

innovation >

in action

www.bull.com



Dassault Aviation
uses bullx to boost
computer simulation

Extreme Computing

BULL
Architect of an Open World®



[DASSAULT AVIATION IS USING BULLX TO FURTHER ENHANCE ITS HPC CENTER CAPACITY, WHICH IS CENTRAL TO ITS DESIGN PROCESS]

© Dassault Aviation - S. Randé

EXTREME COMPUTING

Dassault Aviation uses bullx to boost computer simulation

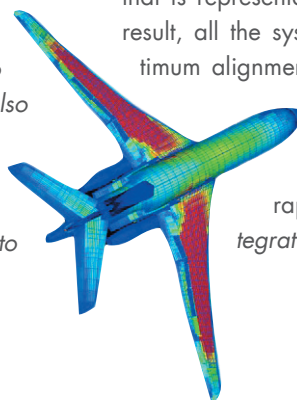
For cutting-edge aeronautical companies, the age of wooden mock-ups and innumerable prototypes is long gone. Nowadays, designing an aircraft is an extremely hi-tech process, and computer simulation is at the very heart of the process. As a major player in both civil and military aeronautics, and a first-rate enterprise in terms of its computerization, Dassault Aviation has a very sophisticated Data Center for its intensive computing. The constant search for greater and greater levels of precision in the simulation of physical properties – these days, several million points are mapped when modeling the structure of an aircraft – requires ever more processing power. Dassault Aviation is constantly upgrading its HPC environment to meet these demands. Most recently, it has been further strengthened with the addition of two bullx clusters.

Modularity, scalability, security, environmental protection

The algorithms used to solve equations are specific to each of the main areas of physics. However, for reasons of cost, all the simulation software packages have to make use of shared resources at Dassault Aviation's HPC Center. In 2009, Dassault Aviation was especially keen to augment its park of supercomputers dedicated mainly to carrying out calculations relating to electro-magnetic phenomena such as responses to lightning strikes and the behaviour of antennas, which consume especially large amounts of memory. "We were looking for a cluster that was not only easy to incorporate into our existing environment, but also modular and capable of being extended from a few Teraflops to several tens of Teraflops, and which also offers guarantees and maintenance that takes into account the security rules relating to

the protection of our information, while at the same time respecting concerns for the environment," explains Alain Samblat, the Manager responsible for Dassault Aviation's intensive computing environment.

As a user of Bull supercomputers since 2003, Dassault Aviation was won over by bullx, the new Extreme Computing platform from Bull, which met all these criteria. Thanks to close cooperation with the sales teams from Bull, the main user programs could be run on a machine that is representative of the chosen configuration. As a result, all the system's parameters were refined for optimum alignment with the different software. The new bullx cluster – which had been pre-configured and tested at the factory – was brought into production very rapidly. "There was no problem at all integrating it into our environment and into the





processing sequences. The performance requirements for user programs have been met, and the machine has been very rapidly adopted, to the extent where it has encouraged the formation of new queues to use it," smiles Alain Samblat.

Advances in production

Apart from the excellent processing performance, Dassault Aviation has been especially pleased with the operational advances enabled by the new bullx system. By enabling simulation programs to go into production more quickly, by facilitating the management of super-computers or improving their reliability, bullx effectively responds to the need for industrial-scale scientific computing. "The bullx cluster provides the ease of use and robustness that our engineers are entitled to expect from

what is, for them, an everyday tool for their work," Alain Samblat sums up.

Today, Bull computers account for around 60% of the resources that Dassault Aviation has dedicated to intensive computing, in the area of electro-magnetic phenomena. A clear measure of its satisfaction, in 2010 Dassault Aviation acquired a second bullx machine. Thanks to Bull – with whom it has established a true partnership around intensive computing solutions – Dassault Aviation is now able to adapt its HPC resources to enable the continuous optimization of its design process. So, with its new eco-friendly design programs, it can continue to work towards its aim of creating ever more competitive, high-performance and environmentally-friendly aircraft.

→ ALAIN SAMBLAT

Manager responsible for intensive computing environment,
Dassault Aviation

"THE BULLX CLUSTER PROVIDES THE EASE OF USE AND ROBUSTNESS THAT OUR ENGINEERS ARE ENTITLED TO EXPECT FROM AN EVERYDAY TOOL FOR THEIR WORK"





A reasonably sized and financially secure private international group, in profit since its creation. The only group in the world that designs, manufactures and sells both combat aircraft, instruments of political independence, and business jets, work and economic development tools.

- Net sales: EUR 3.42 billion
- Products: Rafale, Falcon, nEUROn, Mirage
- One of the world leaders for top-of-the-range business jets
- Last aviation group in the world still owned by its founding family and bearing its name
- Over the past 10 years, exportations account on average for 71% of sales generated
- Over the past 10 years, Falcons account on average for 62% of sales generated
- Near 12,000 employees, with over 8,100 in France
- More than 7,900 aircraft delivered
- In 76 countries around the world
- More than 25 million hours of flight time



©Bull SAS – 2010 - RCS Versailles B 642 058 739 – All trademarks mentioned herein are the property of their respective owners. Bull reserves the right to modify this document at any time without prior notice. Some offers or parts of offers described in this document may not be available locally. Please contact your local Bull correspondent to know which offers are available in your country. This document has no contractual significance.

Bull – rue Jean Jaurès - 78340 Les Clayes-sous-Bois – France
UK: Bull Maxted Road, Hemel Hempstead, Hertfordshire HP2 7DZ / USA: Bull 300 Concord Road, Billerica, MA 01821

This brochure is printed on paper combining 40% eco-certified fibers from sustainable forests management and 60% recycled fibers in line with current environment standards (ISO 14001). 