



Contribution ID: 34

Type: Poster

XtreemOS: a grid operating system providing native virtual organization support

Tuesday, 23 September 2008 16:15 (0 minutes)

Describe the activity, tool or service using or enhancing the EGEE infrastructure or results. A high-level description is needed here (Neither a detailed specialist report nor a list of references is required).

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 organizations 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.

Abstracts for online demonstrations must provide a summary of the demo content. Places for demos are limited and this summary will be used as part of the selection procedure. Please include the visual impact of the demo and highlight any specific requirements (e.g. network connection). In general, a successful demo is expected to have some supporting material (poster) and be capable of running on a single screen or projector.

The demo will demonstrate the interaction between three majors actors of an XtreemOS operating system:

The VO manager demo will demonstrate the VO lifecycle management: creating VOs, registering and managing users, managing VO policies, providing credentials for users, etc.

The resource manager demo will demonstrate how resources can be dynamically managed in VOs in a scalable way.

The end-user demo will demonstrate the interaction between users and the XtreemOS operating system: data management, application management, monitoring, etc.

Live CDs will be distributed to visitors so they can easily boot XtreemOS on their laptops and test the system accessing a remote testbed.

A realistic demo of XtreemOS necessitates a realistic testbed made of a hundred of resources. Such a testbed can hardly been built on the demo site. A good quality internet connection (100 or 1000 Mbits/s) from the demo site to the XtreemOS testbeds (ssh/http/https) is expected for the demos.

Report on the impact of the activity, tool or service. This should include a description of how grid technology enabled or enhanced the result, or how you have enabled or enhanced the infrastructure for other users.

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.

Describe the added value of the grid for your activity, or the value your tool or service adds for other grid users. This should include the scale of the activity and of the potential user community, and the relevance for other scientific or business applications.

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.

Primary authors: MORIN, Christine (INRIA); SÁNCHEZ, Oscar D (INRIA); JEULAND, Sylvain (INRIA); JÉGOU, Yvon (INRIA)

Presenters: JEULAND, Sylvain (INRIA); JÉGOU, Yvon (INRIA)

Session Classification: Demos and Posters

Track Classification: Poster