Computing

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Call for Papers

Special Issue on
Resource Management Techniques and Systems for
Big Data Workflow Processing

Motivation
The continuous shift towards data-driven enterprises and the necessity of getting real-time insights into streaming data (e.g. tweets, clicks) expedite building dozens of data analytics flows (e.g. click-stream analytics). Resource management of such analytics flows is vital, since it enables cost-effective usage of cloud services against unpredictable time-varying workloads. Elasticity management of various resources across a data analytics flow is difficult. Here the challenge is the heterogeneity of the workloads with different performance and quality of service measures, since a typical streaming data analytics flow consists of three layers: data ingestion, analytics, and storage, each of which is backed by a data processing platform (e.g. Amazon Kinesis, Apache Storm, DynamoDB, respectively) and is served by different cloud services (e.g. VM, Queues).

A number of inquiries have been made into the elasticity management of data-intensive workflow systems on public clouds. However, we lack effective procedures for navigating the trade-off between costs and performance of the multiple data processing tiers across workflow including ingestion, analytics, and storage all at once as a single unit. Moreover, existing research works in cloud resource management consider neither uncertainty associated with data-analytics driven workflow applications nor heterogeneous performance management requirements of workflow activities mapped to different types of hardware and software resources in datacenters. From resource management perspective, modelling and implementing algorithmic methods to cope with: (i) inherent variation of data flow behaviours across workflow activities (ingestion, analytics, and storage) and (ii) run-time performance uncertainties of datacenter environments remains a very challenging problem.

Topics of the Special Issue
The special issue will primarily encompass practical solutions that advance the research in big data software systems. The topics of interest include, but are not limited to:

- Methodologies and paradigms for big data workflow processing software systems
- Heterogeneous programming models for big data workflow systems
- Heterogeneous computational models for big data workflow systems
- Parallel processing algorithms for big data workflow computing
- Real-world big data workflow applications
- Infrastructures and systems for big data workflow computing
- Performance characterization, evaluation and optimization for big data workflow systems
- Multi big data programming model scheduling and resource allocation algorithms
Tentative schedule

Below is the tentative schedule for the proposed special issue. (All dates are tentative and subject to the approval of the editor-in-chief)

Paper submission: Nov 01, 2016
Initial notification: Mar 01, 2017
Rebuttal submission: Apr 01, 2017
Revision due: May 01, 2017
Final notification: June 01, 2017

Paper Submission and Review


During submission please select “S.I. Big Data Workflow” under Manuscript Category. Papers submitted to this special issue for possible publication must be original and must not be under consideration for publication in any other journal or conference. Previously published or accepted conference papers must contain at least 30% new material to be considered for the special issue.

There is a 15-page limit on the paper length in the journal format. Papers not adhering to the page limit and/or journal formatting rules will be desk rejected. Springer has LaTeX templates: see “Instructions for Authors / Text” at http://www.springer.com/607. No templates for Word; either LaTeX OR Word is accepted.

Each submitted research paper will be reviewed by at least 3 reviewers. A two round review process will be implemented to: (a) provide authors the opportunity of a rebuttal to any concerns raised by the reviewers and (b) ensure that each research paper is completely and thoroughly reviewed. Moreover, we will encourage the selected reviewers to refrain from “one-liner” reviews. Such one-liner reviewing practices are becoming very common nowadays and are hampering the reputation of a journal.

For further questions or inquiries, please contact the corresponding Guest Editor Dr. Rajiv Ranjan at raj.ranjan@ncl.ac.uk.

Selection and Evaluation Criteria

- Significance to the readership of the journal
- Relevance to the special issue
- Originality of idea, technical contribution, and significance of the presented results
- Quality, clarity, and readability of the written text
- Quality of references and related work
- Quality of research hypothesis, assertions, and conclusion