

# Rubin Observatory

Vera C. Rubin Observatory  
Data Management

## Vera C. Rubin Observatory DM Science Verification Document

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## Abstract

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# Vera C. Rubin Observatory DM Science Verification Document

## 1 Introduction

### 1.1 Scope

The scope of this document is to capture the content and details of all DM Verification Elements categorized in the **Service** sub-component. This will make it possible to:

- provide to users and stakeholders the verification elements details, without the need to access Jira
- approve changes to the verification elements

### 1.2 Specification Flow-down

### 1.3 LSST Verification and Validation JIRA Project (LVV)

The LSST Verification and Validation JIRA Project contains the detailed specifications within or derived from, and traceable to, the DMSR specifications, in Verification Elements. Verification Elements also specify the verification methods, the responsible parties, and additional notes regarding verification, as per the LSE-160 LSST Verification and Validation Process.

The Verification Elements have one or more Test Cases associated with them that describe the implementation of the verification activities in terms of specific tests to be executed. Those Test Cases are then scheduled via Test Plans and Campaigns, and executed with results reported in Test Cycles.

### 1.4 Verification and Validation Schedule and Resources

The schedule and resources required for the verification are defined in the LSST Project Management Control System (PMCS).



## 1.5 Applicable Documents

- LSE-61 LSST DM Subsystem Requirements
- LSE-160 Verification and Validation Process

Draft

## 2 DM Service Verification Elements

The following is the list of verification elements defined in the context of the Service component of the DM subsystem.

### 2.1 [LVV-32] DMS-REQ-0074-V-01: Difference Exposure Attributes

Jira Link	Assignee	Status	Test Cases
LVV-32	Eric Bellm	Not Covered	LVV-T20 LVV-T37

#### Verification Element Description:

Demonstrate that all the noted information can be retrieved from the database system. Requirement needs to be adjusted as PSF matching kernel might not exist.

Requirement Details	
Requirement ID	DMS-REQ-0074
Requirement Description	<b>Specification:</b> For each Difference Exposure, the DMS shall store: the identify of the input exposures and related provenance information, and a set of metadata attributes including at least a representation of the PSF matching kernel used in the differencing.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0122 Provenance DMS-REQ-0066 Keep Exposure Archive

#### 2.1.1 Test Cases Summary

LVV-T20	AG-00-15: Scientific Verification of Difference Images			
Owner	Status	Version	Critical Event	Verification Type
Eric Bellm	Approved	1	false	Test

#### Objective:

This test will check that the difference images delivered by the Alert Generation science payload meet the requirements laid down by LSE-61.

Specifically, this will demonstrate that:

- Difference images have been generated and persisted during payload execution;
- Each difference image includes information about the identity of the input exposures, and metadata such as a representation of the PSF matching kernel (DMS-REQ-0074);
- Masks are correctly propagated from the input images.

This test does not include quantitative targets for the science quality criteria.

LVV-T37	Verify implementation of Difference Exposure Attributes			
Owner	Status	Version	Critical Event	Verification Type
Eric Bellm	Draft	1	false	Test

**Objective:**

Verify that for each Difference Exposure the DMS stores

1. The identify of the input exposures and related provenance information
2. Metadata attributes of the subtraction, including the PSF-matching kernel used.

## 2.2 [LVV-34] DMS-REQ-0077-V-01: Maintain Archive Publicly Accessible

Jira Link	Assignee	Status	Test Cases
LVV-34	Colin Slater	Not Covered	LVV-T150

### Verification Element Description:

For a system with 3 precursor data releases. Verify that queries can be performed on the 2 active DRs and that the DR1 can be downloaded in bulk. No requirement for DR1 to be queryable.

Requirement Details	
Requirement ID	DMS-REQ-0077
Requirement Description	<b>Specification:</b> All releases of the DMS catalog archive shall be maintained and preserved in a publicly accessible state for the entire operational life of the LSST observatory.
Requirement Discussion	<b>Discussion:</b> The scientific intent is satisfied by keeping data products from the current DRP release and the one prior available with low-latency, in a form readily queryable by the public. Earlier releases may be available from deep-store with potentially high latency, for bulk download by users.
Requirement Priority	1b
Upper Level Requirement	DMS-REQ-0076 Keep Science Data Archive OSS-REQ-0186 Access to Previous Data Releases

### 2.2.1 Test Cases Summary

LVV-T150	Verify implementation of Maintain Archive Publicly Accessible			
Owner	Status	Version	Critical Event	Verification Type
Colin Slater	Defined	1	false	Test

#### Objective:

Verify that prior data releases remain accessible.

## 2.3 [LVV-35] DMS-REQ-0078-V-01: Catalog Export Formats

Jira Link	Assignee	Status	Test Cases
LVV-35	Colin Slater	Not Covered	LVV-T151 LVV-T1232

### Verification Element Description:

Using TAP server, form ADQL query and verify that results can be retrieved in the specified formats.

Requirement Details	
Requirement ID	DMS-REQ-0078
Requirement Description	<b>Specification:</b> The DMS catalog archive shall provide catalog data and associated meta-data on request in community standard formats: * Comma-separated ASCII text * eXtensible Markup Language (XML) format, including VOTable ( <a href="http://www.ivoa.net/twiki/bin/view/IVOA/IvoaVOTable">http://www.ivoa.net/twiki/bin/view/IVOA/IvoaVOTable</a> ), and * FITS tables.
Requirement Priority	1a
Upper Level Requirement	DMS-REQ-0076 Keep Science Data Archive OSS-REQ-0176 Data Access

### 2.3.1 Test Cases Summary

LVV-T151	Verify Implementation of Catalog Export Formats From the Notebook Aspect			
Owner	Status	Version	Critical Event	Verification Type
Colin Slater	Defined	1	false	Test

#### Objective:

Verify that catalog data is exportable from the notebook aspect in a variety of community-standard formats.

LVV-T1232	Verify Implementation of Catalog Export Formats From the Portal Aspect			
Owner	Status	Version	Critical Event	Verification Type
Colin Slater	Defined	1	false	Test

**Objective:**

Verify that catalog data is exportable from the portal aspect in a variety of community-standard formats.

Draft

## 2.4 [LVV-37] DMS-REQ-0094-V-01: Keep Historical Alert Archive

Jira Link	Assignee	Status	Test Cases
LVV-37	Eric Bellm	Not Covered	LVV-T152

### Verification Element Description:

Show that alerts go into the L1 live database. Show that it is generated and inspect access policies, retention policies, and disaster recovery scheme. Can not demonstrate that we are keeping it updating for the entire survey.

Requirement Details	
Requirement ID	DMS-REQ-0094
Requirement Description	<b>Specification:</b> The DMS shall preserve and keep in an accessible state an alert archive with all issued alerts for a historical record and for false alert analysis.
Requirement Priority	1b
Upper Level Requirement	DMS-REQ-0092 Alert Attributes OSS-REQ-0128 Alerts

### 2.4.1 Test Cases Summary

LVV-T152	Verify implementation of Keep Historical Alert Archive			
Owner	Status	Version	Critical Event	Verification Type
Eric Bellm	Draft	1	false	Test

### Objective:

Verify that the DMS preserves and makes accessible an Alert Archive for reference and for false alert analyses

## 2.5 [LVV-45] DMS-REQ-0103-V-01: Produce Images for EPO

Jira Link	Assignee	Status	Test Cases
LVV-45	Leanne Guy	Not Covered	LVV-T63

### Verification Element Description:

Requirement is too vague and open-ended. Might include healpix RGB multi-scale images. Might just be coadds? Is generation under control of EPO for “on demand” generation? Or are they part of DRP? This requirement needs to be removed and replaced with real requirements from EPO.

Requirement Details	
Requirement ID	DMS-REQ-0103
Requirement Description	<b>Specification:</b> The DMS shall produce images for EPO purposes, according to the requirements in the DM-EPO ICD.
Requirement Discussion	<b>Discussion:</b> This is expected to include polychromatic (e.g., RGB JPEG) images for casual users. The DM-EPO ICD is LSE-131.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0136 Co-added Exposures

### 2.5.1 Test Cases Summary

LVV-T63	Verify implementation of Produce Images for EPO			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Draft	1	false	Test

#### Objective:

This test will verify that the DRP pipelines produce the image data products called out in LSE-131. Currently this is limited to a color all-sky HiPS map. This will be verified (1) by inspection of pipeline configurations and (2) in operations rehearsals on precursor data. The production of a usable HiPS map will be verified by browsing it with community tools.



## 2.6 [LVV-47] DMS-REQ-0119-V-01: DAC resource allocation for Level 3 processing

Jira Link	Assignee	Status	Test Cases
LVV-47	Colin Slater	Not Covered	LVV-T117

### Verification Element Description:

Create L3 instance. Submit a number of L3 processing jobs and demonstrate that prioritization and resource allocation happens correctly when limits are set lower than normal.

Requirement Details	
Requirement ID	DMS-REQ-0119
Requirement Description	<b>Specification:</b> The DMS shall provide a resource allocation mechanism for the DACs that allows the prioritization and allocation of the resources defined in DMS-REQ-0396 to a variety of Level 3 processing and storage activities based on user identity and group membership.
Requirement Discussion	<b>Discussion:</b> It is assumed that the DAC Level 3 processing resources will likely be over-subscribed, making this necessary. This technical mechanism is intended to be used to implement the decisions made by an anticipated administrative mechanism in the operations organization, such as an allocation committee.
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0143 Resource Allocation

### 2.6.1 Test Cases Summary

LVV-T117	Verify implementation of DAC resource allocation for Level 3 processing			
Owner	Status	Version	Critical Event	Verification Type
Colin Slater	Draft	1	false	Test

### Objective:

Verify that compute time and storage space allocations can be granted to science users.

## 2.7 [LVV-50] DMS-REQ-0122-V-01: Access to catalogs for external Level 3 processing

Jira Link	Assignee	Status	Test Cases
LVV-50	Simon Krughoff	Not Covered	LVV-T204

### Verification Element Description:

Show that a catalog can be exported. Verify that content matches the archive values. Demonstrate that catalog export will work with multiple data releases.

Requirement Details	
Requirement ID	DMS-REQ-0122
Requirement Description	<b>Specification:</b> The DMS shall facilitate Level 3 catalog processing that may take place at external facilities outside the DACs. This will principally be by facilitating the export of catalogs and the provision of tools for maintaining and validating exported data.
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0180 Data Products Query and Download Availability OSS-REQ-0140 Production

### 2.7.1 Test Cases Summary

LVV-T204	Verify implementation of Access to catalogs for external Level 3 processing			
Owner	Status	Version	Critical Event	Verification Type
Kian-Tat Lim	Draft	1	false	Test

### Objective:

Verify that catalog export, and maintenance/validation tools for Level 3 products to outside of the Data Access Centers.

## 2.8 [LVV-51] DMS-REQ-0123-V-01: Access to input catalogs for DAC-based Level 3 processing

Jira Link	Assignee	Status	Test Cases
LVV-51	Colin Slater	Not Covered	LVV-T205

### Verification Element Description:

Show that a L3 job can access L1 and L2 catalogs.

Requirement Details	
Requirement ID	DMS-REQ-0123
Requirement Description	<b>Specification:</b> The DMS shall provide access to all Level 1 and Level 2 catalog products through the LSST project's Data Access Centers, and any others that have been established and funded, for Level 3 processing that takes place at the DACs.
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0140 Production

### 2.8.1 Test Cases Summary

LVV-T205	Verify implementation of Access to input catalogs for DAC-based Level 3 processing			
Owner	Status	Version	Critical Event	Verification Type
Robert Gruendl	Draft	1	false	Test

### Objective:

Verify that data products are available at the Data Access Centers for use in Level 3 processing.

## 2.9 [LVV-55] DMS-REQ-0127-V-01: Access to input images for DAC-based Level 3 processing

Jira Link	Assignee	Status	Test Cases
LVV-55	Colin Slater	Not Covered	LVV-T208

### Verification Element Description:

Show that a L3 job can access L1 and L2 image products.

Requirement Details	
Requirement ID	DMS-REQ-0127
Requirement Description	<b>Specification:</b> The DMS shall provide access to all Level 1 and Level 2 image products through the LSST project's Data Access Centers, and any others that have been established and funded, for Level 3 processing that takes place at the DACs.
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0140 Production

### 2.9.1 Test Cases Summary

LVV-T208	Verify implementation of Access to input images for DAC-based Level 3 processing			
Owner	Status	Version	Critical Event	Verification Type
Kian-Tat Lim	Draft	1	false	Test

### Objective:

Verify that prompt processing and DRP products are available at the DACs for Level 3 processing at the DACs.

## 2.10 [LVV-58] DMS-REQ-0131-V-01: Time allowed to process calibs

Jira Link	Assignee	Status	Test Cases
LVV-58	Robert Lupton	Not Covered	LVV-T106

### Verification Element Description:

With calibration observation data that requires the most processing, ensure that it can be processed and stored on the correct timescale. Simulate a “worst possible” night’s observing and inspect the daily operations plan.

Associated element (LVV-9745) satisfies the number of calibs to be processed in the allotted time.

Requirement Details	
Requirement ID	DMS-REQ-0131
Requirement Description	<b>Specification:</b> Calibration products from a group of up to <b>nCalExpProc</b> related exposures that should be processed together, shall be available from the DMS image archive within <b>calProcTime</b> of the end of the acquisition of images/data for that group.
Requirement Parameters	<b>[nCalExpProc = 25[integer]</b> Maximum number of calibration exposures that can be processed together within time <b>calProcTime</b> ., <b>calProcTime = 1200[second]</b> Time allowed to process <b>nCalExpProc</b> calibration exposures and have them available within the DMS.]
Requirement Discussion	<b>Discussion:</b> The motivation here is that calibration images will be needed at least 1 hour prior to the start of observing and this requirement allows the calibration observations to be planned accordingly.
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0046 Calibration OSS-REQ-0021 Base Site OSS-REQ-0194 Calibration Exposures Per Day DMS-REQ-0130 Calibration Data Products

### 2.10.1 Test Cases Summary

LVV-T106	Verify implementation of Calibration Images Available Within Specified Time			
Owner	Status	Version	Critical Event	Verification Type
Kian-Tat Lim	Draft	1	false	Test

**Objective:**

Execute single-day operations rehearsal, observe data products generated

Draft

## 2.11 [LVV-60] DMS-REQ-0155-V-01: Provide Data Access Services

Jira Link	Assignee	Status	Test Cases
LVV-60	Gregory Dubois-Felsmann	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-REQ-0155
Requirement Description	(This is a composite requirement in the SysML model, which simply aggregates its children.)
Requirement Discussion	
Requirement Priority	1a
Upper Level Requirement	OSS-REQ-0176 Data Access

### 2.11.1 Verified By

- . LVV-129 (2.14) DMS-REQ-0298-V-01: Data Product and Raw Data Access
- . LVV-130 (??) DMS-REQ-0299-V-01: Data Product Ingest
- . LVV-131 (??) DMS-REQ-0300-V-01: Bulk Download Service

## 2.12 [LVV-61] DMS-REQ-0156-V-01: Provide Pipeline Execution Services

Jira Link	Assignee	Status	Test Cases
LVV-61	Robert Gruendl	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-REQ-0156
Requirement Description	(This is a composite requirement in the SysML model, which simply aggregates its children.)
Requirement Discussion	
Requirement Priority	1a
Upper Level Requirement	OSS-REQ-0117 Automated Production OSS-REQ-0037 Observatory Control System Definition

### 2.12.1 Verified By

- . LVV-133 (??) DMS-REQ-0302-V-01: Production Orchestration
- . LVV-134 (??) DMS-REQ-0303-V-01: Production Monitoring
- . LVV-135 (??) DMS-REQ-0304-V-01: Production Fault Tolerance



## 2.13 [LVV-63] DMS-REQ-0160-V-01: Provide User Interface Services

Jira Link	Assignee	Status	Test Cases
			LVV-T131
LVV-63	Gregory Dubois-Felsmann	Not Covered	LVV-T368
			LVV-T368

### Verification Element Description:

Show that the SUI can handle these queries and interactions. Need to be more explicit on resampling/re-project. Healpix?

Requirement Details	
Requirement ID	DMS-REQ-0160
Requirement Description	<b>Specification:</b> The DMS shall provide software for User Interface Services, including services to: browse LSST data products through astronomical views or visualizations; create and serve "best" images of selectable regions of the sky; resample and re-project images, and visualize catalog content.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0057 Image Visualization

### 2.13.1 Test Cases Summary

LVV-T131	Verify implementation of Provide User Interface Services			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

#### Objective:

Verify the availability and functionality of the broad range of user interface services called for in the requirement, as applied to both Nightly and DRP data. This will primarily be done by verifications performed at the LSST Science Platform level, based on the requirements in LDM-554; however, a high-level set of tests corresponding to the DMS-REQ-0160 requirement are defined below.

LVV-T368	Loading and processing Camera test data			
Owner	Status	Version	Critical Event	Verification Type

John Swinbank	Approved	2	false	Test
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**Objective:**

This test will check:

- That Camera test data is available for processing in the LSST Data Facility, and accessible through the LSST Science Platform;
- That the Data Management I/O abstraction (the “Data Butler”) can load that data into the Science Platform environment;
- That Data Management algorithmic “tasks” can be executed to process that data;
- That results can be displayed in the Firefly display tool.

LVV-T368	Loading and processing Camera test data			
<b>Owner</b>	<b>Status</b>	<b>Version</b>	<b>Critical Event</b>	<b>Verification Type</b>
John Swinbank	Approved	2	false	Test

**Objective:**

This test will check:

- That Camera test data is available for processing in the LSST Data Facility, and accessible through the LSST Science Platform;
- That the Data Management I/O abstraction (the “Data Butler”) can load that data into the Science Platform environment;
- That Data Management algorithmic “tasks” can be executed to process that data;
- That results can be displayed in the Firefly display tool.

## 2.14 [LVV-129] DMS-REQ-0298-V-01: Data Product and Raw Data Access

Jira Link	Assignee	Status	Test Cases
LVV-129	Robert Gruendl	Not Covered	LVV-T136
			LVV-T368
			LVV-T374
			LVV-T368

### Verification Element Description:

Some of this is handled by the GUI requirement (DMS-REQ-0160). A key demonstration is to run a test suite that does each of the requests in turn and verifies against reference results.

Requirement Details	
Requirement ID	DMS-REQ-0298
Requirement Description	<b>Specification:</b> The DMS shall provide software for Data Access Services to list and retrieve image, file, and catalog data products (including raw telescope images and calibration data), their associated metadata, their provenance, or any combination thereof, independent of their actual storage location.
Requirement Priority	1a
Upper Level Requirement	OSS-REQ-0176 Data Access

### 2.14.1 Test Cases Summary

LVV-T136	Verify implementation of Data Product and Raw Data Access			
Owner	Status	Version	Critical Event	Verification Type
Colin Slater	Defined	1	false	Test

#### Objective:

Verify that available image, file, and catalog data products, and their metadata and provenance information, can be listed and retrieved.

LVV-T368	Loading and processing Camera test data			
Owner	Status	Version	Critical Event	Verification Type
John Swinbank	Approved	2	false	Test

**Objective:**

This test will check:

- That Camera test data is available for processing in the LSST Data Facility, and accessible through the LSST Science Platform;
- That the Data Management I/O abstraction (the “Data Butler”) can load that data into the Science Platform environment;
- That Data Management algorithmic “tasks” can be executed to process that data;
- That results can be displayed in the Firefly display tool.

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LVV-T374	Ingesting Camera test data			
Owner	Status	Version	Critical Event	Verification Type
John Swinbank	Approved	1	false	Test

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**Objective:**

This test will check:

- That raw Camera test data is available on a filesystem in the LSST Data Facility;
- That raw Camera test data can be ingested and made available through the Data Management I/O abstraction (the “Data Butler”).

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LVV-T368	Loading and processing Camera test data			
Owner	Status	Version	Critical Event	Verification Type
John Swinbank	Approved	2	false	Test

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**Objective:**

This test will check:

- That Camera test data is available for processing in the LSST Data Facility, and accessible through the LSST Science Platform;
- That the Data Management I/O abstraction (the “Data Butler”) can load that data into the Science Platform environment;
- That Data Management algorithmic “tasks” can be executed to process that data;
- That results can be displayed in the Firefly display tool.

## 2.15 [LVV-139] DMS-REQ-0308-V-01: Software Architecture to Enable Community Re-Use

Jira Link	Assignee	Status	Test Cases
			LWV-T10
			LWV-T17
LWV-139	Simon Krughoff	Not Covered	LWV-T124
			LWV-T216
			LWV-T362
			LWV-T363

### Verification Element Description:

Show that a processing run (of limited size) can be performed on a desktop and archive centre. Are we meant to be verifying "high throughput"?

Requirement Details	
Requirement ID	DMS-REQ-0308
Requirement Description	<b>Specification:</b> The DMS software architecture shall be designed to enable high throughput on high-performance compute platforms, while also enabling the use of science-specific algorithms by science users on commodity desktop compute platforms.
Requirement Discussion	<b>Discussion:</b> The high data volume and short processing timeline for LSST Productions anticipates the use of high-performance compute infrastructure, while the need to make the science algorithms immediately applicable to science teams for Level-3 processing drives the need for easy interoperability with desktop compute environments.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0121 Open Source, Open Configuration

### 2.15.1 Test Cases Summary

LWV-T10	DRP-00-00: Installation of the Data Release Production v14.0 science payload			
Owner	Status	Version	Critical Event	Verification Type
Jim Bosch	Approved	1	false	Test

#### Objective:

This test will check:

- That the Data Release Production science payload is available for distribution from documented channels;
- That the Data Release Production science payload can be installed on LSST Data Facility-managed systems.

LVV-T17	AG-00-00: Installation of the Alert Generation v16.0 science payload.			
Owner	Status	Version	Critical Event	Verification Type
Eric Bellm	Approved	1	false	Test

**Objective:**

This test will check:

- That the Alert Generation science payload is available for distribution from documented channels;
- That the Alert Generation science payload can be installed on LSST Data Facility-managed systems.

LVV-T124	Verify implementation of Software Architecture to Enable Community Re-Use			
Owner	Status	Version	Critical Event	Verification Type
Simon Krughoff	Defined	1	false	Test

**Objective:**

Show that the LSST software is capable of being executed in multiple contexts: single user instance, batch processing, continuous integration.

Also show that the algorithms can be reconfigured and, if desired, completely replaced at run time.

LVV-T216	Installation of the Alert Distribution payloads.			
Owner	Status	Version	Critical Event	Verification Type
Eric Bellm	Approved	1	false	Test

**Objective:**

This test will check:

- That the Alert Distribution payloads are available from documented channels.
- That the Alert Distribution payloads can be installed on LSST Data Facility-managed systems.
- That the Alert Distribution payloads can be executed by LSST Data Facility-managed systems.

LVV-T362	Installation of the LSST Science Pipelines Payloads			
Owner	Status	Version	Critical Event	Verification Type
John Swinbank	Draft	1	false	Test

**Objective:**

This test will check that:

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

Note that this test assumes a 2018-era packaging of the Science Pipelines software, in which all the above payloads are represented by a single “meta-package”, `lsst_distrib`.

LVV-T363	Science Pipelines Release Documentation			
Owner	Status	Version	Critical Event	Verification Type
John Swinbank	Draft	1	false	Inspection

**Objective:**

This test will check:

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

## 2.16 [LVV-143] DMS-REQ-0312-V-01: Level 1 Data Product Access

Jira Link	Assignee	Status	Test Cases
LVV-143	Eric Bellm	Not Covered	LVV-T157

### Verification Element Description:

Do a real-time L1 test run. Demonstrate that an end-user can see the L1 database being updated live.

The term "live" Level 1 Database refers to the Prompt Products Database being updated within L1PublicT, and while it is updated as a result of Alert Production it does not contain copies of the alert packets, which are stored elsewhere (LVV-1456).

Requirement Details	
Requirement ID	DMS-REQ-0312
Requirement Description	<b>Specification:</b> The DMS shall maintain a "live" Level 1 Database for query by science users, updated as a result of Alert Production processing.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0185 Transient Alert Query OSS-REQ-0127 Level 1 Data Product Availability

### 2.16.1 Test Cases Summary

LVV-T157	Verify implementation Level 1 Data Product Access			
Owner	Status	Version	Critical Event	Verification Type
Colin Slater	Draft	1	false	Test

#### Objective:

Verify that Level 1 Data Products are accessible by science users.



## 2.17 [LVV-144] DMS-REQ-0313-V-01: Level 1 & 2 Catalog Access

Jira Link	Assignee	Status	Test Cases
LVV-144	Colin Slater	Not Covered	LVV-T158

### Verification Element Description:

Can only really be demonstrated when the 3rd data release is created. This could be done using precursor survey data by demonstrating that DR1 is deleted and moved to tape when DR3 is released. It may be that for commissioning we can only show this by inspection of release policy document.

Requirement Details	
Requirement ID	DMS-REQ-0313
Requirement Description	<b>Specification:</b> The DMS shall maintain both the Level-2 catalog and the reprocessed Level-1 catalog from the most recent two Data Releases for query by science users, as well as versions of the most recent catalogs generated from Special Programs data.
Requirement Discussion	<b>Discussion:</b> There is no requirement for older data releases to be queryable.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0186 Access to Previous Data Releases

### 2.17.1 Test Cases Summary

LVV-T158	Verify implementation Level 1 and 2 Catalog Access			
Owner	Status	Version	Critical Event	Verification Type
Colin Slater	Draft	1	false	Test

#### Objective:

Verify that Data Release Products are accessible by science users.

## 2.18 [LVV-151] DMS-REQ-0320-V-01: Processing of Data From Special Programs

Jira Link	Assignee	Status	Test Cases
LVV-151	Melissa Graham	Not Covered	LVV-T92

### Verification Element Description:

For a simulated night of observing that includes some special program observations, show that the special programs observations are reduced using a specialized recipe.

Requirement Details	
Requirement ID	DMS-REQ-0320
Requirement Description	<p><b>Specification:</b> It shall be possible for special programs to trigger their own data processing recipes, during the night instead of the nightly Alert Processing (but the recipes may still issue Alerts), or on alternative timescales.</p> <p><b>Discussion:</b> LSST will provide these recipes for processing Special Programs data when possible, which includes cases where DM can run original or reconfigured versions of existing pipelines, and excludes cases where the development of new algorithms, or the allocation of significant additional computational resources, are required. An example of an alternative timescale is a nightly trigger to coadd all the deep-drilling field images. Decisions about which recipes are applied to which Special Programs will be made by the Operations team, after consideration of the scientific goals, computational resources, and data rights policy.</p>
Requirement Discussion	
Requirement Priority	2
Upper Level Requirement	LSR-REQ-0075 Survey Time Allocation OSS-REQ-0392 Data Products Handling for Special Programs

### 2.18.1 Test Cases Summary

LVV-T92	Verify implementation of Processing of Data From Special Programs			
Owner	Status	Version	Critical Event	Verification Type
Melissa Graham	Draft	1	false	Test

#### Objective:

For a simulated night of observing that includes some special program observations, show that the SP observations are reduced using their designated reconfigured pipelines (i.e., that the image metadata is sufficient to trigger the processing and include all other relevant images in the processing).

## 2.19 [LVV-171] DMS-REQ-0340-V-01: Access Controls of Level 3 Data Products

Jira Link	Assignee	Status	Test Cases
LVV-171	Simon Krughoff	Not Covered	LVV-T123

### Verification Element Description:

Create some L3 data products. Adjust permissions and show that retrieval fails if permissions are not suitable.

Requirement Details	
Requirement ID	DMS-REQ-0340
Requirement Description	<b>Specification:</b> All Level 3 data products shall be configured to have the ability to have access restricted to the owner, a list of people, a named group, or be completely public.
Requirement Discussion	<b>Discussion:</b> These features are supported by VOspace.
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0176 Data Access OSS-REQ-0187 Information Security OSS-REQ-0142 Access

### 2.19.1 Test Cases Summary

LVV-T123	Verify implementation of Access Controls of Level 3 Data Products			
Owner	Status	Version	Critical Event	Verification Type
Robert Gruendl	Draft	1	false	Test

### Objective:

This test touches upon the interface between the following areas: IT Security, Identity Management, LSP Portal, and Parallel Distributed Database. The purpose is to show that access to user generated data products (previously Level 3) can have a variety of access restrictions varying from single-user, a list, a named group, or open access.

## 2.20 [LVV-172] DMS-REQ-0341-V-01: Max elapsed time for precovery results

Jira Link	Assignee	Status	Test Cases
LVV-172	Robert Gruendl	Not Covered	LVV-T160

### Verification Element Description:

Submit precovery request and compare results with expected values.

Associated element (LVV-9749) satisfies the minimum number of precovery service connections that must be supported.

Requirement Details	
Requirement ID	DMS-REQ-0341
Requirement Description	<b>Specification:</b> A "precovery service" shall be available to end-users to request precovery for a provided sky location across all previous visits, making the results available within <b>precoveryServiceElapsed</b> hours of the request and supporting at least <b>precoveryServicePeakUsers</b> submissions per hour.
Requirement Parameters	[ <b>precoveryServiceElapsed</b> = 24[hour] Maximum time between submitting a request and receiving the results., <b>precoveryServicePeakUsers</b> = 10[integer] Minimum number of precovery service connections to be supported per hour.]
Requirement Discussion	<b>Discussion:</b> This is forced photometry on difference images from each visit. This will include a web interface and scriptable APIs.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0126 Level 1 Data Products

### 2.20.1 Test Cases Summary

LVV-T160	Verify implementation of Providing a Precovery Service			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Draft	1	false	Test

#### Objective:

Verify that a technical capability to perform user-directed precovery analyses on difference images exists and that it is exposed through the LSST Science Platform. Verified by testing against precursor datasets.

(Involves: LSP Portal, MOPS and Forced Photometry)

Draft

## 2.21 [LVV-173] DMS-REQ-0342-V-01: Alert Filtering Service

Jira Link	Assignee	Status	Test Cases
LVV-173	Eric Bellm	Not Covered	LVV-T112 LVV-T218

### Verification Element Description:

In simulated L1 system, register a simple filter and verify that the filter triggers for the correct alerts.

Requirement Details	
Requirement ID	DMS-REQ-0342
Requirement Description	<b>Specification:</b> A basic, limited capacity, alert filtering service shall be provided that can be given user defined filters to reduce the alert stream to manageable levels.
Requirement Priority	2
Upper Level Requirement	LSR-REQ-0025    Transient Filtering

### 2.21.1 Test Cases Summary

LVV-T112	Verify implementation of Alert Filtering Service			
Owner	Status	Version	Critical Event	Verification Type
Eric Bellm	Defined	1	false	Test

#### Objective:

Verify that user-defined filters can be used to generate a basic alert filtering service.

LVV-T218	Simple Filtering of the LSST Alert Stream			
Owner	Status	Version	Critical Event	Verification Type
Eric Bellm	Approved	1	false	Test

#### Objective:

This test will demonstrate the LSST Alert Filtering Service that returns a subset of alerts from the full stream identified by user-provided filters.

Specifically, this will demonstrate that:

- The filtering service can retrieve alerts from the full alert stream and filter them according to their contents;
- The filtered subset can be delivered to science users.

Draft

## 2.22 [LVV-174] DMS-REQ-0343-V-01: Number of full-size alerts

Jira Link	Assignee	Status	Test Cases
LVV-174	Eric Bellm	Not Covered	LVV-T113 LVV-T218

### Verification Element Description:

In simulated L1 system, register numBrokerUsers distinct filter codes and verify that they receive the expected throughput.

Additional element (LVV-9748) satisfies the constraint on the number of simultaneous users.

Requirement Details	
Requirement ID	DMS-REQ-0343
Requirement Description	<b>Specification:</b> The LSST alert filtering service shall support <b>numBrokerUsers</b> simultaneous users with each user allocated a bandwidth capable of receiving the equivalent of <b>numBrokerAlerts</b> alerts per visit.
Requirement Parameters	[ <b>numBrokerUsers = 100[integer]</b> Supported number of simultaneous users connected to the LSST alert filtering system., <b>numBrokerAlerts = 20[integer]</b> Number of full-sized alerts that can be received per visit per user.]
Requirement Discussion	<b>Discussion:</b> The constraint on number of alerts is specified for the full VOEvent alert content, but could also be satisfied by all alerts being received with minimal alert content.
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0193 Alerts per Visit OSS-REQ-0184 Transient Alert Publication

### 2.22.1 Test Cases Summary

LVV-T113	Verify implementation of Performance Requirements for LSST Alert Filtering Service			
Owner	Status	Version	Critical Event	Verification Type
Eric Bellm	Defined	1	false	Test

#### Objective:

Verify that the DMS alert filter service provides sufficient bandwidth for **numBrokerUsers = 100** simultaneously-operating bro-



users to receive up to **numBrokerAlerts = 20** alerts per visit.

---

LVV-T218	Simple Filtering of the LSST Alert Stream			
Owner	Status	Version	Critical Event	Verification Type
Eric Bellm	Approved	1	false	Test

---

**Objective:**

This test will demonstrate the LSST Alert Filtering Service that returns a subset of alerts from the full stream identified by user-provided filters.

Specifically, this will demonstrate that:

- The filtering service can retrieve alerts from the full alert stream and filter them according to their contents;
- The filtered subset can be delivered to science users.

## 2.23 [LVV-175] DMS-REQ-0004-V-01: Time to L1 public release

Jira Link	Assignee	Status	Test Cases
LVV-175	Melissa Graham	Not Covered	LVV-T35 LVV-T95

### Verification Element Description:

This is 3 distinct requirements. OTT1 can be tested with simulated data. L1 Data Products can be created with precursor data but requires that we include some “worst case” datasets (in terms of density and night length). SSO object orbit determination can be done to a certain extent with simulated data. Will need to be verified again during commissioning.

Associated element (LVV-9740) satisfies the latency of reporting transients.

Associated element (LVV-9803) satisfies the availability of Solar System Object orbits.

Associated element (LVV-9744) satisfies the latency of reporting optical transients.

