

Rubin Observatory

Vera C. Rubin Observatory
Data Management

LDM-503-10b: Large Scale CCOB Data Access Test Plan and Report

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DMTR-182

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DRAFT



Abstract

This is the test plan and report for **Large Scale CCOB Data Access** (LDM-503-10b), an LSST milestone pertaining to the Data Management Subsystem.

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LDM-503-10b: Large Scale CCOB Data Access Test Plan and Report

1 Introduction

1.1 Objectives

Demonstrate the ability to transfer data from the CCOB at SLAC with 21 rafts of data, ingest at LDF and make available for viewing and further processing through an instance of the RSP. This is a data transfer of data from SLAC with 21-raft-sized images to NCSA, ingest it into a Butler environment and place the file into file systems accessible by the RSP. The CCOB device might NOT be available, but as 21 raft size data will be available from a test stand at SLAC, we will use a generic test stand data transfer method (e.g., rsync) to bring designated data to NCSA, ingest it, and place into appropriate filesystems, and make available through the RSP. This data comes from the Camera Control System (CCS).

1.2 System Overview

This milestone validates the data from a test stand at SLAC that contains the test data for 21 rafts single image data with proper headers. That data is to be transferred to the LDF and ingested into the Butler, and then placed in file systems that are viewable by the RSP.

1.3 Applicable Documents

LDM-294 Data Management Organization and Management
LDM-503 DM Test Plan
LDM-148 Data Management System Design
LDM-639 Data Management Acceptance Test Specification
LSE-400 Header Service Interface between the OCS and EFD

1.4 Document Overview

This document was generated from Jira, obtaining the relevant information from the LVV-P55 Jira Test Plan and related Test Cycles (LVV-C108).

Section 1 provides an overview of the test campaign, the system under test (DBB Services), the applicable documentation, and explains how this document is organized. Section 2 provides additional information about the test plan, like for example the configuration used for this test or related documentation. Section 3 describes the necessary roles and lists the individuals assigned to them.

Section 4 provides a summary of the test results, including an overview in Table 2, an overall assessment statement and suggestions for possible improvements. Section 5 provides detailed results for each step in each test case.

The current status of test plan LVV-P55 in Jira is **Completed** .

1.5 References

- [1] **[DMTR-182]**, Butler, M., 2019, *LDM-503-10b: Large Scale CCOB Data Access Test Plan and Report*, DMTR-182, URL <http://dmtr-182.lsst.io>, Draft version
- [2] **[LDM-639]**, Guy, L., 2018, *DM Acceptance Test Specification*, LDM-639, URL <https://ls.st/LDM-639>
- [3] **[LSE-400]**, Lim, K.T., 2019, *Header Service Interface*, LSE-400, URL <https://lse-400.lsst.io>
- [4] **[LDM-148]**, Lim, K.T., Bosch, J., Dubois-Felsmann, G., et al., 2018, *Data Management System Design*, LDM-148, URL <https://ls.st/LDM-148>
- [5] **[LDM-294]**, O'Mullane, W., Swinbank, J., Jurić, M., DMLT, 2018, *Data Management Organization and Management*, LDM-294, URL <https://ls.st/LDM-294>
- [6] **[LDM-503]**, O'Mullane, W., Swinbank, J., Jurić, M., Economou, F., 2018, *Data Management Test Plan*, LDM-503, URL <https://ls.st/LDM-503>

2 Test Plan Details

2.1 Data Collection

Observing is not required for this test campaign.

2.2 Verification Environment

2.3 Entry Criteria

Images taken and sent to NCSA through CCS data transfer mechanisms.

2.4 Exit Criteria

Data is viewable on RSP which means that it was ingested and placed in a Butler repo.

2.5 Related Documentation

No additional documentation provided.

