Infrastructure Strategy to Support Collaboration

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Abstract

Successful collaboration tools seek to make communities more efficient by creating more connections between more and different types of users. Such increase in participation however, requires an infrastructure strategy that will enable opportunities for data analysis, data movement and data storage, that will not only grow as the community grows, but that will also support usage modalities compatible with the needs and culture of those new types of users.

This project investigates an infrastructure strategy that seeks to combine the different usage modalities present in DOE communities under one model that encourages collaborative sharing, supports community growth, accommodates emergent usage patterns such as on-demand computing, and lowers the entry barrier to the use of DOE facilities from desktop to exascale.

Building on the experiences of the Magellan project, we adapt and extend the recently emerged trends, in particular cloud computing and virtualization, to define, investigate, and develop tools allowing providers to turn a supercomputer into a cloud, and users to leverage the advantages that this model of provisioning offers, in particular elastic, auto-scaling and integrated compute and storage resources. We argue that such infrastructure strategy, combined with emphasis on ease-of-use, is essential to providing support for community growth and different usage modalities reflecting the needs of broader scientific community at different entry levels that collaboration seeks to engage.

Our approach is designed to maximize community impact by focusing on an iterative cycle composed of (1) research investigation of challenges in appliance and resource management, (2) proposal and development of solutions, and (3) validation of solutions via partnership with application communities.