



MAGIC Meeting Minutes

May 3, 2017

Attendees

Alex Thai	NCO/NITRD
Grant Miller	NCO/NITRD
Ji Lee	NCO/NITRD
Ian Foster	ANL
Devarshi	N/A
Jo Culbertson	NSF
David Martin	PNNL
Jack Wells	ORNL
Shantenu Jha	Rutgers
Ryan Prout	ORNL
Craig Tull	ORNL
Padma Krishnaswami	FCC
Vipin Chaudhary	NSF
Zhengchun liu	ANL

Action Items

Proceedings

This MAGIC meeting was coordinated by Grant Miller of the NCO. Ian Foster from Argonne National Laboratory gave a presentation regarding Accelerating the experimental feedback loop: Data streams and the Advanced Photon Source.

Overview

Context: What is a light source, why are the experimental feedback loop and data streaming important?

Tomography: Experimental data feedback loop in practice

Optimizing: Modeling, analysis, and implementation methods to understand and improve performance

Automation: Further steps towards accelerating end-to-end experimental data lifecycles

Publishing: Collecting and organizing light source data

Futures: Some of the many other things that need to be done

Context

- APS is one four DOE synchrotron light source operated by the U.S.
- Light sources are accelerated electrons bent by magnets to produce x-rays that are focused onto a small area
- Argonne is currently working on an APS upgrade (APS-U) that will include multi-bend achromats (MBA) that will greatly enhance the quality
- Major challenges from large data sets and advanced computation requirements arise from APS/APS-U

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Tomography

- Experimental steering using HPC allows for real-time analysis of streaming experimental data
- Three smart online data acquisition strategies include: fixed angle, interleaved, and optimized interleaved
- Automated stream analysis system composed of: 1. Data Acquisition and Distribution, 2. Stream Reconstruction, and 3. Controller

Optimization

- APS is striving to understanding and optimizing multiple end-to-end pipelines
- Observation: Noticed Gaps between peak and average network load
- Differentiating traffic increases the average usage

Automation

- Ripple is a mechanism to transform static data graveyards into active, responsive storage devise
- Ripple recipes follow the IFTTT-inspired programming model
- A Ripple agent is composed of Triggers, Rule evaluation, and actions

Publishing

- Material Data Facility (Materialsdatafacility.org) aggregates and enables analysis of materials data and metadata
- Working on developing mechanisms to collect data automatically

Futures

- Challenges and Opportunities:
 - Create new scientific instruments that link data acquisition and computation to measure the previously unmeasurable & increase utility of, and access to, expensive resources
 - Enable reliable end-to-end streaming applications that span from instruments to networks to parallel computer memories
 - Integrate pre-experiment and post-experiment activities
 - Automation at all levels for throughput, reliability, and economy
 - Architect and operate distributed computing systems to support varied, often demanding and mission-critical, workloads
- Ian mentioned that managing different data streams is among his future priorities

NCO Report

- Broadband Research and Development Taskforce has been chartered under the Large Scale Networking (LSN) IWG
- BRD just held their first meeting 4/17. They will be compiling an inventory of federal programs focused on broadband R&D.

MAGIC Roundtable

David Martin – Argonne will be releasing a new SC called Theta (July 1st proposed date)

Oakridge – Insight Call on June 23rd for Theta (Argonne/Oakridge joint call)

Next MAGIC Meeting

June 7, 12:00-2:00 Eastern, NSF, Room TBD

Please note that the regular time for the MAGIC meetings has permanently been changed to 12:00-2:00 Eastern.