Vera C. Rubin Observatory
Data Management

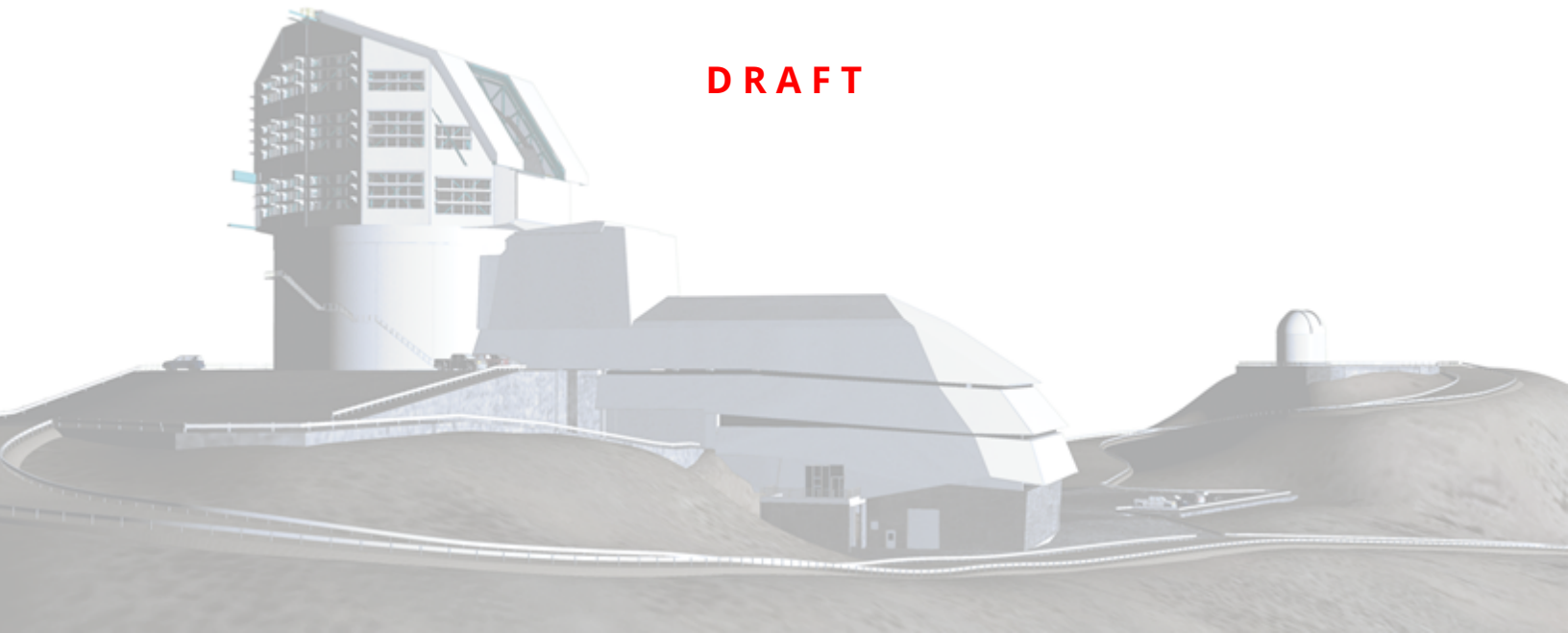
LVV-P117: LDM-503-19a (All P1a DM requirements verified) Test Plan and Report

Jeffrey Carlin

DMTR-412

Latest Revision: 2025-03-27

DRAFT



Abstract

This is the test plan and report for **LDM-503-19a (All P1a DM requirements verified)**, an LSST milestone pertaining to the Data Management Subsystem.
This document is based on content automatically extracted from the Jira test database on 2025-03-27 . The most recent change to the document repository was on 2025-04-16.

Change Record

Version	Date	Description	Owner name
	2023-08-18	First draft	Leanne Guy

Document curator: Leanne Guy
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Version from source repository: 10950d1

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1 Introduction

1.1 Objectives

This DM acceptance test campaign will verify all DM priority 1a requirements that have not been verified as part of prior testing and milestones.

1.2 System Overview

This test campaign is intended to verify that the DM system satisfies all of the priority 1a requirements outlined in the Data Management System Requirements (DMSR; LSE-61), ensuring that we are progressing toward readiness for LSSTCam on-sky observing. Additional DMSR requirements (priorities 1b, 2, and 3) will be verified in later Acceptance Test Campaigns.

Applicable Documents:
LSE-61: Data Management System (DMS) Requirements
LDM-503 Data Management Test Plan
LDM-639: Data Management Acceptance Test Specification

Tests in this campaign will use data products and artifacts from Data Preview 0.2, which consists of DESC Data Challenge 2 (DC2) simulated data reprocessed using the LSST Science Pipelines, on-sky data from auxTel imaging campaigns, precursor data from Subaru+HyperSuprime-Cam (HSC), and camera test-stand data, when appropriate.

1.3 Document Overview

This document was generated from Jira, obtaining the relevant information from the LVV-P117 Jira Test Plan and related Test Cycles (LVV-R275).

Section 1 provides an overview of the test campaign, the system under test (Acceptance), 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-P117 in Jira is **Approved** .

1.4 References

[1] **[DMTN-140]**, Comoretto, G., 2021, *Documentation Automation for the Verification and Validation of Rubin Observatory Software*, Data Management Technical Note DMTN-140, Vera C. Rubin Observatory, URL https://dmtn-140.lsst.io/

[2] **[DMTN-178]**, Comoretto, G., 2021, *Docsteady Usecases for Rubin Observatory Constructions*, Data Management Technical Note DMTN-178, Vera C. Rubin Observatory, URL https://dmtn-178.lsst.io/

[3] **[LSE-61]**, Dubois-Felsmann, G., Jenness, T., 2019, *Data Management System (DMS) Requirements*, Systems Engineering Controlled Document LSE-61, Vera C. Rubin Observatory, URL https://lse-61.lsst.io/

[4] **[LDM-639]**, Guy, L., Wood-Vasey, W., Bellm, E., et al., 2022, *LSST Data Management Acceptance Test Specification*, Data Management Controlled Document LDM-639, Vera C. Rubin Observatory, URL https://ldm-639.lsst.io/

[5] **[LDM-142]**, Kantor, J., 2017, *Network Sizing Model*, Data Management Controlled Document LDM-142, Vera C. Rubin Observatory, URL https://ls.st/LDM-142

[6] **[LDM-503]**, O'Mullane, W., Swinbank, J., Juric, M., et al., 2023, *Data Management Test Plan*, Data Management Controlled Document LDM-503, Vera C. Rubin Observatory, URL https://ldm-503.lsst.io/

[7] **[LSE-160]**, Selvy, B., 2013, *Verification and Validation Process*, Systems Engineering Controlled Document LSE-160, Vera C. Rubin Observatory, URL https://ls.st/LSE-160

2 Test Plan Details

2.1 Data Collection

Observing is not required for this test campaign.

2.2 Verification Environment

Most testing will be performed using the Rubin Science Platform (RSP) and the development cluster at the USDF. All tests will use the most recent available version of the Pipelines.

2.3 Entry Criteria

None

2.4 Exit Criteria

None

2.5 Related Documentation

Docushare collection where additional relevant documentation can be found:

- None

2.6 PMCS Activity

Primavera milestones related to the test campaign: None

3 Personnel

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

	T. Plan LVV-P117 owner:	**Jeffrey Carlin**	
	T. Cycle LVV-R275 owner:	**Jeffrey Carlin**	
Test Cases	**Assigned to**	**Executed by**	**Additional Test Personnel**
LVV-T83	Jim Bosch	Undefined	b″
LVV-T85	Robert Lupton	Undefined	b″
LVV-T2303	Leanne Guy	Undefined	b″
LVV-T33	Kian-Tat Lim	Undefined	b″
LVV-T38	Eric Bellm	Undefined	b″
LVV-T103	Kian-Tat Lim	Undefined	b″
LVV-T45	Eric Bellm	Jeffrey Carlin	b″
LVV-T47	Eric Bellm	Undefined	b″
LVV-T153	Leanne Guy	Jeffrey Carlin	b″
LVV-T88	Eli Rykoff	Undefined	b″
LVV-T89	Eli Rykoff	Undefined	b″
LVV-T189	Leanne Guy	Leanne Guy	b″
LVV-T197	Leanne Guy	Undefined	b″
LVV-T198	Leanne Guy	Undefined	b″
LVV-T34	Kian-Tat Lim	Undefined	b″
LVV-T48	Jim Bosch	Jeffrey Carlin	b″
LVV-T1862	Jeffrey Carlin	Undefined	b″
LVV-T115	Kian-Tat Lim	Undefined	b″
LVV-T98	Kian-Tat Lim	Undefined	b″
LVV-T2693	Jeffrey Carlin	Undefined	b″
LVV-T2699	Jeffrey Carlin	Undefined	b″
LVV-T154	Leanne Guy	Undefined	b″
LVV-T1250	Jeffrey Carlin	Undefined	b″
LVV-T1251	Jeffrey Carlin	Undefined	b″
LVV-T1847	Jeffrey Carlin	Undefined	b″
LVV-T377	Leanne Guy	Undefined	b″
LVV-T1846	Jeffrey Carlin	Undefined	b″
LVV-T1843	Jeffrey Carlin	Undefined	b″
LVV-T1757	Jeffrey Carlin	Jeffrey Carlin	b″

LVV-T1842	Jeffrey Carlin	Undefined	b”
LVV-T1841	Jeffrey Carlin	Undefined	b”
LVV-T1840	Jeffrey Carlin	Undefined	b”
LVV-T1839	Jeffrey Carlin	Undefined	b”
LVV-T1838	Jeffrey Carlin	Undefined	b”
LVV-T1837	Jeffrey Carlin	Undefined	b”
LVV-T1836	Jeffrey Carlin	Jeffrey Carlin	b”
LVV-T1746	Jeffrey Carlin	Jeffrey Carlin	b”
LVV-T1749	Jeffrey Carlin	Jeffrey Carlin	b”
LVV-T1750	Jeffrey Carlin	Jeffrey Carlin	b”
LVV-T1753	Jeffrey Carlin	Jeffrey Carlin	b”
LVV-T1831	Jeffrey Carlin	Undefined	b”
LVV-T129	Jeffrey Carlin	Undefined	b”
LVV-T30	Kian-Tat Lim	Undefined	b”
LVV-T29	Kian-Tat Lim	Jeffrey Carlin	b”
LVV-T2297	Leanne Guy	Undefined	b”
LVV-T1612	Leanne Guy	Cristián Silva	Ron Lambert (LSST), Greg Thayer (SLAC)
LVV-T1168	Leanne Guy	Cristián Silva	Ron Lambert (LSST), Albert Astudillo (REUNA), Mauricio Rojas (CTIO/CISS), Raylex, Coriant, Telefonica contractors
LVV-T1097	Leanne Guy	Cristián Silva	Ron Lambert (Rubin Observatory), Kian-Tat Lim (Rubin Observatory), Matt Kollross (NCSA), Tony Johnson (SLAC), Gregg Thayer (SLAC)
LVV-T192	Leanne Guy	Leanne Guy	Leanne Guy
LVV-T1752	Jeffrey Carlin	Jeffrey Carlin	b”
LVV-T3073	Jeffrey Carlin	Jeffrey Carlin	b”
LVV-T3074	Jeffrey Carlin	Undefined	b”
LVV-T191	Leanne Guy	Leanne Guy	Leanne Guy

4 Test Campaign Overview

4.1 Summary

T. Plan LVV-P117:	**LDM-503-19a (All P1a DM requirements verified)**			Approved
T. Cycle LVV-R275:	**LDM-503-19a (All P1a DM requirements verified)**			In Progress
Test Cases	**Ver.**	**Status**	**Comment**	**Issues**
LVV-T83				
Execution	LVV-E3502	Not Executed	None	
LVV-T85				
Execution	LVV-E3503	Not Executed	None	
LVV-T2303				
Execution	LVV-E3504	Not Executed	None	
LVV-T33				
Execution	LVV-E3505	Not Executed	None	
LVV-T38				
Execution	LVV-E3506	Not Executed	None	
LVV-T103				
Execution	LVV-E3507	Not Executed	None	
LVV-T45				
Execution	LVV-E3508	Pass	It was noted during this testing that a mechanism for exporting the report to PDF would be useful. It is unclear whether such functionality makes sense within Times Square, but we recommend that it either be implemented there, or that a capability should be developed elsewhere to make it straightforward to export a static artifact from the underlying notebook.	
LVV-T47				
Execution	LVV-E3509	Not Executed	None	
LVV-T153				
Execution	LVV-E3510	Pass	Test executed with science pipelines version w_2025_09 in the RSP Notebook aspect at the USDF. The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T153.ipynb."	
LVV-T88				
Execution	LVV-E3511	Not Executed	None	

LVV-T89			
Execution	LVV-E3512	Not Executed	None
LVV-T189			
Execution	LVV-E3519	Pass	None
LVV-T197			
Execution	LVV-E3520	Not Executed	None
LVV-T198			
Execution	LVV-E3521	Not Executed	None
LVV-T34			
Execution	LVV-E3522	Not Executed	None
LVV-T48			
Execution	LVV-E3523	Pass	Test executed with science pipelines version w_2025_09 in the RSP Notebook aspect at the USDF. The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T48.ipynb."
LVV-T1862			
Execution	LVV-E3524	Not Executed	None
LVV-T115			
Execution	LVV-E3525	Not Executed	None
LVV-T98			
Execution	LVV-E3528	Not Executed	None
LVV-T2693			
Execution	LVV-E3530	Not Executed	None
LVV-T2699			
Execution	LVV-E3531	Not Executed	None
LVV-T154			
Execution	LVV-E3532	Not Executed	None
LVV-T1250			
Execution	LVV-E3535	Not Executed	None
LVV-T1251			
Execution	LVV-E3536	Not Executed	None
LVV-T1847			
Execution	LVV-E3537	Not Executed	None
LVV-T377			
Execution	LVV-E3538	Not Executed	None
LVV-T1846			

