LARGE SYNOPTIC SURVEY TELESCOPE

**Large Synoptic Survey Telescope (LSST)
Data Management**

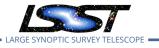# LDM-503-8b (Small Scale CCOB Data Access) Test Plan and Report

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DMTR-102

Latest Revision: 2019-07-15

Abstract

This is the test plan and report for LDM-503-8b (Small Scale CCOB Data Access), an LSST level 2 milestone pertaining to the Data Management Subsystem.
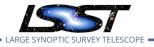
Change Record

Version	Date	Description	Owner name
	2018-10-10	Initial version.	Butler, Comoretto
1.0	2019-07-10	Test Completed	Butler, Comoretto
1.1	2019-07-15	Text tweaks	Butler, Comoretto

Document curator: Michelle Butler

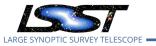*Document source location:* `https://github.com/lsst-dm/DMTR-102`

Version from source repository: 083542f

Contents

LDM-503-8b (Small Scale CCOB Data Access) Test Plan and Report

1 Introduction

1.1 Objectives

This test activity will demonstrate the successful execution of the major components required to transfer raw image files from the DAQ to the DBB and subsequently visualize them via the LSST Science Platform(LSP). This is a small scale proof-of-concept test designed to demonstrate that the key components can interoperate successfully.

It will specifically demonstrate that:

- Data can be transferred into the lsst data facility (LDF)
- The raw data images can be ingested into a Butler (eventually by the DBB along with a subset of image and provenance metadata)
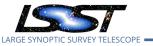- The data files can then be retrieved/viewed by the LSP

1.2 Scope

The overall test plan for the LSST Data Management system is described in LDM-503
This document specifically refers to the milestone LDM-503-8b, which tests the raw image archiving for a CCOB device.
This iteration of the test doesn't include the CCOB data, but the AuxTel data was the considered the closest to a CCOB data devices available for quite some time.   More iterations of this test with more automation is required without humans involved in the first 1/2 of 2020 with the spectrograph working at the summit.

1.3 System Overview

The raw image archiving system that is part of the LSST Data Management system is responsible for the data being stored into the archive environment at the LDF from various sources. It will depend on what DAQ system (spectrograph, comcam, lsstcam, CCOB... others) as to where the data is located originally, and then how it will be sent to NCSA (LDF). The tests

begin with data somewhere that needs to be stored at the archive environment at LDF and ingested into the DBB. The LDM-503-4 milestone is limited to the raw image archive from a CCOB device, specifically the DAQ, not all types of devices are included and is limited in scope.

1.4 Applicable Documents

LDM-294 Data Management Organization and Management
LDM-503 DM Test Plan
LDM-148 Data Management System Design

1.5 Document Overview

This document was generated from Jira, obtaining the relevant information from the LVV-P10 Jira Test Plan and related Test Cycles (LVV-C8).
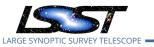
Section 1 provides an overview of the test campaign, the system under test (Archiving), the applicable documentation, and explains how this document is organized. Section 2 describes the configuration used for this test. Section 3 describes the necessary roles and lists the individuals assigned to them.

Section 4 provides a summary of the test results, including an overview in Table 1, 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-P10 in Jira is Completed.

1.6 References

[1] **[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

[2] **[LDM-294]**, O'Mullane, W., Swinbank, J., Jurić, M., DMLT, 2018, *Data Management Organization and Management*, LDM-294, URL https://ls.st/LDM-294

[3] **[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 Configuration

2.1   Data Collection

Observing is not required for this test campaign.

2.2   Verification Environment

LDF center at NCSA. The archive service or data back bone.

2.3   Entry Criteria

Data that needs to be stored from a CCOB or DAQ

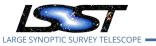## 2.4   Exit Criteria

Data are correctly transferred to the LDF and ingested into the DBB, and can be subsequently viewed on the LSP.

3   Personnel

The following personnel are involved in this test activity:

- Test Plan (LVV-P10) owner: Michelle Butler

- Test Cycles:

  - LVV-C8 owner: Michelle Butler
    - * Test case LVV-T284 tester: Michelle Gower

- Additional Test Personnel involved: None
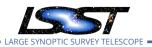
4   Overview of the Test Results

4.1   Summary

		Test Cycle **LVV-C8: 503-8b raw image archiving for CCOB cycle**		
test case	**status**	**comment**		**issues**
LVV-T284	Pass	The CCOB data has been approved to be from the AuxTel system data. In the future when this test is run again, the CCOB data will be from an actual optical bench, but for the time being of this test, the AuxTel was not connected to an optical bench, but was approved by data management leadership team. A step was also skipped in that the Tucson scientist didn't approve of the data before it was placed into the butler/G2 repository because the data was wanted to be viewed by the scientists AFTER it was ingested not before. There was no CCOB or DBB software used in this test.		

Table 1: Test Results Summary

4.2   Overall Assessment

The test was successful.   This was the first iteration, and each step was checked by a human to make sure it executed properly.   There isn't a DBB at this time either.   All data has been stored at the LDF, but it's not replicated to other locations which is a DBB requirement.   So the data was transferred, stored, and viewed at the LDF, but not curated and sent to multiple repositories.

