

Rubin Observatory

Sample Alerts and the Call for Community Alert Brokers

Eric Bellm (UW/Rubin Obs.)
Alert Production Science Lead

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The selection of community brokers is underway.

The call for full proposals for community alert brokers was issued in December.

- all LOI teams were invited to submit full proposals.

Full proposals are due June 15, 2020

- LSST SAC responsible for generating a selection committee

Provisional selection was planned in Q3 2020

- timed to make use of the PCW

Many other proposal calls are being delayed due to COVID-19; should we consider doing the same?

- a difficult time now, as we are all aware
- Rubin summit construction is shut down
- Balance giving teams more time and hindering their ability to secure funds once they are selected



see <http://ls.st/LDM-723>

LDM-612 pledged sample alerts to broker proposers.

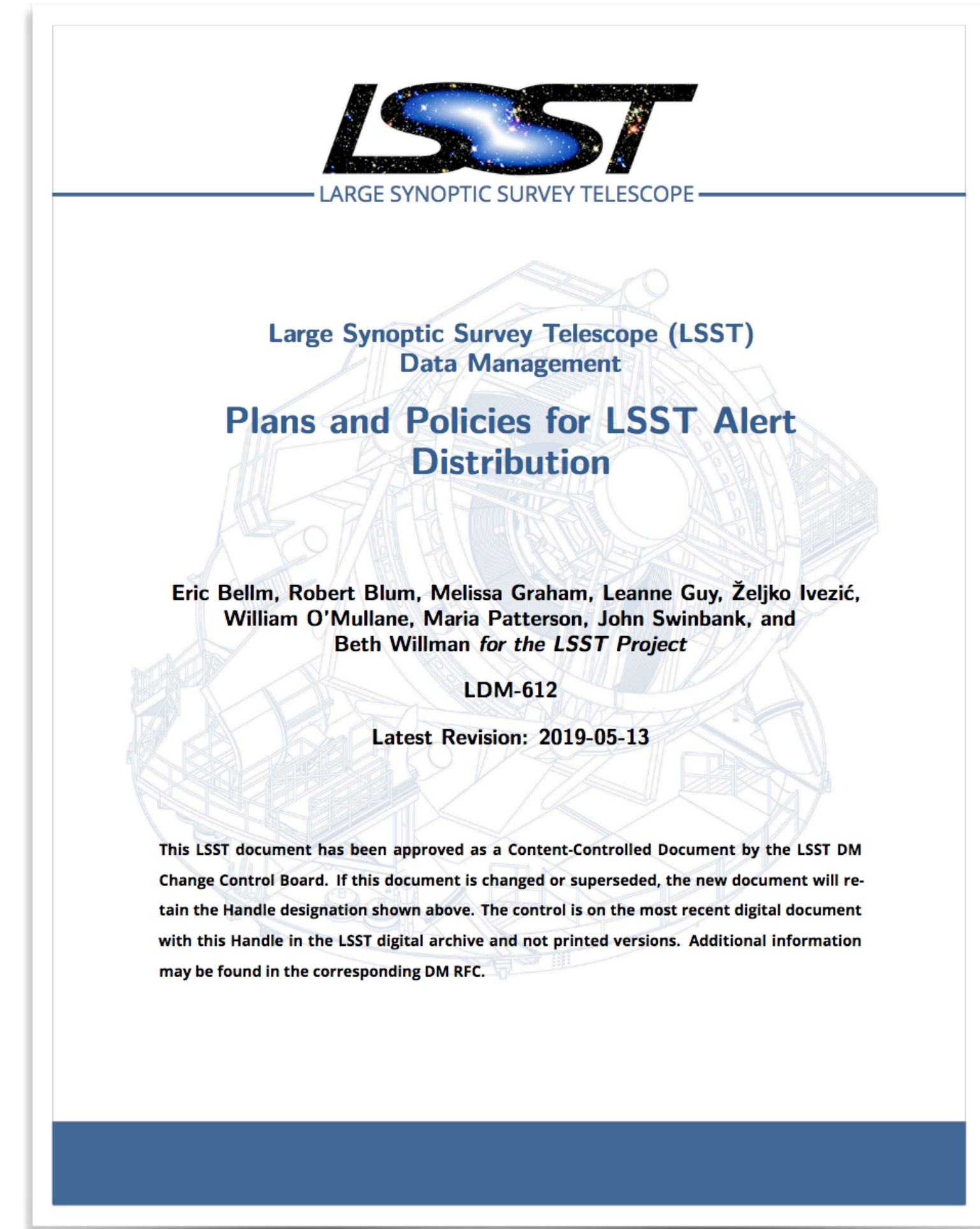
“To aid in broker development and testing, LSST will make available pre-packaged alert streams for precursor and/or simulated datasets generated by the LSST Alert Production pipelines and distributed with the expected formats and protocols.”

Important for community preparation.

But do these products influence broker selection?