Execution	LVV-E3539	Not Executed	None
LVV-T1843			
Execution	LVV-E3540	Not Executed	None
LVV-T1757			
Execution	LVV-E3541	Pass	Test executed with science pipelines version w_2024_34 in the RSP Notebook aspect at the USDF. The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1757.ipynb."
LVV-T1842			
Execution	LVV-E3542	Not Executed	None
LVV-T1841			
Execution	LVV-E3543	Not Executed	None
LVV-T1840			
Execution	LVV-E3544	Not Executed	None
LVV-T1839			
Execution	LVV-E3545	Not Executed	None
LVV-T1838			
Execution	LVV-E3546	Not Executed	None
LVV-T1837			
Execution	LVV-E3547	Not Executed	None
LVV-T1836			
Execution	LVV-E3548	Pass	Test executed with science pipelines version w_2024_34 in the RSP Notebook aspect at the USDF. The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1836.ipynb." To allow for some flexibility in changing the method of calculating this metric, it has not yet been implemented within 'analysis_tools'. Before future large-scale data processing campaigns, this metric will be incorporated into the 'analysis_tools' tasks and pipelines that are executed as part of data release processing.
LVV-T1746			

			Test executed with science pipelines version w_2024_34 in the RSP Notebook aspect at the USDF.
Execution	LVV-E3550	Pass	The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1746.ipynb."
LVV-T1749			
			Test executed with science pipelines version w_2024_34 in the RSP Notebook aspect at the USDF.
Execution	LVV-E3551	Pass	The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1749.ipynb."
LVV-T1750			
			Test executed with science pipelines version w_2024_37 in the RSP Notebook aspect at the USDF.
Execution	LVV-E3552	Pass	The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1750_1753.ipynb."
LVV-T1753			
			Test executed with science pipelines version w_2024_37 in the RSP Notebook aspect at the USDF.
Execution	LVV-E3555	Pass	The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1750_1753.ipynb."
LVV-T1831			
Execution	LVV-E3556	Not Executed	None
LVV-T129			
Execution	LVV-E3558	Not Executed	None
LVV-T30			
Execution	LVV-E3559	Not Executed	None
LVV-T29			

	Execution	LVV-E3560	Pass	Test executed with science pipelines version w_2024_34 in the RSP Notebook aspect at the USDF. The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T29.ipynb."
LVV-T2297				
	Execution	LVV-E3561	Not Executed	None
LVV-T1612				
	Execution	LVV-E3647	Pass	None
LVV-T1168				
	Execution	LVV-E3648	Pass	None
LVV-T1097				
	Execution	LVV-E3649	Pass	None
LVV-T192				
	Execution	LVV-E3651	Pass	None
LVV-T1752				
	Execution	LVV-E3735	Pass	Test executed with science pipelines version w_2024_34 in the RSP Notebook aspect at the USDF. The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1752_AF1_AF2.ipynb."
LVV-T3073				
	Execution	LVV-E3743	Pass	This test was executed at the USDF with science pipelines version w_2024_43.
LVV-T3074				
	Execution	LVV-E3744	Not Executed	None
LVV-T191				

			The cluster was moved to the summit facility from the base and is currently in use in commissioning. There is no specification on what should be installed but to provide a useful system, we have ensured that the science pipelines are in stalled and condor as a batch system is available. The verification submits a batch job to run step#1 of nightly validation on some early ComCam images The batch submission was successful. Aspects of the processing failed and were correctly reported by the batch system as failures. This test does not test the processing, only the batch system on the commissioning cluster
Execution	LVV-E3750	Pass	

Table 2: Test Campaign Summary

4.2 Overall Assessment

None

4.3 Recommended Improvements

None

5 Detailed Test Results

5.1 Test Cycle LVV-R275

Open test cycle *LDM-503-19a (All P1a DM requirements verified)* in Jira.

Test Cycle name: LDM-503-19a (All P1a DM requirements verified)
Status: In Progress

Test campaign supporting milestone LDM-503-19a -- all P1a requirements verified.

5.1.1 Software Version/Baseline

b”

5.1.2 Configuration

b”

5.1.3 Test Cases in LVV-R275 Test Cycle

5.1.3.1 LVV-T83 - Verify implementation of Bad Pixel Map

Version **1.0(d)**. Status **Defined**. Open *LVV-T83* test case in Jira.

Verify that the DMS can produce a map of detector pixels that suffer from pathologies, and that these pathologies are encoded in at least 32-bit values.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.2 LVV-T85 - Verify implementation of Crosstalk Correction Matrix

Version **1.0(d)**. Status **Defined**. Open *LVV-T85* test case in Jira.

Verify that the DMS can generate a cross-talk correction matrix from appropriate calibration data.
Verify that the DMS can measure the effectiveness of the cross-talk correction matrix.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.3 LVV-T2303 - Verify Image Archive

Version **1.0(d)**. Status **Draft**. Open *LVV-T2303* test case in Jira.

Verify that all image Data Products produced by the DMS (Processed Science Exposures, Calibration Exposures, Coadded Exposures) are either archived, or be capable of being recreated on-demand from inputs and processing provenance.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.4 LVV-T33 - Verify implementation of Raw Science Image Metadata

Version **1.0(d)**. Status **Approved**. Open *LVV-T33* test case in Jira.

Verify successful ingestion of raw data and that image metadata is present and queryable.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.5 LVV-T38 - Verify implementation of Processed Visit Images

Version **1.0(d)**. Status **Approved**. Open *LVV-T38* test case in Jira.

Verify that the DMS
1. Successfully produces Processed Visit Images, where the instrument signature has been removed.
2. Successfully combines images obtained during a standard visit.

The verification should include confirming that the images have been trimmed of the overscan, and that correction of the instrumental signature (including crosstalk) has been applied properly.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.6 LVV-T103 - Verify implementation of Generate Data Quality Report Within Specified Time

Version **1.0(d)**. Status **Defined**. Open *LVV-T103* test case in Jira.

Verify that the DMS can generate a nightly L1 Data Quality Report within **dqReportComplTime = 4[hour]**, in both human- and machine-readable formats.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.7 LVV-T45 - Verify implementation of Prompt Processing Data Quality Report Definition

Version **1.0(d)**. Status **Approved**. Open *LVV-T45* test case in Jira.

Verify that the DMS produces a Prompt Processing Data Quality Report. Specifically check absolute value and temporal variation of
1. Photometric zeropoint
2. Sky brightness
3. Seeing
4. PSF
5. Detection efficiency

Preconditions:
None

Execution status: **Pass**
Final comment:
It was noted during this testing that a mechanism for exporting the report to PDF would be useful. It is unclear whether such functionality makes sense within Times Square, but we

recommend that it either be implemented there, or that a capability should be developed elsewhere to make it straightforward to export a static artifact from the underlying notebook.

Detailed steps results LVV-R275-LVV-E3508-1243142032:

Step LVV-E3508-1 Step Execution Status: **Pass**

Description

Identify a dataset that has been processed with the Alert Production pipeline. To generate the report, you will need the observation date and instrument.

Test Data

None

Expected Result

Actual Result

By default, the report will display data from LATISS for 2024-09-04.

Step LVV-E3508-2 Step Execution Status: **Pass**

Description

Visit the url for the "AP Data Quality Report" on Times Square, update the date and instrument, then click "Update" to (re-)generate the report. (A default report will likely appear when you first reach the site.)

Test Data

None

Expected Result

A data quality report showing plots that summarize the data taken on the requested observing night.

Actual Result

The url for the AP Data Quality Report is `https://usdf-rsp-dev.slac.stanford.edu/times-square/github/lsst-dm/ap-times-square-notebooks/AP_Data_Quality_Report`. Below we display the report for LATISS data from 2024-09-04, obtained by entering the date and instrument into the boxes at the left. The following screenshot shows the

top of the report, as well as the interface (on the left side) for changing the configuration of the report:
<**Image Download Error**>Image Download Error>

Step LVV-E3508-3 Step Execution Status: **Pass**

Description

Observe that a dynamically updated Data Quality Report has become available at the relevant UI.

Test Data

None

Expected Result

A Prompt Processing QC report is available via a UI, and contains information about the photometric zeropoint, sky brightness, seeing, PSF, and detection efficiency, and possibly other relevant quantities.

Actual Result

The report is available, and displays the following (sets of) plots:

- Photometric Zeropoint vs. Time, by Filter
- Sky Brightness vs. Time, by Filter
- Seeing vs. Time, by Filter
- PSF Parameters vs. Time, by Filter

The detection efficiency for point sources, as requested in the requirement, is not currently available. To generate this would require injecting synthetic sources into the data, which may be beyond the scope of Prompt Processing. In the future, we may instead include the limiting magnitude for each image as a proxy for the detection efficiency, as these two quantities are intimately related.

Because the definition exists within the Times Square framework, we deem this test a "**Pass".** However, this test should be repeated at a later date to confirm that (a) the detection efficiency (or a proxy for it) is reported, and (b) any additional necessary explanatory text or figures is included. We expect the included information to evolve as the survey proceeds.

5.1.3.8 LVV-T47 - Verify implementation of Prompt Processing Calibration Report Definition

Version **1.0(d)**. Status **Defined**. Open *LVV-T47* test case in Jira.

Verify that the DMS produces a Prompt Processing Calibration Report. Specifically check that this report is capable of identifying when aspects of the telescope or camera are changing with time.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.9 LVV-T153 - Verify implementation of Provide Engineering and Facility Database Archive

Version **1.0(d)**. Status **Defined**. Open *LVV-T153* test case in Jira.

Demonstrate Engineering and Facilities Data (images, associated metadata, and observatory environment and control data) are archived and available for public access within **L1PublicT (24 hours)**.

Preconditions:
None

Execution status: **Pass**
Final comment:
Test executed with science pipelines version w_2025_09 in the RSP Notebook aspect at the USDF.

The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T153.ipynb."

Detailed steps results LVV-R275-LVV-E3510-1243142034:

Step LVV-E3510-1 Step Execution Status: **Pass**

Description

Execute on-sky observing, ingesting OCS commands, image headers, and transformed EFD quantities into the Consolidated Database (ConsDB).

Test Data

None

Expected Result

Actual Result

The test was executed during on-sky spectroscopic observing with the LATISS instrument on AuxTel at Cerro Pachon.

Step LVV-E3510-2 Step Execution Status: **Pass**

Description

While observing is ongoing (or at least within **L1PublicT=24** hours), access the ConsDB and confirm that the data products are present.

Test Data

None

Expected Result

The ConsDB contains the expected data, and they were ingested within **L1PublicT=24** hours of the images' observation.

Actual Result

In the attached notebook, we have demonstrated that the ConsDB contains information taken directly from image headers, transformed data from the Engineering Facilities Database (EFD), and derived data based on image processing. As required, these data include information about each exposure, include the telescope and instrument configuration, telemetry from the telescope, environmental and pointing information, and details about the camera.

We have furthermore demonstrated that the ConsDB records are populated well before the L1PublicT=24 hours requirement.

Step LVV-E3510-3 Step Execution Status: **Pass**

Description

From the public access portal to the EFD (ConsDB), execute a query and demonstrate that the data are publicly available.

Test Data

None

Expected Result

A query at the public interface to the EFD successfully executes and returns EFD data.

Actual Result

See the steps above, and the attached notebook. We have demonstrated that ConsDB is populated in nearly real-time, and that it contains the required telemetry and derived quantities.

5.1.3.10 LVV-T88 - Verify implementation of Calibration Data Products

Version **1.0(d)**. Status **Defined**. Open *LVV-T88* test case in Jira.

Verify that the DMS can produce and archive the required Calibration Data Products: cross talk correction, bias, dark, monochromatic dome flats, broad-band flats, fringe correction, and illumination corrections.

Preconditions:

None

Execution status: **Not Executed**

Final comment:

None

5.1.3.11 LVV-T89 - Verify implementation of Calibration Image Provenance

Version **1.0(d)**. Status **Defined**. Open *LVV-T89* test case in Jira.

Verify that the DMS records the required provenance information for the Calibration Data Products.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.12 LVV-T189 - Verify implementation of Summit Facility Infrastructure

Version **1.0(d)**. Status **Draft**. Open *LVV-T189* test case in Jira.

Verify that the Summit Facility provides sufficient computing, storage, and network infrastructure to support buffering and forwarding of all raw image data to the Archive Facility, and compute facilities to support Commissioning activities.

Preconditions:
Summit facility in place

Execution status: **Pass**
Final comment:
None

Detailed steps results LVV-R275-LVV-E3519-1243142038:

Step LVV-E3519-1	Step Execution Status: **Pass**

Description
Inspect the Computing Infrastructure document https://ittn-014.ls for details of the deployed infrastructure at the summit, section 1.2 Cerro Pachon. Ensure they are sufficient to support planned activities

Test Data
None

Expected Result
Compute for the Summit cluster sufficient to support operations

Actual Result
ITTN-014 describes the compute infrastructure on Cerro Pachon (summit).

Logging on to one of the summit nodes (azar)
$ kubectl exec -it rook-ceph-tools-5887567898-4p7qj -n rook-ceph -- /bin/bash
bash-5.1$ ceph df
--- RAW STORAGE ---
CLASS SIZE AVAIL USED RAW USED %RAW USED
nvme 4.5 PiB 4.5 PiB 16 TiB 16 TiB 0.34
TOTAL 4.5 PiB 4.5 PiB 16 TiB 16 TiB 0.34

There is a total of 4.5 PB of storage available. Nightly (24hr cycle) data volume is expected to be ~20TB. 20 nights of storage on the summit is ~ 0.5PB.An internal buffer of about 3 nights data is planned of the camera. This shows there is more than enough storage at the summit buffering and forwarding of data to the Archive during commissioning and operations.

