



Vera C. Rubin Observatory
Data Management

LDM-503-16a: Science Pipelines Fall 2022 Release Test Plan Test Plan and Report

Yusra AlSayyad

DMTR-411

Latest Revision: 2023-08-17



Abstract

This is the test plan and report for **Science Pipelines Fall 2022 Release Test Plan** (LDM-503-16a), an LSST milestone pertaining to the Data Management Subsystem. This document is based on content automatically extracted from the Jira test database on 2023-08-17 . The most recent change to the document repository was on 2023-08-16.

Change Record

Version	Date	Description	Owner name
	2023-07-20	First draft	Yusra AlSayyad
	2023-08-16	Test Cycle LVV-C263 executed on DM-32561	Yusra AlSayyad

Document curator: Yusra AlSayyad

Document source location: <https://github.com/lstt-dm/DMTR-411>

Version from source repository: 09fb7d5

Contents

1 Introduction	1
1.1 Objectives	1
1.2 Scope	2
1.3 System Overview	2
1.4 Applicable Documents	2
1.5 Document Overview	2
1.6 References	3
2 Test Plan Details	4
2.1 Data Collection	4
2.2 Verification Environment	4
2.3 Related Documentation	4
2.4 PMCS Activity	4
3 Personnel	5
4 Test Campaign Overview	6
4.1 Summary	6
4.2 Overall Assessment	6
4.3 Recommended Improvements	6
5 Detailed Test Results	7
5.1 Test Cycle LVV-C263	7
5.1.1 Software Version/Baseline	7
5.1.2 Configuration	8
5.1.3 Test Cases in LVV-C263 Test Cycle	8
5.1.3.1 LVV-T362 - Installation of the LSST Science Pipelines Payloads . .	8
5.1.3.2 LVV-T1601 - Science Pipelines available on developer hardware .	12
5.1.3.3 LVV-T363 - Science Pipelines Release Documentation	14



A Documentation	17
B Acronyms used in this document	17

LDM-503-16a: Science Pipelines Fall 2022 Release Test Plan Test Plan and Report

1 Introduction

1.1 Objectives

This test plan checks for the successful release of the Fall 2022 release of the LSST Science Pipelines version 25.0.0

It will demonstrate that:

- The release has been tagged, built and made available through standard distribution channels;
- Release documentation, including release notes and a characterization report, are available on the Pipelines documentation website (<https://pipelines.lsst.io/>);
- An end-user can follow standard instructions to install the release onto some representative system;
- The release is installed into the “shared stack” on the rubin-devl shared developer systems at the Rubin Data Facility;
- The `pipelines_check` test package executes successfully in the context of the release.

This test plan does not, in itself, verify the scientific integrity or algorithmic correctness of the release, beyond checking that defined procedures for checking basic correctness and characterizing algorithmic performance have been followed.

1.2 Scope

The overall strategy for testing and verification within Rubin Data Management is described in LDM-503.

This test plan specifically verifies successful completion of milestone LDM-503-16a, which refers to the Fall 2022 release of the LSST Science Pipelines (and Spring 2023 verification of such).

1.3 System Overview

The LSST Science Pipelines comprise the scientific algorithms that will be used to process data for the Rubin Observatory Legacy Survey of Space and Time (Rubin's LSST), arranged into executable pipelines by means of the LSST "task" framework. They also include execution middleware that is common across execution environments (for example, the "Data Butler" I/O abstraction is included, but schedulers or workflow management for specific clusters is not), and "camera packages", which adapt and configure the algorithms for use with specific instrumentation.

1.4 Applicable Documents

LDM-503 Data Management Test Plan
LDM-151 Data Management Science Pipelines Design
LSE-61 Data Management System Requirements

1.5 Document Overview

This document was generated from Jira, obtaining the relevant information from the LVV-P107 Jira Test Plan and related Test Cycles (LVV-C263).

Section 1 provides an overview of the test campaign, the system under test (Science Pipelines SW), 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-P107 in Jira is **Approved**.