### Requirement Details

Requirement ID	DMS-REQ-0004
Requirement Description	<p><b>Specification:</b> With the exception of alerts and Solar System Objects, all Level 1 Data Products shall be made public within time <b>L1PublicT</b> of the acquisition of the raw image data.</p> <p>LSST shall not release image or catalog data resulting from a visit, except for the content of the public alert stream, sooner than time <b>L1PublicT<sub>min</sub></b> following the acquisition of the raw image data from that visit.</p> <p>For visits resulting in fewer than <b>nAlertVisitPeak</b>, LSST shall be capable of supporting the distribution of at least <b>OTR1</b> per cent of alerts via the LSST alert distribution system within time <b>OTT1</b> from the conclusion of the camera's readout of the raw exposures used to generate each alert.</p> <p>Solar System Object orbits will, on average, be calculated before the following night's observing finishes and the results shall be made available within time <b>L1PublicT</b> of those calculations being completed.</p>

Requirement Parameters	<p><b>[OTR1 = 98[percent]</b> Fraction of detectable alerts for which an alert is actually transmitted within latency OTT1 (see LSR-REQ-0101), <b>OTT1 = 1[minute]</b> The latency of reporting optical transients following the completion of readout of the last image of a visit, <b>nAlertVisitPeak = 40000[integer]</b> The instantaneous peak number of alerts per standard visit., <b>L1PublicTMin = 6[hour]</b> Time images and other products (except alerts) will be embargoed before release to the consortium (or the public), <b>L1PublicT = 24[hour]</b> Maximum time from the acquisition of science data to the release of associated Level 1 Data Products (except alerts)]</p>	
Requirement Discussion	<p><b>Discussion:</b> Because of the processing flow of SSO object orbit determination, meeting the base <b>L1PublicT</b>-after-data-acquisition requirement would be far more challenging than for the other L1 Data Products, but the system throughput has to be good enough such that a back log can not build up.</p>	
Requirement Priority	1b	
Upper Level Requirement	DMS-REQ-0003	Create and Maintain Science Data Archive
	OSS-REQ-0127	Level 1 Data Product Availability

## 2.23.1 Test Cases Summary

LVV-T35	Verify implementation of Nightly Data Accessible Within 24 hrs			
<b>Owner</b>	<b>Status</b>	<b>Version</b>	<b>Critical Event</b>	<b>Verification Type</b>
Eric Bellm	Draft	1	false	Test

### Objective:

#### Test Items

Verify that

- Alerts are available within OTT1
- Level 1 Data Products are available within L1PublicT
- Solar System Object orbits are available within L1PublicT of the updated calculations completion on the following night.

LVV-T95	Verify implementation of Constraints on Level 1 Special Program Products Generation			
<b>Owner</b>	<b>Status</b>	<b>Version</b>	<b>Critical Event</b>	<b>Verification Type</b>
Melissa Graham	Draft	1	false	Test

### Objective:

Execute single-day operations rehearsal. Observe Prompt Processing data products generated in time. Confirm that data from Special Programs is processed with the same latency as required for main survey data: release of public data within L1publicT and Alerts within OTT1.

Draft

## 2.24 [LVV-177] DMS-REQ-0346-V-01: Data Availability

Jira Link	Assignee	Status	Test Cases
LVV-177	Gregory Dubois-Felsmann	Not Covered	LVV-T27 LVV-T286

### Verification Element Description:

Retrieve a coadd. Query its provenance and retrieve all the information required to recreate that coadd locally. In theory we could then rereduce the data and compare it to the original coadd.

Requirement Details	
Requirement ID	DMS-REQ-0346
Requirement Description	<b>Specification:</b> All raw data used to generate any public data product (raw exposures, calibration frames, telemetry, configuration metadata, etc.) shall be kept and made available for download.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0004 The Archive Facility OSS-REQ-0167 Data Archiving OSS-REQ-0313 Telemetry Database Retention

### 2.24.1 Test Cases Summary

LVV-T27	Verify implementation of Data Availability			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Draft	1	false	Test

#### Objective:

Determine if all required categories of raw data (specifically enumerated: raw exposures, calibration frames, telemetry, configuration metadata) can be located through the Science Platform and are available for download. Verify through (1) administrative review; (2) checking with precursor data; (3) checking on early data feeds from the Summit such as from AuxTel and ComCam.

LVV-T286	RAS-00-20: Raw image are part of the permanent record of survey via DBB
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<b>Owner</b>	<b>Status</b>	<b>Version</b>	<b>Critical Event</b>	<b>Verification Type</b>
Michelle Butler	Approved	1	false	Test

**Objective:**

This test will check:

- That the handoff of a raw image from the Level 1 Archiver Service to the DBB buffer manager is successful;
- That the raw image is ingested into the Data Backbone successfully;
- That the monitoring of the above items is successful;

This Test Case shall be repeated for each of the different cameras (ATScam, LSSTCam) and sensors (Science, Wavefront, and Guider) combination.

Note: For a complete check of the various aspects of what it means for a raw image to be in the Data Backbone, see the tests for the Data Backbone.

## 2.25 [LVV-184] DMS-REQ-0353-V-01: Publishing predicted visit schedule

Jira Link	Assignee	Status	Test Cases
LVV-184	Colin Slater	Not Covered	LVV-T60

### Verification Element Description:

Use simulated schedule and test that an external unauthenticated user can retrieve the information.

Requirement Details	
Requirement ID	DMS-REQ-0353
Requirement Description	<b>Specification:</b> A service shall be provided to publish to the community the next visit location and the predicted visit schedule provided by the OCS. This service shall consist of both a web page for human inspection and a web API to allow automated tools to respond promptly.
Requirement Discussion	<b>Discussion:</b> The next visit and advanced schedule do not need to be published using the same service or protocol.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0378 Advanced Publishing of Scheduler Sequence

### 2.25.1 Test Cases Summary

LVV-T60	Verify implementation of Publishing predicted visit schedule			
Owner	Status	Version	Critical Event	Verification Type
Eric Bellm	Draft	1	false	Test

### Objective:

Verify that a predict-visit schedule can be published by the OCS.

## 2.26 [LVV-186] DMS-REQ-0355-V-01: Max time to retrieve Prompt Products Database query results

Jira Link	Assignee	Status	Test Cases
LVV-186	Eric Bellm	Not Covered	

### Verification Element Description:

Prompt Products Database query results shall be retrievable in a maximum time of **I1QueryTime = 10 seconds**.

The associated element DMS-REQ-0355-V-02 (LVV-9784) satisfies the additional constraint on the number of simultaneous users.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0355
Requirement Description	<b>Specification:</b> The live Prompt Products Database shall support at least <b>I1QueryUsers</b> simultaneous queries, assuming each query lasts no more than <b>I1QueryTime</b> .
Requirement Parameters	[ <b>I1QueryTime = 10[second]</b> Maximum time allowed for retrieving results of a query of the Prompt Products Database., <b>I1QueryUsers = 20[integer]</b> Minimum number of simultaneous users querying the Prompt Products Database.]
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure



## 2.27 [LVV-187] DMS-REQ-0356-V-01: Radius for low-volume query

Jira Link	Assignee	Status	Test Cases
LVV-187	Robert Gruendl	Not Covered	

### Verification Element Description:

Low volume queries shall use a radius of **lvSkyRadius = 60 arcseconds** on the sky.

The associated element DMS-REQ-0356-V-02 (LVV-9785) satisfies the additional constraint on the maximum size of low volume queries.

The associated element DMS-REQ-0356-V-03 (LVV-9786) satisfies the additional constraint on the number of simultaneous users.

The associated element DMS-REQ-0356-V-04 (LVV-9787) satisfies the additional constraint on the maximum time to return low volume query results.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0356
Requirement Description	<b>Specification:</b> Low volume queries, queries that are spatially restricted to a circle of radius <b>lvSkyRadius</b> and return at most <b>lvMaxReturnedResults</b> of data, shall respond within <b>lvQueryTime</b> under a load of <b>lvQueryUsers</b> simultaneous queries.
Requirement Parameters	<b>[lvSkyRadius = 60[arcsecond]]</b> Radius to be used for a low-volume query on the sky., <b>lvMaxReturnedResults = 0.5[gigabyte]</b> Maximum size of a results set for a query to be defined to be "low-volume", <b>lvQueryUsers = 100[integer]</b> Minimum number of simultaneous users performing low volume queries., <b>lvQueryTime = 10[second]</b> Maximum time allowed for retrieving results of a low-volume query.]
Requirement Discussion	<b>Discussion:</b> We are evaluating whether the latency requirements of low-volume queries can also be met for certain categories of temporal queries or queries on indexed attributes which limit the scope of per-row operations in the query (such as non-indexed WHERE evaluations) to a comparable fraction of the total dataset. The low-volume query requirements also apply to queries selecting data by the primary key of any data product table, or by the associated Object-like primary key for the ForcedSource and DIASource tables.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

## 2.28 [LVV-190] DMS-REQ-0364-V-01: Total number of data releases

Jira Link	Assignee	Status	Test Cases
LVV-190	Colin Slater	Not Covered	LVV-T163

### Verification Element Description:

There shall be at least **nDRTot = 11[integer]** data releases over the course of the survey.

Associated element (LVV-9750) addresses the length of the planned survey.

Requirement Details	
Requirement ID	DMS-REQ-0364
Requirement Description	<b>Specification:</b> The data access services shall be designed to permit, and their software implementation shall support, the service of at least <b>nDRTot</b> Data Releases accumulated over the (find the actual survey-length parameter) <b>surveyYears</b> -year planned survey.
Requirement Parameters	<b>[nDRTot = 11[integer]</b> Total number of data releases over the survey., <b>surveyYears = 10[integer]</b> Length of the survey in years]
Requirement Discussion	<b>Discussion:</b> It is an operations-era decision to choose the actual number of releases to be served, and to allocate hardware resources accordingly. The requirement is that the system delivered at the close of the MREFC construction period be capable of handling ten years of releases if the operations project chooses to allocate adequate hardware resources.
Requirement Priority	3
Upper Level Requirement	OSS-REQ-0396 Data Access Services

### 2.28.1 Test Cases Summary

LVV-T163	Verify implementation of Data Access Services			
Owner	Status	Version	Critical Event	Verification Type
Robert Gruendl	Draft	1	false	Test

#### Objective:

Demonstrate that Data Access Services are capable of scaling to serve data from nDRTot (11) data releases over a surveyYears (10) year survey.

## 2.29 [LVV-191] DMS-REQ-0365-V-01: Operations Subsets

Jira Link	Assignee	Status	Test Cases
LVV-191	Colin Slater	Not Covered	LVV-T164

### Verification Element Description:

tbc

Requirement Details	
Requirement ID	DMS-REQ-0365
Requirement Description	<b>Specification:</b> The data access services shall be designed to permit the service of operations-designated subsets of the full content of the “older Data Releases” referred to in DMS-REQ-0363.
Requirement Discussion	<b>Discussion:</b> This requirement, and the following one, are intended to give the operations project flexibility in, for example, serving only catalogs, and not images, from older releases.
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0398 Operations Subsets

### 2.29.1 Test Cases Summary

LVV-T164	Verify implementation of Operations Subsets			
Owner	Status	Version	Critical Event	Verification Type
Robert Gruendl	Draft	1	false	Test

#### Objective:

Demonstrate that Data Access Services are designed such that subsets of a Data Release may be retained and served (made available) after a Data Release has been superseded. (Data Backbone, Managed Database, LSP Portal, LSP JupyterLab, LSP Web APIs, Parallel Distributed Database)

## 2.30 [LVV-192] DMS-REQ-0366-V-01: Subsets Support

Jira Link	Assignee	Status	Test Cases
LVV-192	Colin Slater	Not Covered	LVV-T165

### Verification Element Description:

tbc

Requirement Details	
Requirement ID	DMS-REQ-0366
Requirement Description	<b>Specification:</b> The data access services shall be designed to support the service of operations-designated subsets of the content of the “older Data Releases” referred to in requirement DMS-REQ-0363 from high-latency media.
Requirement Discussion	<b>Discussion:</b> This means that the “toolkit” of data access services should include elements that, for instance, allow users to understand that certain queries (e.g., for data on tape) may take much longer than for current data releases, and to monitor the status of such queries.
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0400 Subsets Support

### 2.30.1 Test Cases Summary

LVV-T165	Verify implementation of Subsets Support			
Owner	Status	Version	Critical Event	Verification Type
Robert Lupton	Draft	1	false	Test

#### Objective:

Verify that the DMS can provide designated subsets of previous Data Releases.

## 2.31 [LVV-194] DMS-REQ-0368-V-01: Implementation Provisions

Jira Link	Assignee	Status	Test Cases
LVV-194	Robert Gruendl	Not Covered	LVV-T167

### Verification Element Description:

tbc

Requirement Details	
Requirement ID	DMS-REQ-0368
Requirement Description	<b>Specification:</b> Nothing in the design and software implementation of the data access services shall prevent the performance requirements set forth in OSS-REQ-0180 and OSS-REQ-0181 from being met for the “older Data Releases” referred to in DMS-REQ-0363, subject to the provision of sufficient computing and storage resources in the operations era.
Requirement Parameters	<b>nDRMin = 2[integer]</b> Minimum number of recent data releases
Requirement Discussion	<b>Discussion:</b> It is left to the operations project to set standards for the performance on older releases, but they should not be limited by design choices made in the construction era. That is, the system must be scalable to handle full-performance service of all Data Releases, should the operations project so choose. This situation does not arise until, at the release of Data Release ( <b>nDRMin+1</b> ), the operations project must decide on the level of service to be provided for Data Release 1.  This requirement may be verified by analysis, e.g., by expert review of the design of the data access services, as it is recognized that it may be very difficult to perform live performance measurements relevant to the scalability of the data access services across a decade.  While the system is required to be scalable to full performance, it is likely that, for the optimal allocation of limited operations-era resources, performance parameters such as the number of concurrently running queries or image requests may be reduced for products from older data releases.
Requirement Priority	3
Upper Level Requirement	OSS-REQ-0399 Implementation Provisions

### 2.31.1 Test Cases Summary

LVV-T167	Verify Capability to serve older Data Releases at Full Performance			
Owner	Status	Version	Critical Event	Verification Type
Robert Gruendl	Draft	1	false	Test

**Objective:**

Verify that implementation of the data access services do not preclude serving all older Data Releases with the same performance requirements as current Data Releases. Note that it is an operational consideration whether sufficient compute and storage resources would actually be provisioned to meet those requirements.

Draft

## 2.32 [LVV-195] DMS-REQ-0369-V-01: Evolution

Jira Link	Assignee	Status	Test Cases
LVV-195	Colin Slater	Not Covered	LVV-T168

### Verification Element Description:

tbc

Requirement Details	
Requirement ID	DMS-REQ-0369
Requirement Description	<b>Specification:</b> The data access services shall be designed to accommodate evolution of the LSST data model from Data Release to Data Release.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0395 Evolution

### 2.32.1 Test Cases Summary

LVV-T168	Verify design of Data Access Services allows Evolution of the LSST Data Model			
Owner	Status	Version	Critical Event	Verification Type
Robert Gruendl	Draft	1	false	Test

#### Objective:

Verify that the design of the Data Access Services are able to accommodate changes/evolution of the LSST data model from one release to another.

### 2.33 [LVV-196] DMS-REQ-0370-V-01: Older Release Behavior

Jira Link	Assignee	Status	Test Cases
LVV-196	Colin Slater	Not Covered	LVV-T169

#### Verification Element Description:

tbc

Requirement Details	
Requirement ID	DMS-REQ-0370
Requirement Description	<b>Specification:</b> Apart from the flexibility provided by requirements DMS-REQ-0365, DMS-REQ-0366, DMS-REQ-0368, and DMS-REQ-0369, the qualitative behavior of the data access services on the “older Data Releases” defined in DMS-REQ-0363 shall match that for the most recent <b>nDRMin</b> Data Releases.
Requirement Parameters	<b>nDRMin = 2[integer]</b> Minimum number of recent data releases
Requirement Discussion	<b>Discussion:</b> Essentially, the data access services should present the same APIs and user interfaces for all Data Releases except where a difference is required by a change in the data model or, e.g., by changes in UI that may be required to provide an acceptable interface for high-latency data service.
Requirement Priority	3
Upper Level Requirement	OSS-REQ-0397 Older Release Behavior

#### 2.33.1 Test Cases Summary

LVV-T169	Verify implementation of Older Release Behavior			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Draft	1	false	Test

#### Objective:

Verify that the components of the data access system are technically capable of handling data releases beyond the two for which full services are required. DMS-REQ-0364 requires that up to 11 be supported. Verified by inspection, i.e., by determination that the system design and implementation contain the necessary features to support this number of releases, and by direct test in a synthetic test environment with multiple releases.

(Involves: Data Backbone, Managed Database, LSP Portal, LSP JupyterLab, LSP Web APIs, Parallel Distributed Database)



## 2.34 [LVV-197] DMS-REQ-0371-V-01: Query Availability

Jira Link	Assignee	Status	Test Cases
LVV-197	Colin Slater	Not Covered	LVV-T170

### Verification Element Description:

tbc

Requirement Details	
Requirement ID	DMS-REQ-0371
Requirement Description	<p><b>(Goal)</b> A query (e.g., in ADQL) written against a particular Data Release SHOULD continue to be executable against the original Data Release for as long as it is available in the system, with few, if any, modifications.</p> <p><b>Discussion:</b> This is not a full "shall" requirement because there may be constraints imposed by, e.g., the evolution of security models, that do not permit all existing services to be retained unchanged indefinitely. The construction project should attempt to design interfaces that are resilient to reasonably anticipatable changes, and the operations project should attempt to preserve backwards compatibility where feasible.</p>
Requirement Discussion	Note that, in comparison, it clearly cannot be guaranteed that queries developed for earlier Data Releases will be usable unchanged against newer Data Releases (see also requirement OSS-REQ-0395). Users must anticipate that the evolution of the LSST pipelines will lead to changes in the Data Release schemas, though the Project will endeavor to avoid unnecessary changes.
Requirement Priority	3
Upper Level Requirement	OSS-REQ-0401 Query Availability

### 2.34.1 Test Cases Summary

LVV-T170	Verify implementation of Query Availability			
Owner	Status	Version	Critical Event	Verification Type
Colin Slater	Draft	1	false	Test

#### Objective:

Verify that queries continue to be successfully executable over time.

## 2.35 [LVV-3394] DMS-REQ-0377-V-01: Min number of simultaneous single-CCD coadd cutout image users

Jira Link	Assignee	Status	Test Cases
LVV-3394	Leanne Guy	Not Covered	LVV-T385

### Verification Element Description:

Minimum number of simultaneous users retrieving a single CCD-sized coadd cutout must be at least **ccdRetrievalUsers = 20**. The associated element DMS-REQ-0377-V-02 (LVV-9797) satisfies the additional time constraint.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0377
Requirement Description	<b>Specification:</b> A CCD-sized cutout of a coadd, including mask and variance planes, shall be retrievable using the IVOA SODA protocol within <b>ccdRetrievalTime</b> with <b>ccdRetrievalUsers</b> simultaneous requests for distinct areas of the sky.
Requirement Parameters	<b>[ccdRetrievalTime = 15[second]</b> Maximum time allowed for retrieving a CCD-sized coadd cutout., <b>ccdRetrievalUsers = 20[integer]</b> Minimum number of simultaneous users retrieving a single CCD-sized coadd cutout.]
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

### 2.35.1 Test Cases Summary

LVV-T385	Verify implementation of minimum number of simultaneous retrievals of CCD-sized coadd cutouts			
Owner	Status	Version	Critical Event	Verification Type
Leanne Guy	Defined	1	false	Test

### Objective:

Verify that at least **ccdRetrievalUsers = 20** users can simultaneously retrieve a single CCD-sized coadd cutout using the IVOA SODA protocol.

## 2.36 [LVV-3395] DMS-REQ-0374-V-01: Max time to retrieve single-CCD, single-visit PVI image

Jira Link	Assignee	Status	Test Cases
LVV-3395	Leanne Guy	Not Covered	

### Verification Element Description:

PVIs of a single CCD image shall be retrievable in a maximum time of **pviRetrievalTime = 10 seconds**.

The associated element DMS-REQ-0374-V-02 (LVV-9790) satisfies the additional constraint on the number of simultaneous users.

Associated element DMS-REQ-0374-V-03 (LVV-9791) satisfies the expected lifetime of Level-1 data products.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0374
Requirement Description	<b>Specification:</b> A Processed Visit Image of a single CCD shall be retrievable using the VO SIAv2 protocol within <b>pviRetrievalTime</b> with <b>pviRetrievalUsers</b> simultaneous requests for distinct single-CCD PVIs.
Requirement Parameters	<b>[pviRetrievalTime = 10[second]</b> Maximum time allowed for retrieving a PVI image of a single CCD from a single visit, <b>l1CacheLifetime = 30[day]</b> Lifetime in the cache of un-archived Level-1 data products., <b>pviRetrievalUsers = 20[integer]</b> Minimum number of simultaneous users retrieving a single PVI image.]
Requirement Discussion	<b>Discussion:</b> The performance targets for this requirement assume the PVIs are available as files on a file system. For example, this could be those files present in the <b>l1CacheLifetime</b> cache.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

## 2.37 [LVV-3396] DMS-REQ-0376-V-01: Max time to retrieve all PVI images for single visit

Jira Link	Assignee	Status	Test Cases
LVV-3396	Leanne Guy	Not Covered	

### Verification Element Description:

All Processed Visit Images (PVI) for a single visit that are available in cache, including mask and variance planes, shall be identifiable with a single IVOA SIAv2 service query and retrievable, using the link(s) provided in the response, within **allPviRetrievalTime = 60 seconds**.

The associated element DMS-REQ-0376-V-02 (LVV-9795) satisfies the additional constraint on the number of simultaneous users.

Associated element DMS-REQ-0376-V-03 (LVV-9796) satisfies the expected lifetime of Level-1 data products.

*These requirements should be satisfied both separately and together.*

Requirement Details	
Requirement ID	DMS-REQ-0376
Requirement Description	<b>Specification:</b> All Processed Visit Images for a single visit that are available in cache, including mask and variance planes, shall be identifiable with a single IVOA SIAv2 service query and retrievable, using the link(s) provided in the response, within <b>allPviRetrievalTime</b> . This requirement shall be met for up to <b>allPviRetrievalUsers</b> simultaneous requests for distinct focal-plane PVI sets.
Requirement Parameters	<b>[allPviRetrievalUsers = 10[integer]</b> Minimum number of simultaneous users retrieving all PVI images for a visit., <b>allPviRetrievalTime = 60[second]</b> Maximum time allowed for retrieving all PVI images of a single visit., <b>l1CacheLifetime = 30[day]</b> Lifetime in the cache of un-archived Level-1 data products.]
Requirement Discussion	<b>Discussion:</b> The performance targets for this requirement assume the PVI are available as files on a file system. For example, this could be those files present in the <b>l1CacheLifetime</b> cache.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

## 2.38 [LVV-3397] DMS-REQ-0373-V-01: Min number of simultaneous large-area coadd image users

Jira Link	Assignee	Status	Test Cases
LVV-3397	Leanne Guy	Not Covered	

### Verification Element Description:

At least **fplaneRetrievalUsers = 10** simultaneous users shall be able to retrieve single, large-area coadd images.

Associated element DMS-REQ-0373-V-02 (LVV-9789) satisfies the constraint on retrieval time for coadd images.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0373
Requirement Description	<b>Specification:</b> A 10 square degree coadd, including mask and variance planes, shall be retrievable using the IVOA SODA protocol within <b>fplaneRetrievalTime</b> with <b>fplaneRetrievalUsers</b> simultaneous requests for distinct areas of the sky.
Requirement Parameters	[ <b>fplaneRetrievalTime = 60[second]</b> Maximum time allowed for retrieving a focal-plane sized coadd., <b>fplaneRetrievalUsers = 10[integer]</b> Number of simultaneous users retrieving a single large area coadd.]
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

### 2.39 [LVV-3398] DMS-REQ-0375-V-01: Max time to retrieve single-object postage stamp images

Jira Link	Assignee	Status	Test Cases
LVV-3398	Leanne Guy	Not Covered	

#### Verification Element Description:

Users shall be able to retrieve postage stamp images of all observations of a single Object within **postageStampRetrievalTime = 10 seconds**.

The associated element DMS-REQ-0375-V-02 (LVV-9792) satisfies the additional constraint on the minimum size of a postage stamp cutout.

Associated element DMS-REQ-0375-V-03 (LVV-9793) satisfies the expected lifetime of Level-1 data products.

The associated element DMS-REQ-0375-V-04 (LVV-9794) satisfies the additional constraint on the number of simultaneous users retrieving postage stamp images.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0375
Requirement Description	<b>Specification:</b> Postage stamp cutouts, of size <b>postageStampSize</b> square, of all observations of a single Object shall be retrievable within <b>postageStampRetrievalTime</b> , with <b>postageStampRetrievalUsers</b> simultaneous requests of distinct Objects.
Requirement Parameters	<b>[postageStampRetrievalUsers = 10[integer]</b> Minimum number of simultaneous users retrieving a set of postage stamp images., <b>postageStampRetrievalTime = 10[second]</b> Maximum time allowed for retrieving a set of postage stamp images of a single Object., <b>postageStampSize = 51[pixel]</b> Minimum square size of a postage stamp cutout from an image., <b>I1CacheLifetime = 30[day]</b> Lifetime in the cache of un-archived Level-1 data products.]
Requirement Discussion	<b>Discussion:</b> The performance targets for this requirement assume the PVIS are available as files on a file system. For example, this could be those files present in the <b>I1CacheLifetime</b> cache.
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

## 2.40 [LVV-3400] DMS-REQ-0358-V-01: Min number of simultaneous DM EFD query users

Jira Link	Assignee	Status	Test Cases
LVV-3400	Leanne Guy	Not Covered	LVV-T1250

### Verification Element Description:

At least **dmEfdQueryUsers = 5** simultaneous users shall be able to query the EFD.

Associated element DMS-REQ-0358-V-02 (LVV-9788) satisfies the constraint on retrieval time for EFD queries.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0358
Requirement Description	<b>Specification:</b> The DM copy of the EFD shall support at least <b>dmEfdQueryUsers</b> simultaneous queries, assuming each query lasts no more than <b>dmEfdQueryTime</b> .
Requirement Parameters	[ <b>dmEfdQueryTime = 10[second]</b> Maximum time allowed for retrieving results of a DM EFD query., <b>dmEfdQueryUsers = 5[integer]</b> Minimum number of simultaneous users querying the DM EFD.]
Requirement Priority	1a
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

### 2.40.1 Test Cases Summary

LVV-T1250	Verify implementation of minimum number of simultaneous DM EFD query users			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

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.

Draft



## 2.41 [LVV-3403] DMS-REQ-0361-V-01: Simultaneous users for high-volume queries

Jira Link	Assignee	Status	Test Cases
			LVV-T1088
LVV-3403	Leanne Guy	Not Covered	LVV-T1089
			LVV-T1090

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-REQ-0361
Requirement Description	<b>Specification:</b> The system shall support <code>*hvQueryUsers</code> *simultaneous high-volume queries running at any given time.
Requirement Parameters	<b>hvQueryUsers = 50[integer]</b> Minimum number of simultaneous users performing high volume queries.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

### 2.41.1 Test Cases Summary

LVV-T1088	Concurrent Scans Scaling Test			
Owner	Status	Version	Critical Event	Verification Type
Fritz Mueller	Approved	1	false	Test

#### Objective:

This test will show that average completion-time of full-scan queries of the Object catalog table grows sub-linearly with respect to the number of simultaneously active full-scan queries, within the limits of machine resource exhaustion.

LVV-T1089	Load Test			
Owner	Status	Version	Critical Event	Verification Type
Fritz Mueller	Approved	1	false	Test

**Objective:**

This test will check that Qserv is able to meet average query completion time targets per query class under a representative load of simultaneous high and low volume queries while running against an appropriately scaled test catalog.

LVV-T1090	Heavy Load Test			
<b>Owner</b>	<b>Status</b>	<b>Version</b>	<b>Critical Event</b>	<b>Verification Type</b>
Fritz Mueller	Approved	1	false	Test

**Objective:**

This test will check that Qserv is able to meet average query completion time targets per query class under a higher than average load of simultaneous high and low volume queries while running against an appropriately scaled test catalog.

Draft

## 2.42 [LVV-4669] CA-DM-DAQ-ICD-0094-V-03: Ability to load data externally\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4669	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0094
Requirement Description	<p><b>Specification:</b> The Camera shall provide an interface that allows the buffer to be loaded with image data from an external source, and for this data to be retrieved using the interfaces specified in this section. It shall be possible to load image data that can be retrieved with the image identifier given at load time; it shall also be possible to load image data that can be retrieved with a new image identifier, as if it had just been read out from the Camera.</p> <p><b>Discussion:</b> This capability is meant to be used to allow the system to be exercised, and interfaces verified, in advance of the availability of Camera imaging hardware, as well as for diagnostic purposes during commissioning and operations.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.43 [LVV-4670] CA-DM-DAQ-ICD-0094-V-04: Ability to load data externally\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4670	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0094
Requirement Description	<p><b>Specification:</b> The Camera shall provide an interface that allows the buffer to be loaded with image data from an external source, and for this data to be retrieved using the interfaces specified in this section. It shall be possible to load image data that can be retrieved with the image identifier given at load time; it shall also be possible to load image data that can be retrieved with a new image identifier, as if it had just been read out from the Camera.</p> <p><b>Discussion:</b> This capability is meant to be used to allow the system to be exercised, and interfaces verified, in advance of the availability of Camera imaging hardware, as well as for diagnostic purposes during commissioning and operations.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.44 [LVV-4675] CA-DM-DAQ-ICD-0082-V-03: Common interface across classes of sensors\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4675	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0082
Requirement Description	<p><b>Specification:</b> A single interface shall support retrieval of science, wavefront, and full-frame guide sensor images, with API differences limited to those required for the specification of which sensor(s) to access in a retrieval, or otherwise explicitly specified herein.</p> <p><b>Discussion:</b> It is expected that during normal 9Hz guider ROI readout the DAQ system will be configured not to direct the ROI readouts into the Camera data buffer; therefore they will be invisible to the pull interface. A subscription to notifications of buffered data availability for the guide sensors will simply receive no callbacks for as long as that configuration of the DAQ system is in place.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.45 [LVV-4676] CA-DM-DAQ-ICD-0082-V-04: Common interface across classes of sensors\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4676	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0082
Requirement Description	<p><b>Specification:</b> A single interface shall support retrieval of science, wavefront, and full-frame guide sensor images, with API differences limited to those required for the specification of which sensor(s) to access in a retrieval, or otherwise explicitly specified herein.</p> <p><b>Discussion:</b> It is expected that during normal 9Hz guider ROI readout the DAQ system will be configured not to direct the ROI readouts into the Camera data buffer; therefore they will be invisible to the pull interface. A subscription to notifications of buffered data availability for the guide sensors will simply receive no callbacks for as long as that configuration of the DAQ system is in place.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.46 [LVV-4729] CA-DM-DAQ-ICD-0093-V-03: Delivery latency\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4729	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0093
Requirement Description	<b>Specification:</b> The Camera shall complete the delivery of an available image within time <b>daqLatency</b> of each request based on a notification (see CA-DM-DAQ-ICD-0084), starting from the time of the call to the request interface. This requirement shall apply for retrievals up to the scale of a full raft from a single consumer. This requirement shall apply whether or not crosstalk correction is applied.
Requirement Parameters	<b>daqLatency = 1[second]</b> Data delivery latency from time of request to time of delivery
Requirement Priority	
Upper Level Requirement	

## 2.47 [LVV-4730] CA-DM-DAQ-ICD-0093-V-04: Delivery latency\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4730	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0093
Requirement Description	<b>Specification:</b> The Camera shall complete the delivery of an available image within time <b>daqLatency</b> of each request based on a notification (see CA-DM-DAQ-ICD-0084), starting from the time of the call to the request interface. This requirement shall apply for retrievals up to the scale of a full raft from a single consumer. This requirement shall apply whether or not crosstalk correction is applied.
Requirement Parameters	<b>daqLatency = 1[second]</b> Data delivery latency from time of request to time of delivery
Requirement Priority	
Upper Level Requirement	



## 2.48 [LVV-4735] CA-DM-DAQ-ICD-0097-V-03: Error reporting\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4735	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0097
Requirement Description	<b>Specification:</b> Error reporting from the APIs implementing this interface shall be by means of return codes for all non-fatal errors.
Requirement Discussion	<b>Discussion:</b> C++ exceptions may be thrown in rare cases for error conditions from which it is impossible to recover.
Requirement Priority	
Upper Level Requirement	

## 2.49 [LVV-4736] CA-DM-DAQ-ICD-0097-V-04: Error reporting\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4736	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0097
Requirement Description	<b>Specification:</b> Error reporting from the APIs implementing this interface shall be by means of return codes for all non-fatal errors.
Requirement Discussion	<b>Discussion:</b> C++ exceptions may be thrown in rare cases for error conditions from which it is impossible to recover.
Requirement Priority	
Upper Level Requirement	

## 2.50 [LVV-4747] CA-DM-DAQ-ICD-0059-V-03: Image identification\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4747	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0059
Requirement Description	<p><b>Specification:</b> Image data obtained from the Camera shall include a unique identifier for all data derived from each amplifier readout. This identifier shall be capable of being used to associate the image data with metadata obtained from the Observatory Control System (OCS) publish-and-subscribe mechanism or from the Engineering and Facilities Database (EFD), as well as to retrieve image data from the Camera image data buffer.</p> <p><b>Discussion:</b> The rendezvous with other observatory data can be done either through the above identifier, which is based on the "image sequence name" provided by the OCS to the Camera, or through the readout timestamp recorded by the DAQ system.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.51 [LVV-4748] CA-DM-DAQ-ICD-0059-V-04: Image identification\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4748	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0059
Requirement Description	<p><b>Specification:</b> Image data obtained from the Camera shall include a unique identifier for all data derived from each amplifier readout. This identifier shall be capable of being used to associate the image data with metadata obtained from the Observatory Control System (OCS) publish-and-subscribe mechanism or from the Engineering and Facilities Database (EFD), as well as to retrieve image data from the Camera image data buffer.</p> <p><b>Discussion:</b> The rendezvous with other observatory data can be done either through the above identifier, which is based on the "image sequence name" provided by the OCS to the Camera, or through the readout timestamp recorded by the DAQ system.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.52 [LVV-4753] CA-DM-DAQ-ICD-0060-V-03: Image identifier characteristics\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4753	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0060
Requirement Description	<p><b>Specification:</b> The image identifier shall:</p> <ul style="list-style-type: none"> <li>• be unique within the entire LSST survey;</li> <li>• enable differentiation of simulated data and real data;</li> <li>• enable the determination of which data source originated the data (e.g., distinguishing data taken from a spare raft on a test stand from data taken in the operational camera);</li> <li>• have a component that is invariant across the entire FPA for a single synchronized readout, including both science and wavefront sensors;</li> <li>• be invariant no matter how many times this data is delivered to a consumer;</li> <li>• be invariant to whether crosstalk correction has been applied or not.</li> </ul>
Requirement Discussion	<p><b>Discussion:</b> An image name satisfying the LSST convention is sufficient to meet this requirement.</p>
Requirement Priority	
Upper Level Requirement	CA-DM-DAQ-ICD-0059 Image identification

