

# Inauguration of 1st European Petaflop Computer in Jülich, Germany

## Introduction

On May 26, 2009, the Research Center Jülich reached a significant milestone of German and European supercomputing with the inauguration of two new supercomputers: the supercomputer JUROPA and the fusion machine HPC-FF.

The symbolic start of the systems were triggered by the German Federal Minister for Education and Research, Prof. Dr. Annette Schavan, the Prime Minister of North Rhine-Westphalia, Dr. Jürgen Rüttgers, and Prof. Dr. Achim Bachem, Chairman of the Board of Directors at Research Center Jülich as well as high-ranking international guests from academia, industry and politics.



## JUROPA

JUROPA (which stands for Jülich Research on Petaflop Architectures) will be used Pan-European-wide by more than 200 research groups to run their data-intensive applications. JUROPA is based on a cluster configuration of Sun Blade servers, Intel Nehalem processors, Mellanox 40Gb/s InfiniBand and Cluster Operation Software ParaStation from ParTec Cluster Competence Center GmbH. The system was jointly developed by experts of the Jülich Supercomputing Center and implemented with partner companies Bull, Sun, Intel, Mellanox and ParTec. It consists of 2,208 compute nodes with a total computing power of 207 Teraflops and was sponsored by the Helmholtz Community. Prof. Dr. Dr. Thomas Lippert, Head of Jülich Supercomputing Center, explains the HPC Installation in Jülich at the following URL - [http://www.sun.com/jsp\\_utils/vid.jsp?bctid=17945248001&frame=true&autostart=true#vid](http://www.sun.com/jsp_utils/vid.jsp?bctid=17945248001&frame=true&autostart=true#vid)



## HPC-FF

HPC-FF (High Performance Computing – for Fusion), drawn up by the team headed by Dr. Thomas Lippert, director of the Jülich Supercomputing Centre, was optimized and implemented together with the partner companies Bull, SUN, Intel, Mellanox and ParTec. This new best-of-breed system, one of Europe's most powerful, will support advanced research in many areas such as health, information, environment, and energy. It consists of 1,080 computing nodes each equipped with two Nehalem EP Quad Core processors from Intel. Their total computing power of 101 teraflop/s corresponds, at the present moment, to 30th place in the list of the world's fastest supercomputers. The combined cluster will achieve 300 teraflops/s computing power and will be included in the rating of the Top500 list, published this month at ISC'09 in Hamburg, Germany.

40Gb/s InfiniBand from Mellanox is used as the system interconnect. The administrative infrastructure is based on NovaScale R422-E2 servers from French supercomputer manufacturer Bull, who supplied the compute hardware and the SUN ZFS/Lustre Filesystem. The cluster operating system "ParaStation V5" is supplied by Munich software company ParTec.

"ParTec's cluster operating system combined with Quad Data Rate (40Gb/s) InfiniBand-based high-performance systems delivers an integrated, easy to use and reliable compute cluster environment," says Hugo Falter, COO of ParTec GmbH. "This cluster will provide the foundation for the next generation cluster computers to the worldwide community of users and scientists."

HPC-FF is being funded by the European Commission (EURATOM), the member institutes of EFDA, and Forschungszentrum Jülich.

## Complete System Facts

- 3288 compute nodes
- 79TB main memory
- 26304 cores
- 308 Teraflops peak performance



*JUROPA and the fusion machine HPC-FF together provide up to 308 Teraflops peak performance*



*Mellanox 40Gb/s InfiniBand adapters and switches provides the most efficient and highest performance connectivity*



350 Oakmead Parkway, Suite 100, Sunnyvale, CA 94085  
Tel: 408-970-3400 • Fax: 408-970-3403  
[www.mellanox.com](http://www.mellanox.com)

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