

XtreemOS: A Grid Operating System Providing Native Virtual Organization Support

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While much has been done to build Grid middleware on top of existing operating systems, little has been done to extend the underlying operating systems for enabling and facilitating Grid computing, for example by embedding important functionalities directly into the operating system. XtreemOS project aims at investigating and proposing new services that should be added to current operating systems to build a Grid infrastructure in a simple way.

This approach can be seen to have some advantages over conventional Grid middleware toolkits, which may have different programming interfaces and lack of a unifying model. A common interface can be provided to simplify the task of the application developer on the Grid by making the Grid support native to the operating system, and also by removing layers of abstraction, leading to higher dependability of services.

3. Impact

XtreemOS provides native support for the management of VOs in a secure and scalable way, without compromising on flexibility and performance. VO Management (VOM) covers all the infrastructural services that are needed to manage the entities involved in a VO and ensure a consistent and coherent exploitation of the resources, capabilities, and information inside the VO under the governance of the VO policies. VOM is implemented as an operating system service that can be integrated directly with existing authentication infrastructure. This approach reduces the management and performance overheads introduced by the layers of controls. Local user accounts in XtreemOS are allocated dynamically on each resource to match the actual global users exploiting that resource. The dynamic allocation of user accounts ensures XtreemOS scalability and reduces the complexity of VO management: no need to configure resources when users are added or removed from VOs.

URL for further information:

<http://www.xtreemos.eu>

4. Conclusions / Future plans

Users, developers and system administrators of Grid applications and services benefit from XtreemOS in terms of ease of management, scalability and dynamicity. Applications can run in the context of a VO even if they are not VO-aware, and take advantage of a secure environment that provides logging, auditing and accounting. XtreemOS is currently under implementation and the first public release will be available in June 2008. XtreemOS is 4-year project funded by the European Commission.

Provide a set of generic keywords that define your contribution (e.g. Data Management, Workflows, High Energy Physics)

Grid Operating System, Virtual Organization

1. Short overview

XtreemOS is a Linux-based operating system that provides for the Grid what a traditional operating system offers for a single computer: abstraction from the hardware and secure resource sharing between different users. It thus considerably ease the work of users belonging to virtual organisations by giving them the illusion of using a traditional computer, and releasing them from dealing with the complex resource management issues of a typical Grid environment.

Authors: Dr MORIN, Christine (INRIA); Mr SANCHEZ, Oscar David (INRIA); Dr JÉGOU, Yvon (INRIA)

Presenter: Dr JÉGOU, Yvon (INRIA)

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