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Data Management

Call for Proposals for Community Alert Brokers

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LDM-723

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Abstract

A major product of the nightly processing of LSST images is a world-public stream of alerts from transient, variable, and moving sources. Science users may access these alerts through third-party community brokers, which will receive the LSST alerts, add scientific value, and redistribute them to the scientific community.

This document is a call for proposals for community brokers, as described in "Plans and Policies for LSST Alert Distribution" [LDM-612].

DRAFT NOT YET APPROVED – The contents of this document are subject to configuration control by the Rubin Observatory DM Change Control Board. – **DRAFT NOT YET APPROVED**

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Change Record

Version	Date	Description	Owner name
	2019-10-11	Initial draft version	Eric Bellm
1.0	2019-12-27	First issue approved in RFC-654	Eric Bellm, Leanne Guy
1.1	2020-07-09	Update due date and link to sample alerts.	Eric Bellm

Document curator: E. Bellm

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1 Process

The broker selection process has two stages: an initial open call for LOIs from all interested parties (described in [LDM-682]), and a subsequent full proposal call solicited from invited LOI writers (described in this document).

The outcome of this proposal call will be the selection of community brokers to receive the alert stream directly from the LSST Data Facility. Bandwidth for at least five full streams is required to be supported (DMS-REQ-391, LSE-61), although we reserve the right to select fewer brokers to connect during commissioning and the first year of operations.

Some responses to the call for LOIs described broker systems that did not envision direct connection to the alert stream. We welcome proposals from these broker teams so that the selection panel can have a complete picture of the developing alert ecosystem. Proposers should make clear if they are requesting direct access to the alert stream. Proposers requesting direct stream access are encouraged to indicate their capacity to forward full or partial streams to downstream teams as well as any specific agreements they have made to do so. Teams that are not requesting direct stream access from LSST should indicate what they do require and which upstream broker(s) can provide the necessary output, if known.

Proposals provided in response to this call will be treated as private communications and will not be made publicly available by the LSST Project.

2 Proposal Guidelines

2.1 Who Can Submit

Submission is limited to teams who submitted LOIs in 2019; all LOI teams are invited to propose. It is anticipated that there will be future opportunities for additional brokers to join during LSST Operations.

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2.2   Page Limits

Proposals should be no more than ten pages, with standard margins and font sizes. A LaTeX template is available at

`https://github.com/lsst/LDM-723/blob/master/broker_proposal_submission_template.tex`.

2.3   Due Date

For full consideration, proposals should be submitted by December 15, 2020.

2.4   Submission Instructions

Please submit proposals as PDF documents to `lsst-community-brokers@lists.lsst.org`.

2.5   Content

LDM-612: Plans and Policies for LSST Alert Distribution, has been updated, and proposers are encouraged to review it for information on evaluation criteria and a revised timeline. The proposal should address the following items:

2.5.1   Scientific goals of the proposed broker system

- Describe the scientific aims of your proposed broker.

- Does it aim to add value to all LSST alerts, or a subset (e.g., supernovae or asteroids) thereof?

- What science questions will users of your broker be able to ask?

2.5.2   Stream Access

- Are you requesting direct access to the alert stream from LSST? If not, how do you antic-ipate receiving alert data?

- Are you requesting the complete contents of all alerts, or a filtered subset of either the alerts (e.g., only alerts matching Solar System Objects) or their contents (e.g., alerts with

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postage stamps and history removed)? Please be as specific as possible, as this will aid estimates of bandwidth usage.

- If you are requesting a direct connection to the stream, what capacity do you have to forward alerts to more specialized broker systems downstream? Are there other teams with which you already have an existing agreement to forward alerts?

2.5.3   Data Products & Services

- Describe the anticipated outputs and resultant data products of your processing of the LSST alert stream.

- What kinds of transformations, cross-matches to other surveys or catalogs, filters, and/or classifications will your broker perform?

- How will users access them?

- Who will be eligible to use your broker? (Broad access will be favourably viewed.)

- Do you anticipate multiple classes of users and/or differing resource allocations?

- Describe any plans for services to enable follow-up observations or collaborations with follow-up facilities.

2.5.4   Technical Implementation

- Describe the software and hardware technologies with which you intend to implement your broker service, and discuss its architecture.

- Discuss the maturity of the system—which parts are at a conceptual or early design phase? Are some prototyped? Are any in operation already?

- On what timescale will users be able to access alert data after your broker receives it?

- Describe the datacenter(s) in which you plan to host your service.

- Describe plans to support integration activities, both during LSST Commissioning and Early Operations, and later during the course of the survey if or when technical aspects of the broker interface are modified.

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2.5.5   Previous Results

- Present examples of data products, services, and/or scientific results (if any) from your system on precursor data, which may include (but is not limited to) ZTF alerts, data from other time-domain surveys (e.g., *Kepler*, *TESS*, *Gaia*, PanSTARRS, ATLAS, ASAS-SN, DECam, HSC...), simulations, or sample alerts processed by the LSST pipelines.

- Describe community usage of your broker system on any of the above, or plans to encourage community adoption of your service.

2.5.6   Management Plan

- Describe the number of FTEs required during the construction and operations phases.

- Present a detailed timeline and major milestones for implementing, verifying, and validating the services to be developed.

- How long do you anticipate operating your broker system?

- Describe plans and processes to handle downstream user enquiries and issues independently of LSST.

- Discuss potential or actual funding sources available to support these activities.

2.5.7   Proposing Team

- Describe the roles and expertise of the proposers and any key personnel.

- Describe related services the team has developed, if any.

- Describe any experience the team has processing alert streams of currently operational astronomical surveys.

3   Sample Alerts

We are providing sample alerts from precursor survey data processed through the LSST Science Pipelines and serialized in the current LSST formats. Details may be found at `https://www.lsst.org/scientists/alert-brokers`.

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4   Selection Process and Timeline

Please refer to LDM-612 §4.6–4.7 for evaluation criteria and procedures.

We anticipate notifying selected brokers by the second quarter of 2021.

5   References

[1] **[LDM-612]**, Bellm, E., Blum, R., Graham, M., et al., 2019, *Plans and Policies for LSST Alert Distribution*, LDM-612, URL `https://ls.st/LDM-612`

[2] **[LDM-682]**, Bellm, E., Blum, R., Graham, M., et al., 2019, *Call for Letters of Intent for Community Alert Brokers*, LDM-682, URL `https://ls.st/LDM-682`

[3] **[LSE-61]**, Dubois-Felsmann, G., Jenness, T., 2018, *LSST Data Management Subsystem Requirements*, LSE-61, URL `https://ls.st/LSE-61`

6   Acronyms used in this document

Acronym	Description
DM	Data Management
DMS	Data Management Subsystem
DMS-REQ	Data Management System Requirements prefix
HSC	Hyper Suprime-Cam
LDM	LSST Data Management (Document Handle)
LSE	LSST Systems Engineering (Document Handle)
LSST	Large Synoptic Survey Telescope
LaTeX	(Leslie) Lamport TeX (document markup language and document preparation system)
PDF	Portable Document Format
RFC	Request For Comment
ZTF	Zwicky Transient Facility