LSST Data Management Quality Assurance and Reliability Engineering

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ABSTRACT

The software and services delivered by the data management (DM) subsystem have a complex life cycle that requires concerted effort to maintain. This paper describes the life cycle within DM through authoring, deployment, monitoring, to documentation. Each of these aspects require specific tooling and services. We describe in the following sections how code, tooling, and services work together in a coherent ecosystem to service the software quality and reliability engineering needs of the project.

1. INTRODUCTION AND CONTEXT STATEMENT

[S. Krughoff and F. Economou] This section will introduce the following sections and how they fit together.

2. AUTHORING CODE AND SERVICES

[F Economou]

- Introduce the ways that developers learn about the DM system for writing code.

- Describe how developers know about problems with their code.

- Discuss mechanisms in place to ensure code quality

Some topics/services that will be discussed are:

- Style guide

- travis

- SqrBot for ticket unfurling

- SqrBot for report generation

- Jira

3. BUILD AND RELEASE CHAIN

[C Banek and A Thornton] This will be a narrative about how the build/release cycle works in LSST DM.

- Introduction to continuous integration and deployment concepts.

- Specifics of the Rubin Observatory architecture for CI/CD.

- Discussion of dogfooding both products and services.

- Explanation of how build products are used in various contexts: e.g. nublado.

Specific services that may be included are:

- Jenkins

- DockerHub

- Nublado

- ArgoCD

- GitOps

4. CHECKING AND MONITORING THE SYSTEM

[S. Krughoff and A Fausti]

- How do we instrument our pipelines to get processing telemetry?

- Explain how we collect and visualize the telemetry.

- Discuss how logging fits in with telemetry.

- Introduce V&V and how it is supported by other monitoring work.

- Explain the process of cyclical analysis and drill down.

Specific concepts/services may be:

- lsst.verify

- log aggregation

- unit testing

- SQuaSH

- reprocessing

- pipe_analysis

- V&V

- EFD

5. DOCUMENTING AND REPORTING

[J. Sick]

- Introduce documentation system at a high level.

- Enumerate various documentation contexts.

- Discuss developer facing documentation.

- Discuss user facing documentation.

- Discuss reporting/analysis/decision making documentation.

- Detailed description of the technical stack that supports the documentation system.

Specific topics/services that may be covered:

- nbreport

- commmmissioning (LSP)

- API docs

- LTD (for technotes and requirements docs)

APPENDIX

Initial paper list added here for reference.

"Editor" is a responsible team leader but not necessarily the person who will do most of the required work, or who will eventually become the first author. Both issues will be handled by individual teams.

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title: Performance of the LSST Telescope

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editor: Lynne Jones
title: The LSST Scheduler Overview and Performance

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editor: Leanne Guy (with likely delegation to new DM V&V Scientist)
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A. REFERENCES

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B. ACRONYMS

Acronym	Description
API	Application Programming Interface
CI	Cyber Infrastructure
DAQ	Data Acquisition System
DM	Data Management
EFD	Engineering and Facility Database
EPO	Education and Public Outreach
LPM	LSST Project Management (Document Handle)
LSE	LSST Systems Engineering (Document Handle)
LSP	LSST Science Platform
LSST	Large Synoptic Survey Telescope
LaTeX	(Leslie) Lamport TeX (document markup language and document preparation system)
NEO	Near-Earth Object
OpSim	Operations Simulation
SQuaSH	Science Quality Analysis Harness
TBD	To Be Defined (Determined)