted lets you concentrate all your energy on your innovations.

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# **private**

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# extreme factory frees up your capacity for innovation

## A single point of access

The extreme factory computing studio secure portal gives users and system administrators alike direct access to all resources and applications. The user interface is born out of a continual dialogue between Atos and its customers and therefore truly reflects users' expectations.

Once a user is logged on, he or she can access a complete work environment, customized for their job role and applications. From there, they can load and manage data, set parameters for the simulation, run the calculation, track its progress, and then proceed to post-processing and visualization of results. Administrators can manage users and roles, resources, task scheduling, application licensing. As a single point of access to the HPC environment, extreme factory computing studio simplifies the handling and management of an HPC cluster, and

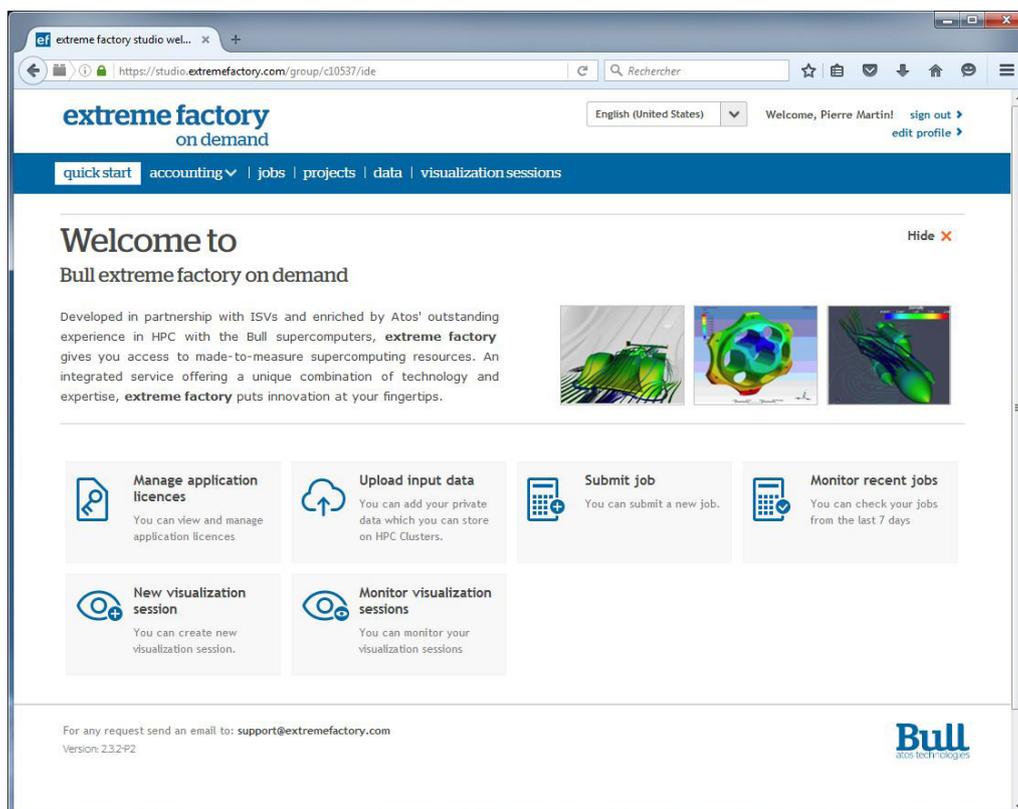
lets you focus on the actual computing and results.

## Security: essential at every level

Whether it's for fundamental research or new product development, the data from computer simulations is among the most critical for companies and laboratories alike, as it goes right to the heart of their investments, strategy and know-how. extreme factory solutions natively integrate very high levels of security to protect data and exchanges. Interconnections are covered by a secure protocol, IP addresses are filtered (only the client's own domain name is allowed), and users can only access a virtual machine, not the physical machine, to ensure total data partitioning. For security reasons, all application installations are carried out by Atos teams. Other options (VPN, encryption...) are possible depending on the context and needs.

