MURPA Seminar 7/2009: User-defined Clusters - Introduction to the Rocks Cluster Toolkit : Merging Clouds and Clusters

Date and time: 30 April 2009, 10:00-11.00am

Location: Building: 26, Room: 135, Clayton Campus (via HD Interactive Video)Presenter: Phil Papadopoulos Program Director, UC Computing Systems, UCSD

Title: User-defined Clusters - Introduction to the Rocks Cluster Toolkit : Merging Clouds and Clusters

Abstract

The "Cloud" and computing in the "Cloud" have become a hot topic in the media and this will impact how HPC users access and define resources. While many groups focus solely on how to more easily get your virtual machine started on a cloud resource, few are addressing the practicalities of building clusters within and in concert with cloud resources. In this talk, we will describe some of the basic mechanisms of Rocks 5.1 that enable the building of physical, completely virtual and mixed clusters for achieving what we term as "cluster extension." Cluster extension is where a physical cluster (temporarily) expands its footprint by using virtual machines (VMs) from a cloud resource. The extended cluster treats the remote VMs as just another "brand" of hardware to be integrated and therefore automatically controls the complete software stack including user definitions, file mounts, queuing system configuration, and applications. We'll describe a practical use of cluster extension for a CAMERA Metagenomics at UCSD resource where a large number of sequence alignment (BLAST) calculations are occasionally needed for data set preparation.

See **http://www.rocksclusters.org** for all software described in this talk.

BIO

Dr. Papadopoulos recevied his PhD in 1993 from UC Santa Barbara in Electrical Engineering. He spent 5 years at Oak Ridge National Laboratory as part of the the Parallel Virtual Machine (PVM) development team. He is currently the Program Director of Grid and Cluster Computing at the San Diego Supercomputer Center. Dr. Papadopoulos is deeply involved in key research projects at UCSD including the Biomedical Informatics Research Network (BIRN), The National Biomedical Computation Resource(NBCR), the Pacific Rim Applications and Grid Middlware Assembly (PRAGMA) and the Community Cyberinfrastructure for Advanced Marine Microbial Ecology Research and Analysis (CAMERA). He is also well known for leading the development of the open source Rocks Cluster toolkit, which has installed base of 1000s of clusters. His research interests revolve around distributed and clustered systems and how they can be used more effectively in an expanding bandwidth-rich environment. Dr. Papadopoulos is the Principal Investigator for NSF Grant - SDCI: NMI: Improvement: The Rocks Cluster Toolkit and Extensions to Build User-Defined Cyberenvironments (OCI-0721623) and Quartzite MRI: Development of Quartzite, a Campus-wide, Terabit-Class Field-Programmable Hybrid Switching Instrument for Comparative Studies (CNS-0421555).

Further Information

http://users.sdsc.edu/~phil/homepage.html

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