1.6 References

- [1] **[DMTN-140]**, Comoretto, G., 2021, *Documentation Automation for the Verification and Validation of Rubin Observatory Software*, DMTN-140, URL <https://dmtn-140.lsst.io/>, Vera C. Rubin Observatory Data Management Technical Note
- [2] **[DMTN-178]**, Comoretto, G., 2021, *Docsteady Usecases for Rubin Observatory Constructions*, DMTN-178, URL <https://dmtn-178.lsst.io/>, Vera C. Rubin Observatory Data Management Technical Note
- [3] **[LSE-61]**, Dubois-Felsmann, G., Jenness, T., 2019, *Data Management System (DMS) Requirements*, LSE-61, URL <https://lse-61.lsst.io/>, Vera C. Rubin Observatory
- [4] **[LDM-503]**, O'Mullane, W., Swinbank, J., Juric, M., et al., 2022, *Data Management Test Plan*, LDM-503, URL <https://ldm-503.lsst.io/>, Vera C. Rubin Observatory Data Management Controlled Document
- [5] **[LSE-160]**, Selvy, B., 2013, *Verification and Validation Process*, LSE-160, URL <https://ls.st/LSE-160>
- [6] **[LDM-151]**, Swinbank, J., Axelrod, T., Becker, A., et al., 2020, *Data Management Science Pipelines Design*, LDM-151, URL <https://ldm-151.lsst.io/>, Vera C. Rubin Observatory Data Management Controlled Document

2 Test Plan Details

2.1 Data Collection

Observing is not required for this test campaign.

2.2 Verification Environment

Several of the tests described in this plan are agnostic of environment: they involve checking that certain content has been properly published. This can be performed from any internet-connected system with a web browser, and will, in this case, likely be executed from the tester's laptop.

Where tests require installation or execution of specific Science Pipelines components, this will be carried out on the shared developer infrastructure at the Rubin Data Facility. This infrastructure provides a number of powerful systems accessible to Rubin developers. At time of writing, they are running Red Hat Enterprise Linux (4.18.0-372.32.1.el8_6.x86_64); in practice, and similar operating system is appropriate for this test plan, as long as it complies with the published installation prerequisites of the LSST Science Pipelines.

2.3 Related Documentation

No additional documentation provided.

2.4 PMCS Activity

Primavera milestones related to the test campaign:

- LDM-503-16a

3 Personnel

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

T. Plan LVV-P107 owner:		Yusra AlSayyad	
T. Cycle LVV-C263 owner:		Yusra AlSayyad	
Test Cases	Assigned to	Executed by	Additional Test Personnel
LVV-T362	Yusra AlSayyad	Yusra AlSayyad	
LVV-T1601	Yusra AlSayyad	Yusra AlSayyad	
LVV-T363	Yusra AlSayyad	Yusra AlSayyad	

4 Test Campaign Overview

4.1 Summary

T. Plan LVW-P107:	LDM-503-16a: Science Pipelines Fall 2022 Release Test Plan			Approved
T. Cycle LVW-C263:	LDM-503-16a: Science Pipelines Fall 2022 Release			Done
Test Cases	Ver.	Status	Comment	Issues
LVW-T362	1	Pass		
LVW-T1601	1	Pass		
LVW-T363	1	Pass		

Table 2: Test Campaign Summary

4.2 Overall Assessment

All tests described in this plan were completed successfully. The lsstinstall method automatically found and installed the appropriate binaries of the LSST Science Pipelines v25.0.0 on the USDF developer hardware.

4.3 Recommended Improvements

No recommendations.

5 Detailed Test Results

5.1 Test Cycle LVV-C263

Open test cycle *LDM-503-16a: Science Pipelines Fall 2022 Release* in Jira.

Test Cycle name: LDM-503-16a: Science Pipelines Fall 2022 Release

Status: Done

This test cycle describes tests performed on the Science Pipelines Fall 2022 (v25.0.0) release, ensuring that the release is properly identified, documented, distributed, installable and tested.

