

An attempt to integrate Clouds on the European Grid e-Infrastructure

Over the last decades Grid computing has become an increasingly hot topic in the world of new technologies and European scientific research has recently benefited from the increasing availability of computing and data infrastructures with unprecedented capabilities for large scale distributed initiatives. The subsequent growing usage of these resources has required the transformation of the computing infrastructures into a professionally managed and standardized service enabling the collaborative sharing of federated and geographically distributed compute and storage resources. Grid computing provides a security framework for identifying inter-organizational parties, managing data access as well as movement, and utilization of remote compute and storage resources. During the last few years, interest has gradually shifted from Grid computing to an independent and complementary new computing paradigm: Cloud computing. Grid and Cloud computing provide access to a large compute or storage resource, but Cloud exploits virtualization to provide uniform interface to the underlying resource hiding physical heterogeneity, geographical distribution and faults. However, in contrast to the Grid, Clouds access support is limited to a single user or single organization and have a high cost to integrate computing, data, or network transfers from outside the Cloud itself. Although Grid technology continues to dominate public sector and scientific computing environments, due to the collaborative nature of such communities and the need to manage resources organizational boundaries, new interests have raised in deploying cloud technology on Grid-enabled resources to improve the management and reliability of those resources via the virtualization layer. The aim of this paper is to present an integration example of both technologies where the virtualization layer of the Cloud is interconnected to Grids as a resource. The proposed architecture allows users to increase their degree of choice between various software and hardware systems by enabling submission of Virtual Machine as canonical Grid's jobs extending the Cloud paradigm to benefit from Grid concepts by integrating federated access control and distributed resource sharing, as well.

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