Step LVV-E3519-2 Step Execution Status: **Pass**

Description
Inspect services running on summit systems that support commissioning and operations

Test Data
None

Expected Result
Services running and supporting commissioning

Actual Result

The compute infrastructure includes the commissioning cluster at the summit. This supports pipelines and runs bps jobs as shown in test LVV-T191 (1.0) / LVV-E3750. Additionally, the Rubin Science Platform runs at the summit, the Telescope control system, LOVE (love01/02.cp.lsst.org), RubinTV

Connect to the summit RSP from a laptop at the base runimg openVPN
> % curl -sL summit-lsp.lsst.codes | sed -n 's/.*<meta property="og:title" content="\([^"]*\)".*/\1/p'
Rubin Science Platform @ Summit

Step LVV-E3519-3 Step Execution Status: **Pass**

Description

Inspect network bandwidth from Summit to USDF

Expected Result

Network bandwidth sufficient for predicted data volumes and rates

Actual Result

Network summit to base is 600Gb/s. The base to USDF has 2 links. 1x100Gb/s exclusively for Rubin use and another 1x100Gb/s shared with other regional programs, with a guarantee of 40Gbit/sec minimum for Rubin.

Step LVV-E3519-4 Step Execution Status: **Not Executed**

Description

Measure transfer rates for some test datasets

Test Data

ComCam data

Expected Result

Actual Result

5.1.3.13 LVV-T197 - Verify implementation of Archive Center

Version **1.0(d)**. Status **Draft**. Open *LVV-T197* test case in Jira.

Verify that the Archive Center is sufficiently provisioned to support prompt processing, DRP, and data access needs.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.14 LVV-T198 - Verify implementation of Archive Center Disaster Recovery

Version **1.0(d)**. Status **Draft**. Open *LVV-T198* test case in Jira.

Verify disaster recovery plan for Archive Center.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.15 LVV-T34 - Verify implementation of Guider Calibration Data Acquisition

Version **1.0(d)**. Status **Defined**. Open *LVV-T34* test case in Jira.

Verify successful
1. Ingestion of calibration frames from L1 Test Stand DAQ
2. Execution of CPP payloads
3. Availability of observed guider calibration products

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.16 LVV-T48 - Verify implementation of Exposure Catalog

Version **1.0(d)**. Status **Defined**. Open *LVV-T48* test case in Jira.

Verify that the DMS creates an Exposure Catalog that includes
1. Observation datetime, exposure time
2. Filter
3. Dome, telescope orientation and status
4. Calibration status
5. Airmass and zenith
6. Environmental information
7. Per-sensor information

Preconditions:
None

Execution status: **Pass**
Final comment:
Test executed with science pipelines version w_2025_09 in the RSP Notebook aspect at the USDF.

The executed notebook was saved in the repository associated with this campaign's test re-

port as “notebooks/test_LVV-T48.ipynb.”

Detailed steps results LVV-R275-LVV-E3523-1243142042:

Step LVV-E3523-1 Step Execution Status: **Pass**

Description

Verify that Exposure Catalogs contain the required elements. At present, the form of the exposure catalog is not defined. This information can be found for a given Butler repo from the metadata, but will ultimately be aggregated into a database/table summarizing available exposures.

Test Data

None

Expected Result

A list of the required metadata for a set of exposures is returned and both human- and machine-readable.

Actual Result

In the attached notebook, we have demonstrated that an exposure log of ComCam on-sky data is accessible via the consolidated database (ConsDB). We show that the ConsDB contains information taken directly from image headers, transformed data from the Engineering Facilities Database (EFD), and derived data based on image processing. As required, these data include information about each exposure, include the telescope and instrument configuration, telemetry from the telescope, environmental and pointing information, and details about the camera.

In some examples shown, columns that exist in the database are not yet populated. Nonetheless, this test is deemed to *PASS* because we have demonstrated the existence of a database (ConsDB) keyed on day_obs, which can take inputs from a variety of sources, all of which can be configured (see the code for configuring and populating ConsDB at this github link).

5.1.3.17 LVV-T1862 - Verify determining effectiveness of dark current frame

Version **1.0(d)**. Status **Draft**. Open *LVV-T1862* test case in Jira.

Verify that the DMS can determine the effectiveness of a dark correction and determine how

often it should be updated.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.18 LVV-T115 - Verify implementation of Calibration Production Processing

Version **1.0(d)**. Status **Approved**. Open *LVV-T115* test case in Jira.

Execute CPP on a variety of representative cadences, and verify that the calibration pipeline correctly produces necessary calibration products.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.19 LVV-T98 - Verify implementation of Selection of Datasets

Version **1.0(d)**. Status **Defined**. Open *LVV-T98* test case in Jira.

Verify that the DMS can identify and retrieve datasets consisting of logical groupings of Exposures, metadata, provenance, etc., or other groupings that are processed or produced as a logical unit.

Preconditions:

None

Execution status: **Not Executed**
Final comment:
None

5.1.3.20 LVV-T2693 - Verify implementation of Image Provenance Access

Version **1.0(d)**. Status **Draft**. Open *LVV-T2693* test case in Jira.

Verify that available image data products' provenance information can be listed and retrieved.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.21 LVV-T2699 - Verify implementation of Catalog Provenance Access

Version **1.0(d)**. Status **Draft**. Open *LVV-T2699* test case in Jira.

Verify that available catalog data products' provenance can be listed and retrieved.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.22 LVV-T154 - Verify implementation of Raw Data Archiving Reliability

Version **1.0(d)**. Status **Draft**. Open *LVV-T154* test case in Jira.

Verify that raw images are reliably archived.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.23 LVV-T1250 - Verify implementation of minimum number of simultaneous DM EFD query users

Version **1.0(d)**. Status **Draft**. Open *LVV-T1250* test case in Jira.

Verify that the DM EFD can support **dmEfdQueryUsers = 5** simultaneous queries. The additional requirement that each query must last no more than **dmEfdQueryTime = 10 seconds** will be verified separately in LVV-T1251, but these must be satisfied together.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.24 LVV-T1251 - Verify implementation of maximum time to retrieve DM EFD query results

Version **1.0(d)**. Status **Draft**. Open *LVV-T1251* test case in Jira.

Verify that the DM EFD can support **dmEfdQueryUsers = 5** simultaneous queries, with each query must executing in no more than **dmEfdQueryTime = 10 seconds.** The requirement on at least 5 simultaneous queries will be verified separately in LVV-T1250, but these must be satisfied together.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.25 LVV-T1847 - Verify calculation of sensor fraction with unusable pixels

Version **1.0(d)**. Status **Draft**. Open *LVV-T1847* test case in Jira.

Verify that the DM system provides software to assess whether the maximum allowable fraction of sensors with **PixFrac > 1** percent scientifically unusable pixels is less than **SensorFraction = 15 percent.**

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.26 LVV-T377 - Verify Calculation of Photometric Performance Metrics

Version **1.0(d)**. Status **Approved**. Open *LVV-T377* test case in Jira.

Verify that the DMS system provides software to calculate photometric performance metrics, and that the algorithms are properly calculating the desired quantities. Note that because the DMS requirement is that the software shall be provided (and not on the actual measured values of the metrics), we verify all of the requirements via a single test case.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.27 LVV-T1846 - Verify calculation of band-to-band color zero-point accuracy including u-band

Version **1.0(d)**. Status **Draft**. Open *LVV-T1846* test case in Jira.

Verify that the DM system provides software to assess whether the accuracy of absolute band-to-band color zero-points for all colors constructed from any filter pair, including the u-band, is less than **PA5u = 10 millimagnitudes**.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.28 LVV-T1843 - Verify calculation of significance of imperfect crosstalk corrections

Version **1.0(d)**. Status **Draft**. Open *LVV-T1843* test case in Jira.

Verify that the DM system provides software to assess whether the maximum local significance integrated over the PSF of imperfect crosstalk corrections is less than **Xtalk = 3 sigma**.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.29 LVV-T1757 - Verify calculation of photometric repeatability in gri filters

Version **1.0(d)**. Status **Approved**. Open *LVV-T1757* test case in Jira.

Verify that the DM system has provided the code to calculate the RMS photometric repeatability of bright non-saturated unresolved point sources in the g, r, and i filters, and assess whether it meets the requirement that it shall be less than **PA1gri = 5.0 millimagnitudes**.

Preconditions:
None

Execution status: **Pass**
Final comment:
Test executed with science pipelines version w_2024_34 in the RSP Notebook aspect at the USDF.

The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1757.ipynb."

Detailed steps results LVV-R275-LVV-E3541-1243142059:

Step LVV-E3541-1	Step Execution Status: **Pass**
Description	

Identify a dataset containing at least one field in each of the g, r, and i filters with multiple overlapping visits.

Test Data
None

Expected Result
A dataset that has been ingested into a Butler repository.

Actual Result
For this test we use the most recent reprocessing of the Subaru+HSC RC2 dataset. The data were processed with the w_2024_34 pipelines.

Step LVV-E3541-2 Step Execution Status: **Pass**

Description
Execute 'analysis_tools' on a repository containing processed data. Identify the path to the data, which we will call 'DATA/path', then execute something similar to the following (with paths, datasets, and flags replaced or additionally specified as needed):

Test Data
None

Expected Result
The output collection (in this case, "u/username/atools_metrics") containing metric measurements and any associated extras and metadata is available via the butler.

Actual Result

```
The processed RC2 data products are accessed via the Butler using the following commands:

from lsst.daf.butler import Butler


# Initialize the butler repo pointing to the DM-45857 (w_2024_34) collection
repo = '/repo/main'
collection = 'HSC/runs/RC2/w_2024_34/DM-45857'
```

```
butler = Butler(repo, collections=collection)
```

Step LVV-E3541-3 Step Execution Status: **Pass**

Description

Confirm that the metric PA1gri has been calculated, and that its values are reasonable.

Test Data

None

Expected Result

A JSON file (and/or a report generated from that JSON file) demonstrating that PA1gri has been calculated.

Actual Result

In the attached notebook, the metrics were retrieved and printed to the screen, resulting in the following output:

```
Tract 9615:

g_stellarPhotRepeatStdev = 7.36 mmag
r_stellarPhotRepeatStdev = 7.31 mmag
i_stellarPhotRepeatStdev = 7.68 mmag

Tract 9697:

g_stellarPhotRepeatStdev = 7.57 mmag
r_stellarPhotRepeatStdev = 7.31 mmag
i_stellarPhotRepeatStdev = 8.46 mmag

Tract 9813:

g_stellarPhotRepeatStdev = 8.24 mmag
r_stellarPhotRepeatStdev = 8.99 mmag
i_stellarPhotRepeatStdev = 8.03 mmag
```

The quantities "{band}_stellarPhotRepeatStdev" correspond to the photometric repeatability metric **PA1**.

In the attached notebook, we also demonstrated the retrieval of plots generated by 'analysis_tools' showing the distribution of repeatability values from which PA1 was calculated.

The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1757.ipynb."

5.1.3.30 LVV-T1842 - Verify calculation of zeropoint error fraction exceeding the outlier limit

Version **1.0(d)**. Status **Draft**. Open *LVV-T1842* test case in Jira.

Verify that the DM system provides software to calculate the fraction of zeropoint errors that exceed the zero point error outlier limit, and confirm that it is less than **PF2 = 10 percent.**

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.31 LVV-T1841 - Verify calculation of scientifically unusable pixel fraction

Version **1.0(d)**. Status **Draft**. Open *LVV-T1841* test case in Jira.

Verify that the DM system provides software to assess whether the maximum fraction of pixels scientifically unusable per sensor out of the total allowable fraction of sensors meeting this performance is less than **PixFrac = 1 percent**.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.32 LVV-T1840 - Verify calculation of sky brightness precision

Version **1.0(d)**. Status **Draft**. Open *LVV-T1840* test case in Jira.

Verify that the DM system provides software to assess whether the maximum error in the precision of the sky brightness determination is less than **SBPrec = 1 percent.**

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.33 LVV-T1839 - Verify calculation of RMS width of photometric zeropoint

Version **1.0(d)**. Status **Draft**. Open *LVV-T1839* test case in Jira.

Verify that the DM system provides code to assess whether the RMS width of the internal photometric zero-point (precision of system uniformity across the sky) for all bands except u-band is less than **PA3 = 10 millimagnitudes**.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.34 LVV-T1838 - Verify calculation of image fraction affected by ghosts

Version **1.0(d)**. Status **Draft**. Open *LVV-T1838* test case in Jira.

Verify that the DM system provides code to assess whether the percentage of image area that has ghosts with surface brightness gradient amplitude of more than 1/3 of the sky noise over 1 arcsec is less than **GhostAF = 1 percent**.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.35 LVV-T1837 - Verify calculation of band-to-band color zero-point accuracy

Version **1.0(d)**. Status **Draft**. Open *LVV-T1837* test case in Jira.

Verify that the DM system provides code to assess whether the accuracy of absolute band-to-band color zero-points for all colors constructed from any filter pair, excluding the u-band, is less than **PA5 = 5 millimagnitudes**.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.36 LVV-T1836 - Verify calculation of resolved-to-unresolved flux ratio errors

Version **1.0(d)**. Status **Defined**. Open *LVV-T1836* test case in Jira.

Verify that the DM system has provided code to assess whether the maximum RMS of the ratio of the error in integrated flux measurement between bright, isolated, resolved sources less than 10 arcsec in diameter and bright, isolated unresolved point sources is less than **ResSource = 2**.

