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A General Purpose Grid and Cloud Portal to simplify Scientific Communities Integration Into Distributed Computing Infrastructures

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Overview (For the conference guide)

In the framework of the Italian Grid Infrastructure, we have designed a web portal which aims at providing a powerful and easy to use gateway to distributed computing resources and cloud services provisioning. We feel that one of the key point that this kind of application must be able to address is the possibility to hide the complexity of the X509 certificates management.

Through the portal users can securely run their applications without facing the complexity of the authentication infrastructure. It also interfaces with external Infrastructure as a Service (IaaS) frameworks for the dynamic provisioning of computing resources.

Description of the Work

One of the main barriers against Grid widespread adoption in scientific communities stems from the intrinsic complexity of handling X.509 certificates, especially for not HEP communities that don't have a large Grid experience, moreover the only use of command line interface for every type of Grid interaction is discouraging for not expert users.

Our General purpose Grid portal, based on Liferay, provides exclusively web graphical user interface access to job submission, workflow definition, data management and accounting services. It is also interfaced with external Infrastructure as a Service (IaaS) frameworks for the dynamic provisioning of computing resources. In our model, authentication is demanded to a Identity Federation while the generation and management of Grid credentials is handled securely integrating an On-Line CA with the MyProxy server. In this way the portal gives users full access to Grid functionality without exposing the complexity of X.509 certificates and proxy management.

On the data management side, we have designed a solution that allows the users two ways to easily upload files to the grid: via browser for local file or making the files accessible, in read only way, to the portal through the publication in a web server.

The files are temporarily saved in a storage element (Storm) close to the portal and than the portal itself, using the proxy provided from the end user, move the file over the grid infrastructure using the Grid File Transfer Service (FTS). In this way the user do not have to learn any details about grid data-management.

Conclusions

We think that our work could be very useful for all that communities that are now approaching the grid for the first time and are not expert in grid technologies, X509 certificate and

These kind of instrument could be a very important for Grid widespread adoption in scientific communities.

Impact

Federation Identity is the most used method for authentication and authorization in Academic and Research Institutes. The number of people that have an X509 certificate, and so who can use grid infrastructure, is much minor than the people who belong to a Federation.

Our project aims to give the possibility to who belong to a recognized federation to use the grid infrastructure avoiding theme the difficult procedures for requesting and managing X509 certificate. An approach to the grid of this type could be have a very impressive impact on the number of potential communities interested to grid usage, especially for small and not expert communities.

Unlike other existing solutions, our portal does not leverage robot certificates for the user credentials. In this way user identity is not obfuscated across the middleware stack thus preserving the functionality and effectiveness of existing distributed accounting and authorization mechanisms. On the other hand, users are not constrained to a predefined set of applications but can freely take advantage of Grid resources power for any computational or data-intensive activity.

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