5.1.1 Software Version/Baseline

A web browser is required for inspecting release artifacts published to the web.

Testing the software installation procedures, and demonstrating that the release's integration tests can be executed successfully, require a supported operating system with the documented prerequisites of the release installed. This will be carried out on the "rubin-devl" shared developer systems at the LSST Data Facility.

At time of writing, Data Facility systems run Red Hat Linux (4.18.0-372.32.1.el8_6.x86_64), and it is anticipated that this will be a supported platform for the Science Pipelines release.

Science Pipelines prerequisites are documented at pipelines.lsst.io; all of these must be installed.

It is possible that the software release will involve a reorganization of documentation describing prerequisites; in this case, the documentation corresponding to the new release must be consulted.

5.1.2 Configuration

No specific configuration is required beyond the availability of test systems with the prerequisite software, described above, installed.

5.1.3 Test Cases in LVV-C263 Test Cycle

5.1.3.1 LVV-T362 - Installation of the LSST Science Pipelines Payloads

Version **1**. Status **Approved**. Open *LVV-T362* test case in Jira.

This test will check that:

- The Alert Production Pipeline payload is available for installation from documented channels;
- The Data Release Production Pipeline payload is available for installation from documented channels;
- The Calibration Products Production Pipeline payload is available for installation from documented channels;
- These payloads can be installed on systems at the LSST Data Facility following available documentation;
- The installed pipeline payloads are capable of successfully executing basic integration tests.

Note that this test assumes packaging of the Science Pipelines software, in which all the above payloads are represented by a single “meta-package”, *lsst_distrib*.

Preconditions:

Execution status: **Pass**

Final comment:

Detailed steps results:

Step 1 Step Execution Status: **Pass**

Description

The LSST Science Pipelines, described by the `lsst_distrib` meta-package, should be installed following the documentation available at <https://pipelines.lsst.io/>. The suggested Conda environment will be used to ensure that a supported execution environment is available.

Expected Result

Detailed output will depend on the installation method chosen, but will confirm the successful installation of the Science Pipelines.

Actual Result

The Science Pipelines were installed on the shared server `sdfrome001` at the USDF which is running `4.18.0-372.32.1.el8_6.x86_64`, using the procedure described in <https://pipelines.lsst.io/install/lsstinstall.html>. The pipelines binaries were installed.

```
mkdir -p lsst_stack
cd lsst_stack
```

```
curl -OL https://lsst.io/lsstinstall
chmod u+x lsstinstall
./lsstinstall -T v25_0_0
```

```
source loadLSST.sh
```

```
eups distrib install -t v25_0_0 lsst_distrib
curl -sSL https://raw.githubusercontent.com/lsst/shebangtron/main/shebangtron | python
```

Step 2 Step Execution Status: **Pass**

Description

The lsst_distrib top-level metapackage will be enabled. Assuming that the software has been installed at `${LSST_DIR}`:

```
source ${LSST_DIR}/loadLSST.bash
setup lsst_distrib
```

Expected Result

Nothing is printed. The command

```
eups list -s lsst_distrib
```

may be used to confirm that the correct version of the codebase has been installed.

Actual Result

The codebase was successfully setup and confirmed to be v25.0.0.

```
(lsst-scipipe-5.0.1) [yusra@sdfrome001 lsst_stack]$ eups list lsst_distrib
g754a7f0350+bf047f9f57 v25_0_0 current v25_0_0_rc7
(lsst-scipipe-5.0.1) [yusra@sdfrome001 lsst_stack]$ setup lsst_distrib
(lsst-scipipe-5.0.1) [yusra@sdfrome001 lsst_stack]$ eups list -s lsst_distrib
g754a7f0350+bf047f9f57 v25_0_0 current v25_0_0_rc7 setup
```

Step 3 Step Execution Status: **Pass**

Description

The “LSST Stack Demo” package will be downloaded onto the test system from https://github.com/lsst/pipelines_check/releases. The version corresponding to the version of the Science Pipelines under test should be chosen.