Preconditions:
None

Execution status: **Pass**
Final comment:
Test executed with science pipelines version w_2024_34 in the RSP Notebook aspect at the USDF.

The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1836.ipynb."

To allow for some flexibility in changing the method of calculating this metric, it has not yet been implemented within 'analysis_tools'. Before future large-scale data processing campaigns, this metric will be incorporated into the 'analysis_tools' tasks and pipelines that are executed as part of data release processing.

Detailed steps results LVV-R275-LVV-E3548-1243142066:

Step LVV-E3548-1 Step Execution Status: **Pass**

Description
Identify a dataset containing at least one tract that has been processed through coaddition to create an objectTable.

Test Data
None

Expected Result
A dataset that has been ingested into a Butler repository.

Actual Result

For this test we use a recent reprocessing of the Subaru+HSC RC2 dataset. The data were processed with the w_2024_34 pipelines.

Step LVV-E3548-2 Step Execution Status: **Pass**

Description

The 'path' that you will use depends on where you are running the science pipelines. Options:

- local (newinstall.sh - based install):[path_to_installation]/loadLSST.bash
- development cluster ("lsst-dev"): /software/lsstsw/stack/loadLSST.bash
- LSP Notebook aspect (from a terminal): /opt/lsst/software/stack/loadLSST.bash

From the command line, execute the commands below in the example code:

Test Data

None

Expected Result

Science pipeline software is available for use. If additional packages are needed (for example, 'obs' packages such as 'obs_subaru'), then additional 'setup' commands will be necessary.

To check versions in use, type:
eups list -s

Actual Result

The pipelines were set up with w_2024_34.

Step LVV-E3548-3 Step Execution Status: **Pass**

Description

Identify the path to the data repository, which we will refer to as 'DATA/path', then execute the following:

Test Data
None

Expected Result
Butler repo available for reading.

Actual Result

```
The processed RC2 data products are accessed via the Butler using the following commands:

from lsst.daf.butler import Butler


# Initialize the butler repo pointing to the DM-45857 (w_2024_34) collection
repo = '/repo/main'
collection = 'HSC/runs/RC2/w_2024_34/DM-45857'

butler = Butler(repo, collections=collection)
```

Step LVV-E3548-4 Step Execution Status: **Pass**

Description
On an 'objectTable_tract' table, execute the following steps:

- Apply a signal-to-noise (SNR) cut to select only bright sources. (Default: SNR > 100)
- Select isolated objects based on the "detect_isIsolated" flag.
- Select galaxies and stars based on their "refSizeExtendedness" values.
- Select only galaxies with diameters less than 10 arcsec (based on their moments-based trace sizes).
- Bin the flux error values for (separately) selected bright, isolated stars and galaxies into magnitude bins.
- Calculate the ratio of the median flux errors in each bin for resolved sources (galaxies) vs. unresolved (stars).
- Report summary statistics aggregating the magnitude-binned ratios, and return these statistics (mean, median, stdev, etc. over all magnitude bins for the patch).

Test Data
None

Expected Result

Summary values of the median ratio of resolved to unresolved flux errors for bright, isolated sources in the objectTable.

Actual Result

In the attached notebook, this calculation is demonstrated for the three tracts of data contained in RC2. The values of **ResSource** are represented by the ”mean values” in the following output:

```
Mean values, stdev for each RC2 tract
-------------------------------------

tract 9615: mean=1.386, std=0.020
tract 9697: mean=1.438, std=0.071
tract 9813: mean=1.261, std=0.086
```

The attached notebook also includes some plots illustrating how the metric was calculated in detail.

We see that the values are well below the threshold (**ResSource < 2**) defined in the requirement, and thus this test passes.

5.1.3.37 LVV-T1746 - Verify calculation of fraction of relative astrometric measurement error on 5 arcminute scales exceeding outlier limit

Version **1.0(d)**. Status **Approved**. Open *LVV-T1746* test case in Jira.

Verify that the DM system has provided the code to calculate the maximum fraction of relative astrometric measurements on 5 arcminute scales that exceed the 5 arcminute outlier limit **AD1 = 20 milliarcseconds**, and assess whether it meets the requirement that it shall be less than **AF1 = 10 percent.**

Preconditions:

None

Execution status: **Pass**
Final comment:
Test executed with science pipelines version w_2024_34 in the RSP Notebook aspect at the USDF.

The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1746.ipynb."

Detailed steps results LVV-R275-LVV-E3550-1243142068:

Step LVV-E3550-1 Step Execution Status: **Pass**

Description
Identify a dataset containing at least one field with multiple overlapping visits.

Test Data
None

Expected Result
A dataset that has been ingested into a Butler repository.

Actual Result
For this test we use the most recent reprocessing of the Subaru+HSC RC2 dataset. The data were processed with the w_2024_34 pipelines.

Step LVV-E3550-2 Step Execution Status: **Pass**

Description
The 'path' that you will use depends on where you are running the science pipelines. Options:

- local (newinstall.sh - based install):[path_to_installation]/loadLSST.bash
- development cluster ("lsst-dev"): /software/lsstsw/stack/loadLSST.bash
- LSP Notebook aspect (from a terminal): /opt/lsst/software/stack/loadLSST.bash

From the command line, execute the commands below in the example code:

Test Data
None

Expected Result
Science pipeline software is available for use. If additional packages are needed (for example, 'obs' packages such as 'obs_subaru'), then additional 'setup' commands will be necessary.

To check versions in use, type:
eups list -s

Actual Result
The pipelines were set up with w_2024_34.

Step LVV-E3550-3 Step Execution Status: **Pass**

Description
Execute 'analysis_tools' on a repository containing processed data. Identify the path to the data, which we will call 'DATA/path', then execute something similar to the following (with paths, datasets, and flags replaced or additionally specified as needed):

Test Data
None

Expected Result
The output collection (in this case, "u/username/atools_metrics") containing metric measurements and any associated extras and metadata is available via the butler.

Actual Result

```
The processed RC2 data products are accessed via the Butler using the following commands:

from lsst.daf.butler import Butler
```

```
# Initialize the butler repo pointing to the DM-45857 (w_2024_34) collection
repo = '/repo/main'
collection = 'HSC/runs/RC2/w_2024_34/DM-45857'

butler = Butler(repo, collections=collection)
```

Step LVV-E3550-4 Step Execution Status: **Pass**

Description

Confirm that the metric AF1 has been calculated using the outlier limit AD1, and that its values are reasonable.

Test Data

None

Expected Result

A JSON file (and/or a report generated from that JSON file) demonstrating that AF1 has been calculated (and used the limit AD1).

Actual Result

In the attached notebook, the metrics were retrieved and printed to the screen, resulting in the following output:

```
Tract 9615:

g_AF1 = 0.07 %
r_AF1 = 0.07 %
i_AF1 = 0.52 %

Tract 9697:

g_AF1 = 1.97 %
r_AF1 = 1.09 %
i_AF1 = 0.07 %

Tract 9813:

g_AF1 = 0.59 %
r_AF1 = 1.42 %
i_AF1 = 1.25 %
```

In the attached notebook, we also demonstrated the retrieval of plots generated by 'analysis_tools' showing the distribution of source separations from which **AF1** was calculated.

Finally, we confirmed via inspection of the relevant code that the AD1 threshold is set to 20 mas by default, as required.

The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1746.ipynb."

5.1.3.38 LVV-T1749 - Verify calculation of fraction of relative astrometric measurement error on 20 arcminute scales exceeding outlier limit

Version **1.0(d)**. Status **Approved**. Open *LVV-T1749* test case in Jira.

Verify that the DM system has provided the code to calculate the maximum fraction of relative astrometric measurements on 20 arcminute scales that exceed the 20 arcminute outlier limit **AD2 = 20 milliarcseconds**, and assess whether it meets the requirement that it shall be less than **AF2 = 10 percent.**

Preconditions:
None

Execution status: **Pass**
Final comment:
Test executed with science pipelines version w_2024_34 in the RSP Notebook aspect at the USDF.

The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1749.ipynb."

Detailed steps results LVV-R275-LVV-E3551-1243142069:

Step LVV-E3551-1	Step Execution Status: **Pass**

Description

Identify a dataset containing at least one field with multiple overlapping visits.

Test Data
None

Expected Result
A dataset that has been ingested into a Butler repository.

Actual Result
For this test we use the most recent reprocessing of the Subaru+HSC RC2 dataset. The data were processed with the w_2024_34 pipelines.

Step LVV-E3551-2 Step Execution Status: **Pass**

Description
The 'path' that you will use depends on where you are running the science pipelines. Options:

- local (newinstall.sh - based install):[path_to_installation]/loadLSST.bash
- development cluster ("lsst-dev"): /software/lsstsw/stack/loadLSST.bash
- LSP Notebook aspect (from a terminal): /opt/lsst/software/stack/loadLSST.bash

From the command line, execute the commands below in the example code:

Test Data
None

Expected Result
Science pipeline software is available for use. If additional packages are needed (for example, 'obs' packages such as 'obs_subaru'), then additional 'setup' commands will be necessary.

To check versions in use, type:
eups list -s

Actual Result

The pipelines were set up with w_2024_34.

Step LVV-E3551-3 Step Execution Status: **Pass**

Description

Execute 'analysis_tools' on a repository containing processed data. Identify the path to the data, which we will call 'DATA/path', then execute something similar to the following (with paths, datasets, and flags replaced or additionally specified as needed):

Test Data

None

Expected Result

The output collection (in this case, "u/username/atools_metrics") containing metric measurements and any associated extras and metadata is available via the butler.

Actual Result

```
The processed RC2 data products are accessed via the Butler using the following commands:

from lsst.daf.butler import Butler


# Initialize the butler repo pointing to the DM-45857 (w_2024_34) collection
repo = '/repo/main'
collection = 'HSC/runs/RC2/w_2024_34/DM-45857'

butler = Butler(repo, collections=collection)
```

Step LVV-E3551-4 Step Execution Status: **Pass**

Description

Confirm that the metric AF2 has been calculated using the outlier limit AD2, and that its values are reasonable.

Test Data

None

Expected Result

A JSON file (and/or a report generated from that JSON file) demonstrating that AF2 has been calculated (and used the limit AD2).

Actual Result

In the attached notebook, the metrics were retrieved and printed to the screen, resulting in the following output:

```
Tract 9615:

g_AF2 = 0.06 %
r_AF2 = 0.05 %
i_AF2 = 0.45 %

Tract 9697:

g_AF2 = 2.01 %
r_AF2 = 1.08 %
i_AF2 = 0.06 %

Tract 9813:

g_AF2 = 0.70 %
r_AF2 = 1.35 %
i_AF2 = 1.33 %
```

In the attached notebook, we also demonstrated the retrieval of plots generated by 'analysis_tools' showing the distribution of source separations from which **AF2** was calculated.

Finally, we confirmed via inspection of the relevant code that the AD2 threshold is set to 20 mas by default, as required.

The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1749.ipynb."

5.1.3.39 LVV-T1750 - Verify calculation of separations relative to r-band exceeding color difference outlier limit

Version **1.0(d)**. Status **Approved**. Open *LVV-T1750* test case in Jira.

Verify that the DM system has provided the code to calculate the separations measured relative to the r-band that exceed the color difference outlier limit **AB2 = 20 milliarcseconds**, and assess whether it meets the requirement that it shall be less than **ABF1 = 10 percent.**

Preconditions:
None

Execution status: **Pass**
Final comment:
Test executed with science pipelines version w_2024_37 in the RSP Notebook aspect at the USDF.

The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1750_1753.ipynb."

Detailed steps results LVV-R275-LVV-E3552-1243142070:

Step LVV-E3552-1 Step Execution Status: **Pass**

Description
Identify a dataset containing at least one field with multiple overlapping visits, and including at least one visit in r-band.

Test Data
None

Expected Result
A dataset that has been ingested into a Butler repository.

Actual Result
For this test we use the most recent reprocessing of the Subaru+HSC RC2 dataset. The data were processed with

the w_2024_34 pipelines.

Step LVV-E3552-2 Step Execution Status: **Pass**

Description

The ‘path‘ that you will use depends on where you are running the science pipelines. Options:

- local (newinstall.sh - based install):[path_to_installation]/loadLSST.bash
- development cluster (”lsst-dev”): /software/lsstsw/stack/loadLSST.bash
- LSP Notebook aspect (from a terminal): /opt/lsst/software/stack/loadLSST.bash

From the command line, execute the commands below in the example code:

– –

Test Data

None

– –

Expected Result

Science pipeline software is available for use. If additional packages are needed (for example, ’obs’ packages such as ‘obs_subaru‘), then additional ‘setup‘ commands will be necessary.

To check versions in use, type:
eups list -s

– –

Actual Result

The pipelines were set up with w_2024_37.

Step LVV-E3552-3 Step Execution Status: **Pass**

Description

Execute ‘analysis_tools‘ on a repository containing processed data. Identify the path to the data, which we will call ’DATA/path’, then execute something similar to the following (with paths, datasets, and flags replaced or additionally specified as needed):

– –

Test Data

None

Expected Result

The output collection (in this case, "u/username/atools_metrics") containing metric measurements and any associated extras and metadata is available via the butler.

Actual Result

Because the relevant 'analysis_tools' tasks are not executed in the default pipeline, we executed them manually by entering the following on the command line:

pipetask run -b /repo/main -i HSC/runs/RC2/w_2024_34/DM-45857 -p ./visitQualityCore.yaml -o u/jcarlin/atools_visitQualityCore_AB
--instrument lsst.obs.subaru.HyperSuprimeCam --register-dataset-types -d "skymap='hsc_rings_v1' AND instrument='HSC'
AND visit IN (26044,26046,26048,26050,26058,23884,23886,23888,23890,23898,1302,1306,1308,1310,1314,23250,23256,23258,270
-j 6 2>&1 | tee atools_visitQualityCore_AB1_gri_test.log

The list of visits contains 5 visits in each of the griz bands.