## 2.53 [LVV-4754] CA-DM-DAQ-ICD-0060-V-04: Image identifier characteristics\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4754	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0060
Requirement Description	<p><b>Specification:</b> The image identifier shall:</p> <ul style="list-style-type: none"> <li>• be unique within the entire LSST survey;</li> <li>• enable differentiation of simulated data and real data;</li> <li>• enable the determination of which data source originated the data (e.g., distinguishing data taken from a spare raft on a test stand from data taken in the operational camera);</li> <li>• have a component that is invariant across the entire FPA for a single synchronized readout, including both science and wavefront sensors;</li> <li>• be invariant no matter how many times this data is delivered to a consumer;</li> <li>• be invariant to whether crosstalk correction has been applied or not.</li> </ul>
Requirement Discussion	<p><b>Discussion:</b> An image name satisfying the LSST convention is sufficient to meet this requirement.</p>
Requirement Priority	
Upper Level Requirement	CA-DM-DAQ-ICD-0059 Image identification

## 2.54 [LVV-4759] CA-DM-DAQ-ICD-0081-V-03: Image pixel data\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4759	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0081
Requirement Description	<p><b>Specification:</b> Image data pixel values shall be delivered as 32-bit signed integers representing ADC counts also known as ADUs.</p> <p><b>Specification:</b> It shall be possible to iterate over the pixel values from consecutively digitized pixels across all 16 amplifiers which occupy consecutive groups of 16 consecutive memory locations with the group memory address increasing in time order of readout. (In other words, the pixel value from a given row and column from each of the 16 amps in sequence is followed by the pixel value from the next column in time order from the same row from each amp, and so on.)</p> <p><b>Specification:</b> Pre-scan and post-scan data within a row shall be delivered contiguously with the physical-pixel data from that row, unless the interface provides for optional separation of this data and that option is explicitly exercised.</p>
Requirement Discussion	<p><b>Discussion:</b> This is based on the understanding that the underlying raw pixel data is 18-bit, and that the application of crosstalk correction is mathematically capable of producing negative pixel values. Note that the requirements that consecutively read-out pixels be consecutive in memory and that pre/post-scan data be in-line with physical-pixel data more or less imply that, if the focal plane region of image data requested is larger than an amplifier segment, the delivered data will end up being grouped by amplifier rather than assembled into a CCD-level image. This is acceptable to (and even desired by) Data Management.</p>
Requirement Priority	
Upper Level Requirement	

## 2.55 [LVV-4760] CA-DM-DAQ-ICD-0081-V-04: Image pixel data\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4760	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0081
Requirement Description	<p><b>Specification:</b> Image data pixel values shall be delivered as 32-bit signed integers representing ADC counts also known as ADUs.</p> <p><b>Specification:</b> It shall be possible to iterate over the pixel values from consecutively digitized pixels across all 16 amplifiers which occupy consecutive groups of 16 consecutive memory locations with the group memory address increasing in time order of readout. (In other words, the pixel value from a given row and column from each of the 16 amps in sequence is followed by the pixel value from the next column in time order from the same row from each amp, and so on.)</p> <p><b>Specification:</b> Pre-scan and post-scan data within a row shall be delivered contiguously with the physical-pixel data from that row, unless the interface provides for optional separation of this data and that option is explicitly exercised.</p> <p><b>Discussion:</b> This is based on the understanding that the underlying raw pixel data is 18-bit, and that the application of crosstalk correction is mathematically capable of producing negative pixel values. Note that the requirements that consecutively read-out pixels be consecutive in memory and that pre/post-scan data be in-line with physical-pixel data more or less imply that, if the focal plane region of image data requested is larger than an amplifier segment, the delivered data will end up being grouped by amplifier rather than assembled into a CCD-level image. This is acceptable to (and even desired by) Data Management.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	



## 2.56 [LVV-4765] CA-DM-DAQ-ICD-0047-V-03: Interface for Buffered Data (“pull” interface)\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4765	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0047
Requirement Description	<p><b>Specification:</b> The Camera shall maintain a buffer of recently acquired image data and shall provide access to images in that buffer to other LSST subsystems. The interface providing this access will be referred to as the “pull” or “buffered data” interface.</p> <p><b>Discussion:</b> The buffered data interface is described in subsidiary requirements below as providing at least the following capabilities: notification of the availability of new data; non-destructive read of any data by identifier; non-destructive query for the identifier of the oldest available data; and discard of the oldest available data.</p> <p>The buffered data interface largely follows a FIFO queue model, with the additional ability to read any data in the queue by its identifier.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.57 [LVV-4766] CA-DM-DAQ-ICD-0047-V-04: Interface for Buffered Data (“pull” interface)\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4766	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0047
Requirement Description	<p><b>Specification:</b> The Camera shall maintain a buffer of recently acquired image data and shall provide access to images in that buffer to other LSST subsystems. The interface providing this access will be referred to as the “pull” or “buffered data” interface.</p> <p><b>Discussion:</b> The buffered data interface is described in subsidiary requirements below as providing at least the following capabilities: notification of the availability of new data; non-destructive read of any data by identifier; non-destructive query for the identifier of the oldest available data; and discard of the oldest available data.</p> <p>The buffered data interface largely follows a FIFO queue model, with the additional ability to read any data in the queue by its identifier.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.58 [LVV-4771] CA-DM-DAQ-ICD-0098-V-03: Lookup-by-name interface\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4771	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0098
Requirement Description	<b>Specification:</b> The Camera shall provide an interface that permits looking up the Container ID for an image based on its Image Name. This interface shall ignore the existence of partitions - that is, it shall return the Container ID for an image regardless of the partition which may currently contain the image.
Requirement Priority	
Upper Level Requirement	

## 2.59 [LVV-4772] CA-DM-DAQ-ICD-0098-V-04: Lookup-by-name interface\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4772	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0098
Requirement Description	<b>Specification:</b> The Camera shall provide an interface that permits looking up the Container ID for an image based on its Image Name. This interface shall ignore the existence of partitions - that is, it shall return the Container ID for an image regardless of the partition which may currently contain the image.
Requirement Priority	
Upper Level Requirement	

## 2.60 [LVV-4777] CA-DM-DAQ-ICD-0100-V-03: Safe-to-delete event\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4777	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0100
Requirement Description	<b>Specification:</b> DM shall publish an event when an image has been safely stored and the copy in the DAQ is no longer needed.
Requirement Discussion	<b>Discussion:</b> Note that this interface does not take a Spatial ID argument.
Requirement Priority	
Upper Level Requirement	

## 2.61 [LVV-4778] CA-DM-DAQ-ICD-0100-V-04: Safe-to-delete event\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4778	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0100
Requirement Description	<b>Specification:</b> DM shall publish an event when an image has been safely stored and the copy in the DAQ is no longer needed.
Requirement Discussion	<b>Discussion:</b> Note that this interface does not take a Spatial ID argument.
Requirement Priority	
Upper Level Requirement	

## 2.62 [LVV-4784] CA-DM-DAQ-ICD-0092-V-04: Maximum number of simultaneous clients\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4784	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0092
Requirement Description	<p><b>Specification:</b> The Camera shall support simultaneous access to the image store by at least four privileged consumers, each of which may consist of multiple nodes retrieving, in combination, up to one focal plane's worth of image data, for which its performance guarantees (for latency and throughput) are met.</p> <p><b>Discussion:</b> The value specified is believed to meet both the requirements of Data Management and the requirements of the Observatory for access to images for display and diagnostic purposes. The Camera may support additional non-privileged consumers, but without any performance guarantees for them.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.63 [LVV-4789] CA-DM-DAQ-ICD-0084-V-03: Notification interface\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4789	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0084
Requirement Description	<p><b>Specification:</b> The Camera shall provide an interface that allows a client to subscribe to notifications of the availability of data from a new image in the buffer. A subscription shall normally be effective, barring unexpected error conditions, for a full night's observing. A notification shall include the unique identifier of the image (see CA-DM-DAQ-ICD-0059), as well as the "container ID", a key which permits the retrieval of the image and associated metadata from the buffer. The delivery of a notification to a client shall be interpreted as a promise that the read-by-container-ID interface (see CA-DM-DAQ-ICD-0086) can immediately be used to request retrieval of the associated image data.</p> <p><b>Discussion:</b> It is expected that the image identifier and container ID will be delivered by value to the callback, obviating the need for memory management. The Camera expects to be able to offer the ability to subscribe to time-sliced partial readouts, in integral numbers of rows, and to support corresponding data requests (see the note in CA-DM-DAQ-ICD-0091).</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	



## 2.64 [LVV-4790] CA-DM-DAQ-ICD-0084-V-04: Notification interface\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4790	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0084
Requirement Description	<p><b>Specification:</b> The Camera shall provide an interface that allows a client to subscribe to notifications of the availability of data from a new image in the buffer. A subscription shall normally be effective, barring unexpected error conditions, for a full night's observing. A notification shall include the unique identifier of the image (see CA-DM-DAQ-ICD-0059), as well as the "container ID", a key which permits the retrieval of the image and associated metadata from the buffer. The delivery of a notification to a client shall be interpreted as a promise that the read-by-container-ID interface (see CA-DM-DAQ-ICD-0086) can immediately be used to request retrieval of the associated image data.</p> <p><b>Discussion:</b> It is expected that the image identifier and container ID will be delivered by value to the callback, obviating the need for memory management. The Camera expects to be able to offer the ability to subscribe to time-sliced partial readouts, in integral numbers of rows, and to support corresponding data requests (see the note in CA-DM-DAQ-ICD-0091).</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.65 [LVV-4795] CA-DM-DAQ-ICD-0099-V-03: Partition catalog query interface\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4795	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0099
Requirement Description	<b>Specification:</b> The Camera shall provide an interface that can be used to query the complete list of valid Container IDs for a given partition. The IDs shall be returned in the order in which they were inserted into the partition.
Requirement Priority	
Upper Level Requirement	

## 2.66 [LVV-4796] CA-DM-DAQ-ICD-0099-V-04: Partition catalog query interface\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4796	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0099
Requirement Description	<b>Specification:</b> The Camera shall provide an interface that can be used to query the complete list of valid Container IDs for a given partition. The IDs shall be returned in the order in which they were inserted into the partition.
Requirement Priority	
Upper Level Requirement	

## 2.67 [LVV-4801] CA-DM-DAQ-ICD-0085-V-03: Partitioning interfaces\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4801	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0085
Requirement Description	<p><b>Specification:</b> The Camera shall provide an interface that allows the partitioning of the data in the buffer into named sets. The Camera shall be configurable to direct newly acquired data into a specified partition or partitions.</p> <p><b>Discussion:</b> This facility may be exclusive - such that a given image may only belong to a single set - or non-exclusive, in which an image may belong to more than one set. The intent of the partitioning interface is to permit distinguishing image data that is meant to be visible to, and retrieved by, clients such as Data Management from image data that is meant for internal Camera purposes. It is also intended to be used as the mechanism that supports LSE-69 requirement CA-DM-CON-ICD-0019's specification that there be a means to communicate to DM what Camera engineering images are being requested to be archived by DM.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.68 [LVV-4802] CA-DM-DAQ-ICD-0085-V-04: Partitioning interfaces\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4802	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0085
Requirement Description	<p><b>Specification:</b> The Camera shall provide an interface that allows the partitioning of the data in the buffer into named sets. The Camera shall be configurable to direct newly acquired data into a specified partition or partitions.</p> <p><b>Discussion:</b> This facility may be exclusive - such that a given image may only belong to a single set - or non-exclusive, in which an image may belong to more than one set. The intent of the partitioning interface is to permit distinguishing image data that is meant to be visible to, and retrieved by, clients such as Data Management from image data that is meant for internal Camera purposes. It is also intended to be used as the mechanism that supports LSE-69 requirement CA-DM-CON-ICD-0019's specification that there be a means to communicate to DM what Camera engineering images are being requested to be archived by DM.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.69 [LVV-4807] CA-DM-DAQ-ICD-0086-V-03: Read-by-container-ID interface\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4807	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0086
Requirement Description	<p><b>Specification:</b> The Camera shall provide an interface that allows any image in the buffer, specified by the client providing its container ID and spatial ID, to be read non-destructively. If the data are not present in the buffer, the Camera shall respond with an appropriate error indication. The Camera is not required to distinguish in such a response whether image data with the requested identifier was previously present but deleted, or never present.</p> <p><b>Discussion:</b> When used for an image or portion of an image for which readout is in progress. this interface will return an error condition; it will not block waiting for completion of readout.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.70 [LVV-4808] CA-DM-DAQ-ICD-0086-V-04: Read-by-container-ID interface\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4808	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0086
Requirement Description	<p><b>Specification:</b> The Camera shall provide an interface that allows any image in the buffer, specified by the client providing its container ID and spatial ID, to be read non-destructively. If the data are not present in the buffer, the Camera shall respond with an appropriate error indication. The Camera is not required to distinguish in such a response whether image data with the requested identifier was previously present but deleted, or never present.</p> <p><b>Discussion:</b> When used for an image or portion of an image for which readout is in progress. this interface will return an error condition; it will not block waiting for completion of readout.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.71 [LVV-4819] CA-DM-DAQ-ICD-0091-V-03: Selection of region of focal plane to be retrieved\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4819	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0091
Requirement Description	<p><b>Specification:</b> The Camera shall permit the selection of a subunit of the focal plane for readout. The largest size that must be supported without degradation of performance requirements is the raft. The smallest unit that must be supported is the amplifier. When data from multiple amplifier segments is requested, the Camera shall by default organize the delivered data by segment; i.e., it shall not attempt to stitch together segments into larger units.</p> <p><b>Discussion:</b> The specification of the maximum region is not meant to prohibit the Camera from offering the ability to request larger regions, at possibly degraded capabilities. There may well be useful applications for this.</p> <p>It is anticipated that time-sliced sub-amplifier regions, such as sets of rows, will be supported. The applications for this capability are still being discussed.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	



## 2.72 [LVV-4820] CA-DM-DAQ-ICD-0091-V-04: Selection of region of focal plane to be retrieved\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4820	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0091
Requirement Description	<p><b>Specification:</b> The Camera shall permit the selection of a subunit of the focal plane for readout. The largest size that must be supported without degradation of performance requirements is the raft. The smallest unit that must be supported is the amplifier. When data from multiple amplifier segments is requested, the Camera shall by default organize the delivered data by segment; i.e., it shall not attempt to stitch together segments into larger units.</p> <p><b>Discussion:</b> The specification of the maximum region is not meant to prohibit the Camera from offering the ability to request larger regions, at possibly degraded capabilities. There may well be useful applications for this.</p> <p>It is anticipated that time-sliced sub-amplifier regions, such as sets of rows, will be supported. The applications for this capability are still being discussed.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.73 [LVV-4825] CA-DM-DAQ-ICD-0075-V-03: Software Delivery\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4825	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0075
Requirement Description	<p><b>Specification:</b> The camera image data access client software providing the interfaces in this document shall be delivered as one or more libraries that can be linked into a C++ application, compiled against the library headers, with its main program provided by the user. The libraries will be supplied as pre-compiled shareables in Unix ".so" format.</p> <p><b>Discussion:</b> The idea here is that the client software is not a framework into which user code is inserted, but the reverse.</p>
Requirement Discussion	The source code for the client libraries will be maintained using common LSST source control tools.
Requirement Priority	
Upper Level Requirement	

## 2.74 [LVV-4826] CA-DM-DAQ-ICD-0075-V-04: Software Delivery\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4826	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0075
Requirement Description	<p><b>Specification:</b> The camera image data access client software providing the interfaces in this document shall be delivered as one or more libraries that can be linked into a C++ application, compiled against the library headers, with its main program provided by the user. The libraries will be supplied as pre-compiled shareables in Unix ".so" format.</p> <p><b>Discussion:</b> The idea here is that the client software is not a framework into which user code is inserted, but the reverse.</p>
Requirement Discussion	The source code for the client libraries will be maintained using common LSST source control tools.
Requirement Priority	
Upper Level Requirement	

## 2.75 [LVV-4831] CA-DM-DAQ-ICD-0080-V-03: Structural metadata\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4831	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0080
Requirement Description	<p><b>Specification:</b> The image data format and its API shall include a limited set of "structural metadata", sufficient to assemble the amplifier segments from the readout of the full focal plane into a representation of the focal plane as a whole. This requirement does not imply the provision of x-y coordinates of the sensors or a sky-to-pixel mapping. It does require that a consumer be able to reconstruct the correct neighbor relationships between amplifiers and sensors and know the serial and parallel readout directions for every amplifier segment.</p> <p><b>Discussion:</b> The metadata to be provided is under review; it may include the CCD manufacturer, the number of values read out in the serial and parallel directions (including image pixels, prescan, and overscan), the number of prescan values, and the number of overscan values. The metadata items are expected to depend on the sequencer program. The CCS is expected to provide these values to the DAQ, but the DAQ API must provide a documented interface to retrieve them. These items are thought to be necessary for the DAQ to be able to perform crosstalk correction.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.76 [LVV-4832] CA-DM-DAQ-ICD-0080-V-04: Structural metadata\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4832	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-DAQ-ICD-0080
Requirement Description	<p><b>Specification:</b> The image data format and its API shall include a limited set of "structural metadata", sufficient to assemble the amplifier segments from the readout of the full focal plane into a representation of the focal plane as a whole. This requirement does not imply the provision of x-y coordinates of the sensors or a sky-to-pixel mapping. It does require that a consumer be able to reconstruct the correct neighbor relationships between amplifiers and sensors and know the serial and parallel readout directions for every amplifier segment.</p> <p><b>Discussion:</b> The metadata to be provided is under review; it may include the CCD manufacturer, the number of values read out in the serial and parallel directions (including image pixels, prescan, and overscan), the number of prescan values, and the number of overscan values. The metadata items are expected to depend on the sequencer program. The CCS is expected to provide these values to the DAQ, but the DAQ API must provide a documented interface to retrieve them. These items are thought to be necessary for the DAQ to be able to perform crosstalk correction.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.77 [LVV-4843] CA-DM-CON-ICD-0003-V-03: Camera Conditions data latency for Alert Production\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4843	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0003
Requirement Description	<b>Specification:</b> Camera Conditions data specified as required for DM's Alert Production, enumerated in document LSE-130, concerning times through the end of the readout of an image shall be published via the OCS middleware within time <b>cameraConditionsLatencyDMAP</b> of the conclusion of readout. The Camera should generally publish this data within time <b>cameraConditionsLatencyDMAP</b> of its acquisition.
Requirement Parameters	<b>cameraConditionsLatencyDMAP = 300[millisecond]</b> Latency for publication of Camera Conditions data for Alert Production
Requirement Discussion	<b>Discussion:</b> The latter condition expresses the desire that Data Management not receive all Conditions data as a lump delivery at the end of readout.
Requirement Priority	
Upper Level Requirement	

## 2.78 [LVV-4844] CA-DM-CON-ICD-0003-V-04: Camera Conditions data latency for Alert Production\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4844	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0003
Requirement Description	<b>Specification:</b> Camera Conditions data specified as required for DM's Alert Production, enumerated in document LSE-130, concerning times through the end of the readout of an image shall be published via the OCS middleware within time <b>cameraConditionsLatencyDMAP</b> of the conclusion of readout. The Camera should generally publish this data within time <b>cameraConditionsLatencyDMAP</b> of its acquisition.
Requirement Parameters	<b>cameraConditionsLatencyDMAP = 300[millisecond]</b> Latency for publication of Camera Conditions data for Alert Production
Requirement Discussion	<b>Discussion:</b> The latter condition expresses the desire that Data Management not receive all Conditions data as a lump delivery at the end of readout.
Requirement Priority	
Upper Level Requirement	

## 2.79 [LVV-4849] CA-DM-CON-ICD-0004-V-03: Camera Conditions data latency for all data\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4849	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0004
Requirement Description	<b>Specification:</b> All Camera Conditions data required by DM shall be published through the OCS middleware within time <b>cameraConditionsLatencyDM</b> of its measurement time.
Requirement Parameters	<b>cameraConditionsLatencyDM = 10[second]</b> Latency for publication of Camera Conditions telemetry data
Requirement Discussion	<b>Discussion:</b> The "measurement time" is meant to be a wall clock time for an underlying physical measurement or equivalent, determined in a way that is reasonable for the telemetry data in question. This is the same time that is referenced in ? , requirement OCS-CA-CMD-ICD-0018. The timely publication of telemetry facilitates the storage of copies of the telemetry database in a time-local organization, and provides flexibility for DM to manage data continuously or in batches.
Requirement Priority	
Upper Level Requirement	



## 2.80 [LVV-4850] CA-DM-CON-ICD-0004-V-04: Camera Conditions data latency for all data\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4850	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0004
Requirement Description	<b>Specification:</b> All Camera Conditions data required by DM shall be published through the OCS middleware within time <b>cameraConditionsLatencyDM</b> of its measurement time.
Requirement Parameters	<b>cameraConditionsLatencyDM = 10[second]</b> Latency for publication of Camera Conditions telemetry data
Requirement Discussion	<b>Discussion:</b> The "measurement time" is meant to be a wall clock time for an underlying physical measurement or equivalent, determined in a way that is reasonable for the telemetry data in question. This is the same time that is referenced in ? , requirement OCS-CA-CMD-ICD-0018. The timely publication of telemetry facilitates the storage of copies of the telemetry database in a time-local organization, and provides flexibility for DM to manage data continuously or in batches.
Requirement Priority	
Upper Level Requirement	

## 2.81 [LVV-4855] CA-DM-CON-ICD-0019-V-03: Camera engineering image data archiving\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4855	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0019
Requirement Description	<b>Specification:</b> The Data Management subsystem shall provide an archiving service for engineering image data from the Camera subsystem.
Requirement Discussion	<b>Discussion:</b> Daytime calibration images are considered part of normal Observatory operations and are not covered under this requirement. The images acquired by Data Management under this requirement will be made available through the normal DM image archive programmatic and graphical user interface tools.
Requirement Priority	
Upper Level Requirement	

## 2.82 [LVV-4856] CA-DM-CON-ICD-0019-V-04: Camera engineering image data archiving\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4856	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0019
Requirement Description	<b>Specification:</b> The Data Management subsystem shall provide an archiving service for engineering image data from the Camera subsystem.
Requirement Discussion	<b>Discussion:</b> Daytime calibration images are considered part of normal Observatory operations and are not covered under this requirement. The images acquired by Data Management under this requirement will be made available through the normal DM image archive programmatic and graphical user interface tools.
Requirement Priority	
Upper Level Requirement	

## 2.83 [LVV-4861] CA-DM-CON-ICD-0008-V-03: Data Management Conditions data latency\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4861	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0008
Requirement Description	<b>Specification:</b> DM Conditions data required by the Camera and derived from individual images in standard visits shall be published through the OCS middleware no more than time <b>dmConditionsLatencyCam</b> after the conclusion of the delivery of all images from the standard visit to DM.
Requirement Parameters	<b>dmConditionsLatencyCam = 60[second]</b> Latency for publication of per-visit Conditions data from DM
Requirement Discussion	<b>Discussion:</b> This data should be available by the conclusion of Alert Production, and the latency is set to match that. It should be available promptly in order to enhance its usefulness for Observatory operators. There is, however, no intent to use this data in any automated feedback loop controlling the Camera. There may be additional types of Conditions data from DM that arise from the analysis of multiple images, such as synthetic flats. This requirement does not apply to that type of data. DM will generally make any such data available to the Camera promptly following its generation.
Requirement Priority	
Upper Level Requirement	

## 2.84 [LVV-4862] CA-DM-CON-ICD-0008-V-04: Data Management Conditions data latency\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4862	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0008
Requirement Description	<b>Specification:</b> DM Conditions data required by the Camera and derived from individual images in standard visits shall be published through the OCS middleware no more than time <b>dmConditionsLatencyCam</b> after the conclusion of the delivery of all images from the standard visit to DM.
Requirement Parameters	<b>dmConditionsLatencyCam = 60[second]</b> Latency for publication of per-visit Conditions data from DM
Requirement Discussion	<b>Discussion:</b> This data should be available by the conclusion of Alert Production, and the latency is set to match that. It should be available promptly in order to enhance its usefulness for Observatory operators. There is, however, no intent to use this data in any automated feedback loop controlling the Camera. There may be additional types of Conditions data from DM that arise from the analysis of multiple images, such as synthetic flats. This requirement does not apply to that type of data. DM will generally make any such data available to the Camera promptly following its generation.
Requirement Priority	
Upper Level Requirement	

## 2.85 [LVV-4873] CA-DM-CON-ICD-0002-V-03: Provide Camera Conditions data\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4873	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0002
Requirement Description	<b>Specification:</b> The Camera shall provide for the use of DM the list of conditions data items, specified in section 1.2 of document LSE-130, as telemetry via the OCS middleware.
Requirement Discussion	<b>Discussion:</b> This information will include the shutter position and various conditions of the sensors and electronics. The full list of telemetry planned to be provided by the Camera is maintained in document ? ; it should be a superset of the telemetry covered by this requirement.
Requirement Priority	
Upper Level Requirement	

## 2.86 [LVV-4874] CA-DM-CON-ICD-0002-V-04: Provide Camera Conditions data\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4874	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0002
Requirement Description	<b>Specification:</b> The Camera shall provide for the use of DM the list of conditions data items, specified in section 1.2 of document LSE-130, as telemetry via the OCS middleware.
Requirement Discussion	<b>Discussion:</b> This information will include the shutter position and various conditions of the sensors and electronics. The full list of telemetry planned to be provided by the Camera is maintained in document ? ; it should be a superset of the telemetry covered by this requirement.
Requirement Priority	
Upper Level Requirement	

## 2.87 [LVV-4879] CA-DM-CON-ICD-0005-V-03: Provide Camera Configuration data\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4879	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0005
Requirement Description	<b>Specification:</b> The Camera shall provide for the use of DM all Configuration data enumerated in document LSE-130.
Requirement Discussion	<b>Discussion:</b> Configuration data includes such things as setpoints for power supplies and temperature regulators. This requirement will be satisfied by means of the mechanism referred to in ? , OCS-CA-CMD-ICD-0025. That requirement ensures that the data are available to DM as soon as Camera configuration is complete, and before any associated data are taken.
Requirement Priority	
Upper Level Requirement	



## 2.88 [LVV-4880] CA-DM-CON-ICD-0005-V-04: Provide Camera Configuration data\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4880	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0005
Requirement Description	<b>Specification:</b> The Camera shall provide for the use of DM all Configuration data enumerated in document LSE-130.
Requirement Discussion	<b>Discussion:</b> Configuration data includes such things as setpoints for power supplies and temperature regulators. This requirement will be satisfied by means of the mechanism referred to in ? , OCS-CA-CMD-ICD-0025. That requirement ensures that the data are available to DM as soon as Camera configuration is complete, and before any associated data are taken.
Requirement Priority	
Upper Level Requirement	

## 2.89 [LVV-4885] CA-DM-CON-ICD-0001-V-03: Provide Camera design, assembly, and laboratory test data\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4885	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0001
Requirement Description	<b>Specification:</b> The Camera shall provide to DM design, assembly, and laboratory test information, as specified in section 1.1 of document LSE-130.
Requirement Discussion	<b>Discussion:</b> The method(s) of delivery will be specified in LSE-130.
Requirement Priority	
Upper Level Requirement	

## 2.90 [LVV-4886] CA-DM-CON-ICD-0001-V-04: Provide Camera design, assembly, and laboratory test data\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4886	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0001
Requirement Description	<b>Specification:</b> The Camera shall provide to DM design, assembly, and laboratory test information, as specified in section 1.1 of document LSE-130.
Requirement Discussion	<b>Discussion:</b> The method(s) of delivery will be specified in LSE-130.
Requirement Priority	
Upper Level Requirement	

## 2.91 [LVV-4897] CA-DM-CON-ICD-0018-V-03: Provide Camera OCS events needed by Data Management\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4897	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0018
Requirement Description	<p><b>Specification:</b> The Camera shall publish at least the OCS middleware "events" <b>startIntegration</b> and <b>startReadout</b>, as defined in ? (requirement OCS-CA-CMD-ICD-0021), for each image generated in response to a takeImages() command from the OCS.</p> <p><b>Discussion:</b> This is recorded in this ICD to make clear that these particular events are part of the operational model on which DM depends, and do not just arise from agreement between Camera and OCS in their ICD. It does not create an additional substantive requirement on the Camera.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.92 [LVV-4898] CA-DM-CON-ICD-0018-V-04: Provide Camera OCS events needed by Data Management\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4898	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0018
Requirement Description	<p><b>Specification:</b> The Camera shall publish at least the OCS middleware "events" <b>startIntegration</b> and <b>startReadout</b>, as defined in ? (requirement OCS-CA-CMD-ICD-0021), for each image generated in response to a takeImages() command from the OCS.</p> <p><b>Discussion:</b> This is recorded in this ICD to make clear that these particular events are part of the operational model on which DM depends, and do not just arise from agreement between Camera and OCS in their ICD. It does not create an additional substantive requirement on the Camera.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.93 [LVV-4903] CA-DM-CON-ICD-0007-V-03: Provide Data Management Conditions data\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4903	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0007
Requirement Description	<p><b>Specification:</b> DM shall generate and make available to the Camera the Conditions data enumerated in document LSE-130.</p> <p><b>Discussion:</b> This is generally data quality information relevant to evaluating the performance of the Camera (e.g., PSF's, WCS's, vignetting maps, statistics on the raw data). This information may be made available either as telemetry or, in certain cases, as data in the DM science archive (e.g., synthetic calibration flats).</p> <p>The Camera is required not to depend on this data for its day-to-day operation. In particular, if the Summit-Base link is severed and live DM analysis of new image data is impossible, the data quality information will not be available.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.94 [LVV-4904] CA-DM-CON-ICD-0007-V-04: Provide Data Management Conditions data\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4904	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0007
Requirement Description	<b>Specification:</b> DM shall generate and make available to the Camera the Conditions data enumerated in document LSE-130.
Requirement Discussion	<b>Discussion:</b> This is generally data quality information relevant to evaluating the performance of the Camera (e.g., PSF's, WCS's, vignetting maps, statistics on the raw data). This information may be made available either as telemetry or, in certain cases, as data in the DM science archive (e.g., synthetic calibration flats). The Camera is required not to depend on this data for its day-to-day operation. In particular, if the Summit-Base link is severed and live DM analysis of new image data is impossible, the data quality information will not be available.
Requirement Priority	
Upper Level Requirement	

## 2.95 [LVV-4909] CA-DM-CON-ICD-0016-V-03: Provide guide sensor data\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4909	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0016
Requirement Description	<b>Specification:</b> The Camera shall provide to Data Management the raw data from the full set of guide sensors during calibration operations, and any other operational modes that require guide sensor data to be archived and/or processed by DM.
Requirement Priority	
Upper Level Requirement	



## 2.96 [LVV-4910] CA-DM-CON-ICD-0016-V-04: Provide guide sensor data\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4910	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0016
Requirement Description	<b>Specification:</b> The Camera shall provide to Data Management the raw data from the full set of guide sensors during calibration operations, and any other operational modes that require guide sensor data to be archived and/or processed by DM.
Requirement Priority	
Upper Level Requirement	

## 2.97 [LVV-4915] CA-DM-CON-ICD-0014-V-03: Provide science sensor data\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4915	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0014
Requirement Description	<b>Specification:</b> The Camera shall provide to Data Management raw data from the full science array during normal science and calibration operations, and any other operational modes that require science array data to be archived and/or processed by DM.
Requirement Priority	
Upper Level Requirement	

## 2.98 [LVV-4916] CA-DM-CON-ICD-0014-V-04: Provide science sensor data\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4916	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0014
Requirement Description	<b>Specification:</b> The Camera shall provide to Data Management raw data from the full science array during normal science and calibration operations, and any other operational modes that require science array data to be archived and/or processed by DM.
Requirement Priority	
Upper Level Requirement	

## 2.99 [LVV-4921] CA-DM-CON-ICD-0015-V-03: Provide wavefront sensor data\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-4921	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0015
Requirement Description	<b>Specification:</b> The Camera shall provide to Data Management the raw data from the full set of wavefront sensors during normal science and calibration operations, and any other operational modes that require wavefront sensor data to be archived and/or processed by DM.
Requirement Priority	
Upper Level Requirement	

## 2.100 [LVV-4922] CA-DM-CON-ICD-0015-V-04: Provide wavefront sensor data\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-4922	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0015
Requirement Description	<b>Specification:</b> The Camera shall provide to Data Management the raw data from the full set of wavefront sensors during normal science and calibration operations, and any other operational modes that require wavefront sensor data to be archived and/or processed by DM.
Requirement Priority	
Upper Level Requirement	

## 2.101 [LVV-5237] OCS-DM-COM-ICD-0040-V-01: Command Completion Response\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5237	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0040
Requirement Description	<b>Specification:</b> After the successful completion of any of the above commands, a SummaryState event shall be published for the CSC indicating which Top-Level subsystem state (as defined in LSE-209) it is in.
Requirement Priority	
Upper Level Requirement	

## 2.102 [LVV-5238] OCS-DM-COM-ICD-0040-V-02: Command Completion Response\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5238	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0040
Requirement Description	<b>Specification:</b> After the successful completion of any of the above commands, a SummaryState event shall be published for the CSC indicating which Top-Level subsystem state (as defined in LSE-209) it is in.
Requirement Priority	
Upper Level Requirement	

## 2.103 [LVV-5243] OCS-DM-COM-ICD-0009-V-01: Command Set Implementation by Data Management\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5243	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0009
Requirement Description	<b>Specification:</b> Data Management shall provide implementations of the basic commands required of all devices by the OCS, as defined in LSE-70 and LSE-209.
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	OCS-DM-COM-ICD-0007 Prompt Processing CSC



## 2.104 [LVV-5244] OCS-DM-COM-ICD-0009-V-02: Command Set Implementation by Data Management\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5244	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0009
Requirement Description	<b>Specification:</b> Data Management shall provide implementations of the basic commands required of all devices by the OCS, as defined in LSE-70 and LSE-209.
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	OCS-DM-COM-ICD-0007 Prompt Processing CSC

