VERA C. RUBIN OBSERVATORY

Status of Community Brokers

Eric Bellm, Leanne Guy

PCW 2022, 8 August 2021

NSF AURA U.S. DEPARTMENT OF ENERGY SLAC CHARLES AND LISA SIMONYI FUND FOR ARTS AND SCIENCES LSST CORPORATION

Rubin has agreed to send the full alert stream to seven brokers; others will operate downstream.

Rubin Operations accepted the SAC recommendation that seven brokers receive direct access to the full alert stream:

- ALeRCE
- AMPEL
- ANTARES
- Babamul
- Fink
- Lasair
- Pitt-Google

Two additional brokers were recommended to operate downstream:

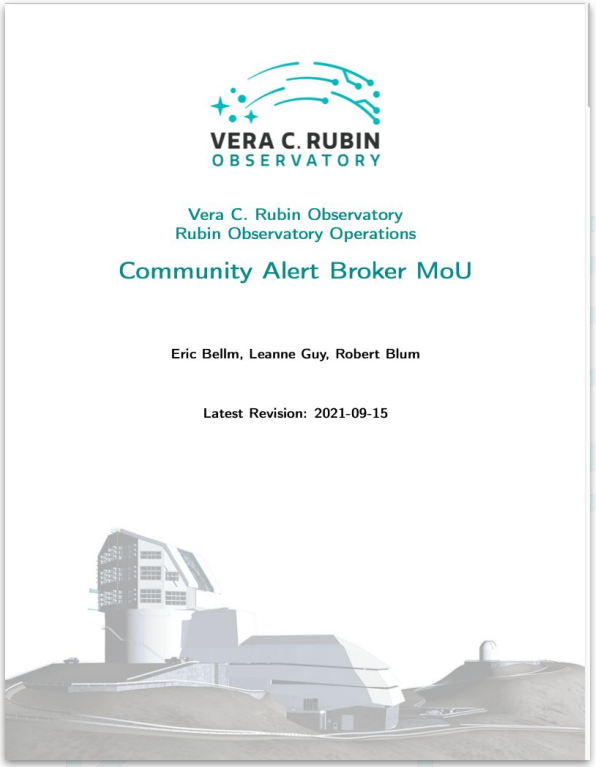
- SNAPS
- POI/Variables

We are drafting MOUs for the broker teams.

The operations project wishes to formalize relationships with the selected community alert brokers.

A lightweight MOU is being drafted to clarify terms and expectations and will be circulated for comment soon.

It specifies an initial term of 2 years after the start of operations and calls for annual reviews of the alert system.

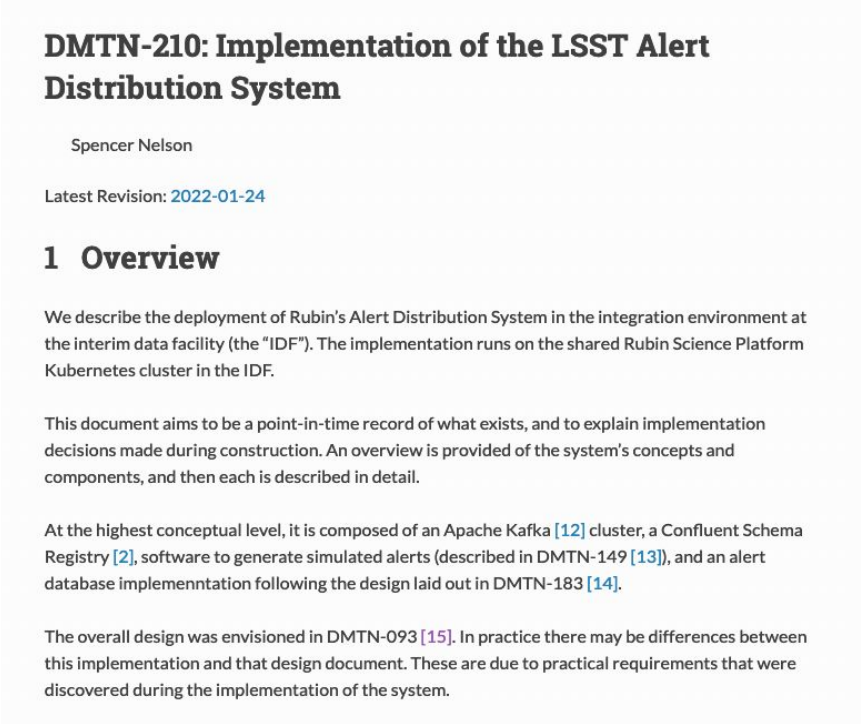


The Alert Distribution infrastructure will be installed in the USDF later this year.