Expected Result

Depends on the tool selected by the user for downloading.

Actual Result

```
(lsst-scipipe-5.0.1) [yusra@sdfrome001 lsst_stack]$ git clone https://github.com/lsst/pipelines_check
(lsst-scipipe-5.0.1) [yusra@sdfrome001 lsst_stack]$ cd pipelines_check
(lsst-scipipe-5.0.1) [yusra@sdfrome001 pipelines_check]$ git checkout 25.0.0
```

Step 4 Step Execution Status: **Pass**

Description

The stack demo package is uncompressed into a directory \${DEMO_DIR}.

Expected Result

Depends on options given to the tar command. Should confirm the availability of the stack demo source.

Actual Result

The stack demo source code downloaded via git is available.

Step 5 Step Execution Status: **Pass**

Description

The demo package will be executed by following the instructions in its README file.

Expected Result

Successful execution will result in the string "Ok" being returned.

Actual Result

The pipelines check demo completed and all tests passed.

```
(lsst-scipipe-5.0.1) [yusra@sdfrome001 pipelines_check]$ setup -j -r .
(lsst-scipipe-5.0.1) [yusra@sdfrome001 pipelines_check]$ ./bin/run_demo.sh
+ '[' '' -f DATA_REPO/butler.yaml ']'
+ butler create --seed-config /sdf/data/rubin/user/yusra/DM-32561/lsst_stack/pipelines_check/configs/butler-seed.yaml
DATA_REPO
+ butler register-instrument DATA_REPO lsst.obs.subaru.HyperSuprimeCam
<snip>
- Docs: https://docs.pytest.org/en/stable/how-to/capture-warnings.html
===== 11 passed, 4 warnings in 8.22s =====
```


5.1.3.2 LVV-T1601 - Science Pipelines available on developer hardware

Version **1**. Status **Approved**. Open *LVV-T1601* test case in Jira.

This test will check that a given release of the LSST Science Pipelines is available for use in a “shared stack” on developer infrastructure.

Preconditions:

Execution status: **Pass**

Final comment:

Detailed steps results:

Step 1	Step Execution Status: Pass
Description	
Consult the LSST Developer Guide (http://developer.lsst.io/) to establish:	
<ul style="list-style-type: none">• An appropriate hostname and login instructions for the shared developer infrastructure at the LSST Data Facility;• Instructions for initializing the shared stack on the developer infrastructure.	
<hr/>	
Expected Result	
The Developer Guide clearly presents information about connecting to and using shared infrastructure.	
<hr/>	
Actual Result	
* Instructions for logging into the head nodes at the USDF are available at https://developer.lsst.io/usdf/lsst-login.html	
* Instructions for accessing the shared stack are available at https://developer.lsst.io/usdf/stack.html	

Step 2 Step Execution Status: **Pass**

Description

Connect to the shared infrastructure following the Developer Guide instructions.

Expected Result

A shell prompt on a shared machine.

Actual Result

login successful and a shell prompt is available.

Step 3 Step Execution Status: **Pass**

Description

Initialize the LSST environment following the Developer Guide instructions.

Expected Result

No errors are shown.

Actual Result

The v25.0.0 stack is available in /cvmfs/sw.lsst.eu/linux-x86_64/lsst_distrib/v25.0.0
The executed command was:

```
[yusra@sdfrome001 ~]$ source /cvmfs/sw.lsst.eu/linux-x86_64/lsst_distrib/v25.0.0/loadLSST.bash
```

Step 4 Step Execution Status: **Pass**

Description

List available software products using EUPS, and check that the release under test is available.

Expected Result

The provided version number should be available in the shared stack.

