IEEE Transactions on Cloud Computing

Special Issue on Scientific Cloud Computing

http://datasys.cs.iit.edu/events/ScienceCloud2014-TCC/

Guest Editors

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Topics:

- Scientific application cases studies on Clouds
- Performance evaluation of Cloud technologies
- Fault tolerance and reliability in cloud systems
- Data-intensive workloads and tools on Clouds
- Programming models such as Map-Reduce
- Storage cloud architectures
- I/O and Data management in the Cloud
- Workflow and resource management in the Cloud
- NoSQL databases for scientific applications
- Data streaming and dynamic applications on Clouds
- Dynamic resource provisioning
- Many-Task Computing in the Cloud
- Application of cloud concepts in HPC environments
- Virtualized High performance parallel file systems
- Virtualized high performance I/O networks
- Virtualization and its Impact on Applications
- Distributed Operating Systems
- Many-core computing and accelerators in the Cloud
- Cloud security

Paper Submission

Authors are invited to submit papers with unpublished, original work to the IEEE Transactions on Cloud Computing, Special Issue on Scientific Cloud Computing. If paper is extended from a workshop or conference paper, it needs to contain at least 50% new material with "brand" new ideas and results. The papers should not be longer than 14 double column pages in the IEEE TCC format. Papers should be submitted directly to TCC at https://mc.manuscriptcentral.com/tcc-cs, and the "SI-ScienceCloud" should be selected.

Computational and Data-Driven Sciences have become the third and fourth pillar of scientific discovery in addition to experimental and theoretical sciences. Scientific Computing has already begun to change how science is done, enabling scientific breakthroughs through new kinds of experiments that would have been impossible only a decade ago. It is the key to solving "grand challenges" in many domains and providing breakthroughs in new knowledge, and it comes in many shapes and forms: high-performance computing (HPC) which is heavily focused on compute-intensive applications; high-throughput computing (HTC) which focuses on using many computing resources over long periods of time to accomplish its computational tasks; many-task computing (MTC) which aims to bridge the gap between HPC and HTC by focusing on using many resources over short periods of time; and data -intensive computing which is heavily focused on data distribution, data-parallel execution, and harnessing data locality by scheduling of computations close to the data. Today's "Big Data" trend is generating datasets that are increasing exponentially in both complexity and volume, making their analysis, archival, and sharing one of the grand challenges of the 21st century. Not surprisingly, it becomes increasingly difficult to design and operate large scale systems capable of addressing these grand challenges.

This journal Special Issue on Scientific Cloud Computing in the IEEE Transactions on Cloud Computing will provide the scientific community a dedicated forum for discussing new research, development, and deployment efforts in running these kinds of scientific computing workloads on Cloud Computing infrastructures. This special issue will focus on the use of cloud-based technologies to meet new compute-intensive and data-intensive scientific challenges that are not well served by the current supercomputers, grids and HPC clusters. The special issue will aim to address questions such as: What architectural changes to the current cloud frameworks (hardware, operating systems, networking and/or programming models) are needed to support science? Dynamic information derived from remote instruments and coupled simulation, and sensor ensembles that stream data for real-time analysis are important emerging techniques in scientific and cyber-physical engineering systems. How can cloud technologies enable and adapt to these new scientific approaches dealing with dynamism? How are scientists using clouds? Are there scientific HPC/HTC/MTC workloads that are suitable candidates to take advantage of emerging cloud computing resources with high efficiency? Commercial public clouds provide easy access to cloud infrastructure for scientists. What are the gaps in commercial cloud offerings and how can they be adapted for running existing and novel eScience applications? What benefits exist by adopting the cloud model, over clusters, grids, or supercomputers? What factors are limiting clouds use or would make them more usable/efficient?

Important Dates

Paper submission: July 31st, 2014 (AOE)
First Round Decisions: September 30th, 2014
Major Revisions Due (if needed): October 31st, 2014 (AOE)
Final Decisions: December 1st, 2014

Web Site: http://datasys.cs.iit.edu/events/ScienceCloud2014-TCC/
More Information: Contact sciencecloud2014-tcc-editors@datasys.cs.iit.edu