

SuMegha Cloud Kit: Create Your Own Private Scientific Cloud

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Abstract— In this paper, we discuss the implementation details of SuMegha Scientific Cloud Lab Kit, which enables users to setup their own private scientific cloud. The scientific cloud offers infrastructure, platform, and/or software services for the scientific community working on modeling and simulation of problems in domains of bioinformatics, climate modeling, etc. It enables the creation of virtual clusters (High Performance Computing as a Service). The lab kit is very useful to the researchers and the student community, who want to set up a cloud, but lack the expertise to do so. It not only helps to effectively utilize the idle computers in the organization, but also provides MPI or Hadoop based clusters on demand to its users. Storage as a service is provided by the in-house developed CloudVault solution integrated into the lab kit. Supplemented with Software as a Service such as Seasonal Forecast Model (SFM), Next Generation Sequencing (NGS), etc. SuMegha Cloud Lab kit offers a comprehensive environment for scientific computing.

The cloud lab kit is designed in a modular fashion using open source components; Nimbus is used as the cloud middleware as it supports virtual cluster creation or contextualization, and Xen is the hypervisor. The SuMegha Portal interface enables users to request for virtual machines/clusters and easily submit jobs to cloud for execution. The SuMegha cloud lab kit is a useful invention to the cloud community which can setup a cloud on a single desktop or on a group of servers. The fact that the Cloud can be set up in a single desktop can greatly aid in adoption of Cloud Computing, since almost anyone can now establish a cloud in their premises. SuMegha will also promote the use of parallel paradigms like MPI and Hadoop to solve compute-data intensive problems. We believe that this lab kit is very useful to the vast number of academic institutions, to easily set up the required Cloud Lab.

Summary

Abstract— In this paper, we discuss the implementation details of SuMegha Scientific Cloud Lab Kit, which enables users to setup their own private scientific cloud. The scientific cloud offers infrastructure, platform, and/or software services for the scientific community working on modeling and simulation of problems in domains of bioinformatics, climate modeling, etc. It enables the creation of virtual clusters (High Performance Computing as a Service). The lab kit is very useful to the researchers and the student community, who want to set up a cloud, but lack the expertise to do so. It not only helps to effectively utilize the idle computers in the organization, but also provides MPI or Hadoop based clusters on demand to its users. Storage as a service is provided by the in-house developed CloudVault solution integrated into the lab kit. Supplemented with Software as a Service such as Seasonal Forecast Model (SFM), Next Generation Sequencing (NGS), etc. SuMegha Cloud Lab kit offers a comprehensive environment for scientific computing.

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