2.6 PMCS Activity

Primavera milestones related to the test campaign:

- LDM-503-10b

3 Personnel

The personnel involved in the test campaign is shown in the following table.

| T. Plan LVV-P55 owner: | | Michelle Butler | |
|--------------------------|--------------------|------------------------|----------------------------------|
| T. Cycle LVV-C108 owner: | | Michelle Butler | |
| Test Cases | Assigned to | Executed by | Additional Test Personnel |
| LVV-T1556 | Michelle Butler | Michelle Butler | |

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4 Test Campaign Overview

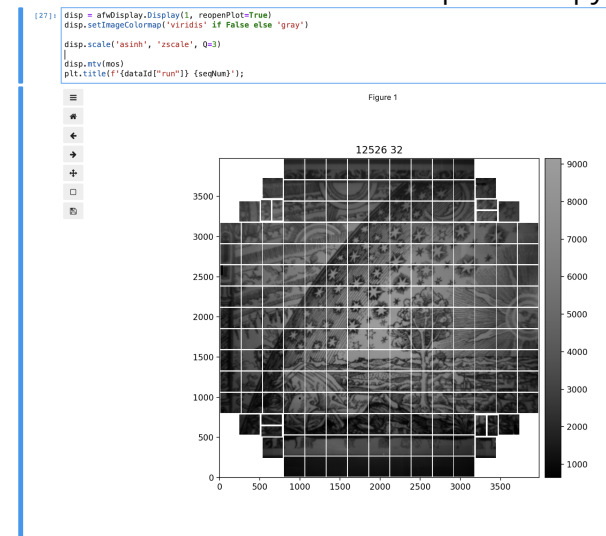
4.1 Summary

| T. Plan LVV-P55: | LDM-503-10b: Large Scale CCOB Data Access | Completed | | |
|--------------------|--|-----------|--|--------|
| T. Cycle LVV-C108: | LDM-503-10b Large Scale CCOB Data Access | Done | | |
| Test Cases | Ver. | Status | Comment | Issues |
| LVV-T1556 | 1 | Pass | Data transferred (20090 files) to NCSA on 8/19/2020. The files were transferred to NCSA and were ingested into the directory(20086 files; 4 were zero length): /lsst-data/offline/teststand/BOT/storage/20200819 | |

Table 2: Test Campaign Summary

4.2 Overall Assessment

CCOB (camera control system) CCS images were transferred to NCSA through the rsync utility (CCS method of data transfer). Data was ingested by cron job at NCSA into a Gen2 repo and was made available on the RSP for further review and processing by scientific staff. Here is a notebook that allows the image generation from the 21 raft data: [github: https://github.com/lsst-dm/DMTR-182/tree/executions/pinholes.ipynb](https://github.com/lsst-dm/DMTR-182/tree/executions/pinholes.ipynb)



4.3 Recommended Improvements

The current data transfer method is too slow for quick changes to the camera and images as the CCOB is currently at SLAC. The timing will change once the CCOB is placed on the mountain. This is temporary due to the environment at SLAC. NCSA then ingests the data into a butler repo as the file arrives at NCSA. A suggestion of the RSP be installed at SLAC so that images can be retrieved quickly and changes to the camera could be quicker. The data at SLAC must be moved to a node that is accessible to an outside internet connection which is able to reach NCSA. This has taken in the past hours. The data is then “rsynced” to NCSA. Currently after the files are placed in a outside visible node, each file takes on average 4 seconds to be transferred and ingested. Depending on how long the CCS environment stays at SLAC, will put priority on how much effort needs to go into making these transfer mechanisms faster or not.

As the CCOB for 21 RAFT data moves from SLAC to the mountain, the CCS data will be available immediately to be transferred to NCSA or available on the telemetry cluster that can have a RSP environment installed for immediate viewing. This. slowness of the CCOB data is temporary due to it's location at SLAC.

5 Detailed Test Results

5.1 Test Cycle LVV-C108

Open test cycle *LDM-503-10b Large Scale CCOB Data Access* in Jira.

Test Cycle name: LDM-503-10b Large Scale CCOB Data Access

Status: Done

Demonstrate the ability to transfer data from the CCOB with 21 rafts from SLAC and ingested at NCSA and make available through an instance of the RSP (Rubin Science Platform)

5.1.1 Software Version/Baseline

Not provided.

5.1.2 Configuration

The data at SLAC is 21 rafts of 9CCD image with proper headers at SLAC. The data transfer environment installed on SLAC systems for specific directories only. Data transfer environment at NCSA. Ingest software installed at LDF. RSP environment installed at NCSA.