## 2.105 [LVV-5249] OCS-DM-COM-ICD-0013-V-01: configure Successful Completion Response\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5249	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0013
Requirement Description	<p><b>Specification:</b> Successful completion of a start command shall include the publication as a SettingsApplied event of:</p> <ul style="list-style-type: none"> <li>The configuration key ("alias")</li> <li>An immutable name for the configuration set applied ("permanent name")</li> <li>The content of the configuration</li> </ul> <p>An AppliedSettingsMatchStart event with parameter True will also be sent to indicate that the DM CSC's settings match those requested in the <b>start</b> command, as opposed to being manually adjusted to be something different.</p>
Requirement Priority	
Upper Level Requirement	

## 2.106 [LVV-5250] OCS-DM-COM-ICD-0013-V-02: configure Successful Completion Response\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5250	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0013
Requirement Description	<p><b>Specification:</b> Successful completion of a start command shall include the publication as a SettingsApplied event of:</p> <ul style="list-style-type: none"> <li>The configuration key ("alias")</li> <li>An immutable name for the configuration set applied ("permanent name")</li> <li>The content of the configuration</li> </ul> <p>An AppliedSettingsMatchStart event with parameter True will also be sent to indicate that the DM CSC's settings match those requested in the <b>start</b> command, as opposed to being manually adjusted to be something different.</p>
Requirement Priority	
Upper Level Requirement	

## 2.107 [LVV-5255] OCS-DM-COM-ICD-0015-V-01: disable Command\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5255	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0015
Requirement Description	<p><b>Specification:</b> Upon completion of the <b>disable</b> command, a DM device shall cease the initiation of new actions in response to events or timers.</p> <p>A DM device may report the completion of <b>disable</b> as soon as it has taken that step. It may still complete actions triggered by events or timers that were received before <b>disable</b>. Specific devices? behavior in this respect shall be documented.</p> <p><b>Parameters:</b> (none)</p>
Requirement Discussion	<p><b>Discussion:</b> This permits pipelined operation of image processing to proceed even in a tight sequence of alternating <b>configure</b> commands and images.</p>
Requirement Priority	
Upper Level Requirement	

## 2.108 [LVV-5256] OCS-DM-COM-ICD-0015-V-02: disable Command\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5256	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0015
Requirement Description	<p><b>Specification:</b> Upon completion of the <b>disable</b> command, a DM device shall cease the initiation of new actions in response to events or timers.</p> <p>A DM device may report the completion of <b>disable</b> as soon as it has taken that step. It may still complete actions triggered by events or timers that were received before <b>disable</b>. Specific devices? behavior in this respect shall be documented.</p> <p><b>Parameters:</b> (none)</p>
Requirement Discussion	<p><b>Discussion:</b> This permits pipelined operation of image processing to proceed even in a tight sequence of alternating <b>configure</b> commands and images.</p>
Requirement Priority	
Upper Level Requirement	

## 2.109 [LVV-5261] OCS-DM-COM-ICD-0014-V-01: enable Command\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5261	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0014
	<b>Parameters:</b> (none)
Requirement Description	<b>Specification:</b> Upon completion of the <b>enable</b> command, a DM device shall begin carrying out its configured function as driven by its monitoring of Observatory events and/or in response to internal timers and predicates.
Requirement Priority	
Upper Level Requirement	

## 2.110 [LVV-5262] OCS-DM-COM-ICD-0014-V-02: enable Command\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5262	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0014
	<b>Parameters:</b> (none)
Requirement Description	<b>Specification:</b> Upon completion of the <b>enable</b> command, a DM device shall begin carrying out its configured function as driven by its monitoring of Observatory events and/or in response to internal timers and predicates.
Requirement Priority	
Upper Level Requirement	

## 2.111 [LVV-5267] OCS-DM-COM-ICD-0038-V-01: enterControl Command\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5267	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0038
Requirement Description	<b>Specification:</b> Upon completion of the <b>enterControl</b> command, a DM CSC shall enter the Standby state.
Requirement Priority	
Upper Level Requirement	



## 2.112 [LVV-5268] OCS-DM-COM-ICD-0038-V-02: enterControl Command\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5268	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0038
Requirement Description	<b>Specification:</b> Upon completion of the <b>enterControl</b> command, a DM CSC shall enter the Standby state.
Requirement Priority	
Upper Level Requirement	

## 2.113 [LVV-5273] OCS-DM-COM-ICD-0039-V-01: enterControl Successful Completion Response\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5273	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0039
Requirement Description	<b>Specification:</b> Successful completion of the <b>enterControl</b> command shall include the publication of a RecommendedSettingsVersions event containing a list of available opaque, unique configuration keys and a list of configuration labels (or aliases) and their corresponding opaque configuration keys.
Requirement Priority	
Upper Level Requirement	

## 2.114 [LVV-5274] OCS-DM-COM-ICD-0039-V-02: enterControl Successful Completion Response\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5274	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0039
Requirement Description	<b>Specification:</b> Successful completion of the <b>enterControl</b> command shall include the publication of a RecommendedSettingsVersions event containing a list of available opaque, unique configuration keys and a list of configuration labels (or aliases) and their corresponding opaque configuration keys.
Requirement Priority	
Upper Level Requirement	

## 2.115 [LVV-5279] OCS-DM-COM-ICD-0037-V-01: exit Command\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5279	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0037
Requirement Description	<b>Specification:</b> Upon completion of the <b>exit</b> command, a DM CSC shall return to the Available substate of the Offline state.
Requirement Priority	
Upper Level Requirement	

## 2.116 [LVV-5280] OCS-DM-COM-ICD-0037-V-02: exit Command\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5280	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0037
Requirement Description	<b>Specification:</b> Upon completion of the <b>exit</b> command, a DM CSC shall return to the Available substate of the Offline state.
Requirement Priority	
Upper Level Requirement	

## 2.117 [LVV-5285] OCS-DM-COM-ICD-0036-V-01: standby Command\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5285	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0036
Requirement Description	<b>Specification:</b> Upon completion of the <b>standby</b> command, a DM CSC shall return to the unconfigured, Standby state.
Requirement Priority	
Upper Level Requirement	

## 2.118 [LVV-5286] OCS-DM-COM-ICD-0036-V-02: standby Command\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5286	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0036
Requirement Description	<b>Specification:</b> Upon completion of the <b>standby</b> command, a DM CSC shall return to the unconfigured, Standby state.
Requirement Priority	
Upper Level Requirement	

## 2.119 [LVV-5291] OCS-DM-COM-ICD-0012-V-01: Start Command\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5291	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0012
Requirement Description	<p><b>Specification:</b> The <b>Start</b> command shall cause a Data Management CSC to set up the details of the behavior it is to perform upon the receipt of the <b>enable</b> command. Upon completion of <b>Start</b>, a DM CSC shall place itself in the DM “disabled” state and shall take no further action until receiving <b>enable</b>.</p> <p>If at any time following <b>Start</b> a DM CSC can no longer ensure that its state is consistent with the commanded configuration, it shall enter the OCS command-model “ERROR” state (as defined in LSE-209).</p> <p>The <b>Start</b> command shall only be valid in the DM “disabled” state.</p> <p>The translation of the configuration_key alias to a specific set of configuration details shall occur only at the time of execution of the <b>Start</b> command. DM shall not attempt to follow any changes to the meaning of the alias until the receipt of a subsequent <b>Start</b> command.</p>
Requirement Discussion	<p><b>Parameters:</b> configuration_key, type: opaque identifier (string)</p> <p><b>Discussion:</b> This command, in effect, establishes the operational mode that a DM CSC will be in.</p> <p>It is expected that the configuration_key will be an “alias” describing a mode and that the translation of that key to specific details may evolve over time. The mapping from the “alias” to a concrete set of details is under the control of DM.</p> <p><b>Start</b> can also take a key (“permanent name”) referring to a specific, unchangeable, set of details.</p>
Requirement Priority	
Upper Level Requirement	



## 2.120 [LVV-5292] OCS-DM-COM-ICD-0012-V-02: Start Command\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5292	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0012
Requirement Description	<p><b>Specification:</b> The <b>Start</b> command shall cause a Data Management CSC to set up the details of the behavior it is to perform upon the receipt of the <b>enable</b> command. Upon completion of <b>Start</b>, a DM CSC shall place itself in the DM “disabled” state and shall take no further action until receiving <b>enable</b>.</p> <p>If at any time following <b>Start</b> a DM CSC can no longer ensure that its state is consistent with the commanded configuration, it shall enter the OCS command-model “ERROR” state (as defined in LSE-209).</p> <p>The <b>Start</b> command shall only be valid in the DM “disabled” state.</p> <p>The translation of the configuration_key alias to a specific set of configuration details shall occur only at the time of execution of the <b>Start</b> command. DM shall not attempt to follow any changes to the meaning of the alias until the receipt of a subsequent <b>Start</b> command.</p>
Requirement Discussion	<p><b>Parameters:</b> configuration_key, type: opaque identifier (string)</p> <p><b>Discussion:</b> This command, in effect, establishes the operational mode that a DM CSC will be in.</p> <p>It is expected that the configuration_key will be an “alias” describing a mode and that the translation of that key to specific details may evolve over time. The mapping from the “alias” to a concrete set of details is under the control of DM.</p> <p><b>Start</b> can also take a key (“permanent name”) referring to a specific, unchangeable, set of details.</p>
Requirement Priority	
Upper Level Requirement	

## 2.121 [LVV-5297] OCS-DM-COM-ICD-0003-V-01: Data Management CSC Command Response Model\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5297	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0003
Requirement Description	<b>Specification:</b> Data Management shall receive and respond to commands issued by the OCS using the Command/Action/Response model of the SAL software packages, as described in LSE-70 "LSST Observatory Control Communication Architecture and Protocol" and LSE-209 "Software Component to OCS Interface Control Document".
Requirement Priority	
Upper Level Requirement	

## 2.122 [LVV-5298] OCS-DM-COM-ICD-0003-V-02: Data Management CSC Command Response Model\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5298	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0003
Requirement Description	<b>Specification:</b> Data Management shall receive and respond to commands issued by the OCS using the Command/Action/Response model of the SAL software packages, as described in LSE-70 "LSST Observatory Control Communication Architecture and Protocol" and LSE-209 "Software Component to OCS Interface Control Document".
Requirement Priority	
Upper Level Requirement	

## 2.123 [LVV-5303] OCS-DM-COM-ICD-0034-V-01: Auxiliary Header Service CSC\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5303	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0034
Requirement Description	<b>Specification:</b> The Auxiliary Header Service CSC shall perform the same function as the Header Service but for the Auxiliary Telescope and the Auxiliary Telescope Spectrograph.
Requirement Priority	
Upper Level Requirement	

## 2.124 [LVV-5304] OCS-DM-COM-ICD-0034-V-02: Auxiliary Header Service CSC\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5304	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0034
Requirement Description	<b>Specification:</b> The Auxiliary Header Service CSC shall perform the same function as the Header Service but for the Auxiliary Telescope and the Auxiliary Telescope Spectrograph.
Requirement Priority	
Upper Level Requirement	

## 2.125 [LVV-5309] OCS-DM-COM-ICD-0032-V-01: Auxiliary Telescope Archiver CSC\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5309	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0032
Requirement Description	<p><b>Specification:</b> The Auxiliary Telescope Archiver CSC shall control the ingest and archiving of image data from the Auxiliary Telescope. The data is to be fetched from a separate Camera Data Acquisition (Camera Data System) unit built specifically for the Auxiliary Telescope System and is expected to be used as a spectrograph.</p> <p><b>Discussion:</b> The Auxiliary Telescope Archiver CSC will provide the same control interface as the other CSCs listed in this document. Its nightly task, however, is much simpler than the Main Telescope CSCs, as it fetches exactly one CCD of image data.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.126 [LVV-5310] OCS-DM-COM-ICD-0032-V-02: Auxiliary Telescope Archiver CSC\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5310	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0032
Requirement Description	<p><b>Specification:</b> The Auxiliary Telescope Archiver CSC shall control the ingest and archiving of image data from the Auxiliary Telescope. The data is to be fetched from a separate Camera Data Acquisition (Camera Data System) unit built specifically for the Auxiliary Telescope System and is expected to be used as a spectrograph.</p> <p><b>Discussion:</b> The Auxiliary Telescope Archiver CSC will provide the same control interface as the other CSCs listed in this document. Its nightly task, however, is much simpler than the Main Telescope CSCs, as it fetches exactly one CCD of image data.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.127 [LVV-5315] OCS-DM-COM-ICD-0006-V-01: Catch-up Archiver\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5315	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0006
Requirement Description	<p><b>Specification:</b> The Catch-up Archiver device shall control the process of acquisition of backlogs of image data from the Camera data buffer by Data Management, and its transfer to storage at the Base and Archive Centers. The configuration mechanism (see requirement OCS-DM-COM-ICD-0012 below) shall be used to control which components of the focal plane shall have their data requested and archived by DM.</p> <p><b>Discussion:</b> Following an enable command, the Catch-Up Archiver will interrogate the Camera for the availability of old data in the Camera buffer, retrieve that data, archive it, and make it available for processing.</p> <p>In general, the Catch-Up Archiver will attempt to follow the configurations that were – or would have been – in force during the acquisition of the data in order to determine what actions to take. This information will be retrieved from the EFD and potentially also from the image data itself.</p> <p>DM must, if possible, apply the configuration key interpretation that would have been in force at the time the start command for the Archiver CSC was or would have been issued, unless explicitly overridden.</p> <p>The configuration of the Catch-up Archiver will include a setting that allows it to determine what buffered Camera data is actually eligible for archiving.</p> <p>The Catch-Up Archiver will report on the success or failure of the archiving of each image via an OCS event that includes the Camera image identifier and, if applicable, the corresponding visit identifier. These reports will be similar in form to, but on a distinct channel from, the reports from the Archiver.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	



## 2.128 [LVV-5316] OCS-DM-COM-ICD-0006-V-02: Catch-up Archiver\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5316	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0006
Requirement Description	<p><b>Specification:</b> The Catch-up Archiver device shall control the process of acquisition of backlogs of image data from the Camera data buffer by Data Management, and its transfer to storage at the Base and Archive Centers. The configuration mechanism (see requirement OCS-DM-COM-ICD-0012 below) shall be used to control which components of the focal plane shall have their data requested and archived by DM.</p> <p><b>Discussion:</b> Following an enable command, the Catch-Up Archiver will interrogate the Camera for the availability of old data in the Camera buffer, retrieve that data, archive it, and make it available for processing.</p> <p>In general, the Catch-Up Archiver will attempt to follow the configurations that were – or would have been – in force during the acquisition of the data in order to determine what actions to take. This information will be retrieved from the EFD and potentially also from the image data itself.</p> <p>DM must, if possible, apply the configuration key interpretation that would have been in force at the time the start command for the Archiver CSC was or would have been issued, unless explicitly overridden.</p> <p>The configuration of the Catch-up Archiver will include a setting that allows it to determine what buffered Camera data is actually eligible for archiving.</p> <p>The Catch-Up Archiver will report on the success or failure of the archiving of each image via an OCS event that includes the Camera image identifier and, if applicable, the corresponding visit identifier. These reports will be similar in form to, but on a distinct channel from, the reports from the Archiver.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.129 [LVV-5321] OCS-DM-COM-ICD-0004-V-01: Data Management Exposed CSCs\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5321	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0004
Requirement Description	<p><b>Specification:</b> Data Management shall expose eight CSCs to the OCS: Archiver, Catch-Up Archiver, Prompt Processing, Auxiliary Telescope Archiver, EFD Transformation Service, Header Service, Auxiliary Header Service, and OCS-Driven Batch.</p> <p><b>Discussion:</b> The behavior of the CSCs in detail is in document LDM-230. It is briefly summarized in descriptive language in the Discussion sections below for readability, but does not form a normative part of this ICD.</p>
Requirement Discussion	Part of the point of the DM CSC model and the enable/disable protocol is to allow the OCS, and the Observatory operator, to stop DM from interacting with the other Observatory components when required for engineering or diagnostic activities. E.g., it allows DM to be prevented from attempting to retrieve images from the Camera or interacting with the EFD query interface.
Requirement Priority	
Upper Level Requirement	

## 2.130 [LVV-5322] OCS-DM-COM-ICD-0004-V-02: Data Management Exposed CSCs\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5322	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0004
Requirement Description	<p><b>Specification:</b> Data Management shall expose eight CSCs to the OCS: Archiver, Catch-Up Archiver, Prompt Processing, Auxiliary Telescope Archiver, EFD Transformation Service, Header Service, Auxiliary Header Service, and OCS-Driven Batch.</p> <p><b>Discussion:</b> The behavior of the CSCs in detail is in document LDM-230. It is briefly summarized in descriptive language in the Discussion sections below for readability, but does not form a normative part of this ICD.</p>
Requirement Discussion	Part of the point of the DM CSC model and the enable/disable protocol is to allow the OCS, and the Observatory operator, to stop DM from interacting with the other Observatory components when required for engineering or diagnostic activities. E.g., it allows DM to be prevented from attempting to retrieve images from the Camera or interacting with the EFD query interface.
Requirement Priority	
Upper Level Requirement	

## 2.131 [LVV-5327] OCS-DM-COM-ICD-0008-V-01: EFD Transformation Service CSC\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5327	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0008
Requirement Description	<b>Specification:</b> The EFD Transformation Service CSC shall control the transformation of the Engineering and Facilities Database to archival versions, including all content, at the Base and Archive Centers, as required under the “Engineering and Facilities Database Archiving” section below.
Requirement Discussion	<b>Discussion:</b> The expectation is that this CSC will be enabled at all times when any Observatory component is active and generating telemetry. The CSC model is provided in order to provide a specific channel for reporting to the OCS when the replication has failed, as well as to allow turning it on and off for debugging purposes.
Requirement Priority	
Upper Level Requirement	

## 2.132 [LVV-5328] OCS-DM-COM-ICD-0008-V-02: EFD Transformation Service CSC\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5328	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0008
Requirement Description	<b>Specification:</b> The EFD Transformation Service CSC shall control the transformation of the Engineering and Facilities Database to archival versions, including all content, at the Base and Archive Centers, as required under the "Engineering and Facilities Database Archiving" section below.
Requirement Discussion	<b>Discussion:</b> The expectation is that this CSC will be enabled at all times when any Observatory component is active and generating telemetry. The CSC model is provided in order to provide a specific channel for reporting to the OCS when the replication has failed, as well as to allow turning it on and off for debugging purposes.
Requirement Priority	
Upper Level Requirement	

### 2.133 [LVV-5333] OCS-DM-COM-ICD-0033-V-01: Header Service CSC\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5333	Leanne Guy	Not Covered	

#### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0033
Requirement Description	<b>Specification:</b> The Header Service CSC will operate within the Summit instance of the EFD. It shall monitor the state of the Main Telescope system and its cameras via events and telemetry and persist that state as an EFD Large File Annex entry for each image readout.
Requirement Priority	
Upper Level Requirement	

## 2.134 [LVV-5334] OCS-DM-COM-ICD-0033-V-02: Header Service CSC\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5334	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0033
Requirement Description	<b>Specification:</b> The Header Service CSC will operate within the Summit instance of the EFD. It shall monitor the state of the Main Telescope system and its cameras via events and telemetry and persist that state as an EFD Large File Annex entry for each image readout.
Requirement Priority	
Upper Level Requirement	

## 2.135 [LVV-5339] OCS-DM-COM-ICD-0005-V-01: Main Camera Archiver\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5339	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0005
Requirement Description	<p><b>Specifications:</b></p> <p>The Main Camera Archiving Device (MCAD) shall control the process of acquisition of raw data from the ComCam, LSST Camera and Auxiliary Camera by Data Management (DM), as well as header and other relevant information from OCS. These data are built into files that are ingested into the Data Backbone.</p> <p>The MCAD shall be presented with parameters specified in ID: OCS-DM-COM-ICD-0031 to classify the files for storage in the Data Backbone. The normal operation of the MCAD is to acquire and ingest raw data, metadata and the information necessary for organizing files in the Data Backbone.</p> <p>The MCAD throughput shall be sized to TBD.</p> <p>The MCAD shall be able to handle the case where the rate of pixel generation exceeds the capacity for archive ingest (e.g. the case of bias generation).</p> <p>It shall be possible to determine which exposures have been archived and which have not.</p>



**Discussion:** Following an enable command, the Catch-Up Archiver will interrogate the Camera for the availability of old data in the Camera buffer, retrieve that data, archive it, and make it available for processing.

In general, the Catch-Up Archiver will attempt to follow the configurations that were – or would have been – in force during the acquisition of the data in order to determine what actions to take. This information will be retrieved from the EFD and potentially also from the image data itself.

Requirement Discussion DM must, if possible, apply the configuration key interpretation that would have been in force at the time the start command for the Archiver CSC was or would have been issued, unless explicitly overridden.

The configuration of the Catch-up Archiver will include a setting that allows it to determine what buffered Camera data is actually eligible for archiving.

The Catch-Up Archiver will report on the success or failure of the archiving of each image via an OCS event that includes the Camera image identifier and, if applicable, the corresponding visit identifier. These reports will be similar in form to, but on a distinct channel from, the reports from the Archiver.

Requirement Pri-  
ority

Upper Level Re-  
quirement

## 2.136 [LVV-5340] OCS-DM-COM-ICD-0005-V-02: Main Camera Archiver\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5340	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0005
Requirement Description	<p><b>Specifications:</b></p> <p>The Main Camera Archiving Device (MCAD) shall control the process of acquisition of raw data from the ComCam, LSST Camera and Auxiliary Camera by Data Management (DM), as well as header and other relevant information from OCS. These data are built into files that are ingested into the Data Backbone.</p> <p>The MCAD shall be presented with parameters specified in ID: OCS-DM-COM-ICD-0031 to classify the files for storage in the Data Backbone. The normal operation of the MCAD is to acquire and ingest raw data, metadata and the information necessary for organizing files in the Data Backbone.</p> <p>The MCAD throughput shall be sized to TBD.</p> <p>The MCAD shall be able to handle the case where the rate of pixel generation exceeds the capacity for archive ingest (e.g. the case of bias generation).</p> <p>It shall be possible to determine which exposures have been archived and which have not.</p>

**Discussion:** Following an enable command, the Catch-Up Archiver will interrogate the Camera for the availability of old data in the Camera buffer, retrieve that data, archive it, and make it available for processing.

In general, the Catch-Up Archiver will attempt to follow the configurations that were – or would have been – in force during the acquisition of the data in order to determine what actions to take. This information will be retrieved from the EFD and potentially also from the image data itself.

Requirement Discussion DM must, if possible, apply the configuration key interpretation that would have been in force at the time the start command for the Archiver CSC was or would have been issued, unless explicitly overridden.

The configuration of the Catch-up Archiver will include a setting that allows it to determine what buffered Camera data is actually eligible for archiving.

The Catch-Up Archiver will report on the success or failure of the archiving of each image via an OCS event that includes the Camera image identifier and, if applicable, the corresponding visit identifier. These reports will be similar in form to, but on a distinct channel from, the reports from the Archiver.

Requirement Pri-  
ority

Upper Level Re-  
quirement

## 2.137 [LVV-5345] OCS-DM-COM-ICD-0035-V-01: OCS-Driven Batch CSC\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5345	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0035
Requirement Description	<p><b>Specification:</b> The OCS-Driven Batch CSC is the only DM-provided CSC that accepts SAL commands beyond the cross-subsystem ones. It shall accept CSC-specific commands to execute batch jobs that process archived data through pre-defined pipelines.</p> <p><b>Discussion:</b> This CSC permits OCS scripts to perform calculations, returning results that are visible to the OCS. Such calculations are expected to include daily master calibration processing, full-focal-plane wavefront processing, and other calibration and commissioning tasks. The results may be returned in the command completion acknowledgment message or, more typically, as DM telemetry.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.138 [LVV-5346] OCS-DM-COM-ICD-0035-V-02: OCS-Driven Batch CSC\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5346	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0035
Requirement Description	<p><b>Specification:</b> The OCS-Driven Batch CSC is the only DM-provided CSC that accepts SAL commands beyond the cross-subsystem ones. It shall accept CSC-specific commands to execute batch jobs that process archived data through pre-defined pipelines.</p> <p><b>Discussion:</b> This CSC permits OCS scripts to perform calculations, returning results that are visible to the OCS. Such calculations are expected to include daily master calibration processing, full-focal-plane wavefront processing, and other calibration and commissioning tasks. The results may be returned in the command completion acknowledgment message or, more typically, as DM telemetry.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.139 [LVV-5351] OCS-DM-COM-ICD-0007-V-01: Prompt Processing CSC\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5351	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0007
Requirement Description	<p><b>Specification:</b> The Prompt Processing CSC shall acquire data from the main imaging camera. The data shall be presented as FITS files on the computing nodes, carrying out the computation. FITS headers shall contain all necessary metadata to support processing of the image.</p> <p>In particular, during normal science operations, the Prompt Processing CSC shall control the operation of the Alert Production pipelines. The configuration mechanism (see requirement OCS-DM-COM-ICD-0012 below) shall be used to control what processing is applied.</p> <p><b>Discussion:</b> Following an enable command, the Prompt Processing will apply a configuration-controlled processing to each image or visit (as appropriate to the configuration).</p> <p>During calibration operations, the Prompt Processing CSC will evaluate per-image quality metrics on raw calibration images as they are acquired, making that assessment available to the OCS.</p> <p>The processing of data retrieved by the Catch-Up Archiver is not under direct OCS control. It is an autonomous function of the DM Archive Center control system.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.140 [LVV-5352] OCS-DM-COM-ICD-0007-V-02: Prompt Processing CSC\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5352	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0007
Requirement Description	<p><b>Specification:</b> The Prompt Processing CSC shall acquire data from the main imaging camera. The data shall be presented as FITS files on the computing nodes, carrying out the computation. FITS headers shall contain all necessary metadata to support processing of the image.</p> <p>In particular, during normal science operations, the Prompt Processing CSC shall control the operation of the Alert Production pipelines. The configuration mechanism (see requirement OCS-DM-COM-ICD-0012 below) shall be used to control what processing is applied.</p> <p><b>Discussion:</b> Following an enable command, the Prompt Processing will apply a configuration-controlled processing to each image or visit (as appropriate to the configuration).</p> <p>During calibration operations, the Prompt Processing CSC will evaluate per-image quality metrics on raw calibration images as they are acquired, making that assessment available to the OCS.</p> <p>The processing of data retrieved by the Catch-Up Archiver is not under direct OCS control. It is an autonomous function of the DM Archive Center control system.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.141 [LVV-5357] OCS-DM-COM-ICD-0048-V-01: Alert Production Complete Event\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5357	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0048
Requirement Description	<b>Specification:</b> DM shall publish an event indicating that a complete visit was successfully processed by the Alert Production Payload in the Prompt Processing service, including the delivery of Alerts to the Alert Distribution system. This event shall include the visit name, the image name(s) included in the visit, and the length of time since the last endReadout event for the visit (float, in units of seconds).
Requirement Priority	
Upper Level Requirement	



## 2.142 [LVV-5358] OCS-DM-COM-ICD-0048-V-02: Alert Production Complete Event\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5358	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0048
Requirement Description	<b>Specification:</b> DM shall publish an event indicating that a complete visit was successfully processed by the Alert Production Payload in the Prompt Processing service, including the delivery of Alerts to the Alert Distribution system. This event shall include the visit name, the image name(s) included in the visit, and the length of time since the last endReadout event for the visit (float, in units of seconds).
Requirement Priority	
Upper Level Requirement	

## 2.143 [LVV-5363] OCS-DM-COM-ICD-0055-V-01: Archiver Resource Availability\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5363	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0055
Requirement Description	<p><b>Specification:</b> DM shall publish as telemetry, at intervals of <b>dmRsrcInterval</b>, the number of Archiver Forwarder nodes available, the load average on each node, the percentage of memory in use on each node, and the percentage of disk space in use on each local filesystem on each node.</p> <p><b>Discussion:</b> The value type for the number of Archiver Forwarder nodes available is "int", the value type for load average on each node is "float", the percentage of memory in use on each node is "float", and the percentage of disk space in use on each local filesystem on each node is "float".</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.144 [LVV-5364] OCS-DM-COM-ICD-0055-V-02: Archiver Resource Availability\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5364	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0055
Requirement Description	<p><b>Specification:</b> DM shall publish as telemetry, at intervals of <b>dmRsrcInterval</b>, the number of Archiver Forwarder nodes available, the load average on each node, the percentage of memory in use on each node, and the percentage of disk space in use on each local filesystem on each node.</p> <p><b>Discussion:</b> The value type for the number of Archiver Forwarder nodes available is "int", the value type for load average on each node is "float", the percentage of memory in use on each node is "float", and the percentage of disk space in use on each local filesystem on each node is "float".</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.145 [LVV-5369] OCS-DM-COM-ICD-0054-V-01: Base-Archive Network Utilization\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5369	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0054
Requirement Description	<b>Specification:</b> DM shall publish as telemetry, at intervals of <b>netUtilInterval</b> , the percent utilization of each Base-Archive network link in each direction. The intervals shall be at 300 seconds, and the data reported is the utilization over the previous 300 second interval, as well as a measurement of the round-trip time in each direction.
Requirement Discussion	<b>Discussion:</b> The value type for the percent utilization and the round trip time is "float" and the unit is in seconds.
Requirement Priority	
Upper Level Requirement	

## 2.146 [LVV-5370] OCS-DM-COM-ICD-0054-V-02: Base-Archive Network Utilization\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5370	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0054
Requirement Description	<b>Specification:</b> DM shall publish as telemetry, at intervals of <b>netUtilInterval</b> , the percent utilization of each Base-Archive network link in each direction. The intervals shall be at 300 seconds, and the data reported is the utilization over the previous 300 second interval, as well as a measurement of the round-trip time in each direction.
Requirement Discussion	<b>Discussion:</b> The value type for the percent utilization and the round trip time is "float" and the unit is in seconds.
Requirement Priority	
Upper Level Requirement	

## 2.147 [LVV-5375] OCS-DM-COM-ICD-0019-V-01: Data Management Events and Telemetry Required by the OCS\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5375	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0019
Requirement Description	<b>Specification:</b> Data Management shall publish to the OCS events and telemetry regarding the progress of Alert Production processing and archiving of specific images and visits, the observed data quality, and the general health of the Alert Production system, as defined by the requirements below.
Requirement Discussion	<b>Discussion:</b> The requirements below give the minimum set of events and telemetry to be published; additional events and telemetry that give visibility into the health and operation of the DM-constructed systems will be specified in design documents.
Requirement Priority	
Upper Level Requirement	

## 2.148 [LVV-5376] OCS-DM-COM-ICD-0019-V-02: Data Management Events and Telemetry Required by the OCS\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5376	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0019
Requirement Description	<b>Specification:</b> Data Management shall publish to the OCS events and telemetry regarding the progress of Alert Production processing and archiving of specific images and visits, the observed data quality, and the general health of the Alert Production system, as defined by the requirements below.
Requirement Discussion	<b>Discussion:</b> The requirements below give the minimum set of events and telemetry to be published; additional events and telemetry that give visibility into the health and operation of the DM-constructed systems will be specified in design documents.
Requirement Priority	
Upper Level Requirement	

## 2.149 [LVV-5381] OCS-DM-COM-ICD-0017-V-01: Data Management Telemetry Interface Model\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5381	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0017
Requirement Description	<p><b>Specification:</b> Data Management shall use the OCS Service Abstraction Layer (SAL) as defined in LSE-70 to present its telemetry interface to the OCS and, through it, make telemetry available to other Observatory subsystems and subscribe to telemetry from the OCS and other subsystems.</p> <p><b>Discussion:</b> The agreements between Data Management and the non-OCS subsystems regarding telemetry exchanges are recorded in the respective ICDs between DM and those subsystems, and not in this document.</p>
Requirement Discussion	The complete list of telemetry planned to be provided by DM will be published in a telemetry dictionary, based on the requirements in those ICDs as well as the present one.
Requirement Priority	
Upper Level Requirement	



## 2.150 [LVV-5382] OCS-DM-COM-ICD-0017-V-02: Data Management Telemetry Interface Model\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5382	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0017
Requirement Description	<p><b>Specification:</b> Data Management shall use the OCS Service Abstraction Layer (SAL) as defined in LSE-70 to present its telemetry interface to the OCS and, through it, make telemetry available to other Observatory subsystems and subscribe to telemetry from the OCS and other subsystems.</p> <p><b>Discussion:</b> The agreements between Data Management and the non-OCS subsystems regarding telemetry exchanges are recorded in the respective ICDs between DM and those subsystems, and not in this document.</p>
Requirement Discussion	The complete list of telemetry planned to be provided by DM will be published in a telemetry dictionary, based on the requirements in those ICDs as well as the present one.
Requirement Priority	
Upper Level Requirement	

## 2.151 [LVV-5387] OCS-DM-COM-ICD-0018-V-01: Data Management Telemetry Time Stamp\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5387	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0018
Requirement Description	<b>Specification:</b> Data Management shall provide the measurement time of all published telemetry.
Requirement Discussion	<b>Discussion:</b> The publication mechanism (provided by OCS) along with the DM-provided time-stamps, are intended to be sufficient to rendezvous telemetry associated with a particular image. The definition of the measurement time is made by DM and documented for each telemetry type. The time-stamp is described in LSE-70.
Requirement Priority	
Upper Level Requirement	

## 2.152 [LVV-5388] OCS-DM-COM-ICD-0018-V-02: Data Management Telemetry Time Stamp\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5388	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0018
Requirement Description	<b>Specification:</b> Data Management shall provide the measurement time of all published telemetry.
Requirement Discussion	<b>Discussion:</b> The publication mechanism (provided by OCS) along with the DM-provided time-stamps, are intended to be sufficient to rendezvous telemetry associated with a particular image. The definition of the measurement time is made by DM and documented for each telemetry type. The time-stamp is described in LSE-70.
Requirement Priority	
Upper Level Requirement	

## 2.153 [LVV-5393] OCS-DM-COM-ICD-0021-V-01: Data Quality Metrics\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5393	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0021
Requirement Description	<p><b>Specification:</b> Data Management shall publish as telemetry a set of data quality metrics that enable the OCS scheduling algorithms for science operations to assess whether visits acquired should be scored as successful and to assess the general observing quality – e.g., weather and seeing – across the sky. DM shall also provide metrics that enable the OCS scheduling algorithm for calibration operations to assess the progress in collecting usable calibration data.</p>
Requirement Discussion	<p><b>Discussion:</b> DM is not responsible for assessing whether a visit or image meets the scheduler criteria; this assessment is the responsibility of the OCS based on lower-level data provided by DM.</p>
Requirement Priority	
Upper Level Requirement	

