

Architect of an Open World™

With its new bullx supercomputers, Bull opens up the way to Extreme Computing,

- Bull today announces the launch of bullx, a new environmentally efficient, ultra-dense and ultra-high performance family of supercomputers
- Designed for unlimited innovation, the bullx supercomputers benefit from the know-how and skills of Europe's largest center of expertise dedicated to Extreme Computing
- Delivering anything from a few Teraflops to several Petaflops of power, bullx supercomputers are easy to use by everyone from a small R&D office to a world-class Data Center
- With over 500 experts in Extreme Computing, Bull reaffirms its aim to actively accelerate the growth of the digital economy and innovation, and its ambition to achieve the leading position in Extreme Computing in Europe



Paris, 16 June 2009: Bull has launched its bullx supercomputer: the first European-designed supercomputer to be totally dedicated to Extreme Computing. Designed by Bull's team of specialists working in close collaboration with major customers, bullx embodies the company's strategy to become one of the three worldwide leaders in Extreme Computing, and number one in Europe. With bullx, access to innovation will be simpler and faster, for all kinds of businesses and research laboratories.

Didier Lamouche, Bull Chairman and CEO, comments: *"The period of acute crisis the world is going through is actually giving us an opportunity to take a closer look at the practices we have all been using, and to rebuild a world that should be based on two foundation stones: innovation and environmental awareness. By allowing us to carry out tests and build prototypes virtually, computer simulation can help researchers and industry speed up projects and open up new horizons, without consuming actual materials or carrying out potentially risky experiments. This is where Extreme Computing comes in: a formidable strategic tool which opens up the possibility of numerous, spectacular applications that will have a significant impact on people's everyday lives in the future. bullx – the new family of supercomputers which we are launching today – is the most tangible illustration of this vision in Europe today."*



bullx: meeting the key challenges of energy consumption, power and operational effectiveness

With the bullx range, Bull is pushing back the boundaries still further, by tackling three key challenges: **energy consumption, power and operational effectiveness**. Cutting the energy consumption of supercomputers. Coordinating the tasks of thousands of processing cores, all running simultaneously. And finally, orchestrating and administering the complexity inherent in such systems... The choice of the components used to create bullx, as well as its architecture, has been guided by its **vocation: to be the most effective instrument for innovation**. Designed by Europe's largest team of experts in the field, bullx is the product of an unparalleled pool of expertise; created by Bull specialists who offer local proximity, rapid response and the ability to deploy powerful, customized solutions.

bullx: high performance in every dimension, for Computing Centers of every size

Energy-efficient, ultra-dense and ultra-powerful, bullx has been designed specifically for intensive computing by the largest team of experts in Extreme Computing in Europe. With more than 500 dedicated experts involved in the project, this represents an unparalleled skill-base. Built in line with industry standards, and featuring the best Open Source applications on the market, bullx has been expressly designed to enable the construction and implementation of extremely reliable and robust production environments.

bullx's technical characteristics – including its scalability, density, low power consumption and powerful in-built computational accelerators – mean it is an unprecedented platform, which can meet the needs of everything from a small design office to a major international research center, in areas as diverse as bio and earth sciences, energy, the oil and chemical industries, climatology, aeronautics, the automotive and finance sectors...

Designed to deliver anything from a number of Teraflops to several Petaflops of power, bullx guarantees outstanding performance in every aspect of its operation: integer and floating point calculation, speed and memory capacity, internal system communications, input-output power, ease of implementation and use, and total cost of ownership.

An architecture built for performance and high-density, with simplified, ultra-fast connector technology

bullx is built around an architecture that features ultra-dense blade servers interconnected via a powerful dedicated network. This in turn is administered by bullx cluster suite, a software suite developed by Bull using Open Source and standard components.

The choice of blade architecture means that essential components, such as the power supply and links to the high-speed interconnection network¹, are shared within the chassis. This architecture liberates a large proportion of the space that is usually dedicated to connector technology, and makes it simpler to install the blades. So compared with standard configurations, the number of cables required by bullx can be reduced by a factor of two to three. For a large-scale configuration, this translates into several thousand fewer cables, a more compact installation and substantial gains in reliability.

Each bullx compute blade incorporates all the components required to deliver the highest levels of performance, and to process the most complex kinds of workloads: latest-generation Intel® Xeon® 5500 series (Nehalem) processors, memory capacity, and efficient connectivity with an adaptor to the integrated interconnection network that can function without local storage or with SSD-type (Solid State Drive) storage.

