

High Performance Computing as a Service Innovation at your fingertips

Enabling UK industry to address some of society's most complex challenges

Generating finer-grained weather forecasts, designing cleaner aircraft engines, leveraging genomics to make personalised medicine a reality. All of these advances require the extreme power of supercomputers. Yet inevitable limits on resources can make it difficult to access a world-leading high performance computing (HPC) infrastructure.

Accessing High Performance Computing: key challenges

Getting access to HPC at the right price point is a challenge. High total costs of ownership combined with variable workloads and the need for specialist skills mean that services in the cloud can be a practical way forward. Yet general-purpose cloud services often do not work for HPC because of:

- Virtual images impacting performance and creating unpredictable results
- Specialised requirements for HPC applications such as high performance interconnects and parallel filesystems
- Data transfer and storage costs for large datasets.

In contrast, Extreme Factory offers leading HPC solutions and services, with all the flexibility and cost-efficiency of the cloud, and is hosted in the UK.

What is Extreme Factory HPC as a Service?

Extreme Factory UK is delivered in collaboration by Atos and the STFC Hartree Centre. It's a dedicated service leveraging our unique combination of expertise and resources to accelerate the adoption of HPC, big data and cognitive technologies by UK industry and the research community.

You'll get commercial access to world-leading supercomputing and cognitive computing facilities, plus a range of value-adding services:

- **Application consultancy**, to ensure you get the most from the latest generation of processor technology
- **Optimisation services** to help scale up your applications in line with your needs
- **Specialist expertise** including engineers, chemists, life scientists, mathematicians, software developers and data scientists to provide domain-specific advice.

Benefits of HPC as a Service

Increased IT agility and flexibility:

- You are free to focus on the use case rather than the system
- Easy, flexible and secure supercomputing simulations
- Up-to-date resources, with new capabilities constantly added
- Ability to tap into additional HPC resources as needed
- Choice of public, private and hybrid models, depending on your need.

Higher returns on your investment:

- Lower system admin and data centre costs
- Mutualised user environments and workloads
- Only pay for what you use, no wasted assets
- No CapEx requirement.

Integrated and secure services:

- Ease of access through web-based portals
- Integrated ISV applications
- Fast remote visualisation: view results in 3D from any location
- Enhanced security.



Choosing the right service

Extreme Factory is available in all configurations:

- **Extreme Factory on demand:** available as an Atos-hosted service
- **Extreme Factory private:** available on premises.

It's also possible to combine these configurations into hybrid solutions according to your needs. Whatever arrangement you choose will be implemented and operated by our experts to guarantee superior performance, reliability, availability and security, with all the power and wealth of environments available on our Bull Sequana X1000 supercomputers.

HPC as a Service solutions

Extreme Factory (XF)	
Extreme Factory on demand / Extreme Factory private	<ul style="list-style-type: none"> • On-/ off-premises HPC clouds designed and operated by Atos • Fully managed and centralised HPC environments
Extreme Factory computing studio (XCS)	
Extreme Factory computing studio	<ul style="list-style-type: none"> • Remote HPC workload management web portal • Available as standalone software+ customisation services
Extreme Factory remote visualiser (XRV)	
Extreme Factory remote visualiser	<ul style="list-style-type: none"> • Remote 3D viewing technology • Avoids large data transfers • Protects intellectual property

Applications for HPC as a service include:

- **Science**
Climate / oceanic modelling, molecular modelling, materials science, quantum mechanics, particle physics & astronomy, biotechnology
- **Aerospace**
Aerodynamics, structural analysis / testing, electromagnetism, bird strike, flight simulation
- **Automotive/Engineering**
Structural analysis, aerodynamics, crashworthiness
- **Defence**
Aerodynamics, fluid mechanics, structures, imaging
- **Chemical, Oil & Gas**
Seismic modelling, bio-mechanics

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For our Digital Vision for Supercomputing and Big Data
<https://atos.net/digital-vision-scbd>