Large Synoptic Survey Telescope (LSST)

Proposed DM OPS Rehearsals

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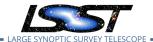
LDM-643

Latest Revision: 2018-07-19
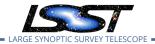
Abstract

For discussion about better specifying Operations Rehearsals.

Change Record

Version	Date	Description	Owner name
1	2018-07-16	Initial version.	Robert Gruendl

Contents

Proposed DM OPS Rehearsals

1 Introduction

As LSST DM moves from construction through commissioning and into operations a number
of rehearsals have been proposed to help prepare for the execution of the survey. Specific
rehearsals are outlined in [LDM-503] but in the larger cases, i.e., the OPS Rehearsals (LDM
503-09, LDM 503-11, and LDM 503-12) the contents of that document alone, does not suffi-
ciently outline the scope, content, action and interaction that are being rehearsed. From the
software side, [LDM-564] summarizes the DM software features that should be available and
helpfully identifies those software releases in the context of the rehearsals. However, the OPS
Rehearsals are not simply periods to test hardware and software systems, they are opportu-
nities to understand/develop operations processes and to observe the interactions of those
hardware/software systems and people.

This document, attempts to outline the OPS Rehearsals in greater detail, first because miss-
ing/late software features and hardware systems may require mitigation (e.g., shims, fake
data, etc...) or might be grounds for postponement, second because the purpose of an OPS
Rehearsal is not to debug a freshly deployed system but rather to understand whether that
system does what is needed, and third because the effort to carry out rehearsals will require
coordination of persons/facilities.

Note: The current draft attempts to level set this process for one OPS rehearsal (the first one)

2 LDM 503-09: Operations Rehearsal #1 for Commissioning

Date: November 2018

Original Description: Choose TBD weeks during commissioning. Pick which parts of plan we
could rehearse. Chuck suggests Instrument Signal Removal should be the focus of this (or the
next rehearsal).

Goal:

The contents of this document are subject to configuration control by the LSST DM Change Control Board.

Sustained nightly CCD-sized "sampling" mode operations for one week of observing. Archiving and ingestion of raw data, offline processing of calibrations and basic image reduction.
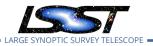
- Use simulated/test-stand AuxTel data (something with expected headers, size, and signature).

- Execute using the as-is: pipeline payload, provenance, and production processing and formal file management systems.

- Roles include (at least) LDF Production Scientist and "Operator," ISci Ops Calibration and ISR Scientists. In addition an independent executor would plan/oversee the activities.

Pre-Requisites:

- NOTE: the size/scale of the data (i.e. CCD-sized) is important because it is not clear that there will be systems (or pipelines) that function at any other scale at the time of this rehearsal. Furthermore, it should be considered that any element that uses a fake process will in turn require effort to produce the "shim" to fake that action.

- Requires RAW images and calibrations to feed the system.

  - Minimum: Can be as simple as a single image for each data type (that can be replicated to feed the system).
  - Stretch: A simulated set of images and base calibrations (e.g. bias/flat).

- Requires a mechanism to feed RAW images into system.

- Requires an endpoint to receive files and messages (that activate processing).

- Requires a means to gather calibrations and initiate calibration processing when all have arrived.

- Requires a Calibration Pipeline to exercise.

  - Minimum: Read files and output a cal (can be as simple as a null... in DES-speak null calibrations were files with the right specs (e.g. header, size) to be considered a calibration by downstream processing but which contained constant values, typically 1 or 0 depending whether the calibration is multiplicative or additive).
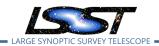
- **–** Stretch: Capable of producing a calibration set (e.g. a rudimentary combined bias/flat).

- Requires a production pipeline to exercise:

  - **–** Minimum: Read incoming files and cals and produce a new output product.
  - **–** Stretch: Actually perform basic ISR on simulated images.

- Requires a service to receive pipeline outputs.

- Requires a base level ability to track/verify outputs are created. Depending on whether stretch goals are being attempted likely need ability to look at output images (and catalogs?).

Actions:

- Assemble proto-ops team; all components from DM into services, with payloads, data sets, configurations, etc. (assumes pre-integration work) – checklist

- Mock receive nightly cals and science images, ingest.

- Mock afternoon stand-up operations meeting.

- Generate nightly calibrations for 1 week of observations.

- Run nightly ISR (offline mode) for 1 week of observations.

- Set up, configure, select calibrations, ingest outputs.

- Generate feedback for discussion in stand-ups (as a stretch goal this could also include telemetry that would be returned to Observatory)?

- Monitor progress of nightly "campaigns," characterize and assess, make records of failures, diagnose issues, generate problem backlog.

- Create mock nightly reports.

Assess:

- Was the rehearsal successful? How long did it take? What anomalies/failure modes were identified, and how did team cope?

- What fixes are needed, and on what timescale (e.g., next ops rehearsal, or we are go for commissioning)?

- What improvements in procedures, documentation, frameworks, systems, and algorithms were identified?

- Budget time and effort to plan and execute priority changes and improvements, and plan for next rehearsal.

References

[LDM-564], O'Mullane, W., Economou, F., Jenness, T., Loftus, A., 2017, *Data Management Software Releases for Verification/Integration*, LDM-564, URL `https://ls.st/LDM-564`

[LDM-503], O'Mullane, W., Jurić, M., Economou, F., 2017, *Data Management Test Plan*, LDM-503, URL `https://ls.st/LDM-503`