A hybrid architecture and energy-efficient technologies for 'Green Power'

The bullx hybrid architecture incorporates blades combining an Intel® Xeon® processor with accelerators using technologies developed for graphical processors. Bull has already demonstrated its high level of expertise in this area, having built one of the most powerful hybrid systems of its kind in the world: performance

¹ Via an integrated non-blocking InfiniBand QDR switch, the most powerful of its kind



levels are effectively doubled without any significant increase in energy consumption, to deliver some of the highest performance/m² and performance/consumption ratios on the market.

An ultra-capacitor module improves the efficiency of the electrical power supply by 10-15% compared with traditional power supplies – enabling the system to cope with micro-outages without the need for a supply regulator; a cooling door that consumes at least 75% less power than a standard cooling system; processor control system to optimize electricity consumption; Bull's expertise in infrastructure design to optimize the Flops/m² ratio... by deploying energy-efficient technologies, bullx offers users 'Green Power', while at the same time tackling the challenge of managing energy consumption in very powerful supercomputers head-on.

For Fabio Gallo, Vice-President and Director of Extreme Computing Solutions at Bull Group: *"We have designed the bullx supercomputers to respond to even the most extreme demands for computing power, while at the same time guaranteeing maximum energy efficiency. Their hybrid architecture, and the components we have chosen to use and the technologies that we have developed specifically for bullx mean that they are among the most advanced on the market in their ability to meet environmental constraints and reduce the cost of energy consumption."*

Higher productivity thanks to an open configuration and powerful administration functionality

Designed by Bull, the bullx cluster suite is built around a Linux system and Open Source components that have been integrated and optimized by Bull's own expert engineers. The suite offers the facility to control the configuration overall – servers, and the interconnection and storage network – as though it were a single system. It simplifies the administration of the infrastructure and the software installation and deployment (so that more than 1,000 nodes can be installed in less than 20 minutes), the monitoring and handling of errors and defective components (from individual processors to the precise identification of an individual cable), the optimization and extension of the cluster. It also reduces power consumption, for example by switching any unused components – manually or automatically - into 'economy' mode. Bull's pledge is to lead all enterprises into an open world, where speed and scalability open up the way to faster innovation.

bullx launch: partners and customers are confident in Bull and testify

ALTAIR

Michael Humphrey, VP of Global Partner Program at Altair, Altair

"Altair is pleased to congratulate our business partner Bull on their introduction of bullx. Due to its exceptional performance and scalability, the new bullx systems from Bull will be an ideal platform for customers running demanding, computing intensive Altair RADIOSS crash simulation. Early tests indicate that performance on a typical 64 cores configuration of the bullx system is 69% better than previous generation systems running the standard RADIOSS Benchmark suite. Additionally, Altair's popular workload management and batch queuing software, PBS Professional, has been optimized to take advantage of bullx's modular architecture while making it easy and quick for end users to submit and monitor their jobs. The PBS GridWorks suite is the ideal solution for maximizing these emerging petaflop clusters from innovative companies like Bull"

Cardiff University

Professor Martyn Guest, Director of ARCCA (Advanced Research Computing @ Cardiff)

"We chose Bull as a supplier for ARCCA because we were impressed with the quality and expertise of Bull's cluster design and technical knowledge. Since then, the quality of the provided system and services is proving to be, as expected, first-class. So I am very happy to witness the announcement of Bull's new generation of high-density, energy-efficient supercomputers, and bullx will definitely be in our thoughts as we plan to upgrade the ARCCA system."



IDC

Steve Conway, IDC, Research Vice-President, High-Performance Computing Group

"Research carried out by IDC shows that Bull has been gaining ground in the market for HPC (High-Performance Computing) systems in the EMEA zone, particularly over the past two years. Bull's new bullx architecture is even better suited to meeting buyers' demands in terms of scalability of processing power and energy efficiency. The bullx systems are designed to ensure that users get maximum performance from their applications and it is worth paying great attention to them."

