Space astronomy science platforms

Nigel Hambly

Institute for Astronomy

What I've learnt

- Meeting format
  - A more sustainable approach but still a positive experience (I hope)…?
  - Reminder: email slides and any other contributions for the website
- Software we need to include / maintain in the Gaia services
  - GaiaXPy (DR4 version)
  - GaiaUnlimited selection function
  - Epoch astrometry (gaiasupdate) package
  - GOST (Gaia scan-law observability forecast tool)
    - Java based web-app… but maybe call-outs to REST API…
  - Bayesian samplers: dynesty (and/or pymultinest)

What I've learnt (continued)

- Functionality wish-list:
  - notebook sharing; data sharing; value added products; groups
  - Topcat/stilts integration
  - Cross-match
    - 10^6 to 10^8 row scale input catalogue by spatial proximity
  - Observability
  - Parallelism outwith the confines of Spark/Dask APIs
- Other suggestions
  - Slack channel and / or mailing list for a self-help support community

Focus week summary

- Up-scale workflow paradigm is shifting
  - Old: RDMBS subset downloads, or wholesale bulk download, local client codes
  - New: thin client, code-to-data
- Gaia DR4 and Euclid DR1 are heading this way rapidly
  - Learn some new tricks on new facilities now to hit the ground running!

When is a Cloud not a Cloud?

As end-users of services, you should not have to care … but:

- Private Cloud instances (e.g. National computing facility Data Centres) will never be as large as commercial Clouds
- Support staff resources are thin
- Service level is necessarily limited
  - Resilience, availability, auto-healing, auto-scaling, …

Mission projects need to bring RSE effort to make these services happen

- Support these initiatives by exploiting them for great science!
  - 79 registrants for this workshop, and 60 user registrations on AstroFlow bodes well …

Open discussion: any further thoughts / comments?

Some final closing remarks

- One facility to rule them all? No.
  - Unreasonable to assume any single Data Centre has the operational resources to serve the European community (much less the entire world)
  - Envisage a collaboration of facilities that can spread the load

- One technical solution to rule them all? No.
  - Usage scenarios require a mixture (rich relational, data-intensive, HPC-like, …)
  - Again, envisage a federation of facilities with complementary functionality

- Are service dev/ops teams in competition with each other? No.
  - We cannot afford to be
  - Coordination is key to avoid duplication of effort and to promote sharing of experience
  - Ensure complementarity amongst the development collaboration

Thank you and goodbye
(and please keep in touch!)

Space astronomy science platforms

Nigel Hambly

Institute for Astronomy