## 2.154 [LVV-5394] OCS-DM-COM-ICD-0021-V-02: Data Quality Metrics\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5394	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0021
Requirement Description	<p><b>Specification:</b> Data Management shall publish as telemetry a set of data quality metrics that enable the OCS scheduling algorithms for science operations to assess whether visits acquired should be scored as successful and to assess the general observing quality – e.g., weather and seeing – across the sky. DM shall also provide metrics that enable the OCS scheduling algorithm for calibration operations to assess the progress in collecting usable calibration data.</p>
Requirement Discussion	<p><b>Discussion:</b> DM is not responsible for assessing whether a visit or image meets the scheduler criteria; this assessment is the responsibility of the OCS based on lower-level data provided by DM.</p>
Requirement Priority	
Upper Level Requirement	

## 2.155 [LVV-5399] OCS-DM-COM-ICD-0020-V-01: Image and Visit Processing and Archiving Status\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5399	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0020
Requirement Description	<p><b>Specification:</b> Data Management shall publish high-level information concerning the processing and archiving of images. All events listed below shall be published at least once for each successful completion of the described activity.</p>
Requirement Discussion	<p><b>Discussion:</b> The granularity of the reporting of per-image data, such as the confirmation of archiving, is to be determined in Phase 3 – e.g., whether this is reported per CCD, per raft, or for the entire focal plane. The selection of publication as event or as telemetry will be revisited at that time, with a view toward the selection of the appropriate quality of service.</p> <p><b>Note:</b> Events related to image processing and archiving may occur a considerable amount of time after the relevant image has been taken.</p>
Requirement Priority	
Upper Level Requirement	

## 2.156 [LVV-5400] OCS-DM-COM-ICD-0020-V-02: Image and Visit Processing and Archiving Status\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5400	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0020
Requirement Description	<p><b>Specification:</b> Data Management shall publish high-level information concerning the processing and archiving of images. All events listed below shall be published at least once for each successful completion of the described activity.</p>
Requirement Discussion	<p><b>Discussion:</b> The granularity of the reporting of per-image data, such as the confirmation of archiving, is to be determined in Phase 3 – e.g., whether this is reported per CCD, per raft, or for the entire focal plane. The selection of publication as event or as telemetry will be revisited at that time, with a view toward the selection of the appropriate quality of service.</p> <p><b>Note:</b> Events related to image processing and archiving may occur a considerable amount of time after the relevant image has been taken.</p>
Requirement Priority	
Upper Level Requirement	

## 2.157 [LVV-5405] OCS-DM-COM-ICD-0047-V-01: Image Archived Event\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5405	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0047
Requirement Description	<b>Specification:</b> DM shall publish an event indicating that a complete image, including all configured portions of the focal plane, was successfully archived, along with its metadata, in the Data Backbone at both the Base and Archive Facilities. This event shall include the camera (Auxiliary Telescope Spectrograph, ComCam, LSSTCam) and the image name.
Requirement Priority	
Upper Level Requirement	



## 2.158 [LVV-5406] OCS-DM-COM-ICD-0047-V-02: Image Archived Event\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5406	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0047
Requirement Description	<b>Specification:</b> DM shall publish an event indicating that a complete image, including all configured portions of the focal plane, was successfully archived, along with its metadata, in the Data Backbone at both the Base and Archive Facilities. This event shall include the camera (Auxiliary Telescope Spectrograph, ComCam, LSSTCam) and the image name.
Requirement Priority	
Upper Level Requirement	

## 2.159 [LVV-5411] OCS-DM-COM-ICD-0046-V-01: Image Forwarded Event\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5411	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0046
Requirement Description	<b>Specification:</b> DM shall publish an event indicating that a complete image, including all configured portions of the focal plane, was successfully provided to the NCSA Distributors (for images to be processed by Prompt Processing). This event shall include the image name.
Requirement Priority	
Upper Level Requirement	

## 2.160 [LVV-5412] OCS-DM-COM-ICD-0046-V-02: Image Forwarded Event\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5412	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0046
Requirement Description	<b>Specification:</b> DM shall publish an event indicating that a complete image, including all configured portions of the focal plane, was successfully provided to the NCSA Distributors (for images to be processed by Prompt Processing). This event shall include the image name.
Requirement Priority	
Upper Level Requirement	

## 2.161 [LVV-5417] OCS-DM-COM-ICD-0045-V-01: Image in OODS Event\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5417	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0045
Requirement Description	<b>Specification:</b> DM shall publish an event indicating that a complete image, including all configured portions of the focal plane, was successfully provided to the Observatory Operations Data Service. This event shall include the camera (Auxiliary Telescope Spectrograph, ComCam, LSSTCam), the image name, and an indication as to whether this was performed by the normal Archiver or the Catch-Up Archiver.
Requirement Priority	
Upper Level Requirement	

## 2.162 [LVV-5418] OCS-DM-COM-ICD-0045-V-02: Image in OODS Event\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5418	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0045
Requirement Description	<b>Specification:</b> DM shall publish an event indicating that a complete image, including all configured portions of the focal plane, was successfully provided to the Observatory Operations Data Service. This event shall include the camera (Auxiliary Telescope Spectrograph, ComCam, LSSTCam), the image name, and an indication as to whether this was performed by the normal Archiver or the Catch-Up Archiver.
Requirement Priority	
Upper Level Requirement	

## 2.163 [LVV-5423] OCS-DM-COM-ICD-0043-V-01: Image Retrieval for Archiving Event\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5423	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0043
Requirement Description	<b>Specification:</b> DM shall publish an event indicating that a complete image, including all configured portions of the focal plane, was successfully retrieved from the Camera DAQ or Auxiliary Telescope Spectrograph DAQ by an Archiver or Catch-Up Archiver Forwarder. This event shall include the camera (Auxiliary Telescope Spectrograph, ComCam, LSSTCam), the image name, and an indication as to whether this was performed by the normal Archiver or the Catch-Up Archiver.
Requirement Priority	
Upper Level Requirement	

## 2.164 [LVV-5424] OCS-DM-COM-ICD-0043-V-02: Image Retrieval for Archiving Event\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5424	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0043
Requirement Description	<b>Specification:</b> DM shall publish an event indicating that a complete image, including all configured portions of the focal plane, was successfully retrieved from the Camera DAQ or Auxiliary Telescope Spectrograph DAQ by an Archiver or Catch-Up Archiver Forwarder. This event shall include the camera (Auxiliary Telescope Spectrograph, ComCam, LSSTCam), the image name, and an indication as to whether this was performed by the normal Archiver or the Catch-Up Archiver.
Requirement Priority	
Upper Level Requirement	

## 2.165 [LVV-5429] OCS-DM-COM-ICD-0044-V-01: Image Retrieval For Processing Event\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5429	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0044
Requirement Description	<b>Specification:</b> DM shall publish an event indicating that a complete image, including all configured portions of the focal plane, was successfully retrieved from the Camera DAQ by a Prompt Processing Forwarder. This event shall include the image name.
Requirement Priority	
Upper Level Requirement	



## 2.166 [LVV-5430] OCS-DM-COM-ICD-0044-V-02: Image Retrieval For Processing Event\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5430	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0044
Requirement Description	<b>Specification:</b> DM shall publish an event indicating that a complete image, including all configured portions of the focal plane, was successfully retrieved from the Camera DAQ by a Prompt Processing Forwarder. This event shall include the image name.
Requirement Priority	
Upper Level Requirement	

## 2.167 [LVV-5435] OCS-DM-COM-ICD-0052-V-01: Number of Alerts Information\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5435	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0052
Requirement Description	<b>Specification:</b> DM shall publish as telemetry, for each detector in each exposure successfully processed by the Alert Production Payload in the Prompt Processing service or by any similar offline processing, the number of Alerts sent due to DiaSources found in that detector.
Requirement Priority	
Upper Level Requirement	

## 2.168 [LVV-5436] OCS-DM-COM-ICD-0052-V-02: Number of Alerts Information\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5436	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0052
Requirement Description	<b>Specification:</b> DM shall publish as telemetry, for each detector in each exposure successfully processed by the Alert Production Payload in the Prompt Processing service or by any similar offline processing, the number of Alerts sent due to DiaSources found in that detector.
Requirement Priority	
Upper Level Requirement	

## 2.169 [LVV-5441] OCS-DM-COM-ICD-0051-V-01: Photometric Zeropoint Information\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5441	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0051
Requirement Description	<b>Specification:</b> DM shall publish as telemetry, for each detector in each exposure successfully processed by the Alert Production Payload in the Prompt Processing service or by any similar offline processing, the flux of a zero-magnitude object (double, in units of ADUs) and the error in the flux (double, in units of ADUs).
Requirement Priority	
Upper Level Requirement	

## 2.170 [LVV-5442] OCS-DM-COM-ICD-0051-V-02: Photometric Zeropoint Information\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5442	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0051
Requirement Description	<b>Specification:</b> DM shall publish as telemetry, for each detector in each exposure successfully processed by the Alert Production Payload in the Prompt Processing service or by any similar offline processing, the flux of a zero-magnitude object (double, in units of ADUs) and the error in the flux (double, in units of ADUs).
Requirement Priority	
Upper Level Requirement	

## 2.171 [LVV-5447] OCS-DM-COM-ICD-0056-V-01: Prompt Processing Resource Availability\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5447	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0056
Requirement Description	<p><b>Specification:</b> DM shall publish as telemetry, at intervals of <b>dmRsrcInterval</b>, the number of Prompt Processing Forwarder nodes available, the number of Prompt Processing Distributor nodes available, the load average on each node (float), the percentage of memory in use on each node, and the percentage of disk space in use on each local filesystem on each node.</p> <p><b>Discussion:</b> The value type for the number of Prompt Processing Forwarder nodes available is "int", for the number of Prompt Processing Distributor nodes available is "int", the load average on each node is "float", the percentage of memory in use on each node is "float", and the percentage of disk space in use on each local filesystem on each node is a "float".</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.172 [LVV-5448] OCS-DM-COM-ICD-0056-V-02: Prompt Processing Resource Availability\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5448	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0056
Requirement Description	<p><b>Specification:</b> DM shall publish as telemetry, at intervals of <b>dmRsrcInterval</b>, the number of Prompt Processing Forwarder nodes available, the number of Prompt Processing Distributor nodes available, the load average on each node (float), the percentage of memory in use on each node, and the percentage of disk space in use on each local filesystem on each node.</p> <p><b>Discussion:</b> The value type for the number of Prompt Processing Forwarder nodes available is "int", for the number of Prompt Processing Distributor nodes available is "int", the load average on each node is "float", the percentage of memory in use on each node is "float", and the percentage of disk space in use on each local filesystem on each node is a "float".</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.173 [LVV-5453] OCS-DM-COM-ICD-0050-V-01: PSF Information\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5453	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0050
Requirement Description	<p><b>Specification:</b> DM shall publish as telemetry, for each detector in each exposure successfully processed by the Alert Production or Raw Calibration Validation Payloads in the Prompt Processing service or by any similar offline processing, the following items derived from a PSF (Point Spread Function) model: full width at half maximum (double), lxx/lyy/lxy quadrupole representation of ellipse (three doubles).</p> <p><b>Discussion:</b> Note that this telemetry message may be the same as is provided for TCS in LSE-75.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	



## 2.174 [LVV-5454] OCS-DM-COM-ICD-0050-V-02: PSF Information\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5454	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0050
Requirement Description	<b>Specification:</b> DM shall publish as telemetry, for each detector in each exposure successfully processed by the Alert Production or Raw Calibration Validation Payloads in the Prompt Processing service or by any similar offline processing, the following items derived from a PSF (Point Spread Function) model: full width at half maximum (double), Ixx/Iyy/Ixy quadrupole representation of ellipse (three doubles).
Requirement Discussion	<b>Discussion:</b> Note that this telemetry message may be the same as is provided for TCS in LSE-75.
Requirement Priority	
Upper Level Requirement	

## 2.175 [LVV-5459] OCS-DM-COM-ICD-0053-V-01: Summit-Base Network Utilization\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5459	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0053
Requirement Description	<b>Specification:</b> DM shall publish as telemetry, at intervals of <code>netUtilInterval</code> , the percent utilization of each Summit-Base network link in each direction. The intervals shall be at 300 seconds, and the data reported is the utilization over the previous 300 second interval, as well as a measurement of the round-trip time in each direction.
Requirement Discussion	<b>Discussion:</b> The value type for the percent utilization and the round trip time is "float" and the unit is in seconds.
Requirement Priority	
Upper Level Requirement	

## 2.176 [LVV-5460] OCS-DM-COM-ICD-0053-V-02: Summit-Base Network Utilization\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5460	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0053
Requirement Description	<b>Specification:</b> DM shall publish as telemetry, at intervals of <code>netUtilInterval</code> , the percent utilization of each Summit-Base network link in each direction. The intervals shall be at 300 seconds, and the data reported is the utilization over the previous 300 second interval, as well as a measurement of the round-trip time in each direction.
Requirement Discussion	<b>Discussion:</b> The value type for the percent utilization and the round trip time is "float" and the unit is in seconds.
Requirement Priority	
Upper Level Requirement	

## 2.177 [LVV-5465] OCS-DM-COM-ICD-0022-V-01: System Health Metrics\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5465	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0022
Requirement Description	<p><b>Specification:</b> Data Management shall publish a basic set of metrics on the operational health of the live data processing and archiving systems. This shall include:</p> <ul style="list-style-type: none"> <li>• Utilization statistics on the Summit-Base and Base-Archive network links</li> <li>• Assessment of whether sufficient resources are available to perform the configured archiving and processing functions.</li> <li>• Amount of time taken by data transfers and data processing.</li> </ul>
Requirement Discussion	<p><b>Discussion:</b> This is not intended to supplant the health monitoring and control functions of the Data Management Control System, but only to permit the central Observatory operator consoles to provide operators a "red/green" indication of DM system health, enabling them to consult DM operations experts for further information when there are problems.</p>
Requirement Priority	
Upper Level Requirement	

## 2.178 [LVV-5466] OCS-DM-COM-ICD-0022-V-02: System Health Metrics\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5466	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0022
Requirement Description	<p><b>Specification:</b> Data Management shall publish a basic set of metrics on the operational health of the live data processing and archiving systems. This shall include:</p> <ul style="list-style-type: none"> <li>Utilization statistics on the Summit-Base and Base-Archive network links</li> <li>Assessment of whether sufficient resources are available to perform the configured archiving and processing functions.</li> <li>Amount of time taken by data transfers and data processing.</li> </ul>
Requirement Discussion	<p><b>Discussion:</b> This is not intended to supplant the health monitoring and control functions of the Data Management Control System, but only to permit the central Observatory operator consoles to provide operators a "red/green" indication of DM system health, enabling them to consult DM operations experts for further information when there are problems.</p>
Requirement Priority	
Upper Level Requirement	

## 2.179 [LVV-5471] OCS-DM-COM-ICD-0049-V-01: WCS Information\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5471	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0049
Requirement Description	<b>Specification:</b> DM shall publish WCS (World Coordinate System) telemetry for each visit successfully processed by the Alert Production Payload in the Prompt Processing service or by any similar offline processing. This telemetry shall contain the equinox (double, currently 2000.0), system (string, currently 'ICRS'), unit (string, currently 'deg'), and then, for each sensor, reference pixel x/y coordinates (two doubles), reference pixel RA/dec coordinates (two doubles), and rotation and scale matrix (four doubles).
Requirement Discussion	<b>Discussion:</b> Note that this telemetry message may be the same as is provided for TCS in LSE-75.
Requirement Priority	
Upper Level Requirement	

## 2.180 [LVV-5472] OCS-DM-COM-ICD-0049-V-02: WCS Information\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5472	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0049
Requirement Description	<b>Specification:</b> DM shall publish WCS (World Coordinate System) telemetry for each visit successfully processed by the Alert Production Payload in the Prompt Processing service or by any similar offline processing. This telemetry shall contain the equinox (double, currently 2000.0), system (string, currently 'ICRS'), unit (string, currently 'deg'), and then, for each sensor, reference pixel x/y coordinates (two doubles), reference pixel RA/dec coordinates (two doubles), and rotation and scale matrix (four doubles).
Requirement Discussion	<b>Discussion:</b> Note that this telemetry message may be the same as is provided for TCS in LSE-75.
Requirement Priority	
Upper Level Requirement	

## 2.181 [LVV-5477] OCS-DM-COM-ICD-0023-V-01: Basic Query Functionality Required by DM\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5477	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0023
Requirement Description	<b>Specification:</b> The OCS shall provide an "sqlclient" interface for querying the temporal data in the Engineering and Facilities Database. The database shall support temporal queries for commands, events, and telemetry based on the publication time of the associated messages, and, for telemetry, based on the measurement time subsystems are required to provide.
Requirement Priority	
Upper Level Requirement	



## 2.182 [LVV-5478] OCS-DM-COM-ICD-0023-V-02: Basic Query Functionality Required by DM\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5478	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0023
Requirement Description	<b>Specification:</b> The OCS shall provide an "sqlclient" interface for querying the temporal data in the Engineering and Facilities Database. The database shall support temporal queries for commands, events, and telemetry based on the publication time of the associated messages, and, for telemetry, based on the measurement time subsystems are required to provide.
Requirement Priority	
Upper Level Requirement	

## 2.183 [LVV-5483] OCS-DM-COM-ICD-0025-V-01: Expected Load of Queries from DM\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5483	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0025
Requirement Description	<b>Specification:</b> The OCS shall support, and DM shall not exceed, <b>queryRateDMEFD</b> level of EFD queries from DM against each table within the OCS-maintained Base instance(s) of the EFD.
Requirement Parameters	<b>queryRateDMEFD = TBD[TBD]</b> Maximum rate of DM queries against OCS EFD instance(s).
Requirement Priority	
Upper Level Requirement	

## 2.184 [LVV-5484] OCS-DM-COM-ICD-0025-V-02: Expected Load of Queries from DM\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5484	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0025
Requirement Description	<b>Specification:</b> The OCS shall support, and DM shall not exceed, <b>queryRateDMEFD</b> level of EFD queries from DM against each table within the OCS-maintained Base instance(s) of the EFD.
Requirement Parameters	<b>queryRateDMEFD = TBD[TBD]</b> Maximum rate of DM queries against OCS EFD instance(s).
Requirement Priority	
Upper Level Requirement	

## 2.185 [LVV-5489] OCS-DM-COM-ICD-0029-V-01: Archive Latency\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5489	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0029
Requirement Description	<b>Specification:</b> Data Management shall ensure that data are available for query in the Transformed EFD copies within no more than time <b>efdArchiveLatency</b> of the storage of new data to the OCS copy of the EFD.
Requirement Parameters	<b>efdArchiveLatency = 3600[second]</b> Maximum latency time for the availability of data for query in the DM replicas of the EFD.
Requirement Priority	
Upper Level Requirement	

## 2.186 [LVV-5490] OCS-DM-COM-ICD-0029-V-02: Archive Latency\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5490	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0029
Requirement Description	<b>Specification:</b> Data Management shall ensure that data are available for query in the Transformed EFD copies within no more than time <b>efdArchiveLatency</b> of the storage of new data to the OCS copy of the EFD.
Requirement Parameters	<b>efdArchiveLatency = 3600[second]</b> Maximum latency time for the availability of data for query in the DM replicas of the EFD.
Requirement Priority	
Upper Level Requirement	

## 2.187 [LVV-5495] OCS-DM-COM-ICD-0042-V-01: EFD Disaster Recovery by Data Management\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5495	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0042
Requirement Description	<b>Specification:</b> DM shall arrange for the preservation of snapshot backups of the EFD table and Large File Annex contents for disaster recovery purposes. The OCS shall be responsible for creating these backups and making them available as files.
Requirement Priority	
Upper Level Requirement	

## 2.188 [LVV-5496] OCS-DM-COM-ICD-0042-V-02: EFD Disaster Recovery by Data Management\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5496	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0042
Requirement Description	<b>Specification:</b> DM shall arrange for the preservation of snapshot backups of the EFD table and Large File Annex contents for disaster recovery purposes. The OCS shall be responsible for creating these backups and making them available as files.
Requirement Priority	
Upper Level Requirement	

## 2.189 [LVV-5501] OCS-DM-COM-ICD-0030-V-01: EFD Transformation Service Interface\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5501	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0030
Requirement Description	<b>Specification:</b> The archiving of the EFD tables shall be performed using standard MySQL queries. The OCS shall expose this interface to the DM EFD Transformation Service CSC at the Base Facility.
Requirement Discussion	<b>Discussion:</b> The replication mechanism for the large-file annex is still to be defined. In particular, it remains to be defined whether DM will replicate all files in a specified directory or directories, or whether DM will replicate only files referenced by large-file-indirection telemetry messages.
Requirement Priority	
Upper Level Requirement	



## 2.190 [LVV-5502] OCS-DM-COM-ICD-0030-V-02: EFD Transformation Service Interface\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5502	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0030
Requirement Description	<b>Specification:</b> The archiving of the EFD tables shall be performed using standard MySQL queries. The OCS shall expose this interface to the DM EFD Transformation Service CSC at the Base Facility.
Requirement Discussion	<b>Discussion:</b> The replication mechanism for the large-file annex is still to be defined. In particular, it remains to be defined whether DM will replicate all files in a specified directory or directories, or whether DM will replicate only files referenced by large-file-indirection telemetry messages.
Requirement Priority	
Upper Level Requirement	

## 2.191 [LVV-5513] OCS-DM-COM-ICD-0028-V-01: Expected Data Volume\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5513	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0028
Requirement Description	<b>Specification:</b> Data Management shall support at least <b>efdArchive24hVolume</b> of new data to be archived per 24-hour period.
Requirement Parameters	<b>efdArchive14hVolume = 300[gigabyte per day]</b> Minimum capacity of Data Management to archive EFD data.
Requirement Discussion	<b>Discussion:</b> The DM database server will be at least as capable as the OCS server, making it relatively easy to keep up.
Requirement Priority	
Upper Level Requirement	

## 2.192 [LVV-5514] OCS-DM-COM-ICD-0028-V-02: Expected Data Volume\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5514	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0028
Requirement Description	<b>Specification:</b> Data Management shall support at least <b>efdArchive24hVolume</b> of new data to be archived per 24-hour period.
Requirement Parameters	<b>efdArchive14hVolume = 300[gigabyte per day]</b> Minimum capacity of Data Management to archive EFD data.
Requirement Discussion	<b>Discussion:</b> The DM database server will be at least as capable as the OCS server, making it relatively easy to keep up.
Requirement Priority	
Upper Level Requirement	

## 2.193 [LVV-5519] OCS-DM-COM-ICD-0041-V-01: Large File Annex Replication Interface\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5519	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0041
Requirement Description	<b>Specification:</b> The archiving of the Large File Annex contents shall be performed using the standard <i>rsync</i> tool. The OCS shall expose a suitable filesystem and server to the DM EFD Transformation Service CSC at the Base Facility.
Requirement Priority	
Upper Level Requirement	

## 2.194 [LVV-5520] OCS-DM-COM-ICD-0041-V-02: Large File Annex Replication Interface\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5520	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0041
Requirement Description	<b>Specification:</b> The archiving of the Large File Annex contents shall be performed using the standard <i>rsync</i> tool. The OCS shall expose a suitable filesystem and server to the DM EFD Transformation Service CSC at the Base Facility.
Requirement Priority	
Upper Level Requirement	

## 2.195 [LVV-5531] OCS-DM-COM-ICD-0031-V-01: Advance Notice of Pointings\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5531	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0031
Requirement Description	<p><b>Specification:</b> Advance notice of telescope pointings for science data acquisition shall be made available to Data Management as an OCS event, no later than time <b>pointingAdvanceNoticeTime</b> before the start of the first exposure of a standard visit or the only exposure of an alternate science visit. The notice shall include the sky coordinates, rotation angle, the azimuth &amp; elevation angles at the start of the first exposure, exposure duration, number of exposures, estimate of shutter motion start time (at least 1 sec precision), filter selection, expected air mass, and survey name (e.g., WFD, DDF-1). The coordinate system for the sky coordinates shall be ICRS, equinox 2000.0. The precision and accuracy of all values shall be based on the capability of the OCS; the precision and accuracy that the OCS is able to achieve should be published in a separate design document so that DM can know what they are.</p>
Requirement Parameters	<p><b>pointingAdvanceNoticeTime = 20[second]</b> Time before the first exposure of a standard visit begins by which advance notice of the pointing must be provided to Data Management.</p> <p><b>Discussion:</b> The purpose of this requirement is to permit Data Management to pipeline the potentially costly operation of preparing (downsampling and rotation) the subtraction template for the visit with the processing of the data from previous visits, as well as to retrieve reference object information from the Science Database. This is essential in order to allow DM to meet the Observatory alert latency requirement.</p> <p>This is not expected to be a difficult constraint to meet during normal operation, as similar advance knowledge is required to plan dome crawl, for instance.</p>
Requirement Discussion	<p>Note that the pipelined nature of the processing envisioned by DM means that if the advance notice requirement is not met, and template preparation is not possible, DM may face the choice of falling behind for a series of visits, or of deferring the processing of the single affected visit to avoid disrupting the pipeline. This choice would depend on the frequency with which the interface requirement is not met, and whether such failures occurred in bursts.</p> <p>The inclusion of survey name in the visit qualities reported in an advance notice will enable alternative, near real-time processing pipelines to be triggered for Special Programs, as required by OSS-REQ-0384 and DMS-REQ-0320.</p>
Requirement Priority	
Upper Level Requirement	

## 2.196 [LVV-5532] OCS-DM-COM-ICD-0031-V-02: Advance Notice of Pointings\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5532	Leanne Guy	Not Covered	

**Verification Element Description:**

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0031
Requirement Description	<p><b>Specification:</b> Advance notice of telescope pointings for science data acquisition shall be made available to Data Management as an OCS event, no later than time <b>pointingAdvanceNoticeTime</b> before the start of the first exposure of a standard visit or the only exposure of an alternate science visit. The notice shall include the sky coordinates, rotation angle, the azimuth &amp; elevation angles at the start of the first exposure, exposure duration, number of exposures, estimate of shutter motion start time (at least 1 sec precision), filter selection, expected air mass, and survey name (e.g., WFD, DDF-1). The coordinate system for the sky coordinates shall be ICRS, equinox 2000.0. The precision and accuracy of all values shall be based on the capability of the OCS; the precision and accuracy that the OCS is able to achieve should be published in a separate design document so that DM can know what they are.</p>
Requirement Parameters	<p><b>pointingAdvanceNoticeTime = 20[second]</b> Time before the first exposure of a standard visit begins by which advance notice of the pointing must be provided to Data Management.</p> <p><b>Discussion:</b> The purpose of this requirement is to permit Data Management to pipeline the potentially costly operation of preparing (downsampling and rotation) the subtraction template for the visit with the processing of the data from previous visits, as well as to retrieve reference object information from the Science Database. This is essential in order to allow DM to meet the Observatory alert latency requirement.</p> <p>This is not expected to be a difficult constraint to meet during normal operation, as similar advance knowledge is required to plan dome crawl, for instance.</p>
Requirement Discussion	<p>Note that the pipelined nature of the processing envisioned by DM means that if the advance notice requirement is not met, and template preparation is not possible, DM may face the choice of falling behind for a series of visits, or of deferring the processing of the single affected visit to avoid disrupting the pipeline. This choice would depend on the frequency with which the interface requirement is not met, and whether such failures occurred in bursts.</p> <p>The inclusion of survey name in the visit qualities reported in an advance notice will enable alternative, near real-time processing pipelines to be triggered for Special Programs, as required by OSS-REQ-0384 and DMS-REQ-0320.</p>
Requirement Priority	
Upper Level Requirement	

## 2.197 [LVV-5537] OCS-DM-COM-ICD-0002-V-01: OCS SAL Middleware Delivery\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5537	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0002
Requirement Description	<b>Specification:</b> The OCS shall deliver the Service Abstraction Layer software in a form usable from the C++ and Python languages. The version(s) of C++ and Python supported and the identities and versions of additional external libraries required, if any, shall be under Observatory-level change control. The OCS shall provide the SAL SDK to generate interface header files and libraries.
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	



## 2.198 [LVV-5538] OCS-DM-COM-ICD-0002-V-02: OCS SAL Middleware Delivery\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5538	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0002
Requirement Description	<b>Specification:</b> The OCS shall deliver the Service Abstraction Layer software in a form usable from the C++ and Python languages. The version(s) of C++ and Python supported and the identities and versions of additional external libraries required, if any, shall be under Observatory-level change control. The OCS shall provide the SAL SDK to generate interface header files and libraries.
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.199 [LVV-5543] OCS-DM-COM-ICD-0001-V-01: OCS Service Abstraction Layer\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5543	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0001
Requirement Description	<b>Specification:</b> The OCS shall provide the Service Abstraction Layer (SAL) middleware described in Interface Support Document LSE-70, supporting a commandable device abstraction as well as a publish/subscribe communications protocol for events and telemetry.
Requirement Priority	
Upper Level Requirement	

## 2.200 [LVV-5544] OCS-DM-COM-ICD-0001-V-02: OCS Service Abstraction Layer\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5544	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-DM-COM-ICD-0001
Requirement Description	<b>Specification:</b> The OCS shall provide the Service Abstraction Layer (SAL) middleware described in Interface Support Document LSE-70, supporting a commandable device abstraction as well as a publish/subscribe communications protocol for events and telemetry.
Requirement Priority	
Upper Level Requirement	

## 2.201 [LVV-5628] DM-TS-CON-ICD-0003-V-01: Wavefront image archive access\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5628	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-CON-ICD-0003
Requirement Description	<p><b>Specification:</b> Data Management shall provide access for the Telescope and Site subsystem, for both personnel and automated processes, to the archive of Wavefront Sensor images. This shall be the same interface that is provided for science image archive access within the project. DM shall support prompt access to the archive from the Summit, at a service level to be determined, but sufficient to support any reasonable level of operator-directed access to individual images. DM shall also support Telescope access to the archive at the Base and Archive facilities, including support for automated bulk analysis. DM may restrict bulk access to large quantities of wavefront archive data at the Summit.</p> <p><b>Discussion:</b> This is required in order to support detailed analysis of the wavefront data, beyond the immediate processing that is enabled by the Telescope's subscription to a live feed of images.</p> <p>The Telescope group is currently willing to accept that the usual science image interface will be suitable. The details of this will be reviewed during Final Design. It is understood that DM will provide authorization and authentication services to support the access required.</p> <p>Bulk processing is currently planned to be done using the same toolkit used for DM's own bulk production, and so DM will support the Telescope group in its use of these tools.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.202 [LVV-5629] DM-TS-CON-ICD-0003-V-02: Wavefront image archive access\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5629	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-CON-ICD-0003
Requirement Description	<p><b>Specification:</b> Data Management shall provide access for the Telescope and Site subsystem, for both personnel and automated processes, to the archive of Wavefront Sensor images. This shall be the same interface that is provided for science image archive access within the project. DM shall support prompt access to the archive from the Summit, at a service level to be determined, but sufficient to support any reasonable level of operator-directed access to individual images. DM shall also support Telescope access to the archive at the Base and Archive facilities, including support for automated bulk analysis. DM may restrict bulk access to large quantities of wavefront archive data at the Summit.</p> <p><b>Discussion:</b> This is required in order to support detailed analysis of the wavefront data, beyond the immediate processing that is enabled by the Telescope's subscription to a live feed of images.</p> <p>The Telescope group is currently willing to accept that the usual science image interface will be suitable. The details of this will be reviewed during Final Design. It is understood that DM will provide authorization and authentication services to support the access required.</p> <p>Bulk processing is currently planned to be done using the same toolkit used for DM's own bulk production, and so DM will support the Telescope group in its use of these tools.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.203 [LVV-5634] DM-TS-CON-ICD-0010-V-01: Wavefront Processing Pipeline\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5634	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-CON-ICD-0010
Requirement Description	<p><b>Specification:</b> T&amp;S shall provide a full-focal-plane wavefront processing pipeline payload, written using Data Management conventions and frameworks, to DM for execution in the OCS-Driven Batch Service on the Commissioning Cluster and/or at NCSA. The input to the pipeline payload shall be the image names of the intra-focal and extra-focal images for either ComCam or LSSTCam; its output shall be the Zernike coefficients describing the wavefront solution for each detector, which shall be transmitted as telemetry.</p> <p><b>Discussion:</b> The AOS will be written as LSST stack tasks and developed in a way consistent with the DM Developer Guide (<a href="http://developer.lsst.io">http://developer.lsst.io</a>) including style guide, code review, development workflow. It will build under the same build-test-release harness as the LSST stack. Additionally, T&amp;S is responsible for providing any datasets and test scripts required to continuously integrate and validate the code.</p> <p>If the latency of OCS-Driven Batch is insufficient, the pipeline can be ported to the Prompt Processing service after LSSTCam comes online.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.204 [LVV-5635] DM-TS-CON-ICD-0010-V-02: Wavefront Processing Pipeline\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5635	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-CON-ICD-0010
Requirement Description	<p><b>Specification:</b> T&amp;S shall provide a full-focal-plane wavefront processing pipeline payload, written using Data Management conventions and frameworks, to DM for execution in the OCS-Driven Batch Service on the Commissioning Cluster and/or at NCSA. The input to the pipeline payload shall be the image names of the intra-focal and extra-focal images for either ComCam or LSSTCam; its output shall be the Zernike coefficients describing the wavefront solution for each detector, which shall be transmitted as telemetry.</p> <p><b>Discussion:</b> The AOS will be written as LSST stack tasks and developed in a way consistent with the DM Developer Guide (<a href="http://developer.lsst.io">http://developer.lsst.io</a>) including style guide, code review, development workflow. It will build under the same build-test-release harness as the LSST stack. Additionally, T&amp;S is responsible for providing any datasets and test scripts required to continuously integrate and validate the code.</p> <p>If the latency of OCS-Driven Batch is insufficient, the pipeline can be ported to the Prompt Processing service after LSSTCam comes online.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.205 [LVV-5652] DM-TS-CON-ICD-0006-V-01: Data\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5652	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-CON-ICD-0006
Requirement Description	<b>Specification:</b> Data Management shall publish as telemetry, for each detector in each exposure, the following items derived from a PSF model: full width at half maximum (double), lxx/lyy/lxy quadrupole representation of ellipse (three doubles). <b>Discussion:</b> The PSF information will serve as a diagnostic tool to conduct quality assurance on the active optics solution. For instance PSF information will be used to determine if there are any focus error trends.
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	