AP has built and tested production-grade Alert Distribution infrastructure

- Kafka broker
- Schema registry
- Alert archive
- Authentication

Minor modifications are required to deploy in the USDF; we plan to do so after the initial NCSA->USDF migration is complete.



DMTN-210: Implementation of the LSST Alert Distribution System

Spencer Nelson

Latest Revision: 2022-01-24

1 Overview

We describe the deployment of Rubin's Alert Distribution System in the integration environment at the interim data facility (the "IDF"). The implementation runs on the shared Rubin Science Platform Kubernetes cluster in the IDF.

This document aims to be a point-in-time record of what exists, and to explain implementation decisions made during construction. An overview is provided of the system's concepts and components, and then each is described in detail.

At the highest conceptual level, it is composed of an Apache Kafka [12] cluster, a Confluent Schema Registry [2], software to generate simulated alerts (described in DMTN-149 [13]), and an alert database implemenntation following the design laid out in DMTN-183 [14].

The overall design was envisioned in DMTN-093 [15]. In practice there may be differences between this implementation and that design document. These are due to practical requirements that were discovered during the implementation of the system.

dmtn-210.lsst.io

In January we conducted connection tests with the broker teams via the IDF.

Cached alerts generated by Science Pipelines were loaded into a production-like Kafka instance.

Five full-stream brokers successfully authenticated and transferred data; two teams were unavailable at the time of the test.

We expect to conduct similar tests with the USDF-based system once it is available.

Brokers are currently performing classification tests with ELAsTiCC alerts.

Several broker teams are currently participating in the DESC ELAsTiCC data challenge.

This fall ~50 million simulated LSST alerts will be transmitted to brokers for classification.

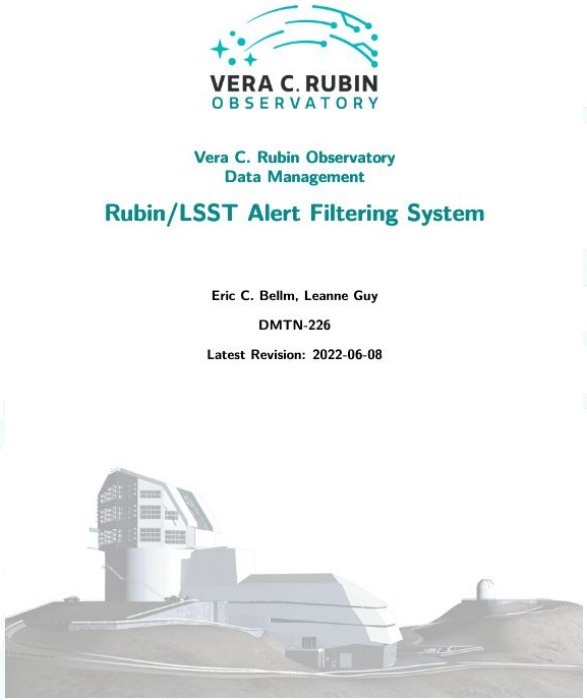
Due to the in-progress migration to the USDF, these alerts are not using Rubin Alert Distribution infrastructure but are making use of the existing ZTF ZADS system.

We are planning to partner with ANTARES on the functionality planned for the Alert Filtering Service.

The SRD recognized the need for user and pre-defined alert filters. The Rubin Alert Filtering System (AFS) was a stopgap if no community brokers became available--with nine operational brokers that concern is reduced. But brokers determine their services independently.

The ANTARES broker has a user filtering service which appears to meet Rubin requirements and operates within NOIRLab along with Rubin operations.

We are partnering with ANTARES to deliver the capabilities envisioned in the Rubin Alert Filtering Service & investigating the programmatic and technical implications.



dmtn-226.lsst.io