



XtreemOS, a Linux-based Operating System to support Virtual Organizations for next generation Grids

Computing grids allow organizations to significantly increase their computational power by connecting their computers together. However using, administrating and programming computing grids is highly complex as the shared resources are distributed, heterogeneous and independently administered and connected through networks with fluctuating performances. Tools developed for grid use, like the Globus Toolkit, are demanding and complex — especially because they are based on operating systems that are not designed to manage distributed and versatile resources.

Partly funded by the sixth framework programme (FP6) of the European Commission, XtreemOS is a 4-year research project, which aims to develop a grid operating system to simplify the usage, management and programming of grids.

XtreemOS is a Grid operating system that will provide native support for Virtual Organizations. Based on Linux, XtreemOS will have 3 different versions capable of running on single PCs, clusters and mobile devices and will provide for the Grid what an operating system offers for a single computer: abstraction from the hardware and secure resource sharing between different users.

XtreemOS core functionalities allow to securely manage computation and data resources: Virtual Organization and Security Management guarantees a secure operational environment for the Grid, covering all common requirements for information security as well as those intrinsic to the Grid; Application Execution Management allows starting, monitoring and controlling applications and selecting and allocating resources to them; and Data Management, a Grid file system (XtreemFS) targeting wide-area networks with high latencies. XtreemOS' cluster version is based on the Kerrighed open source project (<http://www.kerrighed.org>), which provides a Single System Image operating system for clusters.

Additionally, XtreemOS is being comprehensively tested with a set of 11 reference applications from different sectors (aeronautics, economics, biology...) to ensure that end-user perspectives are taken into account in the design, implementation and validation of the system.

The experiments will initially be carried out on the French national grid experimental platform Grid'5000 (<https://www.grid5000.fr>). We plan to extend the initial test bed to the grid in the Netherlands (DAS-3 - <http://www.cs.vu.nl/pub/das3/>) and to the Chinese grid (CNGrid - <http://www.cngid.org/>).

The first public release of XtreemOS will be available in June 2008, while demo prototypes of individual components are already available.

The last two years of the project will be dedicated to the development of advanced features, with a focus on robustness and security of the system and the creation of a users' community.

XtreemOS project – Main features:

Starting date: June 1st 2006

Duration: 48 months

Scientific Coordinator: Dr. Christine Morin – INRIA Rennes Bretagne Atlantique (France)

19 partners / Total funding: 30M€ (of which 14,2M€ from the EC)

To know more about the XtreemOS project, please visit our public website <http://www.xtreemos.eu>
XtreemOS 2nd newsletter is now available: <http://www.xtreemos.eu/publications/newsletter>
Contact: xtreemos-info@irisa.fr