## 2.206 [LVV-5653] DM-TS-CON-ICD-0006-V-02: Data\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5653	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-CON-ICD-0006
Requirement Description	<b>Specification:</b> Data Management shall publish as telemetry, for each detector in each exposure, the following items derived from a PSF model: full width at half maximum (double), lxx/lyy/lxy quadrupole representation of ellipse (three doubles). <b>Discussion:</b> The PSF information will serve as a diagnostic tool to conduct quality assurance on the active optics solution. For instance PSF information will be used to determine if there are any focus error trends.
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.207 [LVV-5658] DM-TS-CON-ICD-0007-V-01: Timing\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5658	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-CON-ICD-0007
Requirement Description	<b>Specification:</b> The PSF data shall be published as telemetry within time <b>psfSolutionFeedbackTime</b> of the close of data acquisition for each exposure.
Requirement Parameters	<b>psfSolutionFeedbackTime = 60[second]</b> Time following the conclusion of a readout of an exposure which DM must provide the PSF information for each detector.
Requirement Discussion	<b>Discussion:</b> The T&S and commissioning teams express the need to know about the PSF coordinates on a 60s to decrease the time overhead of the wait during full array mode and ComCam AOS applications.
Requirement Priority	
Upper Level Requirement	

## 2.208 [LVV-5659] DM-TS-CON-ICD-0007-V-02: Timing\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5659	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-CON-ICD-0007
Requirement Description	<b>Specification:</b> The PSF data shall be published as telemetry within time <b>psfSolutionFeedbackTime</b> of the close of data acquisition for each exposure.
Requirement Parameters	<b>psfSolutionFeedbackTime = 60[second]</b> Time following the conclusion of a readout of an exposure which DM must provide the PSF information for each detector.
Requirement Discussion	<b>Discussion:</b> The T&S and commissioning teams express the need to know about the PSF coordinates on a 60s to decrease the time overhead of the wait during full array mode and ComCam AOS applications.
Requirement Priority	
Upper Level Requirement	

## 2.209 [LVV-5664] DM-TS-CON-ICD-0009-V-01: Calibration Data Products\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5664	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-CON-ICD-0009
Requirement Description	<p><b>Specification:</b> Data Management shall provide master calibration frames for the wave-front and guider sensors via the Observatory Operations Data Service at the Base Facility. At a minimum, these images shall be provided in a filesystem accessible via rsync.</p> <p><b>Discussion:</b> The AOS will need the Calibration Data Products related to the WFS to run the ISR. In case of an outage between the base and the summit, the AOS will use older Calibration Data Products up to the (8) days specified in ? . The CBP and the flat field screen will allow to take calibration data of the WFS.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.210 [LVV-5665] DM-TS-CON-ICD-0009-V-02: Calibration Data Products\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5665	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-CON-ICD-0009
Requirement Description	<p><b>Specification:</b> Data Management shall provide master calibration frames for the wave-front and guider sensors via the Observatory Operations Data Service at the Base Facility. At a minimum, these images shall be provided in a filesystem accessible via rsync.</p> <p><b>Discussion:</b> The AOS will need the Calibration Data Products related to the WFS to run the ISR. In case of an outage between the base and the summit, the AOS will use older Calibration Data Products up to the (8) days specified in ? . The CBP and the flat field screen will allow to take calibration data of the WFS.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.211 [LVV-5670] DM-TS-CON-ICD-0008-V-01: LSST Stack Availability\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5670	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-CON-ICD-0008
Requirement Description	<b>Specification:</b> A container with a T&S-selected release of the LSST stack shall be available at the summit.
Requirement Discussion	<b>Discussion:</b> One of the first steps of the Active Optics System control feedback is to pre-process the wavefront sensor images using routine developed for the Image Signature Removal. Therefore these routines shall be physically on the summit for timing purposes.
Requirement Priority	
Upper Level Requirement	

## 2.212 [LVV-5671] DM-TS-CON-ICD-0008-V-02: LSST Stack Availability\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5671	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-CON-ICD-0008
Requirement Description	<b>Specification:</b> A container with a T&S-selected release of the LSST stack shall be available at the summit.
Requirement Discussion	<b>Discussion:</b> One of the first steps of the Active Optics System control feedback is to pre-process the wavefront sensor images using routine developed for the Image Signature Removal. Therefore these routines shall be physically on the summit for timing purposes.
Requirement Priority	
Upper Level Requirement	

## 2.213 [LVV-5676] DM-TS-CON-ICD-0004-V-01: Use OCS for data transport\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-5676	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-CON-ICD-0004
Requirement Description	<b>Specification:</b> All telemetry exchange required by this ICD shall be mediated by the OCS, following the specification in ICD LSE-70.
Requirement Discussion	<b>Discussion:</b> The intent is that the publish/subscribe mechanism, the EFD, and the Configuration Database will be the means of communication.
Requirement Priority	
Upper Level Requirement	



## 2.214 [LVV-5677] DM-TS-CON-ICD-0004-V-02: Use OCS for data transport\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-5677	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-CON-ICD-0004
Requirement Description	<b>Specification:</b> All telemetry exchange required by this ICD shall be mediated by the OCS, following the specification in ICD LSE-70.
Requirement Discussion	<b>Discussion:</b> The intent is that the publish/subscribe mechanism, the EFD, and the Configuration Database will be the means of communication.
Requirement Priority	
Upper Level Requirement	

## 2.215 [LVV-6140] CA-DM-SUP-ICD-0026-V-03: Analog Electronics Temperature Measurements\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6140	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0026
Requirement Description	<b>Specification:</b> The Camera shall provide measurements of the temperatures of all analog electronics in the data acquisition chain.
Requirement Discussion	<b>Discussion:</b> The details are to be determined in Phase 3. It is TBD whether DM is interested in the temperatures of other parts of the electronics.
Requirement Priority	
Upper Level Requirement	

## 2.216 [LVV-6141] CA-DM-SUP-ICD-0026-V-04: Analog Electronics Temperature Measurements\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6141	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0026
Requirement Description	<b>Specification:</b> The Camera shall provide measurements of the temperatures of all analog electronics in the data acquisition chain.
Requirement Discussion	<b>Discussion:</b> The details are to be determined in Phase 3. It is TBD whether DM is interested in the temperatures of other parts of the electronics.
Requirement Priority	
Upper Level Requirement	

## 2.217 [LVV-6146] CA-DM-SUP-ICD-0027-V-03: Bias Voltage Measurements\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6146	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0027
Requirement Description	<b>Specification:</b> The Camera shall provide measurements of the actual bias voltages applied to the sensors.
Requirement Discussion	<b>Discussion:</b> It is assumed that the setpoints will be available as Configuration data.
Requirement Priority	
Upper Level Requirement	

## 2.218 [LVV-6147] CA-DM-SUP-ICD-0027-V-04: Bias Voltage Measurements\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6147	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0027
Requirement Description	<b>Specification:</b> The Camera shall provide measurements of the actual bias voltages applied to the sensors.
Requirement Discussion	<b>Discussion:</b> It is assumed that the setpoints will be available as Configuration data.
Requirement Priority	
Upper Level Requirement	

## 2.219 [LVV-6152] CA-DM-SUP-ICD-0024-V-03: Filter Changer Readback Information Timeliness\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6152	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0024
Requirement Description	<b>Specification:</b> The Camera shall provide the filter identity information in time for use in Data Management's Alert Production; that is, with a latency conforming to CA-DM-CON-ICD-0003 in LSE-69.
Requirement Priority	
Upper Level Requirement	CA-DM-CON-ICD-0003 Camera Conditions data latency for Alert Production

## 2.220 [LVV-6153] CA-DM-SUP-ICD-0024-V-04: Filter Changer Readback Information Timeliness\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6153	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0024
Requirement Description	<b>Specification:</b> The Camera shall provide the filter identity information in time for use in Data Management's Alert Production; that is, with a latency conforming to CA-DM-CON-ICD-0003 in LSE-69.
Requirement Priority	
Upper Level Requirement	CA-DM-CON-ICD-0003 Camera Conditions data latency for Alert Production

## 2.221 [LVV-6158] CA-DM-SUP-ICD-0023-V-03: Filter Changer Readback Information\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6158	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0023
Requirement Description	<p><b>Specification:</b> The Camera shall provide readback information from the filter changer, including at a minimum a positive identification of the specific filter article that is in place.</p> <p><b>Discussion:</b> It is understood that the micro-positioning of the filter (within the range of motion permitted by the clamping fixtures) will not be measured. The information on the filter identity should be something of the nature of a serial number and not just a filter bandpass specifier. This is required to allow the disambiguation of two filters with the same bandpass, should spare or replacement filters be used in the system.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	



## 2.222 [LVV-6159] CA-DM-SUP-ICD-0023-V-04: Filter Changer Readback Information\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6159	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0023
Requirement Description	<p><b>Specification:</b> The Camera shall provide readback information from the filter changer, including at a minimum a positive identification of the specific filter article that is in place.</p> <p><b>Discussion:</b> It is understood that the micro-positioning of the filter (within the range of motion permitted by the clamping fixtures) will not be measured. The information on the filter identity should be something of the nature of a serial number and not just a filter bandpass specifier. This is required to allow the disambiguation of two filters with the same bandpass, should spare or replacement filters be used in the system.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.223 [LVV-6164] CA-DM-SUP-ICD-0025-V-03: Focal Plane Temperature Measurements\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6164	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0025
Requirement Description	<b>Specification:</b> The Camera shall provide focal plane temperature measurements.
Requirement Discussion	<b>Discussion:</b> The frequency of sampling will be determined by the Camera and will be specified in Phase 3, but should provide several measurements during each nominal exposure.
Requirement Priority	
Upper Level Requirement	

## 2.224 [LVV-6165] CA-DM-SUP-ICD-0025-V-04: Focal Plane Temperature Measurements\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6165	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0025
Requirement Description	<b>Specification:</b> The Camera shall provide focal plane temperature measurements.
Requirement Discussion	<b>Discussion:</b> The frequency of sampling will be determined by the Camera and will be specified in Phase 3, but should provide several measurements during each nominal exposure.
Requirement Priority	
Upper Level Requirement	

## 2.225 [LVV-6170] CA-DM-SUP-ICD-0022-V-03: Shutter Motion Profiles Timeliness\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6170	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0022
Requirement Description	<b>Specification:</b> The Camera shall provide the shutter motion profiles in time for use in Data Management's Alert Production; that is, with a latency conforming to CA-DM-CON-ICD-0003 in LSE-69.
Requirement Priority	
Upper Level Requirement	CA-DM-CON-ICD-0003 Camera Conditions data latency for Alert Production

## 2.226 [LVV-6171] CA-DM-SUP-ICD-0022-V-04: Shutter Motion Profiles Timeliness\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6171	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0022
Requirement Description	<b>Specification:</b> The Camera shall provide the shutter motion profiles in time for use in Data Management's Alert Production; that is, with a latency conforming to CA-DM-CON-ICD-0003 in LSE-69.
Requirement Priority	
Upper Level Requirement	CA-DM-CON-ICD-0003 Camera Conditions data latency for Alert Production

## 2.227 [LVV-6176] CA-DM-SUP-ICD-0021-V-03: Shutter Motion Profiles\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6176	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0021
Requirement Description	<p><b>Specification:</b> The Camera shall provide the shutter motion profiles (the position of the shutter blade edge as a function of absolute time, following the observatory time standard OSS-REQ-0086 et seq.) for each exposure, including the identification of which blades were used and in which direction they moved.</p> <p><b>Discussion:</b> Note that a shadowing model for the shutter is required to be provided under CA-DM-SUP-ICD-0017, allowing the reconstruction of the shadow profile for the shutter as a function of time given the positions recorded in the motion profile.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.228 [LVV-6177] CA-DM-SUP-ICD-0021-V-04: Shutter Motion Profiles\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6177	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0021
Requirement Description	<p><b>Specification:</b> The Camera shall provide the shutter motion profiles (the position of the shutter blade edge as a function of absolute time, following the observatory time standard OSS-REQ-0086 et seq.) for each exposure, including the identification of which blades were used and in which direction they moved.</p> <p><b>Discussion:</b> Note that a shadowing model for the shutter is required to be provided under CA-DM-SUP-ICD-0017, allowing the reconstruction of the shadow profile for the shutter as a function of time given the positions recorded in the motion profile.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.229 [LVV-6182] CA-DM-SUP-ICD-0028-V-03: Telemetry for Parametric Models\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6182	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0028
Requirement Description	<p><b>Specification:</b> The Camera shall provide or identify all telemetry required to support parametric models of the temporal variation of Camera characteristics otherwise provided under the "Design, Assembly, and Laboratory Test Data" section above.</p> <p><b>Discussion:</b> This recognizes that if a Camera parameter is found to have a temperature dependence, for instance, the Camera is permitted to provide the value of the parameter either as a true measurement or as a model parameterized by a temperature measurement or measurements.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	



## 2.230 [LVV-6183] CA-DM-SUP-ICD-0028-V-04: Telemetry for Parametric Models\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6183	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0028
Requirement Description	<b>Specification:</b> The Camera shall provide or identify all telemetry required to support parametric models of the temporal variation of Camera characteristics otherwise provided under the "Design, Assembly, and Laboratory Test Data" section above.
Requirement Discussion	<b>Discussion:</b> This recognizes that if a Camera parameter is found to have a temperature dependence, for instance, the Camera is permitted to provide the value of the parameter either as a true measurement or as a model parameterized by a temperature measurement or measurements.
Requirement Priority	
Upper Level Requirement	

## 2.231 [LVV-6188] CA-DM-SUP-ICD-0029-V-03: Association with Camera Images\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6188	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0029
Requirement Description	<b>Specification:</b> Configuration data shall be provided to DM in a manner that allows the association of this data with the specific camera images to which it pertains.
Requirement Discussion	<b>Discussion:</b> This will be accomplished by using an observatory-wide configuration tracking mechanism.
Requirement Priority	
Upper Level Requirement	

## 2.232 [LVV-6189] CA-DM-SUP-ICD-0029-V-04: Association with Camera Images\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6189	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0029
Requirement Description	<b>Specification:</b> Configuration data shall be provided to DM in a manner that allows the association of this data with the specific camera images to which it pertains.
Requirement Discussion	<b>Discussion:</b> This will be accomplished by using an observatory-wide configuration tracking mechanism.
Requirement Priority	
Upper Level Requirement	

### 2.233 [LVV-6194] CA-DM-SUP-ICD-0031-V-03: Readout Micro-Program Characteristics\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6194	Leanne Guy	Not Covered	

#### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0031
Requirement Description	<b>Specification:</b> The camera shall make available the readout micro-program characteristics, e.g., the readout pixel rate and the number of overclock pixels, and the readout timing diagram.
Requirement Priority	
Upper Level Requirement	

## 2.234 [LVV-6195] CA-DM-SUP-ICD-0031-V-04: Readout Micro-Program Characteristics\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6195	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0031
Requirement Description	<b>Specification:</b> The camera shall make available the readout micro-program characteristics, e.g., the readout pixel rate and the number of overclock pixels, and the readout timing diagram.
Requirement Priority	
Upper Level Requirement	

## 2.235 [LVV-6200] CA-DM-SUP-ICD-0030-V-03: Versioning Identifiers for Code & Firmware\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6200	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0030
Requirement Description	<b>Specification:</b> The camera shall make available version control identifiers for all code involved in the data acquisition chain. Code versions for all firmware that can be updated in place are included in this configuration data.
Requirement Discussion	<b>Discussion:</b> Code versions for firmware that can only be modified by physical access to the Camera hardware should be treated as assembly data, as above.
Requirement Priority	
Upper Level Requirement	

## 2.236 [LVV-6201] CA-DM-SUP-ICD-0030-V-04: Versioning Identifiers for Code & Firmware\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6201	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0030
Requirement Description	<b>Specification:</b> The camera shall make available version control identifiers for all code involved in the data acquisition chain. Code versions for all firmware that can be updated in place are included in this configuration data.
Requirement Discussion	<b>Discussion:</b> Code versions for firmware that can only be modified by physical access to the Camera hardware should be treated as assembly data, as above.
Requirement Priority	
Upper Level Requirement	

## 2.237 [LVV-6206] CA-DM-SUP-ICD-0008-V-03: As-Built Camera Geometry Specifications\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6206	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0008
Requirement Description	<p><b>Specification:</b> The geometry model shall include at least:</p> <ul style="list-style-type: none"> <li>• The spatial position, in the Camera coordinate system, of each sensor;</li> <li>• A map of the vertical position of the sensor surfaces, z(x,y);</li> <li>• The location of the intersection of the corrector optical axis with the focal plane.</li> </ul> <p><b>Discussion:</b> The required precision is TBD. An initial, post-assembly version of this information should be provided, as well as periodic updates (e.g., derived from the CCOB or from focus sweeps) and updates when there are hardware changes (e.g., when rafts are exchanged or serviced).</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	



## 2.238 [LVV-6207] CA-DM-SUP-ICD-0008-V-04: As-Built Camera Geometry Specifications\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6207	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0008
Requirement Description	<p><b>Specification:</b> The geometry model shall include at least:</p> <ul style="list-style-type: none"> <li>• The spatial position, in the Camera coordinate system, of each sensor;</li> <li>• A map of the vertical position of the sensor surfaces, z(x,y);</li> <li>• The location of the intersection of the corrector optical axis with the focal plane.</li> </ul> <p><b>Discussion:</b> The required precision is TBD. An initial, post-assembly version of this information should be provided, as well as periodic updates (e.g., derived from the CCOB or from focus sweeps) and updates when there are hardware changes (e.g., when rafts are exchanged or serviced).</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.239 [LVV-6212] CA-DM-SUP-ICD-0007-V-03: As-Built Camera Geometry\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6212	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0007
Requirement Description	<b>Specification:</b> The Camera shall make available a model of the as-built geometry of the instrument.
Requirement Priority	
Upper Level Requirement	

## 2.240 [LVV-6213] CA-DM-SUP-ICD-0007-V-04: As-Built Camera Geometry\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6213	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0007
Requirement Description	<b>Specification:</b> The Camera shall make available a model of the as-built geometry of the instrument.
Requirement Priority	
Upper Level Requirement	

## 2.241 [LVV-6218] CA-DM-SUP-ICD-0009-V-03: Coordinate System Conventions\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6218	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0009
Requirement Description	<b>Specification:</b> The geometry model shall obey the LSST coordinate system conventions.
Requirement Discussion	<b>Discussion:</b> As of this writing the details of the coordinate system to be used are TBD and expected to be settled in Phase 2. An LSE-series document is in preparation.
Requirement Priority	
Upper Level Requirement	

## 2.242 [LVV-6219] CA-DM-SUP-ICD-0009-V-04: Coordinate System Conventions\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6219	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0009
Requirement Description	<b>Specification:</b> The geometry model shall obey the LSST coordinate system conventions.
Requirement Discussion	<b>Discussion:</b> As of this writing the details of the coordinate system to be used are TBD and expected to be settled in Phase 2. An LSE-series document is in preparation.
Requirement Priority	
Upper Level Requirement	

## 2.243 [LVV-6224] CA-DM-SUP-ICD-0010-V-03: Geometry Distortion Model\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6224	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0010
Requirement Description	<b>Specification:</b> The Camera shall provide a model of the distortions of the geometry as a function of significant state variables, such as the spatial orientation of the instrument or its temperature. <b>Discussion:</b> The de minimis level below which this is not required is TBD. When a state variable is needed for the model, Requirement CA-DM-SUP-ICD-0028 below applies and the Camera must ensure that that variable is available as telemetry.
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	CA-DM-SUP-ICD-0028 Telemetry for Parametric Models

## 2.244 [LVV-6225] CA-DM-SUP-ICD-0010-V-04: Geometry Distortion Model\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6225	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0010
Requirement Description	<b>Specification:</b> The Camera shall provide a model of the distortions of the geometry as a function of significant state variables, such as the spatial orientation of the instrument or its temperature. <b>Discussion:</b> The de minimis level below which this is not required is TBD. When a state variable is needed for the model, Requirement CA-DM-SUP-ICD-0028 below applies and the Camera must ensure that that variable is available as telemetry.
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	CA-DM-SUP-ICD-0028 Telemetry for Parametric Models

## 2.245 [LVV-6230] CA-DM-SUP-ICD-0020-V-03: Applicable Documentation\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6230	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0020
Requirement Description	<b>Specification:</b> The Camera shall provide the documentation necessary to understand and apply the data provided under this ICD.
Requirement Priority	
Upper Level Requirement	



## 2.246 [LVV-6231] CA-DM-SUP-ICD-0020-V-04: Applicable Documentation\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6231	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0020
Requirement Description	<b>Specification:</b> The Camera shall provide the documentation necessary to understand and apply the data provided under this ICD.
Requirement Priority	
Upper Level Requirement	

## 2.247 [LVV-6236] CA-DM-SUP-ICD-0019-V-03: Machine Readable Format\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6236	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0019
Requirement Description	<b>Specification:</b> The Camera shall provide all data under this ICD in a machine-readable form suitable for use as input to automated processes. The Camera shall provide sufficient metadata to associate the test results with the identifiers required by CA-DM-SUP-ICD-0002, -0003, and -0004 above.
Requirement Priority	
Upper Level Requirement	CA-DM-SUP-ICD-0002 Camera Instrument Composition Description CA-DM-SUP-ICD-0003 Component Geographical and Physical Location Pairing CA-DM-SUP-ICD-0004 Component Mapping Persistence

## 2.248 [LVV-6237] CA-DM-SUP-ICD-0019-V-04: Machine Readable Format\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6237	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0019
Requirement Description	<b>Specification:</b> The Camera shall provide all data under this ICD in a machine-readable form suitable for use as input to automated processes. The Camera shall provide sufficient metadata to associate the test results with the identifiers required by CA-DM-SUP-ICD-0002, -0003, and -0004 above.
Requirement Priority	
Upper Level Requirement	CA-DM-SUP-ICD-0002 Camera Instrument Composition Description CA-DM-SUP-ICD-0003 Component Geographical and Physical Location Pairing CA-DM-SUP-ICD-0004 Component Mapping Persistence

## 2.249 [LVV-6242] CA-DM-SUP-ICD-0005-V-03: Focal Plane Electronic Layout Description\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6242	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0005
Requirement Description	<b>Specification:</b> The Camera shall make available a description of the electronic layout of the focal plane, including sensor pixel dimensions, the structure of any pre-scan regions, the readout directions of the segments within the sensors, the locations of bloom stops, and the like. <b>Discussion:</b> Note that the definitions of readout regions and overclocking are not physical properties of the sensors, but are programmable, and as such are part of the Configuration Data below.
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.250 [LVV-6243] CA-DM-SUP-ICD-0005-V-04: Focal Plane Electronic Layout Description\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6243	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0005
Requirement Description	<b>Specification:</b> The Camera shall make available a description of the electronic layout of the focal plane, including sensor pixel dimensions, the structure of any pre-scan regions, the readout directions of the segments within the sensors, the locations of bloom stops, and the like. <b>Discussion:</b> Note that the definitions of readout regions and overclocking are not physical properties of the sensors, but are programmable, and as such are part of the Configuration Data below.
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.251 [LVV-6248] CA-DM-SUP-ICD-0006-V-03: Geographical Mapping Between Sensors and Electronics\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6248	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0006
Requirement Description	<b>Specification:</b> The Camera shall make available the mapping of geographical identifiers between sensors and their associated electronics.
Requirement Priority	
Upper Level Requirement	

## 2.252 [LVV-6249] CA-DM-SUP-ICD-0006-V-04: Geographical Mapping Between Sensors and Electronics\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6249	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0006
Requirement Description	<b>Specification:</b> The Camera shall make available the mapping of geographical identifiers between sensors and their associated electronics.
Requirement Priority	
Upper Level Requirement	

## 2.253 [LVV-6254] CA-DM-SUP-ICD-0002-V-03: Camera Instrument Composition Description\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6254	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0002
Requirement Description	<b>Specification:</b> The Camera shall provide data describing the composition of the instrument. This shall at a minimum include information on the identity of each sensor, each significant line-replaceable electronic component in the readout chain, each raft, and each filter.
Requirement Discussion	<b>Discussion:</b> The full list of components that will be tracked in this manner is TBD. It is anticipated that the Camera will be likely to track a superset of the above-required information, simply as a result of sound engineering practice ? to support diagnostics, preventative maintenance, spares tracking, and the like.
Requirement Priority	
Upper Level Requirement	



## 2.254 [LVV-6255] CA-DM-SUP-ICD-0002-V-04: Camera Instrument Composition Description\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6255	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0002
Requirement Description	<b>Specification:</b> The Camera shall provide data describing the composition of the instrument. This shall at a minimum include information on the identity of each sensor, each significant line-replaceable electronic component in the readout chain, each raft, and each filter.
Requirement Discussion	<b>Discussion:</b> The full list of components that will be tracked in this manner is TBD. It is anticipated that the Camera will be likely to track a superset of the above-required information, simply as a result of sound engineering practice ? to support diagnostics, preventative maintenance, spares tracking, and the like.
Requirement Priority	
Upper Level Requirement	

## 2.255 [LVV-6260] CA-DM-SUP-ICD-0003-V-03: Component Geographical and Physical Location Pairing\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6260	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0003
Requirement Description	<p><b>Specification:</b> Each identified component and assembly shall be tracked by pairing a “slot” or geographical identifier of a location in the camera or in a camera assembly with a physical identity, such as a serial number, associated with the object in that location.</p> <p><b>Discussion:</b> This means, for instance, that it should be possible to determine that the raft with serial number X is present in raft bay Y, and that CCD Z is in grid position W on the raft with serial number X.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.256 [LVV-6261] CA-DM-SUP-ICD-0003-V-04: Component Geographical and Physical Location Pairing\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6261	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0003
Requirement Description	<p><b>Specification:</b> Each identified component and assembly shall be tracked by pairing a “slot” or geographical identifier of a location in the camera or in a camera assembly with a physical identity, such as a serial number, associated with the object in that location.</p> <p><b>Discussion:</b> This means, for instance, that it should be possible to determine that the raft with serial number X is present in raft bay Y, and that CCD Z is in grid position W on the raft with serial number X.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.257 [LVV-6266] CA-DM-SUP-ICD-0004-V-03: Component Mapping Persistence\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6266	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0004
Requirement Description	<b>Specification:</b> The evolution of this mapping shall be made available for the entire history of integration and test data, and of commissioning and operations.
Requirement Discussion	<b>Discussion:</b> The spirit of this requirement is that any change made to the camera assembly hierarchy must be recorded if any archived data was taken in that configuration.
Requirement Priority	
Upper Level Requirement	

## 2.258 [LVV-6267] CA-DM-SUP-ICD-0004-V-04: Component Mapping Persistence\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6267	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0004
Requirement Description	<b>Specification:</b> The evolution of this mapping shall be made available for the entire history of integration and test data, and of commissioning and operations.
Requirement Discussion	<b>Discussion:</b> The spirit of this requirement is that any change made to the camera assembly hierarchy must be recorded if any archived data was taken in that configuration.
Requirement Priority	
Upper Level Requirement	

## 2.259 [LVV-6272] CA-DM-SUP-ICD-0016-V-03: Optical Distortion Map\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6272	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0016
Requirement Description	<b>Specification:</b> The Camera shall provide the data necessary to construct an optical distortion map.
Requirement Discussion	<b>Discussion:</b> The Camera is not required to do the end-to-end modeling; this is expected to be a task for Systems Engineering.
Requirement Priority	
Upper Level Requirement	

## 2.260 [LVV-6273] CA-DM-SUP-ICD-0016-V-04: Optical Distortion Map\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6273	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0016
Requirement Description	<b>Specification:</b> The Camera shall provide the data necessary to construct an optical distortion map.
Requirement Discussion	<b>Discussion:</b> The Camera is not required to do the end-to-end modeling; this is expected to be a task for Systems Engineering.
Requirement Priority	
Upper Level Requirement	

## 2.261 [LVV-6278] CA-DM-SUP-ICD-0015-V-03: Scattered Light Model\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6278	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0015
Requirement Description	<b>Specification:</b> The Camera shall provide the data necessary to construct a model of the scattered light and ghosting as a function of wavelength. The model shall include all relevant optical elements, including baffles.
Requirement Discussion	<b>Discussion:</b> The Camera is not required to do the end-to-end modeling; this is expected to be a task for Systems Engineering.
Requirement Priority	
Upper Level Requirement	



## 2.262 [LVV-6279] CA-DM-SUP-ICD-0015-V-04: Scattered Light Model\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6279	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0015
Requirement Description	<b>Specification:</b> The Camera shall provide the data necessary to construct a model of the scattered light and ghosting as a function of wavelength. The model shall include all relevant optical elements, including baffles.
Requirement Discussion	<b>Discussion:</b> The Camera is not required to do the end-to-end modeling; this is expected to be a task for Systems Engineering.
Requirement Priority	
Upper Level Requirement	

## 2.263 [LVV-6284] CA-DM-SUP-ICD-0017-V-03: Shutter Shadowing Model\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6284	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0017
Requirement Description	<b>Specification:</b> The Camera shall provide a model of the shadowing produced by the shutter as a function of its reported position (c.f. CA-DM-SUP-ICD-0021 below), as a function of passband.
Requirement Priority	
Upper Level Requirement	CA-DM-SUP-ICD-0021 Shutter Motion Profiles

## 2.264 [LVV-6285] CA-DM-SUP-ICD-0017-V-04: Shutter Shadowing Model\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6285	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0017
Requirement Description	<b>Specification:</b> The Camera shall provide a model of the shadowing produced by the shutter as a function of its reported position (c.f. CA-DM-SUP-ICD-0021 below), as a function of passband.
Requirement Priority	
Upper Level Requirement	CA-DM-SUP-ICD-0021 Shutter Motion Profiles

## 2.265 [LVV-6290] CA-DM-SUP-ICD-0014-V-03: Vignetting Model\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6290	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0014
Requirement Description	<b>Specification:</b> The Camera shall provide the data necessary to construct a model of the vignetting as a function of wavelength. The model shall include all relevant optical elements, including baffles.
Requirement Discussion	<b>Discussion:</b> The Camera is not required to do the end-to-end modeling; this is expected to be a task for Systems Engineering.
Requirement Priority	
Upper Level Requirement	

## 2.266 [LVV-6291] CA-DM-SUP-ICD-0014-V-04: Vignetting Model\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6291	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0014
Requirement Description	<b>Specification:</b> The Camera shall provide the data necessary to construct a model of the vignetting as a function of wavelength. The model shall include all relevant optical elements, including baffles.
Requirement Discussion	<b>Discussion:</b> The Camera is not required to do the end-to-end modeling; this is expected to be a task for Systems Engineering.
Requirement Priority	
Upper Level Requirement	

## 2.267 [LVV-6296] CA-DM-SUP-ICD-0013-V-03: Filter and Lens Vendor Test Results\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6296	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0013
Requirement Description	<b>Specification:</b> The Camera shall provide the quantitative results of optical tests performed by the filter and lens vendors.
Requirement Discussion	<b>Discussion:</b> The precise nature of the vendor tests have not all been determined at the time of writing of the present version of this ICD. Measurements of the as-built filter passbands are of particular interest to Data Management.
Requirement Priority	
Upper Level Requirement	

## 2.268 [LVV-6297] CA-DM-SUP-ICD-0013-V-04: Filter and Lens Vendor Test Results\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6297	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0013
Requirement Description	<b>Specification:</b> The Camera shall provide the quantitative results of optical tests performed by the filter and lens vendors.
Requirement Discussion	<b>Discussion:</b> The precise nature of the vendor tests have not all been determined at the time of writing of the present version of this ICD. Measurements of the as-built filter passbands are of particular interest to Data Management.
Requirement Priority	
Upper Level Requirement	

## 2.269 [LVV-6302] CA-DM-SUP-ICD-0011-V-03: Quantitative Test Results\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6302	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0011
Requirement Description	<b>Specification:</b> The Camera shall provide the quantitative results of the tests performed under the a) LSST Sensor Electro-Optical Test Plan, LCA-10103; b) science raft test plan (document TBD); corner raft test plan (document TBD); and d) Camera Verification Test Plan, LCA-283.
Requirement Priority	
Upper Level Requirement	



## 2.270 [LVV-6303] CA-DM-SUP-ICD-0011-V-04: Quantitative Test Results\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6303	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0011
Requirement Description	<b>Specification:</b> The Camera shall provide the quantitative results of the tests performed under the a) LSST Sensor Electro-Optical Test Plan, LCA-10103; b) science raft test plan (document TBD); corner raft test plan (document TBD); and d) Camera Verification Test Plan, LCA-283.
Requirement Priority	
Upper Level Requirement	

## 2.271 [LVV-6308] CA-DM-SUP-ICD-0012-V-03: Temperature, Pressure, Physical Orientation Measurements\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6308	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0012
Requirement Description	<b>Specification:</b> The Camera shall provide the ambient, sensor, and electronics temperatures and the physical orientation of the test article measured at the time of all tests whose results are provided under this section. The Camera shall provide the ambient atmospheric pressure measured at the time of all optical tests whose results are provided under this section.
Requirement Priority	
Upper Level Requirement	

## 2.272 [LVV-6309] CA-DM-SUP-ICD-0012-V-04: Temperature, Pressure, Physical Orientation Measurements\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6309	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0012
Requirement Description	<b>Specification:</b> The Camera shall provide the ambient, sensor, and electronics temperatures and the physical orientation of the test article measured at the time of all tests whose results are provided under this section. The Camera shall provide the ambient atmospheric pressure measured at the time of all optical tests whose results are provided under this section.
Requirement Priority	
Upper Level Requirement	

## 2.273 [LVV-6314] CA-DM-SUP-ICD-0018-V-03: Thermal Model\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6314	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0018
Requirement Description	<b>Specification:</b> The Camera shall provide a thermal model for each detector, allowing the estimation of the temperature profile across the detector as a function of the measurement from the single temperature sensor per detector.
Requirement Discussion	<b>Discussion:</b> CAM-REQ-0103 specifies that the level of precision is 0.5K.
Requirement Priority	
Upper Level Requirement	

## 2.274 [LVV-6315] CA-DM-SUP-ICD-0018-V-04: Thermal Model\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6315	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0018
Requirement Description	<b>Specification:</b> The Camera shall provide a thermal model for each detector, allowing the estimation of the temperature profile across the detector as a function of the measurement from the single temperature sensor per detector.
Requirement Discussion	<b>Discussion:</b> CAM-REQ-0103 specifies that the level of precision is 0.5K.
Requirement Priority	
Upper Level Requirement	

