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XTreemOS: Building and Promoting a Linux-based Operating System to Support Virtual Organizations for Next Generation Grids

Description

The overall objective of the XtreemOS project was the design, implementation, evaluation and distribution of an open source Grid operating system (named XtreemOS) with native support for virtual organizations (VO) and capable of running on a wide range of underlying platforms, from clusters to mobiles.

The approach proposed in this project was to investigate the construction of a new Grid OS, XtreemOS, based on the existing general purpose OS Linux. A set of system services, extending those found in the traditional Linux, provided users with all the Grid capabilities associated with current Grid middleware, but fully integrated into the OS. The underlying Linux was extended as needed to support VOs spanning across many machines and to provide appropriate interfaces to the Grid OS services.

Installed on each participating machine, the XtreemOS system provided for the Grid what an operating system offers for a single computer: abstraction from the hardware, and secure resource sharing between different users. It can thus considerably ease the work of users belonging to VOs by giving them (as far as possible) the illusion of using a traditional computer, and releasing them from dealing with the complex resource management issues of a Grid environment. By integrating Grid capabilities into the kernel, XtreemOS provided a more robust, secure and easier to manage infrastructure for system administrators.

The XtreemOS consortium composition is a balance between academic and industrial partners interested in designing and implementing the XtreemOS components (Linux extensions to support VOs and Grid OS services), packaging and distributing the XtreemOS system on different hardware platforms, promoting and providing user support for the XtreemOS system, and experimenting with Grid applications using the XtreemOS system. Different end-users were involved in XtreemOS project, providing various test cases in scientific and business computing domains.

Barcelona Supercomputing Center - Centro Nacional de Supercomputación

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