Special Issue on

Cloud Computing for Data-driven Science and Engineering

Guest Editors
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Wiley's Concurrency and Computation: Practice and Experience Journal invites authors to submit articles for the Special Issue on Cloud Computing for Data-driven Science and Engineering. This special issue follows the topics of the 3rd Workshop on Scientific Cloud Computing (ScienceCloud), collocated with HPDC, but also welcomes contributions by authors who have not participated in the workshop.

Introduction

Data-driven science and engineering are changing the way research is performed, enabling innovations through new kinds of experiments that would have been impossible only a decade ago. Today's science has access to advanced instruments like next generation genome sequencers and gigapixel survey telescopes that generate datasets that are increasing exponentially in complexity and data volume. Engineering and cyber physical applications ranging from transportation networks to smart power grids have access to realtime monitoring through pervasive sensors that operate round the clock, generating large data rates that require time sensitive analysis for operations. Such dynamic, distributed and data intensive applications hold the solutions to grand scientific and societal challenges of the 21st century. In order to achieve breakthrough in new knowledge and impact sustainable policies, there is a vital need to model these applications, perform analytics at large scales, manage data from instruments and analyses, and share and visualize the results with scientific peers and the society at large.

Cloud computing offers a novel computing paradigm for mapping such data-driven scientific and engineering applications, and has democratized resource access to under-served disciplines. In this special issue, we invite articles that discuss new research, development, and deployment efforts in running eScience and eEngineering workloads on Cloud infrastructures and platforms. We encourage work that use and expand upon Cloud-based technologies to address innovative compute and data driven scientific problems that are not well served by current supercomputers, Grids, HPC clusters or workstations. Exploratory work on architectural changes to Cloud frameworks, programming platforms for dynamic and streaming applications, performance and cost effective Cloud computing, gaps in Commercial/open/public/private Cloud fabrics and service offerings, and security and privacy issues that impact the use of Clouds for data intensive domains are relevant, among others.
Topics of Interest

We invite works that discuss the state-of-the-art in research, development, and deployment efforts on Cloud computing for data-driven scientific and engineering applications. Topics of interest include:

- Scientific application cases studies on Cloud infrastructure
- Performance evaluation of Cloud environments and technologies
- Fault tolerance and reliability in Cloud system
- Data-intensive workloads and tools on Clouds
- Use of programming models such as Map-Reduce and its implementations
- Storage Cloud architectures
- I/O and Data management in the Cloud
- Workflow and resource management in the Cloud
- Use of Cloud technologies for scientific and engineering applications
- Data streaming and dynamic applications on Clouds
- Application of Cloud concepts in HPC environments
- Research and best practices in Cloud security

Instructions for the Authors

We invite the submission of manuscripts that have not previously been published and those not currently under review. We expect submission to be about 20-25 pages in length (12 point single space format, inclusive of figures and tables). They can be submitted electronically through the journal’s online submission website http://mc.manuscriptcentral.com/cpe as a special issue with the special issue title “ScienceCloud 2012“. LaTeX and Word (.doc) formats are accepted. Formatting instructions and LaTeX templates are available at http://onlinelibrary.wiley.com/journal/10.1002/%28ISSN%291532-0634/homepage/ForAuthors.html.

Tentative Schedule

1. Submission deadline: August 15, 2012
4. Final decision: January 31, 2013

The schedule may be subject to revisions. Prospective authors are encouraged to contact the editors ahead of time to facilitate the harmonization of the issue and ensure that the authors will be informed of any change. The editors may be reached by email at simmhan@usc.edu and lramakrishnan@lbl.gov.