A butler with results from the processing is initialized using the following commands:

```
repo = '/repo/main'
collection = 'u/jcarlin/atools_visitQualityCore_AB1'

butler = Butler(repo, collections=collection)
```

Step LVV-E3552-4 Step Execution Status: **Pass**

Description

Confirm that the metric ABF1 has been calculated using the outlier limit AB2, and that its values are reasonable.

Test Data

None

Expected Result

A JSON file (and/or a report generated from that JSON file) demonstrating that ABF1 has been calculated (and used the limit AB2).

Actual Result

In the attached notebook, the metrics were retrieved and printed to the screen, resulting in the following output for the mean values of ABF1:

```
g
abf1_ra = 0.02 %
abf1_dec = 0.08 %
abf1_tot = 0.12 %

i
abf1_ra = 2.72 %
abf1_dec = 3.67 %
abf1_tot = 5.78 %

z
abf1_ra = 0.38 %
abf1_dec = 0.67 %
abf1_tot = 1.47 %
```

In the attached notebook, we also demonstrated the retrieval of plots generated by 'analysis_tools' showing the distribution of source separations from which **ABF1** was calculated.

Finally, we confirmed via inspection of the relevant code that the AB2 threshold is set to 20 mas by default, as required.

The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1750_1753.ipynb."

5.1.3.40 LVV-T1753 - Verify calculation of RMS difference of separations relative to r-band

Version **1.0(d)**. Status **Approved**. Open *LVV-T1753* test case in Jira.

Verify that the DM system has provided the code to calculate the separations measured relative to the r-band, and assess whether it meets the requirement that it shall be less than **AB1**

= 10 milliarcseconds.

Preconditions:
None

Execution status: **Pass**
Final comment:
Test executed with science pipelines version w_2024_37 in the RSP Notebook aspect at the USDF.

The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1750_1753.ipynb."

Detailed steps results LVV-R275-LVV-E3555-1243142073:

Step LVV-E3555-1 Step Execution Status: **Pass**

Description
Identify a dataset containing at least one field with multiple overlapping visits, and including at least one visit in r-band.

Test Data
None

Expected Result
A dataset that has been ingested into a Butler repository.

Actual Result
For this test we use the most recent reprocessing of the Subaru+HSC RC2 dataset. The data were processed with the w_2024_34 pipelines.

Step LVV-E3555-2 Step Execution Status: **Pass**

Description
The 'path' that you will use depends on where you are running the science pipelines. Options:

- local (newinstall.sh - based install):[path_to_installation]/loadLSST.bash
- development cluster (”lsst-dev”): /software/lsstsw/stack/loadLSST.bash
- LSP Notebook aspect (from a terminal): /opt/lsst/software/stack/loadLSST.bash

From the command line, execute the commands below in the example code:

Test Data
None

Expected Result
Science pipeline software is available for use. If additional packages are needed (for example, ’obs’ packages such as ‘obs_subaru‘), then additional ‘setup‘ commands will be necessary.

To check versions in use, type:
eups list -s

Actual Result
The pipelines were set up with w_2024_37.

Step LVV-E3555-3 Step Execution Status: **Pass**

Description
Execute ‘analysis_tools‘ on a repository containing processed data. Identify the path to the data, which we will call ’DATA/path’, then execute something similar to the following (with paths, datasets, and flags replaced or additionally specified as needed):

Test Data
None

Expected Result
The output collection (in this case, ”u/username/atools_metrics”) containing metric measurements and any associated extras and metadata is available via the butler.

Actual Result

Because the relevant 'analysis_tools' tasks are not executed in the default pipeline, we executed them manually by entering the following on the command line:

pipetask run -b /repo/main -i HSC/runs/RC2/w_2024_34/DM-45857 -p ./visitQualityCore.yaml -o u/jcarlin/atools_visitQualityCore_AB1 --instrument lsst.obs.subaru.HyperSuprimeCam --register-dataset-types -d "skymap='hsc_rings_v1' AND instrument='HSC' AND visit IN (26044,26046,26048,26050,26058,23884,23886,23888,23890,23898,1302,1306,1308,1310,1314,23250,23256,23258,270 -j 6 2>&1 | tee atools_visitQualityCore_AB1_gri_test.log

The list of visits contains 5 visits in each of the griz bands.

A butler with results from the processing is initialized using the following commands:

```
repo = '/repo/main'
collection = 'u/jcarlin/atools_visitQualityCore_AB1'

butler = Butler(repo, collections=collection)
```

Step LVV-E3555-4 Step Execution Status: **Pass**

Description

Confirm that the metric AB1 has been calculated, and that its values are reasonable.

Test Data

None

Expected Result

A JSON file (and/or a report generated from that JSON file) demonstrating that AB1 has been calculated.

Actual Result

In the attached notebook, the metrics were retrieved and printed to the screen, resulting in the following output for the mean values of AB1:

```
g
ab1_ra = 3.67 mas
ab1_dec = 4.40 mas
ab1_tot = 5.78 mas
```

```
i
ab1_ra = 8.62 mas
ab1_dec = 10.73 mas
ab1_tot = 11.62 mas

z
ab1_ra = 12.32 mas
ab1_dec = 11.27 mas
ab1_tot = 17.60 mas
```

In the attached notebook, we also demonstrated the retrieval of plots generated by 'analysis_tools' showing the distribution of source separations from which **AB1** was calculated.

The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1750_1753.ipynb."

5.1.3.41 LVV-T1831 - Verify Implementation of Data Management Nightly Reporting

Version **1.0(d)**. Status **Draft**. Open *LVV-T1831* test case in Jira.

Verify that the LSST Data Management subsystem produces a searchable - interactive nightly report(s), from information published in the EFD by each subsystem, summarizing performance and behavior over a user defined period of time (e.g. the previous 24 hours).

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.42 LVV-T129 - Verify implementation of Provide Calibrated Photometry

Version **1.0(d)**. Status **Approved**. Open *LVV-T129* test case in Jira.

Verify that the DMS provides photometry calibrated in AB mags and fluxes (in nJy) for all measured objects and sources. Must be tested for both DRP and AP products.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.43 LVV-T30 - Verify implementation of Wavefront Sensor Data Acquisition

Version **1.0(d)**. Status **Defined**. Open *LVV-T30* test case in Jira.

Verify successful ingestion of wavefront sensor data from L1 Test Stand DAQ while simulating all modes.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.44 LVV-T29 - Verify implementation of Raw Science Image Data Acquisition

Version **1.0(d)**. Status **Approved**. Open *LVV-T29* test case in Jira.

Verify acquisition of raw data from an LSST camera in all modes.

Preconditions:
None

Execution status: **Pass**
Final comment:
Test executed with science pipelines version w_2024_34 in the RSP Notebook aspect at the USDF.

The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T29.ipynb."

Detailed steps results LVV-R275-LVV-E3560-1243142078:

Step LVV-E3560-1 Step Execution Status: **Pass**

Description
Obtain images from a camera (either real or simulated) in each observing mode.

Test Data
None

Expected Result
CCD images ingested into the Data Backbone.

Actual Result
For this test we use images from a recent Auxtel imaging night. To access these images in the USDF RSP, we execute the following:

```
from lsst.daf.butler import Butler

# Initialize the butler repo pointing to the LATISS/raw/all collection
repo = '/repo/embargo_new'
collection = 'LATISS/raw/all'

butler = Butler(repo, collections=[collection])
```

Step LVV-E3560-2 Step Execution Status: **Pass**

Description

Observe that the images and their metadata are present and queryable in the Data Backbone.

Test Data

None

Expected Result

Well-formed image data with appropriate associated metadata.

Actual Result

In the attached notebook, we demonstrate that the raw LATISS images can be queried as follows:

flats = butler.query_datasets('raw', where="day_obs=20240807 AND instrument='LATISS' AND band in ('g','r','i','z','y') AND exposure.observation_type='flat'")

Example images are then examined, including confirming that metadata and objects made up of translated versions of those metadata are available. We also displayed the images, confirming that they are well-formed and look as expected for raw images.

Finally, the attached notebook looks at the LSST Science Pipelines "obs" packages in some detail. For more information about these, see lsst.obs_base for the base class, lsst.obs_lsst for implementations of various LSST cameras, and this guidance about how to set up an obs package.

We have demonstrated that raw images can be obtained with an LSST camera, and that the interfaces exist to transform them as needed and ingest them into the Butler. The result of this test is a **Pass**.

5.1.3.45 LVV-T2297 - Verify implementation of Science Data Archive

Version **1.0(d)**. Status **Draft**. Open *LVV-T2297* test case in Jira.

Verify that a Science Data Archive has been created and that all LSST public data products have been archived together with the raw data necessary to reproduce them. Verify that the archive is scalable to the data from the full survey and all Data Releases.

This requirement will be verified by analysis. Verification must demonstrate that we have a a written plan for how data will be archived and that the storage systems needed exist. The plan should include details on recovery. This is needed before commissioning to support commissioning data taking.

Preconditions:
None

Execution status: **Not Executed**
Final comment:
None

5.1.3.46 LVV-T1612 - Verify Summit - Base Network Integration (System Level)

Version **1.0(d)**. Status **Approved**. Open *LVV-T1612* test case in Jira.

Verify ISO Layer 3 full (22 x 10 Gbps ethernet ports on DAQ side with test data from DAQ test stand, AURA, Camera DAQ team do test). Demonstrate transfer of data at or exceeding rates specified in LDM-142.

Preconditions:

1. PMCS DMTC-7400-2400 COMPLETE
2. LVV-T1168 Passed
3. EITHER: Full Camera DAQ installed on summit and loaded with data OR: high-quality DAQ application-level simulators that match the form, volume, file paths, compressibility, and cadence of the expected instrument data, running on end node computers that are the production hardware or equivalent to it. Scientific validity of the data content is not essential.
4. Archiver/forwarders installed at Base running on end node computers that are the production hardware or equivalent to it.
5. As-built documentation for all of the above is available.

NOTE: This test will be repeated at increasing data volumes as additional observatory capabilities (e.g. ComCAM, FullCam) become available. Final verification will be tested at full operational volume.After the initial test, the corresponding verification elements will be flagged as “Requires Monitoring” such that those requirements will be closed out as having been verified but will continue to be monitored throughout commissioning to ensure they do not drop out of compliance. This will also be monitored for end to end Summit - Data Facility transfers during Commissioning.

Execution status: **Pass**
Final comment:
None

Detailed steps results LVV-R275-LVV-E3647-1243142145:

Step LVV-E3647-1 Step Execution Status: **Pass**

Description
Verify Pre-conditions are satisfied.

Test Data
NA

Expected Result
Pre-conditions are satisfied.

Actual Result
Pre-conditions are met, T1168 is passed

Step LVV-E3647-2 Step Execution Status: **Pass**

Description
Transfer data between summit and base over uninterrupted 1 day period. Monitor transfer of data at or exceeding rates specified in LDM-142.

Test Data
DAQ pre-loaded data

Expected Result
Data transfers at or exceeding rates specified in LDM-142.

Actual Result
Summit - Base links are operational. It has been used many times during night runs. The link is 6x100 and 2x100
<**Image Download Error**>Image Download Error>

5.1.3.47 LVV-T1168 - Verify Summit - Base Network Integration

Version **1.0(d)**. Status **Approved**. Open *LVV-T1168* test case in Jira.

Verify the integration of the summit to base network by demonstrating a sustained and uninterrupted transfer of data between summit and base over 1 day period at or exceeding rates specified in LDM-142. Done in 3 phases in collaboration with equipment/installation vendors (see test procedure).

Preconditions:
PMCS DMTC-7400-2330 COMPLETE
By phase:

1. Posts from Cerro Pachon to AURA Gatehouse repaired/improved. Fiber installed on posts from Cerro Pachon to AURA Gatehouse. Fiber installed from AURA Gatehouse to AURA compound in La Serena. OTDR purchased.
2. AURA DWDM installed in caseta on Cerro Pachon and in existing computer room in La Serena. DTN installed in La Serena. DTN loaded with software and test data staged.
3. Base Data Center (BDC) ready for installation of LSST DWDM. Fiber connecting existing computer room to BDC. LSST DWDM equipment installed in Summit Computer Room and BDC.

Execution status: **Pass**
Final comment:
None

Detailed steps results LVV-R275-LVV-E3648-1243142146:

Step LVV-E3648-1 Step Execution Status: **Pass**

Description

Test optical fiber with OTDR:

Installation of fiber optic cables and Optical Time Domain Reflector (OTDR) fiber testing (completed 20170602 REUNA deliverable RD10)

Test Data

OTDR generated optical data

Expected Result

Fiber tested to within acceptable Db.

Actual Result

Completed ad per document indicated and in section ”Annex1: OTDR Measures”

Step LVV-E3648-2 Step Execution Status: **Pass**

Description

Test AURA DWDM:

Installation of AURA DWDM and Data Transfer Node (DTN) (completed 20171218 DMTR-82)

Test Data

DTN perfSonar generated data

Expected Result

Summit - Base bandwidth and latency within specifications

Actual Result

Completed and DTN reachable at dnt01.ls.lsst.org

Step LVV-E3648-3 Step Execution Status: **Pass**

Description

Test LSST DWDM:

Installation of LSST DWDM and Bit Error Rate Tester (BERT) data (completed 20190505 collection-7743, 20191108 DAQ DWDM Connection Tests)

Test Data
BERT generated data

Expected Result
Summit - Base bandwidth, latency, bit error rate within specifications

Actual Result
Completed as per documents

5.1.3.48 LVV-T1097 - Verify Summit Facility Network Implementation

Version **1.0(d)**. Status **Approved**. Open *LVV-T1097* test case in Jira.

