

extreme factory

An integrated on-demand, pay-as-you-go computer simulation offering

extreme factory is a flexible on-demand HPC offer for users who do not have enough compute resources to satisfy their HPC workloads. With extreme factory, organizations of all sizes are free to innovate without needing major investments in powerful computing resources. All you need is Internet access via a dedicated portal. Bull provides the full infrastructure needed to run workloads in targeted turnaround times. The user is charged for the time used, which enables operating costs to be adjusted to the specific schedules and goals of each project. extreme factory is hosted in the Bull datacenter in Les Clayes-sous-Bois, (Paris Region), in a highly secure environment.

A wide variety of applications supported

Many ISVs, including ESI Group, CD-adapco, Exa and The Bakery, have worked with Bull to make their applications available on the extreme factory platform. All Open Source applications can potentially be made available on extreme factory. Bull's experts can build, customize and preinstall applications as you need them. Applications developed in-house by end users can also be installed as needed for their own usage*.

Bull collaborates with ISVs in order to facilitate license control operations (FLEXIm configuration, IP tunnels for online license checking). Each user is responsible for purchasing his/her own license for commercial software.

A powerful portal accessible on line

extreme factory studio is a powerful web portal designed by Bull to ease and secure user interactions with the applications hosted on extreme factory. It manages users, jobs, projects, security, data download and upload, in a unified interface which hides all complexity from the user and returns accounting information for extreme factory usage.

Highly skilled services

Most HPC users need highly skilled configuration, support and maintenance services. Bull's HPC experts have preinstalled many standard applications, and can offer the services required to customize or adapt new ones. Bull also understands that customers often need to test-bench specific setups. Usability, model data feeds and compute turnaround times often have to be assessed before full production can begin.

Three usage models available

User needs vary around three main situations and we have designed three usage models to meet these needs:

- **XF Dedicated:** Resources dedicated to users with a long-term need (6 months or more) for compute resources, we allocate dedicated HW resources (compute and service nodes, storage) to ensure guaranteed stability and security. Customization can easily be added to this model. Optional VPNs can be either operated by the customer's operator or by Bull.
- **XF Reserved:** Guaranteed resources upon reservation - lots of users have peak loads requiring resources, and compute time is allocated in periods of one or more weeks. This is achieved by dedicating virtual login nodes and provisioning the associated physical compute nodes for the duration requested.
- **XF Shared:** Resources are mutualized and allocated on a 'First-In-First-Out' basis. This is the model which is the closest to the traditional commercial 'cloud' model. Users access extreme factory whenever they want to, whenever they need to and are billed for the actual time used.

** If you need other applications and/or tests or proof-of-concepts (POCs), contact Bull at <http://www.bull.com/extremefactory/register.html>*

A datacenter for extreme performance

extreme factory is hosted in the Bull datacenter located in Bull's main premises in Les Clayes-sous-Bois, (Paris Region). It is a highly secure environment that is physically accessible only to authorized Bull operators.

- Two types of compute nodes are available in the extreme factory supercomputer. They are regularly updated in order to accommodate state-of-art technology: bullx B500 and B505 blades have highly optimized HPC dual Intel® Xeon® 5600 processors with 24 Gigabytes of memory, and bullx B505 have additional dual Nvidia™ M2070 GPUs.
- A few large memory nodes based on bullx R423-E2 or bullx S6030 are also available for specific operations like pre-processing data models which require large memory configurations (512 gigabytes and more).
- Service nodes are either physical bullx R423-E2 nodes with good I/O and memory capabilities or virtual nodes for login and security isolation and R425-E2 nodes for visualization.
- All nodes run a standard Linux® environment based in RHEL 5 or 6 compatible kernels as well as Bull's own cluster management software. Windows® nodes can also be deployed on an individual project basis.
- There are two types of storage: a high-performance parallel Panasas storage cluster for scratch and a dedicated high capacity NetApp system for long term storage.
- Standard communication needs are addressed by 100Mb/s to 1Gb/s bandwidth secured lines which are accessible via the Internet with optional VPN. For customers who have higher bandwidth requirements, Bull PI (a Bull subsidiary) proposes the rapid installation of adequate point-to-point links at speeds up to 10Gbits/s.

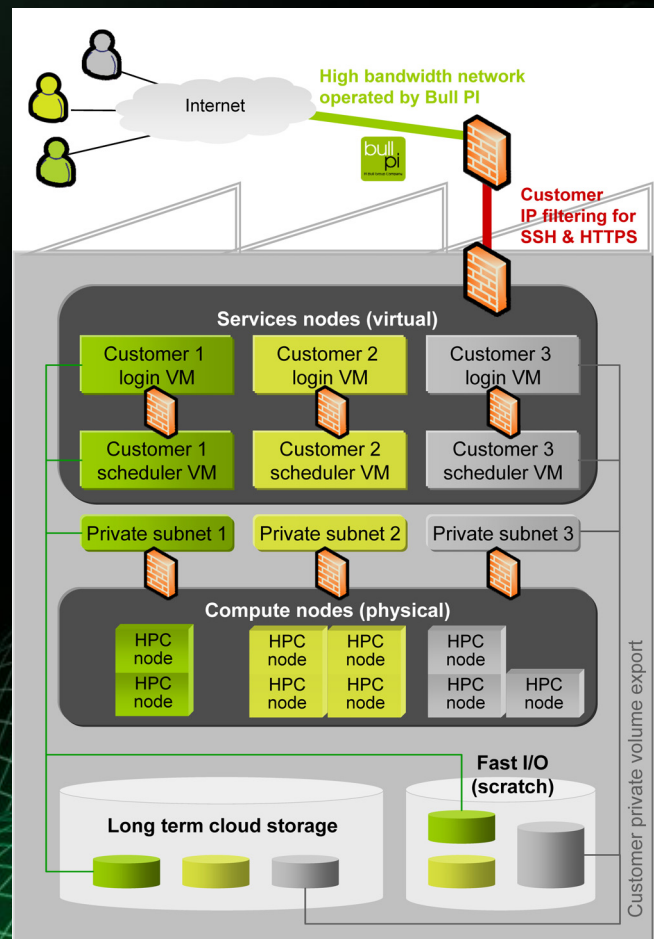
An ideal combination of security and flexibility

Each customer has full access to and visibility over its own jobs, projects and data, and has no means of accessing any other part of the infrastructure at any time.

No customer can log in without providing its own secured identifiers associated with its unique authorized IP address. Two access modes have been configured to provide an ideal combination of security and flexibility:

- **HTTPS connections** are the preferred means of access. Bull has designed extreme factory studio, a fully functional web portal to publish HPC applications and manage all standard HPC user interactions.

extreme factory architecture



Access control, security verification, data upload and download, job launch and monitoring and remote visualization are all possible via this portal, freeing average users from the need to launch complicated command-line operations.

- **SSH connections** (with VPN settings if necessary) are provided with strictly restricted shell access to allow customers to access their compute environments.

How to register for extreme factory:

<http://www.bull.com/extremefactory/register.html>