## Security: essential at every level

The exclusive 3D visualization module, extreme factory remote visualizer (XRV) is compatible with most available applications and lets you use post-processing modules directly on the server: only the compressed image is transferred to the user workstation. Exchanging less data means greater security, more fluidity, and less use of infrastructure resources (networks, user workstations...), as well as being more convenient for users and offering more opportunities for increased collaboration.



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## Application expertise and service: getting more from support

In areas as sophisticated as industrial design and scientific research, the slightest difference in the quality and accuracy of results can have a significant impact. To gain an extra edge in performance and obtain perfectly understandable and usable results, each link in the chain has to be optimized: and only a person who knows the area of application, the software used, the vocabulary or common way to present the results will be able to translate business needs into technical settings.

In Atos's dedicated HPC teams, technological expertise is coupled with genuine scientific know-how. Thanks to this dual culture, the services that support extreme factory solutions provide a significant added value at every stage of the project: the design of the solution architecture; platform design and optimization; the ergonomics and security of the work environment; integration of third-party tools, post-processing of the data produced... In addition - when it comes to hosted solutions - industry-scale application services (maintenance, monitoring...) ensure high levels of service and usability via a single point of contact.

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# Atos in extreme computing

As Europe's only supercomputer manufacturer through its brand Bull, Atos operates in the ultrahigh processing power market, to accelerate its customers' research and innovation.

With its Extreme Computing solutions - focused around its sequana and bullx supercomputers - Atos delivers all the benefits of a leader in Petascale technologies to everyone from research centers to the design offices of major multinationals, or to innovative SMEs.

Over the years, Bull supercomputers have gained a strong presence in the list of the world's top supercomputers.

With more HPC specialists than any other player in Europe, Atos is recognized for the technological excellence of its Bullx systems, its HPC applications expertise and its ability to manage large-scale projects.

Across the world, numerous institutions (Météo-France, SURFsara in the Netherlands, LNCC in Brazil, CSC in Finland, DKRZ in Germany, the Universities of Dresden, Rijeka, Grenoble, Reims Champagne Ardenne and many others) and companies (CCRT, CEA, Dassault-Aviation, Cenaero) have turned to Atos to implement powerful, robust systems that are easy to manage and use, and are designed for round-the-clock operation. Every day, thanks to their Bull systems, their researchers and engineers are pushing back the boundaries of the possible.

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# About Atos & Bull

Atos SE (Societas Europaea) is a leader in digital services with pro forma annual revenue of circa € 12 billion and circa 100,000 employees in 72 countries. Serving a global client base, the Group provides Consulting & Systems Integration services, Managed Services & BPO, Cloud operations, Big Data & Cyber-security solutions, as well as transactional services through Worldline, the European leader in the payments and transactional services industry. With its deep technology expertise and industry knowledge, the Group works with clients across different business sectors: Defense, Financial Services, Health, Manufacturing, Media, Utilities, Public sector, Retail, Telecommunications, and Transportation.

Atos is focused on business technology that powers progress and helps organizations to create their firm of the future. The Group is the Worldwide Information Technology Partner for the Olympic & Paralympic Games and is listed on the Euronext Paris market. Atos operates under the brands Atos, Atos Consulting, Atos Worldgrid, Bull, Canopy, Unify and Worldline.

For more information

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## **Bull, the Atos technologies for the digital transformation**

Bull is the Atos brand for its technology products and software, which are today distributed in over 50 countries worldwide. With a rich heritage of over 80 years of technological innovation, 2000 patents and a 700 strong R&D team supported by the Atos Scientific Community, it offers products and value-added software to assist clients in their digital transformation, specifically in the areas of Big Data and Cybersecurity.

Bull is the European leader in HPC and its products include bullx, the energy-efficient supercomputer; bullion, one of the most powerful x86 servers in the world developed to meet the challenges of Big Data; Evidian, the software security solutions for identity and access management; Trustway, the hardware security module and Hoox, the ultra-secure smartphone. Bull is part of Atos.

For more information

**bull.com**

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