Intel

Richard Dracott, Intel Corporation General Manager of High Performance Computing

"Bull's new blade system, designed specifically for HPC, leverages the technological advances of the latest Intel® Xeon® processors, such as the Intel Turbo Boost and Intel QuickPath Technologies, and takes advantage of the Intel power management tools. This combination of Intel and Bull skills will allow the deployment of even faster and more reliable HPC clusters, while optimizing energy efficiency"

University of Cologne

Prof. Dr.-Ing. Ulrich Lang, holder of the Chair of Computing Sciences and Director of the Computing Center at the University of Cologne.

"Bull's bullx solution provided the best response to our needs in terms of computing power, density and energy efficiency, even for the most demanding of our users in the scientific community. It will help us to respond to the most exacting requirements of our researchers in an extremely wide range of areas, including life sciences, chemistry, climate prediction and physics."

Availability

bullx systems are available from the announcement date.

About Bull, Architect of an Open World™

Bull is an Information Technology company, dedicated to helping Corporations and Public Sector organizations optimize the architecture, operations and the financial return of their Information Systems and their mission-critical related businesses.

Bull focuses on open and secure systems, and as such is the only European-based company offering expertise in all the key elements of the IT value chain.

For more information: <http://www.bull.com> and www.bull.com/extremecomputing

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Technical characteristics

bullx chassis

Form factor	Chassis	Rack mount 7U drawer
	Blade	18 compute blades per drawer
Management	Chassis Management Module (CMM)	1 chassis Management Module (CMM) including: OPMA board with a microcontroller for drawer management 24-port 1Gb Ethernet switch / of which 3 external ports connected to the Ethernet switch Led for status indications
	Display	Local Control Panel display on chassis front ,
Power supply		Consumption: typical 6.5 KW, max 8.2 KW 4 hot-swap power blocks (PSU) N+1 redundancy on power
Cooling		2 fan blades per chassis + 2 fans per server blade ,
Interconnect	InfiniBand Switch Module (ISM)	Module with 36 QDR ports ,
Network	Ethernet switch Module (ESM)	1Gb Ethernet Switch Module for backbone access (optional)
Midplane		Passive board consisting of connectors for 18 server blades, 2 fan blades, ISM, UCM, CMM, ESM, PSUs
Ultracapacitor	Ultra Capacitor Module (UCM)	Ultra Capacitor Module to offset power outages up to 250ms (optional)
Physical specifications	Drawer size (H x W x d)	31.1cm (7u) x 48cm (19") x 74cm
	Weight	126 kg (full, maximum weight with all options)
OS & Cluster Mgt. SW	Windows® server support	Microsoft® Windows® HPC server 2008
	Linux® support	Red Hat Enterprise Linux 5 + bullx cluster suite

bullx B500 compute blade

Form factor		Single-width blade
Processors		2 quad core Intel® Xeon® 55xx processors up to 2.93 GHz (8MB shared L3 cache)
Architecture	Chipset	Intel S5500 chipset (Tylersburg IO H-24D) with QPI up to 6.4GT/s
Memory	Memory slots (number, type)	12 DDR 3 DIMM sockets
	Memory max	Up to 96GB Reg EC DDR 3 1066MHz (with 8GB DIMM's) Up to 48GB Reg EC DDR 3 1333MHz (with 8GB DIMM's)
InfiniBand		ConnectX adapter providing single QDR IB channel
Management		Integrated Baseboard Management Controller (BMC)
Ethernet		1Gb dual port Ethernet controller for the links to CMM and ESM
Storage devices	Disk Drives	1 SATA HDD or 1 SSD drive or diskless
Safety	Regulatory compliance	CE (UL, FC, RoHS)

bullx B505 accelerator blade

Form factor		Double-width blade
Processors *		2 quad core Intel® Xeon® 55xx processors up to 2.93 GHz (8MB shared L3 cache) 2 GPUs
Architecture	Chipset	2 Intel S5520 chipset (Tylersburg IO H-36D) with QPI up to 6.4GT/s
Memory	Memory slots (number, type)	6 DDR 3 DIMM sockets
	Memory max	Up to 48GB Reg EC DDR 3 1333MHz (with 8GB DIMM's)
InfiniBand		2 ConnectX adapters providing single QDR IB channel
Management		Integrated Baseboard Management Controller (BMC)
Ethernet		1Gb dual port Ethernet controller for the links to CMM and ESM
Storage devices	Disk Drives	1 SATA HDD or 1 SSD drive or diskless
Safety	Regulatory compliance	CE (UL, FC , RoHS)

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