## 2.275 [LVV-6320] CA-DM-SUP-ICD-0001-V-03: Version Control\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6320	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0001
Requirement Description	<b>Specification:</b> The camera shall provide version control for the format of all data to be shared with Data Management.
Requirement Priority	
Upper Level Requirement	

## 2.276 [LVV-6321] CA-DM-SUP-ICD-0001-V-04: Version Control\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6321	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-SUP-ICD-0001
Requirement Description	<b>Specification:</b> The camera shall provide version control for the format of all data to be shared with Data Management.
Requirement Priority	
Upper Level Requirement	

## 2.277 [LVV-6324] EP-DM-CON-ICD-0004-V-01: DM Transfer of Catalog Tabular Data to EPO\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6324	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details																	
Requirement ID	EP-DM-CON-ICD-0004																
Requirement Description	<p><b>Specification:</b> As it becomes available, Data Management shall transfer to EPO a subset of catalog data as defined in the table below.</p> <p><b>Discussion:</b> Definition of the queries to satisfy the subset requirement will be defined by EPO once ComCam data is available. The historical notion of a single bulk data transfer from DM to EPO just prior to each data release had a number of disadvantages and risks. DM and EPO were both in favor of changing this to a “trickle feed” where data was sent in small amounts over a longer period of time as part of the <i>solar system object processing and data release processing</i> pipelines. This approach reduces bandwidth spikes, allows for errors/problems to be identified sooner, and gives DM and EPO greater flexibility. DM is permitted to apply additional restrictions in order to stay within the mandatory bounds, but should notify EPO in advance. The values specified in this requirement represent the maximum size of the data release products to be transferred from DM to EPO during the last data transfer that will occur during the ten year survey (DR11), representing the bounding case.</p>																
Requirement Discussion	<table border="1"> <thead> <tr> <th>Product</th> <th>Table</th> <th>Columns</th> <th>Not to Exceed (compressed)</th> </tr> </thead> <tbody> <tr> <td>Prompt</td> <td>SSObject</td> <td><i>all</i></td> <td>33 gigabytes</td> </tr> <tr> <td>Data Release</td> <td>Object</td> <td> <ul style="list-style-type: none"> <li>· objectId</li> <li>· bdFluxB</li> <li>· bdFluxD</li> <li>· bdEllip</li> <li>· bdReB</li> <li>· bdReD</li> <li>· psChi2</li> <li>· psCov</li> <li>· psFlux</li> <li>· psLnL</li> <li>· psNdata</li> <li>· psRadec</li> <li>· psRadecTai</li> </ul> </td> <td>10 terabytes</td> </tr> <tr> <td>Data Release</td> <td>ForcedSource</td> <td><i>all</i></td> <td>10 terabytes</td> </tr> </tbody> </table>	Product	Table	Columns	Not to Exceed (compressed)	Prompt	SSObject	<i>all</i>	33 gigabytes	Data Release	Object	<ul style="list-style-type: none"> <li>· objectId</li> <li>· bdFluxB</li> <li>· bdFluxD</li> <li>· bdEllip</li> <li>· bdReB</li> <li>· bdReD</li> <li>· psChi2</li> <li>· psCov</li> <li>· psFlux</li> <li>· psLnL</li> <li>· psNdata</li> <li>· psRadec</li> <li>· psRadecTai</li> </ul>	10 terabytes	Data Release	ForcedSource	<i>all</i>	10 terabytes
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Data Release	ForcedSource	<i>all</i>	10 terabytes														



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## 2.278 [LVV-6325] EP-DM-CON-ICD-0004-V-02: DM Transfer of Catalog Tabular Data to EPO\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6325	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details																	
Requirement ID	EP-DM-CON-ICD-0004																
Requirement Description	<p><b>Specification:</b> As it becomes available, Data Management shall transfer to EPO a subset of catalog data as defined in the table below.</p> <p><b>Discussion:</b> Definition of the queries to satisfy the subset requirement will be defined by EPO once ComCam data is available. The historical notion of a single bulk data transfer from DM to EPO just prior to each data release had a number of disadvantages and risks. DM and EPO were both in favor of changing this to a “trickle feed” where data was sent in small amounts over a longer period of time as part of the <i>solar system object processing and data release processing</i> pipelines. This approach reduces bandwidth spikes, allows for errors/problems to be identified sooner, and gives DM and EPO greater flexibility. DM is permitted to apply additional restrictions in order to stay within the mandatory bounds, but should notify EPO in advance. The values specified in this requirement represent the maximum size of the data release products to be transferred from DM to EPO during the last data transfer that will occur during the ten year survey (DR11), representing the bounding case.</p>																
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Data Release	ForcedSource	<i>all</i>	10 terabytes														

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## 2.279 [LVV-6330] EP-DM-CON-ICD-0021-V-01: DM Generation of a Color Hierarchical Progressive Survey for EPO\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6330	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0021
Requirement Description	<p><b>Specification:</b> As part of their co-add image processing pipeline, DM shall create a Hierarchical Progressive Survey (HiPS) for EPO in the form of color JPEG HEALPix tiles limited to 1 arcsecond resolution.</p> <p><b>Discussion:</b> These tiles will be used in the EPO Portal Skyviewer (powered by a sky atlas tool, such as Aladin Lite) and our JupyterLab-based educational investigations (powered by a compatible astronomy image viewer extension, such as pyaladin). The EPO Skyviewer will have the same sky coverage as the full survey (southern hemisphere), but the maximum zoom level may be different for different regions of the sky. For some deep drilling fields, we may have additional zoom levels to see extra detail. Definition of EPO's color scheme, definition of the varying depth coverage, and the method for transferring the tiles to the EDC will be defined by EPO once ComCam data is available. EPO may later choose PNG if the JPEG user experience is not satisfactory. Fees related to this deliverable will be paid by EPO but we hope to leverage cost efficiencies by inserting our specific output as part of existing NCSA data processing workflows. Note: these images do not count toward the EPO world public data subset quota because the scientific data is scrubbed and the image format is not FITS-like.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.280 [LVV-6331] EP-DM-CON-ICD-0021-V-02: DM Generation of a Color Hierarchical Progressive Survey for EPO\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6331	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0021
Requirement Description	<p><b>Specification:</b> As part of their co-add image processing pipeline, DM shall create a Hierarchical Progressive Survey (HiPS) for EPO in the form of color JPEG HEALPix tiles limited to 1 arcsecond resolution.</p> <p><b>Discussion:</b> These tiles will be used in the EPO Portal Skyviewer (powered by a sky atlas tool, such as Aladin Lite) and our JupyterLab-based educational investigations (powered by a compatible astronomy image viewer extension, such as pyaladin). The EPO Skyviewer will have the same sky coverage as the full survey (southern hemisphere), but the maximum zoom level may be different for different regions of the sky. For some deep drilling fields, we may have additional zoom levels to see extra detail. Definition of EPO's color scheme, definition of the varying depth coverage, and the method for transferring the tiles to the EDC will be defined by EPO once ComCam data is available. EPO may later choose PNG if the JPEG user experience is not satisfactory. Fees related to this deliverable will be paid by EPO but we hope to leverage cost efficiencies by inserting our specific output as part of existing NCSA data processing workflows. Note: these images do not count toward the EPO world public data subset quota because the scientific data is scrubbed and the image format is not FITS-like.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.281 [LVV-6342] EP-DM-CON-ICD-0009-V-01: Catalog Format\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6342	Leanne Guy	Not Covered	

### Verification Element Description:

Verified by demonstration of import into EPO system.

Inspection of data content as per future document describing data format and content.

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0009
Requirement Description	<b>Specification:</b> The Data Management System shall deliver catalog data to EPO preferably in Apache Parquet format.
Requirement Discussion	<b>Discussion:</b> Apache Parquet is a promising, emerging data format. More testing will be required to verify it meets all of EPO's needs. As a fallback option, EPO could accept catalog data in Apache Avro or the sub-optimal but universally-supported CSV format.
Requirement Priority	
Upper Level Requirement	

## 2.282 [LVV-6343] EP-DM-CON-ICD-0009-V-02: Catalog Format\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6343	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0009
Requirement Description	<b>Specification:</b> The Data Management System shall deliver catalog data to EPO preferably in Apache Parquet format.
Requirement Discussion	<b>Discussion:</b> Apache Parquet is a promising, emerging data format. More testing will be required to verify it meets all of EPO's needs. As a fallback option, EPO could accept catalog data in Apache Avro or the sub-optimal but universally-supported CSV format.
Requirement Priority	
Upper Level Requirement	

## 2.283 [LVV-6348] EP-DM-CON-ICD-0034-V-01: Citizen Science Data\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6348	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0034
Requirement Description	<p><b>Specification:</b> EPO shall lead the development of DM stack community modules that provide data processing capabilities needed for citizen science projects as well as a data transfer mechanism and data rights review workflow.</p> <p><b>Discussion:</b> Community modules would include: "Color Mixer", "Metadata Scrubber", and "FITS to TIFF/PNG/JPEG Converter". The data transfer mechanism (notionally referred to as a "data funnel") will transfer data from the DAC to a protected S3 API-compliant object storage bucket. A data rights panel will be established to verify proper protocol is followed. EPO will partner with Zooniverse in this development effort. More detail can be found here: <a href="https://confluence.lsstcorp.org/display/EPO/Citizen+Science">https://confluence.lsstcorp.org/display/EPO/Citizen+Science</a></p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	



## 2.284 [LVV-6349] EP-DM-CON-ICD-0034-V-02: Citizen Science Data\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6349	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0034
Requirement Description	<p><b>Specification:</b> EPO shall lead the development of DM stack community modules that provide data processing capabilities needed for citizen science projects as well as a data transfer mechanism and data rights review workflow.</p> <p><b>Discussion:</b> Community modules would include: "Color Mixer", "Metadata Scrubber", and "FITS to TIFF/PNG/JPEG Converter". The data transfer mechanism (notionally referred to as a "data funnel") will transfer data from the DAC to a protected S3 API-compliant object storage bucket. A data rights panel will be established to verify proper protocol is followed. EPO will partner with Zooniverse in this development effort. More detail can be found here: <a href="https://confluence.lsstcorp.org/display/EPO/Citizen+Science">https://confluence.lsstcorp.org/display/EPO/Citizen+Science</a></p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.285 [LVV-6360] EP-DM-CON-ICD-0031-V-01: Data Rights Protection\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6360	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0031
Requirement Description	<b>Specification:</b> EPO shall not provide products, interfaces, or services that could allow users without data rights to query, access, or otherwise interact with an LSST Data Access Center (DAC).
Requirement Discussion	<b>Discussion:</b> See <a href="https://jira.lsstcorp.org/browse/LIT-97">https://jira.lsstcorp.org/browse/LIT-97</a> for further elaboration.
Requirement Priority	
Upper Level Requirement	

## 2.286 [LVV-6361] EP-DM-CON-ICD-0031-V-02: Data Rights Protection\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6361	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0031
Requirement Description	<b>Specification:</b> EPO shall not provide products, interfaces, or services that could allow users without data rights to query, access, or otherwise interact with an LSST Data Access Center (DAC).
Requirement Discussion	<b>Discussion:</b> See <a href="https://jira.lsstcorp.org/browse/LIT-97">https://jira.lsstcorp.org/browse/LIT-97</a> for further elaboration.
Requirement Priority	
Upper Level Requirement	

## 2.287 [LVV-6372] EP-DM-CON-ICD-0019-V-01: DM to EPO Data Transfer Cadence\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6372	Leanne Guy	Not Covered	

### Verification Element Description:

Demonstration that data is transferred (DM). DM needs write access to EPO data storage. Alternatively, EPO must pull data and demonstrate it is received. Finally inspection of data content to ensure correctness.

verified as complete and accurate by the EPO Scientist within 30 days following each major LSST data release.

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0019
Requirement Description	<b>Specification:</b> The cloud-based EPO Data Center (EDC) shall receive data products from the U.S. Data Access Center (DAC) at various frequencies.
Requirement Discussion	<b>Discussion:</b> Such as: a "trickle feed" of DM products as they're processed throughout the year, periodic batches of vetted citizen science subject sets, and on-demand Science Platform queries.
Requirement Priority	
Upper Level Requirement	

## 2.288 [LVV-6373] EP-DM-CON-ICD-0019-V-02: DM to EPO Data Transfer Cadence\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6373	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0019
Requirement Description	<b>Specification:</b> The cloud-based EPO Data Center (EDC) shall receive data products from the U.S. Data Access Center (DAC) at various frequencies.
Requirement Discussion	<b>Discussion:</b> Such as: a "trickle feed" of DM products as they're processed throughout the year, periodic batches of vetted citizen science subject sets, and on-demand Science Platform queries.
Requirement Priority	
Upper Level Requirement	

## 2.289 [LVV-6378] EP-DM-CON-ICD-0002-V-03: EPO is an Authorized Science User\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6378	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0002
Requirement Description	<b>Specification:</b> DM shall provide to EPO a single DAC account with the same permissions as an authorized science user.
Requirement Discussion	<b>Discussion:</b> This account will enable EPO to access the Science Platform, make queries, process data within our Kubernetes cluster, transfer data from the DAC to our EDC, etc. Note: data transfer related to citizen science by a PI will be logged as that individual.
Requirement Priority	
Upper Level Requirement	

## 2.290 [LVV-6379] EP-DM-CON-ICD-0002-V-04: EPO is an Authorized Science User\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6379	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0002
Requirement Description	<b>Specification:</b> DM shall provide to EPO a single DAC account with the same permissions as an authorized science user.
Requirement Discussion	<b>Discussion:</b> This account will enable EPO to access the Science Platform, make queries, process data within our Kubernetes cluster, transfer data from the DAC to our EDC, etc. Note: data transfer related to citizen science by a PI will be logged as that individual.
Requirement Priority	
Upper Level Requirement	

## 2.291 [LVV-6384] EP-DM-CON-ICD-0033-V-01: EPO Quota Management\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6384	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0033
Requirement Description	<b>Specification:</b> EPO shall be responsible to ensure EPO data usage falls within the quota terms outlined in this document.
Requirement Discussion	<b>Discussion:</b> DM/NCSA will not need to programmatically restrict data usage by the EPO account accessing the DAC but can at their discretion monitor usage. The onus is on EPO to conform to the quota agreements stated herein. There may be situations where the default scientist account quota is too low for allowed EPO usage and, upon mutual agreement, an exception will need to be implemented by DM/NCSA.
Requirement Priority	
Upper Level Requirement	



## 2.292 [LVV-6385] EP-DM-CON-ICD-0033-V-02: EPO Quota Management\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6385	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0033
Requirement Description	<p><b>Specification:</b> EPO shall be responsible to ensure EPO data usage falls within the quota terms outlined in this document.</p> <p><b>Discussion:</b> DM/NCSA will not need to programmatically restrict data usage by the EPO account accessing the DAC but can at their discretion monitor usage. The onus is on EPO to conform to the quota agreements stated herein. There may be situations where the default scientist account quota is too low for allowed EPO usage and, upon mutual agreement, an exception will need to be implemented by DM/NCSA.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.293 [LVV-6390] EP-DM-CON-ICD-0032-V-01: EPO World Public Data Subset\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6390	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0032
Requirement Description	<b>Specification:</b> EPO shall be able to use and distribute its data subset publicly, without access restrictions, data rights control, or tracking required.
Requirement Discussion	<b>Discussion:</b> In short, all EPO data is world public.
Requirement Priority	
Upper Level Requirement	

## 2.294 [LVV-6391] EP-DM-CON-ICD-0032-V-02: EPO World Public Data Subset\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6391	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0032
Requirement Description	<b>Specification:</b> EPO shall be able to use and distribute its data subset publicly, without access restrictions, data rights control, or tracking required.
Requirement Discussion	<b>Discussion:</b> In short, all EPO data is world public.
Requirement Priority	
Upper Level Requirement	

## 2.295 [LVV-6402] EP-DM-CON-ICD-0020-V-03: No Regulatory Issues from EPO\_DM\_3

Jira Link	Assignee	Status	Test Cases
LVV-6402	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0020
Requirement Description	<p><b>Specification:</b> EPO shall ensure that the DM system (particularly the DAC) will never need to be concerned with any regulatory issues coming from EPO or its users.</p> <p><b>Discussion:</b> Possible sources of regulation include the Children's Online Privacy Protection Act (COPPA) and the Family Educational Rights and Privacy Act (FERPA), among others. It is expected that EPO will meet this requirement by not passing any identifying information about its users to DM and by not storing any state for identifiable users within the DM system. Any "citizen science" results incorporated into the DM system (e.g. object annotations or classifications) will be the responsibility of the project's Principal Investigator (PI).</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.296 [LVV-6403] EP-DM-CON-ICD-0020-V-04: No Regulatory Issues from EPO\_DM\_4

Jira Link	Assignee	Status	Test Cases
LVV-6403	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0020
Requirement Description	<p><b>Specification:</b> EPO shall ensure that the DM system (particularly the DAC) will never need to be concerned with any regulatory issues coming from EPO or its users.</p> <p><b>Discussion:</b> Possible sources of regulation include the Children's Online Privacy Protection Act (COPPA) and the Family Educational Rights and Privacy Act (FERPA), among others. It is expected that EPO will meet this requirement by not passing any identifying information about its users to DM and by not storing any state for identifiable users within the DM system. Any "citizen science" results incorporated into the DM system (e.g. object annotations or classifications) will be the responsibility of the project's Principal Investigator (PI).</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.297 [LVV-6420] DM-TS-AUX-ICD-0020-V-01: Additional Data - Data Latency\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6420	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0020
Requirement Description	<b>Specification:</b> The data in this section shall be supplied to DM within time <b>additional-DataLatency</b> of its derivation.
Requirement Parameters	<b>daqLatency = 5[second]</b> Time to publish all-sky and weather data.
Requirement Discussion	<b>Discussion:</b> This requirement is driven by the desire to make data quality assessments available to Observatory operators in a timely manner. It is currently a soft requirement.
Requirement Priority	
Upper Level Requirement	

## 2.298 [LVV-6421] DM-TS-AUX-ICD-0020-V-02: Additional Data - Data Latency\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6421	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0020
Requirement Description	<b>Specification:</b> The data in this section shall be supplied to DM within time <b>additional-DataLatency</b> of its derivation.
Requirement Parameters	<b>daqLatency = 5[second]</b> Time to publish all-sky and weather data.
Requirement Discussion	<b>Discussion:</b> This requirement is driven by the desire to make data quality assessments available to Observatory operators in a timely manner. It is currently a soft requirement.
Requirement Priority	
Upper Level Requirement	

## 2.299 [LVV-6426] DM-TS-AUX-ICD-0029-V-01: Cloud Mapping\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6426	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0029
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall make available to Data Management the cloud maps obtained under OSS-REQ-0071.
Requirement Discussion	<b>Discussion:</b> The latency and data format for this information will be determined during Phase 3 work on this ICD.
Requirement Priority	
Upper Level Requirement	



## 2.300 [LVV-6427] DM-TS-AUX-ICD-0029-V-02: Cloud Mapping\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6427	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0029
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall make available to Data Management the cloud maps obtained under OSS-REQ-0071.
Requirement Discussion	<b>Discussion:</b> The latency and data format for this information will be determined during Phase 3 work on this ICD.
Requirement Priority	
Upper Level Requirement	

### 2.301 [LVV-6432] DM-TS-AUX-ICD-0027-V-01: DIMM Instrument\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6432	Leanne Guy	Not Covered	

#### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0027
Requirement Description	<p><b>Specification:</b> The Telescope and Site subsystem shall make available to DM the seeing data derived from the DIMM instrument.</p> <p><b>Discussion:</b> It is anticipated that an existing instrument will be used, including its associated analysis software. The details of the data transport required are TBD. DM will compare the seeing data from the DIMM instrument to the image quality assessment it performs based on the science image data. The results are of interest to the Observatory operator.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.302 [LVV-6433] DM-TS-AUX-ICD-0027-V-02: DIMM Instrument\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6433	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0027
Requirement Description	<p><b>Specification:</b> The Telescope and Site subsystem shall make available to DM the seeing data derived from the DIMM instrument.</p> <p><b>Discussion:</b> It is anticipated that an existing instrument will be used, including its associated analysis software. The details of the data transport required are TBD. DM will compare the seeing data from the DIMM instrument to the image quality assessment it performs based on the science image data. The results are of interest to the Observatory operator.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

### 2.303 [LVV-6456] DM-TS-AUX-ICD-0025-V-01: Visible-light All-Sky Camera Data Transport\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6456	Leanne Guy	Not Covered	

#### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0025
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall publish the visible-light all-sky camera images by means of the large-binary-data interface of the Engineering and Facilities Database (EFD).
Requirement Priority	
Upper Level Requirement	

## 2.304 [LVV-6457] DM-TS-AUX-ICD-0025-V-02: Visible-light All-Sky Camera Data Transport\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6457	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0025
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall publish the visible-light all-sky camera images by means of the large-binary-data interface of the Engineering and Facilities Database (EFD).
Requirement Priority	
Upper Level Requirement	

## 2.305 [LVV-6462] DM-TS-AUX-ICD-0026-V-01: Visible-Light All-Sky Camera Exposure Data\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6462	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0026
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall publish as telemetry the absolute time interval over which each exposure was obtained, as well as any other configurable parameters of each exposure.
Requirement Priority	
Upper Level Requirement	

## 2.306 [LVV-6463] DM-TS-AUX-ICD-0026-V-02: Visible-Light All-Sky Camera Exposure Data\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6463	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0026
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall publish as telemetry the absolute time interval over which each exposure was obtained, as well as any other configurable parameters of each exposure.
Requirement Priority	
Upper Level Requirement	

## 2.307 [LVV-6468] DM-TS-AUX-ICD-0024-V-01: Visible-light All-Sky Camera\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6468	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0024
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall make the data from the visible-light all-sky camera available to DM.
Requirement Priority	
Upper Level Requirement	



## 2.308 [LVV-6469] DM-TS-AUX-ICD-0024-V-02: Visible-light All-Sky Camera\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6469	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0024
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall make the data from the visible-light all-sky camera available to DM.
Requirement Priority	
Upper Level Requirement	

## 2.309 [LVV-6474] DM-TS-AUX-ICD-0037-V-01: Weather Data\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6474	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0037
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall make data acquired by the weather station available to DM.
Requirement Discussion	<b>Discussion:</b> Data will include wind speed, wind direction, relative humidity, temperature and dew point.
Requirement Priority	
Upper Level Requirement	

## 2.310 [LVV-6475] DM-TS-AUX-ICD-0037-V-02: Weather Data\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6475	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0037
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall make data acquired by the weather station available to DM.
Requirement Discussion	<b>Discussion:</b> Data will include wind speed, wind direction, relative humidity, temperature and dew point.
Requirement Priority	
Upper Level Requirement	

## 2.311 [LVV-6480] DM-TS-AUX-ICD-0002-V-01: Use of OCS Telemetry as Default Data Transport\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6480	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0002
Requirement Description	<p><b>Specification:</b> Unless otherwise specified, all operational data transfers under this ICD shall be represented as OCS telemetry topics, following the specifications set forth in LSE-70 and subordinate documents.</p> <p><b>Discussion:</b> The exceptions, as noted below, are the transfer of the raw 2D images from the auxiliary telescope spectrograph, from the all-sky cameras, and from the illumination reference spectrograph, as well as the reduced spectra from the illumination reference spectrograph.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.312 [LVV-6481] DM-TS-AUX-ICD-0002-V-02: Use of OCS Telemetry as Default Data Transport\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6481	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0002
Requirement Description	<p><b>Specification:</b> Unless otherwise specified, all operational data transfers under this ICD shall be represented as OCS telemetry topics, following the specifications set forth in LSE-70 and subordinate documents.</p> <p><b>Discussion:</b> The exceptions, as noted below, are the transfer of the raw 2D images from the auxiliary telescope spectrograph, from the all-sky cameras, and from the illumination reference spectrograph, as well as the reduced spectra from the illumination reference spectrograph.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

### 2.313 [LVV-6486] DM-TS-AUX-ICD-0001-V-01: Use of the OCS for Data Transport\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6486	Leanne Guy	Not Covered	

#### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0001
Requirement Description	<b>Specification:</b> The Observatory Control System middleware, as defined in document LSE-70, shall be used to mediate all operational data transfers covered under this ICD except for Auxiliary Telescope Spectrograph images and associated metadata.
Requirement Discussion	<b>Discussion:</b> No direct data interfaces between DM and the auxiliary instrumentation are envisioned. The restriction to “operational” allows for one-time data transfers, e.g., of fundamental specifications of the auxiliary instrumentation, to be carried out by other means.
Requirement Priority	
Upper Level Requirement	

## 2.314 [LVV-6487] DM-TS-AUX-ICD-0001-V-02: Use of the OCS for Data Transport\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6487	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0001
Requirement Description	<b>Specification:</b> The Observatory Control System middleware, as defined in document LSE-70, shall be used to mediate all operational data transfers covered under this ICD except for Auxiliary Telescope Spectrograph images and associated metadata.
Requirement Discussion	<b>Discussion:</b> No direct data interfaces between DM and the auxiliary instrumentation are envisioned. The restriction to “operational” allows for one-time data transfers, e.g., of fundamental specifications of the auxiliary instrumentation, to be carried out by other means.
Requirement Priority	
Upper Level Requirement	

## 2.315 [LVV-6492] DM-TS-AUX-ICD-0007-V-01: Auxiliary Telescope Exposure Data\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6492	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0007
Requirement Description	<p><b>Specification:</b> The Telescope and Site subsystem shall publish as events or telemetry the auxiliary telescope pointing, photodiode currents, filter wheel settings, temperatures, and pressure, among others. The Auxiliary Telescope Spectrograph camera control system shall publish the start of integration, shutter open, shutter close, start of readout, and end of readout events, among others, identical with those that the Camera CCS publishes according to LSE-69. Both systems shall use the same events as for ComCam or the LSST Camera, but marked as for the Auxiliary Telescope. For each exposure, these publications shall be made no later than the readout of the raw spectrograph image data.</p> <p><b>Discussion:</b> It is anticipated that there will be additional telemetry describing the state of the spectrograph, but it is impossible to enumerate the data items at this time since the basic spectrograph design has not been chosen.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	



## 2.316 [LVV-6493] DM-TS-AUX-ICD-0007-V-02: Auxiliary Telescope Exposure Data\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6493	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0007
Requirement Description	<p><b>Specification:</b> The Telescope and Site subsystem shall publish as events or telemetry the auxiliary telescope pointing, photodiode currents, filter wheel settings, temperatures, and pressure, among others. The Auxiliary Telescope Spectrograph camera control system shall publish the start of integration, shutter open, shutter close, start of readout, and end of readout events, among others, identical with those that the Camera CCS publishes according to LSE-69. Both systems shall use the same events as for ComCam or the LSST Camera, but marked as for the Auxiliary Telescope. For each exposure, these publications shall be made no later than the readout of the raw spectrograph image data.</p> <p><b>Discussion:</b> It is anticipated that there will be additional telemetry describing the state of the spectrograph, but it is impossible to enumerate the data items at this time since the basic spectrograph design has not been chosen.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.317 [LVV-6498] DM-TS-AUX-ICD-0008-V-01: Auxiliary Telescope Spectrograph Calibration Data\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6498	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0008
Requirement Description	<p><b>Specification:</b> The Telescope and Site subsystem shall acquire calibration data for the spectrograph, as required and as appropriate to its design, and shall make these available to DM. This data shall include at a minimum bias frames, dark frames, flat fields, and calibration lamp exposures.</p> <p><b>Discussion:</b> DM will perform instrument signature removal and calibrations such as bias subtraction, flat-fielding, and wavelength mapping of the raw image data, and will require appropriate reference data in order to do so. It is assumed that the OCS will coordinate the necessary commands to the auxiliary telescope and spectrograph in order to ensure that the calibration data are collected.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.318 [LVV-6499] DM-TS-AUX-ICD-0008-V-02: Auxiliary Telescope Spectrograph Calibration Data\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6499	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0008
Requirement Description	<p><b>Specification:</b> The Telescope and Site subsystem shall acquire calibration data for the spectrograph, as required and as appropriate to its design, and shall make these available to DM. This data shall include at a minimum bias frames, dark frames, flat fields, and calibration lamp exposures.</p> <p><b>Discussion:</b> DM will perform instrument signature removal and calibrations such as bias subtraction, flat-fielding, and wavelength mapping of the raw image data, and will require appropriate reference data in order to do so. It is assumed that the OCS will coordinate the necessary commands to the auxiliary telescope and spectrograph in order to ensure that the calibration data are collected.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.319 [LVV-6528] DM-TS-AUX-ICD-0004-V-01: Auxiliary Telescope Spectrograph Image Data Transport\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6528	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0004
Requirement Description	<p><b>Specification:</b> The Telescope and Site subsystem shall publish the raw two-dimensional image data from the spectrograph by means of the Camera data acquisition interface specified in LSE-68, including all relevant timings.</p> <p><b>Discussion:</b> See the EFD design document, LTS-210, for a brief description. The specifics of the large-file interface remain to be defined. DM will obtain the data via its routine replication of the EFD, including its large-binary-data sector, to the Data Management Base and Archive Centers. (The replication is to be defined in the OCS-DM ICD LSE-72; it is anticipated to occur in close to real time, though it is not a required step in the Alert Production 60-second pipeline.)</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.320 [LVV-6529] DM-TS-AUX-ICD-0004-V-02: Auxiliary Telescope Spectrograph Image Data Transport\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6529	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0004
Requirement Description	<p><b>Specification:</b> The Telescope and Site subsystem shall publish the raw two-dimensional image data from the spectrograph by means of the Camera data acquisition interface specified in LSE-68, including all relevant timings.</p> <p><b>Discussion:</b> See the EFD design document, LTS-210, for a brief description. The specifics of the large-file interface remain to be defined. DM will obtain the data via its routine replication of the EFD, including its large-binary-data sector, to the Data Management Base and Archive Centers. (The replication is to be defined in the OCS-DM ICD LSE-72; it is anticipated to occur in close to real time, though it is not a required step in the Alert Production 60-second pipeline.)</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.321 [LVV-6534] DM-TS-AUX-ICD-0003-V-01: Auxiliary Telescope Spectrograph\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6534	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0003
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall make available to DM the data from the auxiliary telescope spectrograph. DM shall analyze the data and shall make certain results available to the Telescope and Site subsystem.
Requirement Priority	
Upper Level Requirement	

## 2.322 [LVV-6535] DM-TS-AUX-ICD-0003-V-02: Auxiliary Telescope Spectrograph\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6535	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0003
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall make available to DM the data from the auxiliary telescope spectrograph. DM shall analyze the data and shall make certain results available to the Telescope and Site subsystem.
Requirement Priority	
Upper Level Requirement	

## 2.323 [LVV-6540] DM-TS-AUX-ICD-0034-V-01: Calibrated photodiodes\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6540	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0034
Requirement Description	<p><b>Specification:</b> The Telescope and Site subsystem shall acquire data from multiple calibrated photodiodes monitoring the calibration light sources and shall make the data available to DM.</p> <p><b>Discussion:</b> The photodiodes are expected to be read out at high rates (typically 100Hz but up to 1kHz) that are not suitable for individual readout to be transmitted as telemetry items. The photodiode DAQ system is expected to aggregate time histories of the photodiode voltage and send them at a reduced rate. Each photodiode will have a voltage to flux conversion constant that is expected to be reported as part of each aggregate.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	



## 2.324 [LVV-6541] DM-TS-AUX-ICD-0034-V-02: Calibrated photodiodes\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6541	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0034
Requirement Description	<p><b>Specification:</b> The Telescope and Site subsystem shall acquire data from multiple calibrated photodiodes monitoring the calibration light sources and shall make the data available to DM.</p> <p><b>Discussion:</b> The photodiodes are expected to be read out at high rates (typically 100Hz but up to 1kHz) that are not suitable for individual readout to be transmitted as telemetry items. The photodiode DAQ system is expected to aggregate time histories of the photodiode voltage and send them at a reduced rate. Each photodiode will have a voltage to flux conversion constant that is expected to be reported as part of each aggregate.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.325 [LVV-6546] DM-TS-AUX-ICD-0036-V-01: Collimated Beam Projector Control System\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6546	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0036
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall make available to DM the collimated beam projector's configuration and conditions data.
Requirement Discussion	<b>Discussion:</b> The instrument configuration data expected to be supplied are the altitude and azimuth position, mask wheel position, mask selection, tip/tilt stage position, and focuser position. The instrument should report both commanded set points and actual read-backs.
Requirement Priority	
Upper Level Requirement	

## 2.326 [LVV-6547] DM-TS-AUX-ICD-0036-V-02: Collimated Beam Projector Control System\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6547	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0036
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall make available to DM the collimated beam projector's configuration and conditions data.
Requirement Discussion	<b>Discussion:</b> The instrument configuration data expected to be supplied are the altitude and azimuth position, mask wheel position, mask selection, tip/tilt stage position, and focuser position. The instrument should report both commanded set points and actual read-backs.
Requirement Priority	
Upper Level Requirement	

## 2.327 [LVV-6552] DM-TS-AUX-ICD-0019-V-01: Dome Screen Illumination Reference System Data Latency\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6552	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0019
Requirement Description	<b>Specification:</b> Data from the dome screen illumination reference system shall be published as telemetry as it is acquired, with <b>domeScreenDataLatency</b> latency.
Requirement Parameters	<b>domeScreenDataLatency = 1[second]</b> Time to publish calibration data.
Requirement Discussion	<b>Discussion:</b> DM must be able to incorporate this data into its analysis of the daytime calibration image data from the Camera in time to make use of the results in the subsequent night's observing. Since flats may be acquired immediately preceding the start of science observations for a night, the latency for the reference system data must be relatively short. Note that the actual requirement for the total time from the last calibration image of a day/evening to the first science image of the evening/night for which the corresponding reduced calibration data are available is TBD. This will be part of the calibration implementation plan.
Requirement Priority	
Upper Level Requirement	