Actual Result

The installation includes v25.0.0, and the exact rubin-env used to build the release.

```
[yusra@sdfrome001 ~]$ source /cvmfs/sw.lsst.eu/linux-x86_64/lsst_distrib/v25.0.0/loadLSST.bash  
(lsst-scipipe-5.0.1-exact) [yusra@sdfrome001 ~]$ eups list lsst_distrib  
g754a7f0350+bf047f9f57 v25_0_0 o_latest v25_0_0_rc7 current
```

5.1.3.3 LVV-T363 - Science Pipelines Release Documentation

Version **1**. Status **Approved**. Open *LVV-T363* test case in Jira.

This test will check:

- That a particular Science Pipelines release is adequately described by documentation at the <https://pipelines.lsst.io/> site;
- That the Science Pipelines release is accompanied by a characterization report which describes its scientific performance.

Preconditions:

Execution status: **Pass**

Final comment:

Detailed steps results:

Step 1	Step Execution Status: Pass
Description	
Load the Science Pipelines website at https://pipelines.lsst.io/ .	

Expected Result

The website is displayed.

Actual Result

The website <https://pipelines.lsst.io> is displayed

Step 2 Step Execution Status: **Pass**

Description

Identify documentation for the release under test. This should be clearly labelled on the documentation site.

If the latest release is being tested, the default page loaded when visiting <https://pipelines.lsst.io/> should be the documentation required.

If this test is for another release, the site should present clear instructions for changing the edition (or version) of the documentation being examined, and documentation for the release under test should be available.

Expected Result

The documentation for the release under test is displayed.

Actual Result

<https://pipelines.lsst.io> is for the release under test and clearly states: "This documentation covers version **v25_0_0**" It was also simple to navigate to "Other Versions", and click on v25_0_0 and land on the permanent page address for this release: https://pipelines.lsst.io/v/v25_0_0/index.html

Step 3 Step Execution Status: **Pass**

Description

Inspect the documentation to ensure that it refers to the release under test, and that it provides:

- Release notes, describing changes in this release relative to the previous;
- Installation instructions, together with a list of supported platforms and prerequisites;
- Getting started information.

Expected Result

The user is satisfied that the required information is available.

Actual Result

The documentation for the following are all available on the front page or linked from the front page:

- Release notes: https://pipelines.lsst.io/v/v25_0_0/releases/v25_0_0.html#release-latest
- Installation instructions: https://pipelines.lsst.io/v/v25_0_0/index.html#installation
- Getting started information: https://pipelines.lsst.io/v/v25_0_0/index.html#getting-started

Step 4 Step Execution Status: **Pass**

Description

Locate the Characterization Metric Report corresponding to this release. It should be linked from the main release documentation.

Expected Result

The user is satisfied that the report is available.

Actual Result

The Metrics Characterization Report at <https://dmtr-392.lsst.io> is clearly linked to the release notes page

Step 5 Step Execution Status: **Pass**

Description

Verify that the characterization metric report describes the scientific performance of the release in terms of a selection of performance metrics drawn from high-level requirements documentation (the Science Requirements Document, LPM-17; the LSST System Requirements, LSE-29; and/or the Observatory System Specifications, LSE-30).

Expected Result

Metric values describing the performance of the release, for example as computed by `validate_drp`, are described in the report.

Actual Result

Metrics computed by `validate_drp`'s `gen3` successor, `faro`, are clearly described in the report and compared with the SRD thresholds and the values in the previous release `v24`.

A Documentation

The verification process is defined in LSE-160. The use of Docsteady to format Jira information in various test and planing documents is described in DMTN-140 and practical commands are given in DMTN-178.

B Acronyms used in this document

Acronym	Description
DM	Data Management
DMTN	DM Technical Note
EUPS	Extended Unix Product System
LDM	LSST Data Management (Document Handle)
LPM	LSST Project Management (Document Handle)
LSE	LSST Systems Engineering (Document Handle)
LSST	Legacy Survey of Space and Time (formerly Large Synoptic Survey Telescope)
LVV	LSST Verification and Validation
PMCS	Project Management Controls System
SRD	LSST Science Requirements; LPM-17
USDF	United States Data Facility