Verify that data acquired by a AuxTel DAQ can be transferred to Summit DWDM and loaded in the EFD without problems.

Preconditions:

1. Summit Control Network and Camera Data Backbone installed and operating properly.
2. Summit - Base Network installed and operating properly.
3. EITHER: AuxTel hardware and control systems are functional with LATISS. AuxTel TCS, AuxTel EFD, AuxTel CCS, AuxTel DAQ are connected via Control Network on Summit to Rubin Observatory DWDM (with at least 2 x 10 Gbps ethernet port client cards) OR: high-quality DAQ application-level simulators that match the form, volume, file paths, compressibility, and cadence of the expected instrument data, running on end node computers that are the production hardware or equivalent to it. Scientific validity of the data content is not essential.
4. AuxTel Archiver/forwarders installed in Summit and operating properly running on end node computers that are the production hardware or equivalent to it.

5. As-built documentation for all of the above is available.

NOTE: This test will be repeated at increasing data volumes as additional observatory capabilities (e.g. ComCAM, LSSTCam) become available. Final verification will be tested at full operational volume. After the initial test, the corresponding verification elements will be flagged as "Requires Monitoring" such that those requirements will be closed out as having been verified but will continue to be monitored throughout commissioning to ensure they do not drop out of compliance. This will also be monitored for end to end Summit - Data Facility transfers during Commissioning.

Execution status: **Pass**
Final comment:
None

Detailed steps results LVV-R275-LVV-E3649-1243142147:

Step LVV-E3649-1 Step Execution Status: **Pass**

Description
Verify the pre-conditions have been satisfied

Test Data
NA

Expected Result
Pre-conditions are satisfied.

Actual Result
Pre-conditions are met. ComCam was on sky, we used it instead of Auxtel

---

Step LVV-E3649-2 Step Execution Status: **Pass**

Description
Control the AuxTel through a night of Observing. While observing, read out LATISS data and transfer to Rubin Observatory Summit DWDM while monitoring latency.

Test Data
LATISS images and metadata

Expected Result
Data is fed to DWDM without delays or errors.

Actual Result
From Nightlog, ComCam didnt have any problems observing during the night, data was transfer to USDF, the following link is a plot the night transfer
https://usdf-rsp-dev.slac.stanford.edu/times-square/github/lsst-dm/image-transfers-info/ImageLatency-Summit-USDF?day=20241

Step LVV-E3649-3 Step Execution Status: **Pass**

Description
Verify that data acquired by a AuxTel DAQ can be transferred and loaded in EFD without problems.

Test Data
LATISS images and metadata

Expected Result
Examine the EFD to ensure that the data has been loaded properly.

Actual Result
ComCam data was feed into EFD and visible by Chronograf
https://summit-lsp.lsst.codes/chronograf/sources/1/dashboards/53?refresh=Paused&lower=2024-12-02T17%3A49%3A00.000Z&u
12-03T17%3A49%3A00.000Z

5.1.3.49 LVV-T192 - Verify implementation of Base Wireless LAN (WiFi)

Version **1.0(d)**. Status **Approved**. Open *LVV-T192* test case in Jira.

Verify as-built wireless network at the Base Facility supports minBaseWiFi bandwidth (1000 Mbs).

Preconditions:

1. Base Wireless LAN is installed/configured and Test Personnel have accounts for email, internet access.
2. As-built documentation for all of the above is available.

Execution status: **Pass**
Final comment:
None

Detailed steps results LVV-R275-LVV-E3651-1244810980:

Step LVV-E3651-1 Step Execution Status: **Pass**

Description
Connect to Rubin Base wireless network RubinObs-Guest by scanning the QR code

Test Data
None

Expected Result
Connection to network is successful

Actual Result
Connection successful with full strength showing <**Image Download Error**>Image Download Error>

Step LVV-E3651-2 Step Execution Status: **Pass**

Description
Disconnect from Rubin Base wireless and connect again using the provided SSID/pasaswd combination

Test Data
None

Expected Result
Connection to Network is successful

Actual Result
Successful connection

Step LVV-E3651-3 Step Execution Status: **Pass**

Description
Execute script scripts/LVV_T192.sh that tests connection to external sites, file download and runs a network speed test

Test Data
None

Expected Result
Verify as-built wireless network at the Base Facility supports regular work activities. Verify wireless signal strength meets or exceeds typical, and average and peak bandwidths and that web browsing, download and connection to external sites is possible

Actual Result
Successful connection to external sites and download if a file. Network speed reported as
Download Speed: 282.29 Mbit/s
Upload Speed: 268.29 Mbit/s
Ping Time: 14.934 ms

5.1.3.50 LVV-T1752 - Verify calculation of fraction of relative astrometric measurement error on 200 arcminute scales exceeding outlier limit

Version **1.0(d)**. Status **Approved**. Open *LVV-T1752* test case in Jira.

Verify that the DM system has provided the code to calculate the maximum fraction of relative astrometric measurements on 200 arcminute scales that exceed the 200 arcminute outlier limit **AD3 = 30 milliarcseconds**, and assess whether it meets the requirement that it shall be

less than **AF3 = 10 percent.**

Preconditions:
None

Execution status: **Pass**
Final comment:
Test executed with science pipelines version w_2024_34 in the RSP Notebook aspect at the USDF.

The executed notebook was saved in the repository associated with this campaign's test report as "notebooks/test_LVV-T1752_AF1_AF2.ipynb."

Detailed steps results LVV-R275-LVV-E3735-1288458853:

Step LVV-E3735-1 Step Execution Status: **Pass**

Description
Identify a dataset containing at least one field with multiple overlapping visits, and that has previously gone through Data Release Processing, including calculation of data quality metrics.

Test Data
None

Expected Result
A dataset that has been ingested into a Butler repository.

Actual Result
For this test we use a recent reprocessing of the Subaru+HSC RC2 dataset. The data were processed with the w_2024_34 pipelines.

Step LVV-E3735-2 Step Execution Status: **Pass**

Description
Retrieve the AF1 and AF2 metrics calculated for this dataset to demonstrate that they have been measured and are well-formed.

Test Data

None

Expected Result

AF1 and AF2 metrics for the dataset.

Actual Result

In the attached notebook, we demonstrate the retrieval of these metrics. The results are as follows:

```
Tract 9615:

g_AF1 = 0.06679791871747996 %
r_AF1 = 0.06546091100993683 %
i_AF1 = 0.519371635336687 %

g_AF2 = 0.056792018419033 %
r_AF2 = 0.04708780063749638 %
i_AF2 = 0.44838105038773934 %

Tract 9697:

g_AF1 = 1.9712959844317206 %
r_AF1 = 1.0932507987220448 %
i_AF1 = 0.07248196921310417 %

g_AF2 = 2.0060957760060614 %
r_AF2 = 1.081161689594751 %
i_AF2 = 0.05548913674036633 %

Tract 9813:

g_AF1 = 0.5892173229892959 %
r_AF1 = 1.425046176579239 %
i_AF1 = 1.2487806237632042 %

g_AF2 = 0.7005543674105357 %
r_AF2 = 1.3457338124427536 %
i_AF2 = 1.3252626295841194 %
```

Step LVV-E3735-3 Step Execution Status: **Pass**

Description

The same pipelines tasks that produce AF1 and AF2 can be reconfigured to calculate the metric at any spatial scale. Demonstrate via inspection of the relevant code that this is the case.

Test Data

None

Expected Result

Code snippets that show the configurability of the size scale for AFx metrics and the associated threshold ADx.

Actual Result

The task to calculate the AMx (i.e., AM1, AM2, AM3) metrics begins with the following configuration options:

```
class AstrometricRelativeRepeatability(AnalysisTool):
"""Calculate the AMx, ADx, AFx metrics and make histograms showing the data
used to compute the metrics.
"""

fluxType = Field[str](doc="Flux type to calculate repeatability with", default="psfFlux")
xValue = Field[int](doc="Metric suffix corresponding to annulus size (1, 2, or 3)", default=1)
```

The pipeline that calls this task is where the annulus size for calculation is specified. Here are the relevant lines from the pipeline YAML configuration for AM1, AM2, and AM3:

```
atools.stellarAstrometricRepeatability1: AstrometricRelativeRepeatability
atools.stellarAstrometricRepeatability1.xValue: 1
atools.stellarAstrometricRepeatability1.process.calculateActions.rms.annulus: 5
atools.stellarAstrometricRepeatability2: AstrometricRelativeRepeatability
atools.stellarAstrometricRepeatability2.xValue: 2
atools.stellarAstrometricRepeatability2.process.calculateActions.rms.annulus: 20
atools.stellarAstrometricRepeatability3: AstrometricRelativeRepeatability
atools.stellarAstrometricRepeatability3.xValue: 3
atools.stellarAstrometricRepeatability3.process.calculateActions.rms.annulus: 200
atools.stellarAstrometricRepeatability3.process.calculateActions.rms.threshAD: 30
```

Note the final line, which sets the "AD3" threshold to 30 mas for the AF3 calculation. This configuration is by default

set to 20 mas, the required value for AD1 and AD2.

We have thus demonstrated that the pipelines contain the code to calculate AF3, and apply its threshold AD3, once we have datasets that are sufficient for the purpose.

5.1.3.51 LVV-T3073 - Verify implementation of L1 Data Product pixel embargo

Version **1.0(d)**. Status **Approved**. Open *LVV-T3073* test case in Jira.

Verify that Rubin Observatory pixel data is held in a secure location and not released prior to **L1CommissioningEmbargoT=30 days** after data acquisition during the Commissioning phase.

Preconditions:
None

Execution status: **Pass**
Final comment:
This test was executed at the USDF with science pipelines version w_2024_43.

Detailed steps results LVV-R275-LVV-E3743-1290916404:

Step LVV-E3743-1 Step Execution Status: **Pass**

Description
Identify a butler repository in the ”embargo rack (e.g., /repo/embargo)” containing on-sky datasets that have been obtained within the past week. Then execute a butler query similar the example code to identify datasets.

Test Data
None

Expected Result
A long list of datasets.

Actual Result

We will query for ”raw” exposures from recent ComCam on-sky imaging (using ”day_obs > 20241022” to select images observed on or after 22 Oct 2024).

butler query-datasets /repo/embargo raw --where ”detector IN (0..9) AND instrument='LSSTComCam' AND day_obs > 20241022” --collections ”*' | less

The first few lines of output look like the following:

type run id instrument detector exposure band day_obs group physical_filter
---- ---------- ---------- ---------- -------- ---------- ------- -------- ---------- ---------------
raw LSSTComCam/raw/all 21a65a59-447c-51e2-8568-382e64b060a8 LSSTComCam 0 2024102300001 r 20241023 BT220_O_20241023_000001 r_03
raw LSSTComCam/raw/all 27edf641-28f4-5fce-b631-103cf87a94b1 LSSTComCam 1 2024102300001 r 20241023 BT220_O_20241023_000001 r_03
raw LSSTComCam/raw/all 627d5780-83ce-58eb-99d5-da4a5a9ae9e6 LSSTComCam 2 2024102300001 r 20241023 BT220_O_20241023_000001 r_03
raw LSSTComCam/raw/all ef7f8d7d-7502-5fe5-affa-6e6b5f291534 LSSTComCam 3 2024102300001 r 20241023 BT220_O_20241023_000001 r_03
raw LSSTComCam/raw/all f490fcb1-471b-5134-99db-e5328c26a916 LSSTComCam 4 2024102300001 r 20241023 BT220_O_20241023_000001 r_03
raw LSSTComCam/raw/all d96d6efa-be1e-5cd5-91a8-f504ddd60bf2 LSSTComCam 5 2024102300001 r 20241023 BT220_O_20241023_000001 r_03
raw LSSTComCam/raw/all ed9842a3-638d-5739-8aee-cd3dd5e979a7 LSSTComCam 6 2024102300001 r 20241023 BT220_O_20241023_000001 r_03
raw LSSTComCam/raw/all e0ea2df1-b4d3-5b4f-8561-94bd6c69abaf LSSTComCam 7 2024102300001 r 20241023 BT220_O_20241023_000001 r_03
raw LSSTComCam/raw/all 154d1ba6-af36-5bef-a617-c8a06dba9609 LSSTComCam 8 2024102300001 r 20241023 BT220_O_20241023_000001 r_03
raw LSSTComCam/raw/all 5e2e8cbe-6693-52e6-9492-91474f65ae50 LSSTComCam 0 2024102300002 r 20241023 BT220_O_20241023_000001 r_03
raw LSSTComCam/raw/all 9da0d4be-49ed-5f43-a074-bdc895235753 LSSTComCam 1 2024102300002 r 20241023 BT220_O_20241023_000001 r_03

To count the number of results, change the command to:
butler query-datasets /repo/embargo raw --where ”detector IN (0..9) AND instrument='LSSTComCam' AND day_obs > 20241022” --collections ”*” > embargo_query_results.txt

Executing ”wc embargo_query_results.txt” yields:
10498 104960 1616386 embargo_query_results.txt

Not counting the first two lines, which are header rows, the query has returned 10496 raw images.

Step LVV-E3743-2 Step Execution Status: **Pass**

Description

Execute the same query against ”/repo/main”, which should only contain data that are no longer under embargo. Observe that the query returns no results.

Test Data

None

Expected Result

An empty query result, confirming that the datasets are not in the public repository.

