Harnessing Cloud Technologies for a Virtualized Distributed Computing Infrastructure

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Summary

Motivation: InterGrid system aims to provide an execution environment for running applications on top of interconnected infrastructures. The system uses virtual machines as building blocks to construct execution environments that span multiple computing sites. article show the scalability of an InterGrid managed infrastructure and how the system can benefit from using the cloud.

Contribution : In this article, they examine the InterGrid's realization.They conducted two experiments to evaluate InterGrid architecture. Also work on the administrator can update, add, and delete templates at any time. In addition, each gateway in the InterGrid network must agree on the templates to provide the same configuration on each site.

Methodology : In this work, architecture relies on InterGrid gateways that mediate access to participating grids' resources. It also aims to tackle hardware and software heterogeneity within grids. Using virtualization technology can ease the deployment of applications spanning multiple grids because it allows for resource control in a contained manner. In this way, resources allocated by one grid to another can help deploy virtual machines, which also let InterGrid use resources from cloud computing providers.

Conclusion: In this paper experiments with InterGrid have shown that it can balance load between distributed sites and have validated that a bag of tasks application can run on distributed sites using VMs. Currently provide a minimal gateway that lets resource providers interconnect sites and deploy VMs on different kinds of infrastructures, such as local clusters, Amazon EC2, and Grid'5000.

Limitations

First limitation: The gateway administrator must upload the images to Amazon if the gateway uses the cloud as a resource provider. Users can't submit their own templates or disk images to the gateway.

Second limitation: Evolutionary Multi-Criterion Optimization a bag-of-tasks application for solving optimization problems using a multi-objective evolutionary algorithm. In this paper, find the optimal solution using an iterative process that evolves the collection of individuals to improve the solution's quality. But The execution time of the bag-of-tasks application doesn't suffer important performance degradations with one or two gateways.

Synthesis: To improve the VM template directory to let users submit their own VMs and synchronize the available VMs between gateways. In addition, addressed security aspects in this work because they're handled at the operating system and network levels, it would be interesting to address those concerns at the InterGrid level