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Offering GridWay users more power by means of the Amazon public cloud

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We present a mechanism to easily provision public cloud resources for grid users. The extension of the underlying grid infrastructure benefits demanding situations coming from a single user, a group belonging to a Virtual Organization, or even from an institutional requirement. A set of very simple tools allows the GridWay administrator to deploy arbitrary instances and monitor how the enrolment is performed, guaranteeing the usability of the new resources to the specific target community.

Detailed analysis

Major work is being carried out nowadays in order to integrate cloud and grid, into a flexible, on-demand, and heterogeneous computing infrastructure. Such approach could overcome the stringent requirements to be met at grid computing. Moreover, the latencies coming from long awaited queues, diminish the operational efficiency of time-critical studies. Those experiments therefore, would not consider the trade-off from porting the application to the grid. By means of deploying more machines coming from a public cloud provider as Amazon EC2, we show how users at different grouping levels can profit from the instantaneous provisioning of such services. Indeed, it is left to the GridWay administrator (i.e the administrator of the grid user interface), the responsibility of safeguarding the public and private keys coming from the Amazon EC2 billing account. A new set of commands, similar to the ec2-tools, let the administrator determine, launch, monitor and enrol the new machines into the GridWay information system. The connectivity between GridWay and the virtual new instances is handled with the ssh middleware access driver, ensuring therefore safe and encrypted data transmission.

Conclusions and Future Work

We show how the launching, provisioning and addition of public resources might help users with specific and highly-demanding requirements to speed up their jobs. The extra work needed to set up such infrastructure extension is assumed by the administrator, who gets at his disposal new tools that make straightforward the whole process. Future work is oriented towards the automation of the mechanism, to establish a clear protocol for getting access to the Amazon EC2 account data, and new policies for self-acquiring resources while monitoring the GridWay jobs' queue.

Impact

This study provides grid communities more arguments to consider the possibility of including public cloud as a new actor, besides traditional computing centres, for extending their existing infrastructure. This extension is not free, requiring a shift from the static scientific model of budget allocation. At this point, we consider necessary a debate whether on-demand resources are required as utility computing and should be addressed as running costs depending on the relevant scientific analysis.

From a technical point, we consider a new communication mechanism to be integrated into the GridWay metascheduler, allowing much faster using of grid resources. We believe this is one of the key points where grid computing is still far off the desirable standards.

Keywords

metascheduler, grid, public cloud, ssh

URL for further information

<http://gridway.org>, <http://aws.amazon.com>

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