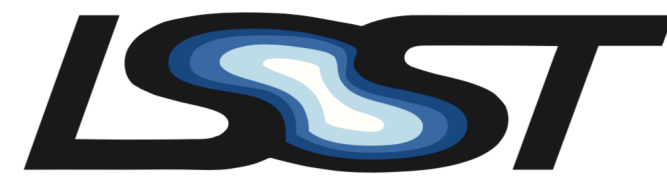
- Ability to interface w/ software not likely to distinguish proposals
- Making interesting large-scale simulations is lots of hard work
- How do we evaluate processing of precursor data?
 - Current AP processing is on relatively small datasets

(If I personally were evaluating, I would ask brokers to analyze the two years of ZTF public alerts available in bulk.)



see <http://ls.st/LDM-612>

In October 2019 we undertook an in-kind partnership to deliver streaming tools for broker proposers and simulated alerts.



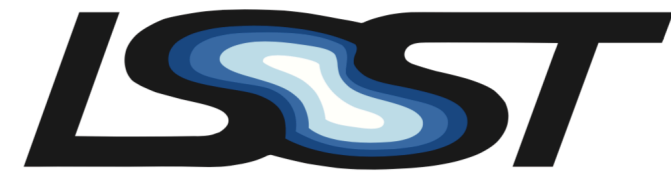
Statement of Work

- A stand-alone alert stream simulator for broker testing (“Kafka in a box”)
- 10M simulated alert packets with contents from catsim + Opsim, and tools for regenerating more alerts as desired.
- Plus code & documentation
- Product owner: E. Bellm, management support from J. Swinbank
- Delivery by Dec. 31, 2019

No deliverables are complete as of this writing.

- Stream simulator is AWOL
- 10M simulated alert packets have been delivered but have significant problems
 - not “5 sigma” detections (many objects at 29th magnitude...)
 - confusion around difference and total flux (contents are variable stars)
 - fixable issues, but at present there is little science value over random numbers
- no code or documentation

AP's new alert stream dev is now delivering the “alert stream in a box.”

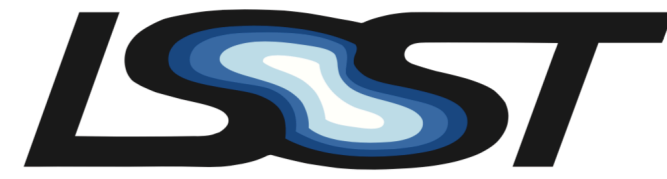


Spencer Nelson (Twitch->AWS->UW) is now the AP lead developer for alert distribution (25% FTE)

- He has drafted a design sketch as a starting point:
<https://dmtm-149.lsst.io/v/DM-24271/index.html>
- We expect implementation based on existing work should converge quickly (April (stretch due to availability) or May)



In preparation for the Algorithms Workshop we serialized our first alert packets from Pipelines-processed precursor data.



Notebook-level code generated Avro-formatted alerts for several thousand DECam HiTS alert packets

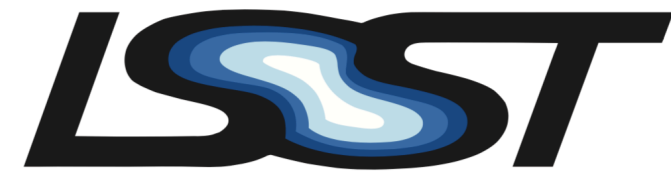
- included triggering DIASource, DIASource history, DIAObject, diffim cutout
- DIAForcedSource history and template cutout also easy to add

Tickets now in progress to build alert packet generation into ap_association

- DM-24324 and subsequent follow-on tickets, scheduled for April-May

HiTS has >1M DIASources (raw sample is ~80% bogus), so we can potentially generate a large set of alerts from real precursor data using current pipeline processing

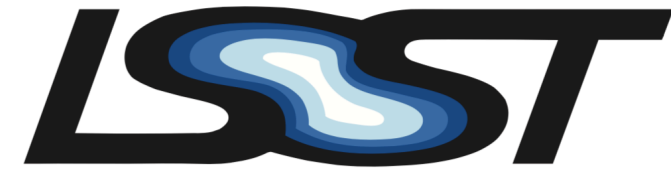
DESC has requested more input on sample alerts.



DESC emailed me to ask about our plans

- “DESC has created a topical team for alerts led by Alex Kim and Johann Cohen-Tanugi, which will coordinate the DESC Time Domain Astronomy work related to alerts.
- As part of this team, **we look forward to using sample alerts in the LSST alert formats later this year** to better quantify our requirements for Broker Infrastructure. There is a consensus within the group that **it is desirable to have sample alerts that correspond to astrophysical sources with abundances expected at LSST depths.**
- We would like to learn more about the project plans for generation of such sample alerts, mostly with a view to understanding if we can provide any useful help. It would be great if you could give us a starting point either from documents that exist, or perhaps chatting with you if you have the time.”

What are the implications for the broker call?



After some false starts we are now making good progress on generating alerts from Science Pipelines and producing an alert stream simulator

- May timescale seems like a useful target
- Project personnel can deliver stream simulator + real HiTS alerts

Delivery of a large volume of *functional* simulated alerts remains uncertain

Does the above influence when the due date for broker proposals should be?

- Maybe a question for the SAC—how would they like broker teams to use the sample products?
- Could poll the LOI teams, but expect a differential response based on how developed the brokers are.