Actual Result

Execute the following query, which is identical to the one in the previous step, but with ”/repo/embargo” replaced with ”/repo/main”:

butler query-datasets /repo/main raw --where ”detector IN (0..9) AND instrument=’LSSTComCam’ AND day_obs > 20241022” --collections ”*” > main_query_results.txt

wc main_query_results.txt
1 0 1 main_query_results.txt

The query returned no results, confirming that the images have not been copied to the ”public” repository ”/repo/main.” We have thus verified that a system is in place to hold images until the embargo period has passed.

5.1.3.52 LVV-T3074 - Verify implementation of Level 1 Data Product embargo time

Version **1.0(d)**. Status **Draft**. Open *LVV-T3074* test case in Jira.

Verify that Rubin Observatory visit image data is not released in any form other than the contents of the public alert stream prior to **L1EmbargoTMin = 80[hour]** after acquisition of the raw image.

Preconditions:

None

Execution status: **Not Executed**
Final comment:
None

5.1.3.53 LVV-T191 - Verify implementation of Commissioning Cluster

Version **1.0(d)**. Status **Approved**. Open *LVV-T191* test case in Jira.

Verify that the Commissioning Cluster has sufficient Compute/Storage/LAN at the Base Facility to support Commissioning.

Preconditions:
None

Execution status: **Pass**
Final comment:
The cluster was moved to the summit facility from the base and is currently in use in commissioning. There is no specification on what should be installed but to provide a useful system, we have ensured that the science pipelines are in stalled and condor as a batch system is available. The verification submits a batch job to run step#1 of nightly validation on some early ComCam images

The batch submission was successful. Aspects of the processing failed and were correctly reported by the batch system as failures.

This test does not test the processing, only the batch system on the commissioning cluster

Detailed steps results LVV-R275-LVV-E3750-1306416784:

Step LVV-E3750-1 Step Execution Status: **Pass**
Description
The Rubin commissioning cluster is described in the ”Computing Infrastructure” technote at ittn-014.lsst.io under the section ”’Cerro Pachon”. Yagan is the commissioning cluster, it contains 20 nodes, 2200 cores + ~7TB RAM

Test Data
None

Expected Result
Technote exists

Actual Result
ittn-014.lsst.io describes the commissioning cluster on Cerro Pachon

Step LVV-E3750-2 Step Execution Status: **Pass**

Description
Connect to openvpn

Test Data
None

Expected Result
Successful connection to openvpn

Actual Result

Step LVV-E3750-3 Step Execution Status: **Pass**

Description
Connect to commissioning cluster head node htcondor.cp.lsst.org

Test Data
None

Expected Result

Actual Result
Sucessfully connected

Step LVV-E3750-4 Step Execution Status: **Pass**

Description
Set up the LSST stack

source /project/stack/loadLSST.sh
setup lsst_distrib
eups list -s | grep lsst_distrib

Test Data
None

Expected Result
Stack set up and a valid result returned, e.g.
> lsst_distrib gc7ba34d93f+b61867af9c current w_2024_43 setup

Actual Result
(Weekly 43 set up

lsst-scipipe-9.0.0) [lguy@htcondor test_LVV-T191]$ eups list -s | grep lsst_distrib
lsst_distrib gc7ba34d93f+b61867af9c current w_2024_43 setup

Step LVV-E3750-5 Step Execution Status: **Pass**

Description
Check condor is alive and well
> condor_status

Test Data
None

Expected Result

Status returned

Actual Result

```
(lsst-scipipe-9.0.0) [lguy@htcondor test_LVV-T191]$ condor_status
Name                          OpSys     Arch   State     Activity LoadAv Mem     ActvtyTime

slot1@htcondor-worker-5b7cf78857-h5fwn LINUX     X86_64 Unclaimed Idle      0.000 515101  8+21:44:52
slot1@htcondor-worker-5b7cf78857-wwblw LINUX     X86_64 Unclaimed Idle      0.000 515101  8+21:44:51
slot1@htcondor-worker-5b7cf78857-zdfw4 LINUX     X86_64 Unclaimed Idle      0.000 515101  8+21:45:08

               Total Owner Claimed Unclaimed Matched Preempting  Drain Backfill BkIdle

 X86_64/LINUX     3     0       0         3       0          0     0        0      0

Total 3 0 0 3 0 0 0 0
```

Step LVV-E3750-6 Step Execution Status: **Pass**

Description

Submit the bps batch job defined in ./scripts/test_LVV-T191/LVV-T191.yaml
with

```
> bps submit LVV-T191.yaml
```

Test Data

None

Expected Result

Actual Result

Job submitted and valid RunId and RubName returned

```
(lsst-scipipe-9.0.0) [lguy@htcondor test_LVV-T191]$ bps submit LVV-T191.yaml
lsst.ctrl.bps.drivers INFO: DISCLAIMER: All values regarding memory consumption reported below are approxi-
mate and may not accurately reflect actual memory usage by the bps process.
lsst.ctrl.bps.drivers INFO: The workflow is submitted to the local Data Facility.
lsst.ctrl.bps.drivers INFO: Starting submission process
lsst.ctrl.bps.drivers INFO: Initializing execution environment
Submit dir: /home/lguy/repos/dmtr-412/scripts/test_LVV-T191/submit/u/lguy/LVV-T191/20241029T010847Z
```

lsst.ctrl.bps.drivers INFO: Initializing execution environment completed: Took 6.7785 seconds; current memory usage: 0.199 Gibyte, delta: 0.012 Gibyte, peak delta: 0.017 Gibyte
lsst.ctrl.bps.drivers INFO: Peak memory usage for bps process 0.204 Gibyte (main), 0.000 Gibyte (largest child process)
lsst.ctrl.bps.drivers INFO: Starting acquire stage (generating and/or reading quantum graph)
lsst.ctrl.bps.pre_transform INFO: Creating quantum graph
lsst.ctrl.bps.pre_transform INFO: /project/stack/conda/envs/lsst-scipipe-9.0.0/share/eups/Linux64/ctrl_mpexec/g3abcffb608+e4b6b
--long-log --log-level=VERBOSE qgra
ph --butler-config /repo/LSSTComCam -i LSSTComCam/defaults -o u/lguy/LVV-T191 --output-run u/lguy/LVV-T191/20241029T010847
--pipeline /project/stack/conda/envs/lsst-scipipe-9.0.0/s
hare/eups/Linux64/drp_pipe/g406d2130e7+9fa41d294b/pipelines/LSSTComCam/nightly-validation.yaml#step1 -
-save-qgraph /home/lguy/repos/dmtr-412/scripts/test_LVV-T191/submit/u/lguy/LVV-
T191/20241029T010847Z/u_lguy_LVV-T191_20241029T010847Z.qgraph --qgraph-datastore-records -d "exposure.day_obs=202410
and instrument='LSSTComCam' and exposure.observation_type IN (
'science', 'acq')"
lsst.ctrl.bps.pre_transform INFO: INFO 2024-10-29T01:09:03.706+00:00 lsst.pipe.base.quantum_graph_builder ()(quantum_graph_builder.py:344) - Processing pipeline subgraph 1 of 1 with
5 task(s).

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:03.706+00:00 lsst.pipe.base.quantum_graph_builder
()(quantum_graph_builder.py:350) - Subgraph tasks: [isr, characterizeIma
ge, calibrate, writePreSourceTable, transformPreSourceTable]

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:03.708+00:00 lsst.pipe.base.quantum_graph_builder
()(all_dimensions_quantum_graph_builder.py:495) - Querying for data IDs
with arguments:

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:03.708+00:00 lsst.pipe.base.quantum_graph_builder
()(all_dimensions_quantum_graph_builder.py:496) - dimensions=['band',
'instrument', 'day_obs', 'detector', 'group', 'physical_filter', 'exposure', 'visit'],

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:03.709+00:00 lsst.pipe.base.quantum_graph_builder
()(all_dimensions_quantum_graph_builder.py:497) - dataId={'instrument'
: 'LSSTComCam'},

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:03.709+00:00 lsst.pipe.base.quantum_graph_builder
()(all_dimensions_quantum_graph_builder.py:499) - where="exposure.day_
obs=20241027 and instrument='LSSTComCam' and exposure.observation_type IN ('science', 'acq')",

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:03.709+00:00 lsst.pipe.base.quantum_graph_builder
()(all_dimensions_quantum_graph_builder.py:501) - datasets=['raw'],

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:03.709+00:00 lsst.pipe.base.quantum_graph_builder
()(all_dimensions_quantum_graph_builder.py:503) - collections=['LSSTCo

mCam/raw/all', 'LSSTComCam/calib/DM-46360/isrTaskLSST/flat-i.20240926a', 'LSSTComCam/calib/DM-46360/isrTaskLSST/flat-r.20240926a', 'LSSTComCam/calib/DM-46360/isrTaskLSST/flat-g.2024
0926a', 'LSSTComCam/calib/DM-46360/isrTaskLSST/dark.20240926a', 'LSSTComCam/calib/DM-46360/isrTaskLSST/bias.20240926a', 'LSSTComCam/calib/DM-46360/isrTaskLSST/bfk.20240926a', 'LSSTC
omCam/calib/DM-46360/isrTaskLSST/ptc.20240926a', 'LSSTComCam/calib/DM-46360/isrTaskLSST/linearizer.20240926a', 'LSSTComCam/calib/DM-46360/isrTaskLSST/defects.20240926a', 'LSSTComCam
/calib/DM-45877', 'LSSTComCam/calib/DM-45877/unbounded', 'refcats'],

lsst.ctrl.bps.pre_transform INFO: INFO 2024-10-29T01:09:03.935+00:00 lsst.pipe.base.quantum_graph_builder ()(all_dimensions_qu
- Iterating over query resu
lts to associate quanta with datasets.

lsst.ctrl.bps.pre_transform INFO: INFO 2024-10-29T01:09:04.008+00:00 lsst.pipe.base.quantum_graph_builder ()(all_dimensions_qu
- Initial bipartite graph h
as 810 quanta, 3900 dataset nodes, and 4860 edges from 162 query row(s).

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:04.048+00:00 lsst.pipe.base.quantum_graph_builder
()(all_dimensions_quantum_graph_builder.py:242) - Found 162 overall-inpu
t dataset(s) of type 'raw'.

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:04.100+00:00 lsst.pipe.base.quantum_graph_builder
()(all_dimensions_quantum_graph_builder.py:367) - Added 162 prerequisite
input edge(s) from dataset type 'defects' to task 'isr'.

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:04.143+00:00 lsst.pipe.base.quantum_graph_builder
()(all_dimensions_quantum_graph_builder.py:367) - Added 162 prerequisite
input edge(s) from dataset type 'crosstalk' to task 'isr'.

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:04.185+00:00 lsst.pipe.base.quantum_graph_builder
()(all_dimensions_quantum_graph_builder.py:367) - Added 162 prerequisite
input edge(s) from dataset type 'bias' to task 'isr'.

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:04.226+00:00 lsst.pipe.base.quantum_graph_builder
()(all_dimensions_quantum_graph_builder.py:367) - Added 162 prerequisite
input edge(s) from dataset type 'dark' to task 'isr'.

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:04.289+00:00 lsst.pipe.base.quantum_graph_builder
()(all_dimensions_quantum_graph_builder.py:367) - Added 162 prerequisite
input edge(s) from dataset type 'camera' to task 'isr'.

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:04.371+00:00 lsst.pipe.base.quantum_graph_builder
()(all_dimensions_quantum_graph_builder.py:367) - Added 162 prerequisite
input edge(s) from dataset type 'bfk' to task 'isr'.

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:04.412+00:00 lsst.pipe.base.quantum_graph_builder ()(all_dimensions_quantum_graph_builder.py:367) - Added 162 prerequisite
input edge(s) from dataset type 'ptc' to task 'isr'.

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:04.473+00:00 lsst.pipe.base.quantum_graph_builder ()(all_dimensions_quantum_graph_builder.py:367) - Added 162 prerequisite
input edge(s) from dataset type 'linearizer' to task 'isr'.

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:04.591+00:00 lsst.pipe.base.quantum_graph_builder ()(all_dimensions_quantum_graph_builder.py:367) - Added 454 prerequisite
input edge(s) from dataset type 'the_monster_20240904' to task 'calibrate'.

