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Providing resources through Cloud and Grid Interfaces by means of the standard CREAM CE and the WNoDeS cloud solution

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Conclusions

This work will be of help for all the site administrators that would provide a cloud infrastructure to their users with simple and not invasive changes to their production computing infrastructure.

This possibility will be a good opportunity for the end user that could easily have much more resource available through a simple and intuitive user interface.

This resources could also be used in order to deploy easily specific services that could not be deployed using the standard tools provided by the EGI grid infrastructure. We will also provide few examples of such a new services deployed over the grid infrastructure using the capabilities provided by WNoDeS.

Description of the Work

In this work we will describe the installation and configuration of the WNoDeS cloud solution over a standard EGI grid farm.

WNoDeS is a cloud solution, developed from INFN and already in production at the INFN Tier1 over LSF batch system managing few thousand of concurrent jobs.

We start our work with a farm that was already configured using the standard YAIM procedure and standard EMI software release. All the changes needed in order to provide new cloud functionalities could be executed without any service interruption or disruption. The solution described, exploits specific functionalities provided by standard Torque and Maui installation plus few simple configurations and customizations.

From a point of view of the system administrator all computing requests are always managed by the usual batch system, and all typical configurations are needed in order to deal with resource sharing, priorities and limits about resource usage.

We will describe also the functionalities offered from the web interface installed on the testbed.

A consistent part of the work will be dedicated to explaining the activities carried on to provide images dedicated to each Virtual Organization, in order to fulfill the requirement of the users.

We will describe also the OCCI interface and the option available to the end user. Through this interface indeed it is possible to request via a command line interface or a dedicated software, the execution and the monitoring of the virtual machine.

This is the first time that WNoDeS tool is used in a production environment that exploit Torque/Maui as batch system.

We will provide all the detailed information in order to implement all the functionalities described in this work.

Impact

This work could allow the grid site to add a new and more dynamic interface, that provide the capability to allocate virtual machine on demand.

Using this interface each Virtual Organization could ask the site to provide a dedicated virtual host images that could fulfill its own specific requirement in terms of memory, library and services.

With this installation the end user could also achieve the interactive usage of one or few virtual machines with the required configuration.

This give to the site admin the possibility to optimize the usage of the resources because same Worker Nodes belonging to the cluster of the grid site could be used also to fulfill the request for virtual machine.

In this configuration the scheduler that is already in use in the farm is able to distribute all the request for execution, both standard job and virtual machine request, to the available request.

The WNoDeS tools provide the capability to pre-allocate resources in order to reduce the latency between the request from the users and the start of the virtual machine. This is done by means of a dedicated component (the cache manager), that guarantees that there are at least few virtual machine available to the users, re-allocating or destroying the machine according to the dynamic need of the users.

We will present also the test executed on the cloud infrastructure build within this work using few different use cases coming from a variety of communities like: bioinformatics, enmr, and others.

We will also describe how the user can exploit this infrastructure by means of the standard interfaces provided by EGI grid, like direct CE job submission or WMS job submission, as this will be the first example of usage of a federation of cloud infrastructures.

URL

<http://www.italiangrid.it/>

<http://web.infn.it/wnodes/index.php>

Overview (For the conference guide)

We will show the work done in order to enable a standard EGI grid farm with a cloud infrastructure and User Interface by means of the standard CREAM CE and the WNoDeS cloud solution.

The final goal of this work is to provide to the end user a rich set of interfaces to access to computing resources, such as: standard grid job submission, grid job submission to a specific virtual machine images, a web interface for allocating virtual machines, interactive usage of specific virtual images, etc.

The whole infrastructure is based on open source software like: CREAM CE, WNoDeS, Torque/Maui and Lustre.

It is intended to fulfill the computing requirement of several and completely different community of researchers, starting from LHC and other communities that has great experiences in grid computing but providing also simple and user friendly interfaces for user that do not have the needed knowledge to exploit complex grid infrastructure.

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