Summary of Blueprint Workshop:

Analysis Systems R&D on Scalable Platforms

June 21–22, 2019
New York University
Meeting URL: https://indico.cern.ch/event/820946/

Workshop Organizers:

Kyle Cranmer (New York University)
Rob Gardner (University of Chicago)
Mark Neubauer (University of Illinois at Urbana-Champaign)

Summary prepared by:

Mark Neubauer (University of Illinois at Urbana-Champaign)

Major Goals

- Review the status of AS milestones and deliverables

- Develop the Scalable Systems Laboratory (SSL) scope, architecture and plans, using Analysis Systems (AS) R&D activties as concrete examples.

- Develop requirements on SSL to support the AS area, particularly the prototyping, benchmarking and scaling of AS deliverables toward deployment.

- Increase the visibility of SSL and AS R&D beyond IRIS-HEP to facilitate partnerships with organizations that could potentially provide software and computing resources for SSL.

- Get informed on latest developments in technologies and methods relevant for SSL and AS.

Key Outcomes

- Communication of the AS area plans and preliminary requirements to SSL.

- Kubernetes as a planned "common denominator" for SSL, increasing the capabilities through flexible infrastruture. This idea spawned plans for a multi-site SSL "substrate" project.

- Productive engagement of the AS/SSL team with representatives from NCSA, SDSC, NYU Research Computing, industry & cloud providers (Google, Redhat), generating action items.

Planning around

- collection and curatation of analysis use cases, each with a reference implementation.

- translation of analysis examples into new specifications, providing feedback and iteration.

- development of initial specifications for user-facing interfaces to analysis system components.

- benchmarking of existing analysis components and integrating the benchmarking into SSL.

- development of accelerator-based fitting & statistical tools (and other relevant components).

- integrating prototypes of AS components into SSL, followed by benchmarking & assessment.

About the Blueprint Activity: Designed to inform the development and evolution of the Institute's strategic vision. At its core, a series of workshops that bring together IRIS-HEP team members, key stakeholders and domain experts from disciplines of importance to the Institute's mission.

I Overview

Together with the OSG-LHC, the Scalable Systems Laboratory (SSL) is designed to be the primary integration path to deliver the output of IRIS-HEP R&D activities into the distributed and scientific production infrastructure of the experiments. The aim of this workshop is to further develop the IRIS-HEP SSL concept using specific R&D examples from the AS area, including low-latency, query-based data systems and modular, reusable cyberinfrastructure for physics inference and results dissemination. Registered attendees include those from IRIS-HEP (primarily SSL and AS areas), US ATLAS/CMS operations programs, national labs, CERN, supercomputing centers (SDSC, NCSA), university research IT, and industry (RedHat, Google).

The venue for the workshop was the Physics Department at New York University and was hosted by Kyle Cranmer.

II Attendees

There were 26 registered participants for workshop, with all but a few attending in person. The workshop attendees were: Andrew Chien (Chicago), Andrew Melo (Vanderbilt), Aravindh Puthiyaparambil (Red Hat), Benjamin Galewsky (Illinois/NCSA), Dan S. Katz (Illinois/NCSA), David Ackerman (NYU), Edgar Fajardo (SDSC), Eric Borenstein (NYU), Gordon Watts (Washington), Ianna Osborne (Fermilab), Jim Pivarski (Princeton), Kyle Cranmer (NYU), Lincoln Bryant (Chicago), Lindsey Gray (Fermilab), Mark Neubauer (Illinois), Mason Proffitt (Washington), Matthew Feickert (SMU), Nils Krumnack (Iowa State), Ricardo Brito Da Rocha (CERN), Rob Gardner (Chicago), Sanjay Arora (Red Hat), Stephen Fang (Google), Stratos Efstathiadis (NYU), Tatiana Polunina (NYU), Tim Boerner (Illinois/NCSA), Wei Yang (SLAC)

III Goals

The primary goals of the workshop were to

- Review the status of AS milestones and deliverables

- Develop the Scalable Systems Laboratory (SSL) scope, architecture and plans, using Analysis Systems (AS) R&D activties as concrete examples.

- Develop requirements on SSL to support the AS area, particularly the prototyping, benchmarking and scaling of AS deliverables toward deployment.

- Increase the visibility of SSL and AS R&D beyond IRIS-HEP to facilitate partnerships with organizations that could potentially provide software and computing resources for SSL.

- Get informed on latest developments in technologies and methods relevant for SSL and AS.

IV Activites

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IV.1 Presentations and Discussion

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IV.2 Breakout Session

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V Key Outcomes

The workshop lead to several key outcomes, including:

- Communication of the AS area plans and preliminary requirements to SSL.

- Kubernetes as a planned "common denominator" for SSL, increasing the capabilities through flexible infrastruture. This idea spawned plans for a multi-site SSL "substrate" project.

- Productive engagement of the AS/SSL team with representatives from NCSA, SDSC, NYU Research Computing, industry & cloud providers (Google, Redhat), generating action items.

Planning around

- collection and curation of analysis use cases, each with a reference implementation.

- translation of analysis examples into new specifications, providing feedback and iteration.

- development of initial specifications for user-facing interfaces to analysis system components.

- benchmarking of existing & prototype AS components and tying into SSL infrastructure.

- development of accelerator-based fitting & statistical tools (and other relevant components).

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VI   Action Items

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VII   Feedback from Attendees

- Some preparatory documents

- Back to Ben's point about IRIS needing community developement / management etc.

- Start planning earlier (obvs)

- AS contribution to accelerated inference blueprint

VIII   Summary

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A   Revision History

- Version 0.0
  - Initial version