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:04.685+00:00 lsst.pipe.base.quantum_graph_builder ()(all_dimensions_quantum_graph_builder.py:367) - Added 454 prerequisite
input edge(s) from dataset type 'the_monster_20240904' to task 'calibrate'.

lsst.ctrl.bps.pre_transform INFO: INFO 2024-10-29T01:09:04.755+00:00 lsst.pipe.base.quantum_graph_builder ()(quantum_graph_builder.py:572) - Generated 162 quanta for task isr.

lsst.ctrl.bps.pre_transform INFO: INFO 2024-10-29T01:09:04.785+00:00 lsst.pipe.base.quantum_graph_builder ()(quantum_graph_builder.py:572) - Generated 162 quanta for task characteri
zeImage.

lsst.ctrl.bps.pre_transform INFO: INFO 2024-10-29T01:09:04.837+00:00 lsst.pipe.base.quantum_graph_builder ()(quantum_graph_builder.py:572) - Generated 162 quanta for task calibrate.

lsst.ctrl.bps.pre_transform INFO: INFO 2024-10-29T01:09:04.858+00:00 lsst.pipe.base.quantum_graph_builder ()(quantum_graph_builder.py:572) - Generated 162 quanta for task writePreSo
urceTable.

lsst.ctrl.bps.pre_transform INFO: INFO 2024-10-29T01:09:04.879+00:00 lsst.pipe.base.quantum_graph_builder ()(quantum_graph_builder.py:572) - Generated 162 quanta for task transformP
reSourceTable.

lsst.ctrl.bps.pre_transform INFO: INFO 2024-10-29T01:09:11.244+00:00 lsst.ctrl.mpexec.cmdLineFwk ()(cmdLineFwk.py:909) - QuantumGraph contains 810 quanta for 5 tasks, graph ID: '173
0164151.1788852-957876'
Quanta Tasks
------ ----------------------
162 isr
162 characterizeImage
162 calibrate
162 writePreSourceTable
162 transformPreSourceTable

lsst.ctrl.bps.pre_transform INFO: VERBOSE 2024-10-29T01:09:11.244+00:00 lsst.ctrl.mpexec.cmdLineFwk ()(cmd-LineFwk.py:694) - Writing QuantumGraph to '/home/lguy/repos/dmtr-412/script
s/test_LVV-T191/submit/u/lguy/LVV-T191/20241029T010847Z/u_lguy_LVV-T191_20241029T010847Z.qgraph'.

lsst.ctrl.bps.pre_transform INFO: Completed creating quantum graph: Took 19.2857 seconds
lsst.ctrl.bps.pre_transform INFO: Reading quantum graph from '/home/lguy/repos/dmtr-412/scripts/test_LVV-T191/submit/u/lguy/L
T191/20241029T010847Z/u_lguy_LVV-T191_20241029T010847
Z.qgraph'
lsst.ctrl.bps.pre_transform INFO: Completed reading quantum graph: Took 6.2427 seconds
lsst.ctrl.bps.drivers INFO: Acquire stage completed: Took 25.5348 seconds; current memory usage: 0.452 Gibyte, delta: 0.253 Gibyte, peak delta: 0.247 Gibyte
lsst.ctrl.bps.drivers INFO: Peak memory usage for bps process 0.452 Gibyte (main), 0.482 Gibyte (largest child process)
lsst.ctrl.bps.drivers INFO: Starting cluster stage (grouping quanta into jobs)
lsst.ctrl.bps.drivers INFO: Cluster stage completed: Took 0.0314 seconds; current memory usage: 0.452 Gibyte, delta: 0.000 Gibyte, peak delta: 0.000 Gibyte
lsst.ctrl.bps.drivers INFO: Peak memory usage for bps process 0.452 Gibyte (main), 0.482 Gibyte (largest child process)
lsst.ctrl.bps.drivers INFO: ClusteredQuantumGraph contains 810 cluster(s)
lsst.ctrl.bps.drivers INFO: Starting transform stage (creating generic workflow)
lsst.ctrl.bps.drivers INFO: Generic workflow name 'u_lguy_LVV-T191_20241029T010847Z'
lsst.ctrl.bps.drivers INFO: Transform stage completed: Took 0.1669 seconds; current memory usage: 0.453 Gibyte, delta: 0.001 Gibyte, peak delta: 0.001 Gibyte
lsst.ctrl.bps.drivers INFO: Peak memory usage for bps process 0.453 Gibyte (main), 0.482 Gibyte (largest child process)
lsst.ctrl.bps.drivers INFO: GenericWorkflow contains 812 job(s) (including final)
lsst.ctrl.bps.drivers INFO: Starting prepare stage (creating specific implementation of workflow)
lsst.ctrl.bps.htcondor.htcondor_service INFO: Completed HTCondor workflow creation: Took 0.0546 seconds
lsst.ctrl.bps.htcondor.htcondor_service INFO: Completed writing out HTCondor workflow: Took 0.8290 seconds
lsst.ctrl.bps.drivers INFO: Prepare stage completed: Took 0.8908 seconds; current memory usage: 0.457 Gibyte, delta: 0.004 Gibyte, peak delta: 0.004 Gibyte
lsst.ctrl.bps.drivers INFO: Peak memory usage for bps process 0.457 Gibyte (main), 0.482 Gibyte (largest child process)
lsst.ctrl.bps.drivers INFO: Starting submit stage
lsst.ctrl.bps.submit INFO: Submitting run to a workflow management system for execution
lsst.ctrl.bps.htcondor.htcondor_service INFO: Submitting from directory: /home/lguy/repos/dmtr-412/scripts/test_LVV-T191/submit/u/lguy/LVV-T191/20241029T010847Z
lsst.ctrl.bps.submit INFO: Completed submitting to a workflow management system: Took 0.2570 seconds
lsst.ctrl.bps.drivers INFO: Run 'u_lguy_LVV-T191_20241029T010847Z' submitted for execution with id '1873.0'
lsst.ctrl.bps.drivers INFO: Completed submit stage: Took 0.2633 seconds; current memory usage: 0.458 Gibyte, delta: 0.001 Gibyte, peak delta: 0.001 Gibyte
lsst.ctrl.bps.drivers INFO: Completed entire submission process: Took 33.7108 seconds; current memory usage: 0.458 Gibyte, delta: 0.271 Gibyte, peak delta: 0.271 Gibyte

lsst.ctrl.bps.drivers INFO: Peak memory usage for bps process 0.458 Gibyte (main), 0.482 Gibyte (largest child process)
Run Id: 1873.0
Run Name: u_lguy_LVV-T191_20241029T010847Z

Step LVV-E3750-7 Step Execution Status: **Pass**

Description

Get a report on the job status
> bps report --id <id or path>

Test Data

None

Expected Result

Valid report returned

Actual Result

(lsst-scipipe-9.0.0) [lguy@htcondor test_LVV-T191]$ bps report --id 1873.0
X STATE %S ID OPERATOR PROJECT CAMPAIGN PAYLOAD RUN
--- ------- --- ------ -------- ------- -------- -------- --------------------------------
F RUNNING 4 1873.0 lguy LVV-T191 u_lguy_LVV-T191_20241029T010847Z

Path: /home/lguy/repos/dmtr-412/scripts/test_LVV-T191/submit/u/lguy/LVV-T191/20241029T010847Z
Global job id: htcondor.cp.lsst.org#1873.0#1730164161

	UNKNOWN	MISFIT	UNREADY	READY	PENDING	RUNNING	DELETED	HELD	SUCCEEDED	FAILED	PRUNED	EXPECTED
TOTAL	0	0	634	0	0	139	0	0	38	1	0	812
pipetaskInit	0	0	0	0	0	0	0	0	1	0	0	1
isr	0	0	0	0	0	126	0	0	36	0	0	162
characterizeImage	0	0	148	0	0	12	0	0	1	1	0	162
calibrate	0	0	161	0	0	1	0	0	0	0	0	162
writePreSourceTable	0	0	162	0	0	0	0	0	0	0	0	162
transformPreSourceTable	0	0	162	0	0	0	0	0	0	0	0	162

Step LVV-E3750-8 Step Execution Status: **Pass**

Description

When the job is complete, inspect the full job report

Test Data

None

Expected Result

Valid job report accessible listing successes and failures

Actual Result

(lsst-scipipe-9.0.0) [lguy@htcondor test_LVV-T191]$ bps report --id 1873.0
X STATE %S ID OPERATOR PROJECT CAMPAIGN PAYLOAD RUN
--- ------ --- ------ -------- ------- -------- -------- --------------------------------
FAILED 63 1873.0 lguy LVV-T191 u_lguy_LVV-T191_20241029T010847Z

Path: /home/lguy/repos/dmtr-412/scripts/test_LVV-T191/submit/u/lguy/LVV-T191/20241029T010847Z
Global job id: htcondor.cp.lsst.org#1873.0#1730164161

UNKNOWN MISFIT UNREADY READY PENDING RUNNING DELETED HELD SUCCEEDED FAILED PRUNED EXPECTED
---------- ------- ------ ------- ----- ------- ------- ------- ---- --------- ------ ------ --------
TOTAL 0 0 0 0 0 0 0 0 512 75 225 812
---------- ------- ------ ------- ----- ------- ------- ------- ---- --------- ------ ------ --------
pipetaskInit 0 0 0 0 0 0 0 0 1 0 0 1
isr 0 0 0 0 0 0 0 0 162 0 0 162
characterizeImage 0 0 0 0 0 0 0 0 87 75 0 162
calibrate 0 0 0 0 0 0 0 0 87 0 75 162
writePreSourceTable 0 0 0 0 0 0 0 0 87 0 75 162
transformPreSourceTable 0 0 0 0 0 0 0 0 87 0 75 162
finalJob 0 0 0 0 0 0 0 0 1 0 0 1

This bps job completed successfully. The pipetaskInit and isr tasks were successful but there were processing fail-

ures in characterizeImage and onwards. This is a failure in processing, not the batch system . The batch system correctly reported processing failures.

Inspect the detailed output in
> ls submit/u/lguy/LVV-T191/20241029T010847Z/jobs

In this case, the cause was no objects passing cuts for consideration as psf stars.
File "/project/stack/conda/envs/lsst-scipipe-9.0.0/share/eups/Linux64/meas_algorithms/ga1f12eb575+e479d44c40/python/lsst/m
line 408, in selectSources
raise RuntimeError("No objects passed our cuts for consideration as psf stars")
RuntimeError: No objects passed our cuts for consideration as psf stars

---

Step LVV-E3750-9 Step Execution Status: **Pass**

Description

Inspect the data products and runs via the Butler

Test Data

None

Expected Result

utler collections accessible

Actual Result

> butler query-collections /repo/LSSTComCam *lguy*

(lsst-scipipe-9.0.0) [lguy@htcondor jobs]$ butler query-collections /repo/LSSTComCam *LVV-T191*

Name	Type
u/lguy/LVV-T191	CHAINED
u/lguy/LVV-T191/20241029T010847Z	RUN
LSSTComCam/raw/all	RUN
LSSTComCam/calib/DM-46360/isrTaskLSST/flat-i.20240926a	CALIBRATION
LSSTComCam/calib/DM-46360/isrTaskLSST/flat-r.20240926a	CALIBRATION
LSSTComCam/calib/DM-46360/isrTaskLSST/flat-g.20240926a	CALIBRATION
LSSTComCam/calib/DM-46360/isrTaskLSST/dark.20240926a	CALIBRATION
LSSTComCam/calib/DM-46360/isrTaskLSST/bias.20240926a	CALIBRATION
LSSTComCam/calib/DM-46360/isrTaskLSST/bfk.20240926a	CALIBRATION
LSSTComCam/calib/DM-46360/isrTaskLSST/ptc.20240926a	CALIBRATION

```
  LSSTComCam/calib/DM-46360/isrTaskLSST/linearizer.20240926a CALIBRATION
  LSSTComCam/calib/DM-46360/isrTaskLSST/defects.20240926a    CALIBRATION
  LSSTComCam/calib/DM-45877                                  CALIBRATION
  LSSTComCam/calib/DM-45877/unbounded                            RUN
  refcats                                                    RUN
u/lguy/LVV-T191/20241029T010847Z RUN
```

We see that data products clear
for the successful ISR task are available

```
> (lsst-scipipe-9.0.0) [lguy@htcondor jobs]$ butler query-dataset-types /repo/LSSTComCam --collections *LVV-T191*
              name
--------------------------------
         atlas_refcat2_20220201
                            bfk
                           bias
                         calexp
               calexpBackground
          calexpSummary_metrics
             calibrate_config
                calibrate_log
            calibrate_metadata
                         camera
        characterizeImage_config
           characterizeImage_log
      characterizeImage_metadata
                      crosstalk
                           dark
                        defects
                           flat
              gaia_dr2_20200414
                          icExp
                icExpBackground
                          icSrc
                   icSrc_schema
                 isrStatistics
                    isr_config
                       isr_log
                  isr_metadata
                     linearizer
                       packages
                     postISRCCD
                      preSource
                preSourceTable
```

ps1_pv3_3pi_20170110
ptc
raw
sdss_dr9_fink_v5b
src
srcMatch
srcMatchFull
src_schema
the_monster_20240904
transformPreSourceTable_config
transformPreSourceTable_log
transformPreSourceTable_metadata
transmission_filter
transmission_optics
transmission_sensor
writePreSourceTable_config
writePreSourceTable_log
writePreSourceTable_metadata

> butler query-datasets /repo/LSSTComCam --collections *LVV-T191*

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
AP	Alert Production
AURA	Association of Universities for Research in Astronomy
BDC	Base Data Center
CCD	Charge-Coupled Device
CCS	Camera Control System
CPP	Calibration Production Processing
CTIO	Cerro Tololo Inter-American Observatory
DAQ	Data Acquisition System
DC2	Data Challenge 2 (DESC)
DESC	Dark Energy Science Collaboration
DM	Data Management
DMS	Data Management Subsystem
DMSR	DM System Requirements; LSE-61
DMTN	DM Technical Note
DMTR	DM Test Report
DRP	Data Release Production
DTN	Data Transfer Node
DWDM	Dense Wave Division Multiplex
Db	Decibel
EFD	Engineering and Facility Database
HSC	Hyper Suprime-Cam
ISO	Information Security Officer
ISR	Instrument Signal Removal
ITTN	IT Technote
JSON	JavaScript Object Notation

L1	Lens 1
LAN	Local Area Network
LATISS	LSST Atmospheric Transmission Imager and Slitless Spectrograph
LDM	LSST Data Management (Document Handle)
LOVE	LSST Operators Visualization Environment
LSE	LSST Systems Engineering (Document Handle)
LSP	LSST Science Platform (now Rubin Science Platform)
LSST	Legacy Survey of Space and Time (formerly Large Synoptic Survey Telescope)
LSSTC	LSST Corporation
LVV	LSST Verification and Validation
NCSA	National Center for Supercomputing Applications
OCS	Observatory Control System
PB	PetaByte
PDF	Portable Document Format
PMCS	Project Management Controls System
PSF	Point Spread Function
QC	Quality Control
RAM	Random Access Memory
REUNA	Red Universitaria Nacional
RMS	Root-Mean-Square
RSP	Rubin Science Platform
SLAC	SLAC National Accelerator Laboratory
SNR	Signal to Noise Ratio
SSID	Service Set Identifier
TCS	Telescope Control System
UI	User Interface
USDF	United States Data Facility
YAML	Yet Another Markup Language
bps	bit(s) per second