4.3   Recommended Improvements

There should be many more iterations of this test and with much more automation.   The data should automatically be sent to NCSA, ingested automatically, replicated to mulitple locations as needed, and then also be placed into filesystems that can be viewed by the LSP.   The DBB should include a database to be able to query against to find the images that is wanted along with searching for matching metadata.

5 Detailed Test Results

5.1 Test Cycle LVV-C8

Open test cycle *503-8b raw image archiving for CCOB cycle* in Jira.

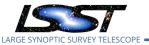503-8b raw image archiving for CCOB cycle
Status: Done

Test cycle for the raw image archiving of data from a CCOB device. This data needs to be stored at the LDF and ingested so that it can be looked at by scientists. The data needs to be transferred to the LDF and then ingested into the archive service so that it can be retrieved through a butler to be displayed for further use. This should be tested with a human involved at first for moving the data and making sure all the pieces work. It should also be tested for when things are working more as a service, and without a human involved for an automatic data archive process.

5.1.1 Software Version/Baseline

The DBB version used in this campaign is 1.0, and can be found in the github repository when it has been fully developed. The current DBB is a script for scraping data from the header file and getting the file name and the metadata required along with provence. At the time of this writing, the DBB use cases and requirements are just being written. The database component is Oracle and the ingest file systems and output file systems for DBB are in GPFS at the LDF.

5.1.2 Configuration

The configuration for this test is the data is located in a file system somewhere. It is transferred to LSST GPFS file system at LDF. Files that are needed in the DBB are moved to the DBB ingest file system. The data backbone gathers the necessary information from the headers and file name. It inserts rows into the DBB consolidated DB environment and moves the file to the DBB file systems that are used by the LSP to once again find the raw image file to be inspected for further analysis.

All files from the CCOB are to be transferred to NCSA.   A directory of where the CCOB files are stored is required so that the directory can be monitored for when new files are written, they can be transferred.   At the first iteration, a human will point out where the files are, and begin the execution of the "rsync" process to bring all the files to the LDF.   This is so that the files can be inspected by scientists to ensure that all the files and data have been transferred. This test will be run with humans involved, and then will be run as a integrated test of the whole infrastructure.

5.1.3   Test Cases in LVV-C8 Test Cycle

5.1.3.1   Test Case LVV-T284 - RAS-00-05: (LDM-503-8b) Writing data from CCOB to the DBB for further data processing

Open *LVV-T284* test case in Jira.

This test will check:

- The successful integration of the DAQ archiver components with the CCOB
- That the file can then be ingested into the DBB and be retrieved for further analysis
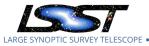
 Preconditions:
None.

Execution status: **Pass**

Final comment:
The CCOB data has been approved to be from the AuxTel system data. In the future when this test is run again, the CCOB data will be from an actual optical bench, but for the time being of this test, the AuxTel was not connected to an optical bench, but was approved by data management leadership team.   A step was also skipped in that the Tucson scientist didn't approve of the data before it was placed into the butler/G2 repository because the data was wanted to be viewed by the scientists AFTER it was ingested not before.   There was no CCOB or DBB software used in this test.

Detailed step results:

Step		Description, Results and Status
1	Description	CCOB device directs a human to where a raw file is wanted to be stored in the DBB
	Expected Result	A file with a unique file name is in a file system somewhere, and the data is then transferred to NCSA.
	Actual Result	An image file was created by the AT-archiver software machine and placed into the transfer directory. The file directory on the AT-archiver is /data/export/2019-06-11. It had 1 image file(s) created. The image has proper headers generated by the header service.
	Status	Pass
2	Description	Move the data from the transferred directory into the DBB foreign file ingest file system.
	Expected Result	A command is executed by a human with a file name and path to the file wanted to be stored in the DBB. The file is transferred to NCSA's DBB ingest area.
	Actual Result	The at-archiver machine has a cron job that executes a rsync command to push the data to a data transfer machine or a gateway machine at NCSA. The single file lands on NCSA's GPFS file system. path is: /lsstdata/offline/teststand/<auxTel>/<L1Archiver | DAQ>
	Status	Pass
3	Description	Have data inspected by scientist for managing that all data was transferred.
	Expected Result	a specific Okay to move forward; or something is broke.
	Actual Result	This was not done, and this data is not considered for a release or any step needing a scientist to view the file at this time. The LSP is being used after the file is ingested to actually view the files. This is part of QA and isn't needed for this test.
	Status	Not Executed
4	Description	The DBB is notified of a new file being in the ingest area, and the DBB ingest is run manually to ingest the CCOB file.

	Expected Result	The DBB puts the resulting file into the DBB file systems depending on what type of file it is. The DB is updated with metadata and providence of the file to be kept. The resulting file system is queryable by the LSP to find the CCOB raw image.
	Actual Result	A system at NCSA has a cron job (lsst-dev03) that executes a script that copies the file from the rsync directory to a temporary location and ingests them into a Butler/G2 repository.
	Status	Pass
5	Description	The LSP can review and use the CCOB raw data file that was stored originally somewhere else such as slac
	Expected Result	LSP has the ability to find the file and view/use it.
	Actual Result	After the ButlerG2 ingestion the file is available at: /project/production/tmpdataloc/auxTel/storage/2019-06-11/AT_O_20190611_000001-ats-wfs_ccd.fits
	Status	Pass