5.1.3 Test Cases in LVV-C108 Test Cycle

5.1.3.1 LVV-T1556 - LDM-503-10B Large Scale CCOB Data Access

Version 1. Open *LW-T1556* test case in Jira.

Demonstrate the ability to transfer data from the SLAC test stand or CCOB with 21 rafts from SLAC and ingested at NCSA and make available through an instance of the RSP

Preconditions:

SLAC or some other test stand needs to have produced 21 rafts of data that has some environment for transferring the data to NCSA. The images won't be able to be ingested at NCSA into butler repositories if the headers are not correct. The LSE-400 document calls out what fields are designed to be completed by the image properly. The headers at this time are still in test form, and are being updated as images are created. The confluence page of: <https://confluence.lsstcorp.org/display/SYSENG/ComCam+Header+Information+Topic+Mapping> has the current header configuration and what the information maps to for the ingest information.

Execution status: **Pass**

Final comment:

Data transferred (20090 files) to NCSA on 8/19/2020. The files were transferred to NCSA and were ingested into the directory(20086 files; 4 were zero length): /lsstdata/offline/test-stand/BOT/storage/20200819

Detailed steps results:

| Step | Step Details |
|------|---|
| 1 | <p>Description</p> <p>Have a system at SLAC that has the 21 raft data that needs to be transferred to NCSA, and all accounts and scripts installed on environment that can read that data.</p> <hr/> <p>Test Data</p> <p>21 rafts of data with proper headers</p> <hr/> <p>Expected Result</p> <p>scripts are able to transfer the data to NCSA though rsync or bbcp.</p> <hr/> <p>Actual Result</p> <p>SLAC started in late August with the main telescope camera (MTCam) having the ability to generate 21 raft scale images.</p> |

 Status: **Pass**

2

Description

Data is transferred to NCSA and ingested into Butler

 Test Data

21 rafts of data

 Expected Result

Data is transferred to NCSA, and can now be see in file systems by the RSP.

 Actual Result

Data was transferred and ingested into Gen2 Butler: /lsstdata/offline/teststand/BOT/storage/20200819

 Status: **Pass**

3

Description

using the RSP view the data in the ingested directory

 Test Data

21 rafts of data with proper headers and available with Butler.get

 Expected Result

data can be viewed.

 Actual Result

Data is available on the RSP: /lsstdata/offline/teststand/BOT/storage/20200819

 Status: **Pass**

A Traceability

| Test Case | VE Key | VE Summary |
|-----------|--------|---|
| LVV-T1556 | LW-8 | DMS-REQ-0018-V-01: Raw Science Image Data Acquisition |
| | LW-9 | DMS-REQ-0020-V-01: Wavefront Sensor Data Acquisition |
| | LW-11 | DMS-REQ-0024-V-01: Raw Image Assembly |
| | LW-146 | DMS-REQ-0315-V-01: DMS Communication with OCS |
| | LW-28 | DMS-REQ-0068-V-01: Raw Science Image Metadata |

B Acronyms used in this document

| Acronym | Description |
|----------------|--|
| CCOB | Camera Calibration Optical Bench |
| CCS | Camera Control System |
| ComCam | The commissioning camera is a single-raft, 9-CCD camera that will be installed in LSST during commissioning, before the final camera is ready. |
| DM | Data Management |
| DMS | Data Management Subsystem |
| DMS-REQ | Data Management System Requirements prefix |
| DMTR | DM Test Report |
| EFD | Engineering and Facility Database |
| LDF | LSST Data Facility |
| LDM | LSST Data Management (Document Handle) |
| LSE | LSST Systems Engineering (Document Handle) |
| LSST | Legacy Survey of Space and Time (formerly Large Synoptic Survey Telescope) |
| NCSA | National Center for Supercomputing Applications |
| OCS | Observatory Control System |
| PMCS | Project Management Controls System |
| RSP | Rubin Science Platform |
| SLAC | SLAC National Accelerator Laboratory |
| VE | Verification Element |