## 2.328 [LVV-6553] DM-TS-AUX-ICD-0019-V-02: Dome Screen Illumination Reference System Data Latency\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6553	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0019
Requirement Description	<b>Specification:</b> Data from the dome screen illumination reference system shall be published as telemetry as it is acquired, with <b>domeScreenDataLatency</b> latency.
Requirement Parameters	<b>domeScreenDataLatency = 1[second]</b> Time to publish calibration data.
Requirement Discussion	<b>Discussion:</b> DM must be able to incorporate this data into its analysis of the daytime calibration image data from the Camera in time to make use of the results in the subsequent night's observing. Since flats may be acquired immediately preceding the start of science observations for a night, the latency for the reference system data must be relatively short. Note that the actual requirement for the total time from the last calibration image of a day/evening to the first science image of the evening/night for which the corresponding reduced calibration data are available is TBD. This will be part of the calibration implementation plan.
Requirement Priority	
Upper Level Requirement	

## 2.329 [LVV-6558] DM-TS-AUX-ICD-0018-V-01: Dome Screen Illumination Reference System\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6558	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0018
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall make available to DM the data from the illumination reference system for the dome screen whenever dome screen calibration activities are under way.
Requirement Priority	
Upper Level Requirement	

### 2.330 [LVV-6559] DM-TS-AUX-ICD-0018-V-02: Dome Screen Illumination Reference System\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6559	Leanne Guy	Not Covered	

#### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0018
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall make available to DM the data from the illumination reference system for the dome screen whenever dome screen calibration activities are under way.
Requirement Priority	
Upper Level Requirement	

## 2.331 [LVV-6564] DM-TS-AUX-ICD-0014-V-01: GPS Water Vapor Data Quality\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6564	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0014
Requirement Description	<b>Specification:</b> The publication of GPS water vapor data shall include any data quality or accuracy assessment generated by the data reduction.
Requirement Discussion	<b>Discussion:</b> Typically GPS instruments are able to estimate the quality of their data reductions based on data such as the number of GPS satellites visible and their locations. This and other information can be used to compute accuracy estimates on the results of the reduction.
Requirement Priority	
Upper Level Requirement	



## 2.332 [LVV-6565] DM-TS-AUX-ICD-0014-V-02: GPS Water Vapor Data Quality\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6565	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0014
Requirement Description	<b>Specification:</b> The publication of GPS water vapor data shall include any data quality or accuracy assessment generated by the data reduction.
Requirement Discussion	<b>Discussion:</b> Typically GPS instruments are able to estimate the quality of their data reductions based on data such as the number of GPS satellites visible and their locations. This and other information can be used to compute accuracy estimates on the results of the reduction.
Requirement Priority	
Upper Level Requirement	

### 2.333 [LVV-6570] DM-TS-AUX-ICD-0012-V-01: GPS Water Vapor Data\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6570	Leanne Guy	Not Covered	

#### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0012
Requirement Description	<p><b>Specification:</b> The Telescope and Site subsystem shall make available to DM the total column water vapor result derived from the GPS water vapor instrument.</p> <p><b>Discussion:</b> It is assumed that this is a commercially acquired instrument, delivered by the Telescope &amp; Site team, with the intrinsic capability of acquiring multi-channel GPS data. The data will be analyzed, using algorithms that are in the professional literature, to extract total column water vapor and, potentially, vertical profile data. The analysis might be performed on LSST computers or through an external initiative such as the NOAA "Suominet" project.</p>
Requirement Discussion	See the LSST Calibration Plan (LSE-180) and the Telescope and Site requirements document (LSE-60) for details describing the GPS instrumentation and its measurements. Details of the reduced data required, including latency, accuracy/precision, and data record fields are TBD and will be filled in during Phases 2 and 3 of the development of this ICD. Aspects of this depend on the calibration implementation plan currently under development.
Requirement Priority	
Upper Level Requirement	

## 2.334 [LVV-6571] DM-TS-AUX-ICD-0012-V-02: GPS Water Vapor Data\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6571	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0012
Requirement Description	<p><b>Specification:</b> The Telescope and Site subsystem shall make available to DM the total column water vapor result derived from the GPS water vapor instrument.</p> <p><b>Discussion:</b> It is assumed that this is a commercially acquired instrument, delivered by the Telescope &amp; Site team, with the intrinsic capability of acquiring multi-channel GPS data. The data will be analyzed, using algorithms that are in the professional literature, to extract total column water vapor and, potentially, vertical profile data. The analysis might be performed on LSST computers or through an external initiative such as the NOAA "Suominet" project.</p>
Requirement Discussion	See the LSST Calibration Plan (LSE-180) and the Telescope and Site requirements document (LSE-60) for details describing the GPS instrumentation and its measurements. Details of the reduced data required, including latency, accuracy/precision, and data record fields are TBD and will be filled in during Phases 2 and 3 of the development of this ICD. Aspects of this depend on the calibration implementation plan currently under development.
Requirement Priority	
Upper Level Requirement	

## 2.335 [LVV-6576] DM-TS-AUX-ICD-0028-V-01: GPS Water Vapor Raw Data Archiving\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6576	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0028
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall publish the raw data from the GPS water vapor instrument as telemetry.
Requirement Discussion	<b>Discussion:</b> The intent of this is to ensure that the raw data can always be reprocessed if an improved reduction algorithm becomes available in the future. Publication as telemetry results in the permanent archiving of the data in the EFD.
Requirement Priority	
Upper Level Requirement	

## 2.336 [LVV-6577] DM-TS-AUX-ICD-0028-V-02: GPS Water Vapor Raw Data Archiving\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6577	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0028
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall publish the raw data from the GPS water vapor instrument as telemetry.
Requirement Discussion	<b>Discussion:</b> The intent of this is to ensure that the raw data can always be reprocessed if an improved reduction algorithm becomes available in the future. Publication as telemetry results in the permanent archiving of the data in the EFD.
Requirement Priority	
Upper Level Requirement	

## 2.337 [LVV-6594] DM-TS-AUX-ICD-0035-V-01: SED Spectrograph\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6594	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0035
Requirement Description	<p><b>Specification:</b> The Telescope and Site subsystem shall acquire data from the illumination system SED spectrograph and shall make the data available to DM.</p> <p><b>Discussion:</b> The reduction of the raw data from the spectrograph to spectra will be done by the Telescope and Site subsystem. The reduced data, expected to be two column files (wavelength and intensity) will be made available to DM. The Telescope and Site subsystem will also make the raw data and any self-calibration data from this instrument available. Most likely all this data will be in files in the large-file annex of the Engineering and Facilities Database.</p> <p>The reduced spectra will be associated with the concurrent camera image(s) by Data Management.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.338 [LVV-6595] DM-TS-AUX-ICD-0035-V-02: SED Spectrograph\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6595	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0035
Requirement Description	<p><b>Specification:</b> The Telescope and Site subsystem shall acquire data from the illumination system SED spectrograph and shall make the data available to DM.</p> <p><b>Discussion:</b> The reduction of the raw data from the spectrograph to spectra will be done by the Telescope and Site subsystem. The reduced data, expected to be two column files (wavelength and intensity) will be made available to DM. The Telescope and Site subsystem will also make the raw data and any self-calibration data from this instrument available. Most likely all this data will be in files in the large-file annex of the Engineering and Facilities Database.</p> <p>The reduced spectra will be associated with the concurrent camera image(s) by Data Management.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.339 [LVV-6600] DM-TS-AUX-ICD-0033-V-01: Tunable Laser\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6600	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0033
Requirement Description	<b>*Specification:</b> The Telescope and Site subsystem shall make the instrument configuration and conditions data from the tunable laser light source available to DM.
Requirement Discussion	<b>Discussion:</b> This is expected to include intensity, wavelength selection, and operating temperature but will be revised upon hardware selection. We currently plan for both the set points and readback to be transmitted as telemetry using the OCS middleware (TBR).
Requirement Priority	
Upper Level Requirement	



## 2.340 [LVV-6601] DM-TS-AUX-ICD-0033-V-02: Tunable Laser\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6601	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0033
Requirement Description	<b>*Specification:</b> The Telescope and Site subsystem shall make the instrument configuration and conditions data from the tunable laser light source available to DM.
Requirement Discussion	<b>Discussion:</b> This is expected to include intensity, wavelength selection, and operating temperature but will be revised upon hardware selection. We currently plan for both the set points and readback to be transmitted as telemetry using the OCS middleware (TBR).
Requirement Priority	
Upper Level Requirement	

## 2.341 [LVV-6606] DM-TS-AUX-ICD-0032-V-01: White-Light Source\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6606	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0032
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall make the instrument configuration and conditions data from the white light source available to DM.
Requirement Discussion	<b>Discussion:</b> This is expected to include intensity setting and operating temperature but will be revised upon hardware selection. We currently plan for both the set points and readback to be transmitted as telemetry using the OCS middleware (TBR).
Requirement Priority	
Upper Level Requirement	

## 2.342 [LVV-6607] DM-TS-AUX-ICD-0032-V-02: White-Light Source\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6607	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DM-TS-AUX-ICD-0032
Requirement Description	<b>Specification:</b> The Telescope and Site subsystem shall make the instrument configuration and conditions data from the white light source available to DM.
Requirement Discussion	<b>Discussion:</b> This is expected to include intensity setting and operating temperature but will be revised upon hardware selection. We currently plan for both the set points and readback to be transmitted as telemetry using the OCS middleware (TBR).
Requirement Priority	
Upper Level Requirement	

### 2.343 [LVV-6751] EP-DM-CON-ICD-0036-V-01: DM Services\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6751	Leanne Guy	Not Covered	

#### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0036
Requirement Description	<b>Specification:</b> DM shall ensure that the following services are made available to the EPO systems: Image Cutout Service, Metaserv, Mini-Broker, TAP, and ObsTAP.
Requirement Discussion	<b>Discussion:</b> The purpose is as follows: Image Cutout Service for obtaining single-band co-add images, Metaserv for querying the database, Mini-Broker for applying EPO-provided filters to obtain variable star classifications, and TAP/ObsTAP for ad-hoc queries. In addition to the EPO-provided filters, we also hope to leverage the simple filters mentioned in the DPDD: "we will provide a limited number of pre-defined filters for a small number of object types of common interest. These will answer non-exclusive questions such as "is the light curve consistent with an RR Lyra?"
Requirement Priority	
Upper Level Requirement	

## 2.344 [LVV-6752] EP-DM-CON-ICD-0036-V-02: DM Services\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6752	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0036
Requirement Description	<b>Specification:</b> DM shall ensure that the following services are made available to the EPO systems: Image Cutout Service, Metaserv, Mini-Broker, TAP, and ObsTAP.
Requirement Discussion	<b>Discussion:</b> The purpose is as follows: Image Cutout Service for obtaining single-band co-add images, Metaserv for querying the database, Mini-Broker for applying EPO-provided filters to obtain variable star classifications, and TAP/ObsTAP for ad-hoc queries. In addition to the EPO-provided filters, we also hope to leverage the simple filters mentioned in the DPDD: "we will provide a limited number of pre-defined filters for a small number of object types of common interest. These will answer non-exclusive questions such as "is the light curve consistent with an RR Lyra?"
Requirement Priority	
Upper Level Requirement	

## 2.345 [LVV-6757] EP-DM-CON-ICD-0035-V-01: DM Software\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6757	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0035
Requirement Description	<b>Specification:</b> DM shall provide the following software, which is expected to be used in development of the EPO systems: Butler, Supertask.
Requirement Discussion	<b>Discussion:</b> The purpose is as follows: Butler for accessing formal DM data products, Supertask for grouping and running related tasks.
Requirement Priority	
Upper Level Requirement	

## 2.346 [LVV-6758] EP-DM-CON-ICD-0035-V-02: DM Software\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6758	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0035
Requirement Description	<b>Specification:</b> DM shall provide the following software, which is expected to be used in development of the EPO systems: Butler, Supertask.
Requirement Discussion	<b>Discussion:</b> The purpose is as follows: Butler for accessing formal DM data products, Supertask for grouping and running related tasks.
Requirement Priority	
Upper Level Requirement	

## 2.347 [LVV-6763] EP-DM-CON-ICD-0037-V-01: EPO Compute Cluster\_DM\_1

Jira Link	Assignee	Status	Test Cases
LVV-6763	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0037
Requirement Description	<p><b>Specification:</b> NCSA shall host a compute cluster for EPO and allow it to transfer approved public subset data to the EPO Data Center (EDC).</p> <p><b>Discussion:</b> This will be similar to the Kubernetes cluster they currently host for DM and will be paid for by EPO. This EPO cluster will be used to apply EPO-specific processing (such as converting FITS to TIFF) close to the data as well as to act as a storage buffer while transferring data from the DAC to the EDC. Special VPN or firewall configuration will be required to allow the cluster to push data to the cloud-based EDC.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	



## 2.348 [LVV-6764] EP-DM-CON-ICD-0037-V-02: EPO Compute Cluster\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-6764	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	EP-DM-CON-ICD-0037
Requirement Description	<b>Specification:</b> NCSA shall host a compute cluster for EPO and allow it to transfer approved public subset data to the EPO Data Center (EDC).
Requirement Discussion	<b>Discussion:</b> This will be similar to the Kubernetes cluster they currently host for DM and will be paid for by EPO. This EPO cluster will be used to apply EPO-specific processing (such as converting FITS to TIFF) close to the data as well as to act as a storage buffer while transferring data from the DAC to the EDC. Special VPN or firewall configuration will be required to allow the cluster to push data to the cloud-based EDC.
Requirement Priority	
Upper Level Requirement	

## 2.349 [LVV-6771] SYS-ALL-COM-ICD-0047-V-06: Bulk Data Logging\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6771	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0047
Requirement Description	<b>Specification:</b> Any bulk data transport mechanism shall log data to the EFD Cluster.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0046 Data Logging SYS-ALL-COM-ICD-0048 Bulk Data Transport

## 2.350 [LVV-6772] SYS-ALL-COM-ICD-0047-V-07: Bulk Data Logging\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6772	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0047
Requirement Description	<b>Specification:</b> Any bulk data transport mechanism shall log data to the EFD Cluster.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0046 Data Logging SYS-ALL-COM-ICD-0048 Bulk Data Transport

## 2.351 [LVV-6777] SYS-ALL-COM-ICD-0048-V-06: Bulk Data Transport\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6777	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0048
Requirement Description	<b>Specification:</b> The principal subsystems shall exchange point-to-point bulk data (large datasets) through a mutually agreed mechanism.
Requirement Discussion	<b>Discussion:</b> This allows for some flexibility where teams decide DDS is not the best option for special cases. DDS, of course, may be the mutually agreed mechanism.
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0042 Operational Data

## 2.352 [LVV-6778] SYS-ALL-COM-ICD-0048-V-07: Bulk Data Transport\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6778	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0048
Requirement Description	<b>Specification:</b> The principal subsystems shall exchange point-to-point bulk data (large datasets) through a mutually agreed mechanism.
Requirement Discussion	<b>Discussion:</b> This allows for some flexibility where teams decide DDS is not the best option for special cases. DDS, of course, may be the mutually agreed mechanism.
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0042 Operational Data

## 2.353 [LVV-6783] SYS-ALL-COM-ICD-0043-V-06: Common Data Exchange Means\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6783	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0043
Requirement Description	<b>Specification:</b> The normal means for operational data exchange between principal systems shall be through a common publish-subscribe middleware.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0042 Operational Data

## 2.354 [LVV-6784] SYS-ALL-COM-ICD-0043-V-07: Common Data Exchange Means\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6784	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0043
Requirement Description	<b>Specification:</b> The normal means for operational data exchange between principal systems shall be through a common publish-subscribe middleware.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0042 Operational Data

## 2.355 [LVV-6789] SYS-ALL-COM-ICD-0046-V-06: Data Logging\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6789	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0046
Requirement Description	<b>Specification:</b> The system shall log all operational data to an Engineering Facilities Database.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0042 Operational Data



## 2.356 [LVV-6790] SYS-ALL-COM-ICD-0046-V-07: Data Logging\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6790	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0046
Requirement Description	<b>Specification:</b> The system shall log all operational data to an Engineering Facilities Database.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0042 Operational Data

## 2.357 [LVV-6795] SYS-ALL-COM-ICD-0044-V-06: DDS Standard\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6795	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0044
Requirement Description	<b>Specification:</b> The system middleware shall comply with the OMG Data-Distribution Service for Real-Time Systems (DDS) standard.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0046 Data Logging SYS-ALL-COM-ICD-0043 Common Data Exchange Means

## 2.358 [LVV-6796] SYS-ALL-COM-ICD-0044-V-07: DDS Standard\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6796	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0044
Requirement Description	<b>Specification:</b> The system middleware shall comply with the OMG Data-Distribution Service for Real-Time Systems (DDS) standard.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0046 Data Logging SYS-ALL-COM-ICD-0043 Common Data Exchange Means

## 2.359 [LVV-6801] SYS-ALL-COM-ICD-0045-V-06: DDS Version\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6801	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0045
Requirement Description	<b>Specification:</b> The system middleware shall comply with a mutually agreed upon version and implementation of the DDS standard.
Requirement Discussion	<b>Discussion:</b> We want to take advantage of updates, but there may be reasons not to jump to the absolute latest version immediately. (Indeed, some time may be required after the release of a version of the specification before an implementation is available.)
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0044 DDS Standard

## 2.360 [LVV-6802] SYS-ALL-COM-ICD-0045-V-07: DDS Version\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6802	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0045
Requirement Description	<b>Specification:</b> The system middleware shall comply with a mutually agreed upon version and implementation of the DDS standard.
Requirement Discussion	<b>Discussion:</b> We want to take advantage of updates, but there may be reasons not to jump to the absolute latest version immediately. (Indeed, some time may be required after the release of a version of the specification before an implementation is available.)
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0044 DDS Standard

## 2.361 [LVV-6807] SYS-ALL-COM-ICD-0042-V-06: Operational Data\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6807	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0042
Requirement Description	<b>Specification:</b> The principal systems shall exchange operational system data.
Requirement Discussion	<b>Discussion:</b> Nonoperational data are not within the scope of this requirement, to allow for some flexibility, although in most cases the same data transport mechanism would be appropriate.
Requirement Priority	
Upper Level Requirement	

## 2.362 [LVV-6808] SYS-ALL-COM-ICD-0042-V-07: Operational Data\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6808	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0042
Requirement Description	<b>Specification:</b> The principal systems shall exchange operational system data.
Requirement Discussion	<b>Discussion:</b> Nonoperational data are not within the scope of this requirement, to allow for some flexibility, although in most cases the same data transport mechanism would be appropriate.
Requirement Priority	
Upper Level Requirement	

### 2.363 [LVV-6813] SYS-ALL-COM-ICD-0029-V-06: 64-bit Support\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6813	Leanne Guy	Not Covered	

#### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0029
Requirement Description	<b>Specification:</b> The system middleware shall support a 64-bit version.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0026 Provide Interface To Middleware SYS-ALL-COM-ICD-0043 Common Data Exchange Means



## 2.364 [LVV-6814] SYS-ALL-COM-ICD-0029-V-07: 64-bit Support\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6814	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0029
Requirement Description	<b>Specification:</b> The system middleware shall support a 64-bit version.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0026 Provide Interface To Middleware SYS-ALL-COM-ICD-0043 Common Data Exchange Means

## 2.365 [LVV-6819] SYS-ALL-COM-ICD-0028-V-06: Configure Quality of Service\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6819	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0028
Requirement Description	<b>Specification:</b> The API to the middleware shall support configuring quality of service attributes for DDS topics.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0026 Provide Interface To Middleware

## 2.366 [LVV-6820] SYS-ALL-COM-ICD-0028-V-07: Configure Quality of Service\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6820	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0028
Requirement Description	<b>Specification:</b> The API to the middleware shall support configuring quality of service attributes for DDS topics.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0026 Provide Interface To Middleware

## 2.367 [LVV-6825] SYS-ALL-COM-ICD-0005-V-06: Dynamic Data Source Selection\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6825	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0005
Requirement Description	<b>Specification:</b> The system middleware shall support a dynamic data source selection mechanism to switch automatically between the engineering facility databases based on availability,application, and location.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0026 Provide Interface To Middleware

## 2.368 [LVV-6826] SYS-ALL-COM-ICD-0005-V-07: Dynamic Data Source Selection\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6826	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0005
Requirement Description	<b>Specification:</b> The system middleware shall support a dynamic data source selection mechanism to switch automatically between the engineering facility databases based on availability,application, and location.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0026 Provide Interface To Middleware

## 2.369 [LVV-6831] SYS-ALL-COM-ICD-0030-V-06: Operating System\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6831	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0030
Requirement Description	<b>Specification:</b> The system middleware shall support a Linux operating system.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0026 Provide Interface To Middleware SYS-ALL-COM-ICD-0043 Common Data Exchange Means

## 2.370 [LVV-6832] SYS-ALL-COM-ICD-0030-V-07: Operating System\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6832	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0030
Requirement Description	<b>Specification:</b> The system middleware shall support a Linux operating system.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0026 Provide Interface To Middleware SYS-ALL-COM-ICD-0043 Common Data Exchange Means

## 2.371 [LVV-6837] SYS-ALL-COM-ICD-0026-V-06: Provide Interface To Middleware\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6837	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0026
Requirement Description	<p><b>Specification:</b> The project shall provide a set of APIs to the middleware for the programming languages:</p> <ul style="list-style-type: none"> <li>• C++</li> <li>• Java</li> <li>• Python</li> <li>• LabVIEW</li> <li>• Tcl</li> </ul>
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	



## 2.372 [LVV-6838] SYS-ALL-COM-ICD-0026-V-07: Provide Interface To Middleware\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6838	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0026
Requirement Description	<p><b>Specification:</b> The project shall provide a set of APIs to the middleware for the programming languages:</p> <ul style="list-style-type: none"> <li>• C++</li> <li>• Java</li> <li>• Python</li> <li>• LabVIEW</li> <li>• Tcl</li> </ul>
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	

## 2.373 [LVV-6843] SYS-ALL-COM-ICD-0027-V-06: Support Data Transport Functions\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6843	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0027
Requirement Description	<b>Specification:</b> The API to the middleware shall support publishing and subscribing to data on DDS topics.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0026 Provide Interface To Middleware

## 2.374 [LVV-6844] SYS-ALL-COM-ICD-0027-V-07: Support Data Transport Functions\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6844	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0027
Requirement Description	<b>Specification:</b> The API to the middleware shall support publishing and subscribing to data on DDS topics.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0026 Provide Interface To Middleware

## 2.375 [LVV-6849] SYS-ALL-COM-ICD-0050-V-06: Event after elapsed time\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6849	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0050
Requirement Description	<b>Specification:</b> The system shall be able to generate an event to a client after a prescribed interval has elapsed.
Requirement Discussion	<b>Discussion:</b> If the client process crashes, this will not return.
Requirement Priority	
Upper Level Requirement	

## 2.376 [LVV-6850] SYS-ALL-COM-ICD-0050-V-07: Event after elapsed time\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6850	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0050
Requirement Description	<b>Specification:</b> The system shall be able to generate an event to a client after a prescribed interval has elapsed.
Requirement Discussion	<b>Discussion:</b> If the client process crashes, this will not return.
Requirement Priority	
Upper Level Requirement	

## 2.377 [LVV-6855] SYS-ALL-COM-ICD-0049-V-06: Event at absolute time\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6855	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0049
Requirement Description	<b>Specification:</b> The system shall be able to generate an event to a client at an absolute time requested by that client.
Requirement Discussion	<b>Discussion:</b> If the client process crashes, this will not return.
Requirement Priority	
Upper Level Requirement	

## 2.378 [LVV-6856] SYS-ALL-COM-ICD-0049-V-07: Event at absolute time\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6856	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0049
Requirement Description	<b>Specification:</b> The system shall be able to generate an event to a client at an absolute time requested by that client.
Requirement Discussion	<b>Discussion:</b> If the client process crashes, this will not return.
Requirement Priority	
Upper Level Requirement	

## 2.379 [LVV-6861] SYS-ALL-COM-ICD-0031-V-06: Capture event time\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6861	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0031
Requirement Description	<b>Specification:</b> The system shall allow the sender of a message to include an event time associated with a message.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	



## 2.380 [LVV-6862] SYS-ALL-COM-ICD-0031-V-07: Capture event time\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6862	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0031
Requirement Description	<b>Specification:</b> The system shall allow the sender of a message to include an event time associated with a message.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	

## 2.381 [LVV-6867] SYS-ALL-COM-ICD-0033-V-06: Capture message arrival time in message metadata\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6867	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0033
Requirement Description	<b>Specification:</b> The system shall capture the time of arrival of each message at each subscriber in the message metadata.
Requirement Discussion	<b>Discussion:</b> Used for consistency checking and error detection.
Requirement Priority	
Upper Level Requirement	

## 2.382 [LVV-6868] SYS-ALL-COM-ICD-0033-V-07: Capture message arrival time in message metadata\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6868	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0033
Requirement Description	<b>Specification:</b> The system shall capture the time of arrival of each message at each subscriber in the message metadata.
Requirement Discussion	<b>Discussion:</b> Used for consistency checking and error detection.
Requirement Priority	
Upper Level Requirement	

### 2.383 [LVV-6873] SYS-ALL-COM-ICD-0035-V-06: Capture message send time in message metadata\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6873	Leanne Guy	Not Covered	

#### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0035
Requirement Description	<b>Specification:</b> The system shall capture the time of egress from a publisher for a message in the message metadata.
Requirement Discussion	<b>Discussion:</b> Used for consistency checking and error detection.
Requirement Priority	
Upper Level Requirement	

## 2.384 [LVV-6874] SYS-ALL-COM-ICD-0035-V-07: Capture message send time in message metadata\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6874	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0035
Requirement Description	<b>Specification:</b> The system shall capture the time of egress from a publisher for a message in the message metadata.
Requirement Discussion	<b>Discussion:</b> Used for consistency checking and error detection.
Requirement Priority	
Upper Level Requirement	

## 2.385 [LVV-6879] SYS-ALL-COM-ICD-0037-V-06: Display times in UTC\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6879	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0037
Requirement Description	<b>Specification:</b> The system shall display all human-readable timestamps using Universal Coordinated Time (UTC).
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0036 Human Readable Timestamp Representation

## 2.386 [LVV-6880] SYS-ALL-COM-ICD-0037-V-07: Display times in UTC\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6880	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0037
Requirement Description	<b>Specification:</b> The system shall display all human-readable timestamps using Universal Coordinated Time (UTC).
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0036 Human Readable Timestamp Representation

## 2.387 [LVV-6885] SYS-ALL-COM-ICD-0040-V-06: Follow Clock Synchronization Protocol\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6885	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0040
Requirement Description	<b>Specification:</b> System components requiring accurate time shall follow the IEEE 1588-2008 Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems, also known as PTP Version 2.
Requirement Discussion	<b>Discussion:</b> A hardware consequence of this is that the relevant system components will need firmware support for this protocol in a GigE Ethernet controller.
Requirement Priority	
Upper Level Requirement	



## 2.388 [LVV-6886] SYS-ALL-COM-ICD-0040-V-07: Follow Clock Synchronization Protocol\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6886	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0040
Requirement Description	<b>Specification:</b> System components requiring accurate time shall follow the IEEE 1588-2008 Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems, also known as PTP Version 2.
Requirement Discussion	<b>Discussion:</b> A hardware consequence of this is that the relevant system components will need firmware support for this protocol in a GigE Ethernet controller.
Requirement Priority	
Upper Level Requirement	

## 2.389 [LVV-6891] SYS-ALL-COM-ICD-0036-V-06: Human Readable Timestamp Representation\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6891	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0036
Requirement Description	<b>Specification:</b> The system shall follow ISO 8601 Data elements and interchange formats – Information interchange – Representation of dates and times when representing human-readable timestamps.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	

## 2.390 [LVV-6892] SYS-ALL-COM-ICD-0036-V-07: Human Readable Timestamp Representation\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6892	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0036
Requirement Description	<b>Specification:</b> The system shall follow ISO 8601 Data elements and interchange formats – Information interchange – Representation of dates and times when representing human-readable timestamps.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	

## 2.391 [LVV-6897] SYS-ALL-COM-ICD-0041-V-06: Internal Timestamp Representation\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6897	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0041
Requirement Description	<b>Specification:</b> Internal to the system (includes SAL or nonSAL sources), a timestamp shall be in the format specified in the standard, that is, with a secondsField and a nanosecondsField.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0040 Follow Clock Synchronization Protocol

## 2.392 [LVV-6898] SYS-ALL-COM-ICD-0041-V-07: Internal Timestamp Representation\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6898	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0041
Requirement Description	<b>Specification:</b> Internal to the system (includes SAL or nonSAL sources), a timestamp shall be in the format specified in the standard, that is, with a secondsField and a nanosecondsField.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0040 Follow Clock Synchronization Protocol

### 2.393 [LVV-6903] SYS-ALL-COM-ICD-0038-V-06: Interpret internal time in displayed timestamp\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6903	Leanne Guy	Not Covered	

#### Verification Element Description:

Undefined

Requirement Details					
Requirement ID	SYS-ALL-COM-ICD-0038				
Requirement Description	<b>Specification:</b> The system shall convert PTP time to UTC upon request.				
Requirement Discussion	<b>Discussion:</b> PTP time (internal representation) uses TAI (elapsed time from reference date-no leap seconds), but UTC uses leap seconds.				
Requirement Priority					
Upper Level Requirement	<table border="0"> <tr> <td>SYS-ALL-COM-ICD-0041</td> <td>Internal Timestamp Representation</td> </tr> <tr> <td>SYS-ALL-COM-ICD-0037</td> <td>Display times in UTC</td> </tr> </table>	SYS-ALL-COM-ICD-0041	Internal Timestamp Representation	SYS-ALL-COM-ICD-0037	Display times in UTC
SYS-ALL-COM-ICD-0041	Internal Timestamp Representation				
SYS-ALL-COM-ICD-0037	Display times in UTC				

## 2.394 [LVV-6904] SYS-ALL-COM-ICD-0038-V-07: Interpret internal time in displayed timestamp\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6904	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details					
Requirement ID	SYS-ALL-COM-ICD-0038				
Requirement Description	<b>Specification:</b> The system shall convert PTP time to UTC upon request.				
Requirement Discussion	<b>Discussion:</b> PTP time (internal representation) uses TAI (elapsed time from reference date-no leap seconds), but UTC uses leap seconds.				
Requirement Priority					
Upper Level Requirement	<table border="0"> <tr> <td>SYS-ALL-COM-ICD-0041</td> <td>Internal Timestamp Representation</td> </tr> <tr> <td>SYS-ALL-COM-ICD-0037</td> <td>Display times in UTC</td> </tr> </table>	SYS-ALL-COM-ICD-0041	Internal Timestamp Representation	SYS-ALL-COM-ICD-0037	Display times in UTC
SYS-ALL-COM-ICD-0041	Internal Timestamp Representation				
SYS-ALL-COM-ICD-0037	Display times in UTC				

## 2.395 [LVV-6909] SYS-ALL-COM-ICD-0034-V-06: Log message arrival time at database\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6909	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0034
Requirement Description	<b>Specification:</b> The system shall log each message and the associated metadata for the message as it arrives at the logger.
Requirement Discussion	<b>Discussion:</b> This means the system logs only one arrival time for each message that is associated with arrival at the EFD.
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0033 Capture message arrival time in message metadata



## 2.396 [LVV-6910] SYS-ALL-COM-ICD-0034-V-07: Log message arrival time at database\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6910	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0034
Requirement Description	<b>Specification:</b> The system shall log each message and the associated metadata for the message as it arrives at the logger.
Requirement Discussion	<b>Discussion:</b> This means the system logs only one arrival time for each message that is associated with arrival at the EFD.
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0033 Capture message arrival time in message metadata

## 2.397 [LVV-6915] SYS-ALL-COM-ICD-0032-V-06: Provide current time to application\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6915	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0032
Requirement Description	<b>Specification:</b> The system shall provide the currentTime to a client on demand.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0031 Capture event time

## 2.398 [LVV-6916] SYS-ALL-COM-ICD-0032-V-07: Provide current time to application\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6916	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0032
Requirement Description	<b>Specification:</b> The system shall provide the currentTime to a client on demand.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0031 Capture event time

## 2.399 [LVV-6921] SYS-ALL-COM-ICD-0039-V-06: Use standard time conversion library\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6921	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0039
Requirement Description	<b>Specification:</b> The system shall use the standard time conversion library for time conversion calculations.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0038 Interpret internal time in displayed timestamp

## 2.400 [LVV-6922] SYS-ALL-COM-ICD-0039-V-07: Use standard time conversion library\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6922	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	SYS-ALL-COM-ICD-0039
Requirement Description	<b>Specification:</b> The system shall use the standard time conversion library for time conversion calculations.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	SYS-ALL-COM-ICD-0038 Interpret internal time in displayed timestamp

## 2.401 [LVV-6927] CPT-OCS-INT-ICD-0001-V-06: Client Interface\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6927	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0001
Requirement Description	<b>Specification:</b> Each component controller shall define an external interface that allows an interfacing component (loosely, a client) to interact with that controller in a precise fashion.
Requirement Discussion	<b>Discussion:</b> A client may be a View associated with the controller, or another controller.
Requirement Priority	
Upper Level Requirement	

## 2.402 [LVV-6928] CPT-OCS-INT-ICD-0001-V-07: Client Interface\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6928	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0001
Requirement Description	<b>Specification:</b> Each component controller shall define an external interface that allows an interfacing component (loosely, a client) to interact with that controller in a precise fashion.
Requirement Discussion	<b>Discussion:</b> A client may be a View associated with the controller, or another controller.
Requirement Priority	
Upper Level Requirement	

## 2.403 [LVV-6933] CPT-OCS-INT-ICD-0005-V-06: Interface Design\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6933	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0005
Requirement Description	<b>Specification:</b> This interface information shall be part of the design definition.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0001 Client Interface



## 2.404 [LVV-6934] CPT-OCS-INT-ICD-0005-V-07: Interface Design\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6934	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0005
Requirement Description	<b>Specification:</b> This interface information shall be part of the design definition.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0001 Client Interface

## 2.405 [LVV-6939] CPT-OCS-INT-ICD-0006-V-06: Interface Elements\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6939	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0006
Requirement Description	<b>Specification:</b> The component interface shall minimally include the external triggers to which it responds (i.e., data to which it subscribes), and the consequent behaviors (including data the component publishes).
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0005 Interface Design

## 2.406 [LVV-6940] CPT-OCS-INT-ICD-0006-V-07: Interface Elements\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6940	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0006
Requirement Description	<b>Specification:</b> The component interface shall minimally include the external triggers to which it responds (i.e., data to which it subscribes), and the consequent behaviors (including data the component publishes).
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0005 Interface Design

## 2.407 [LVV-6945] CPT-OCS-INT-ICD-0008-V-06: Real-time Information\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6945	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0008
Requirement Description	<b>Specification:</b> Each component shall provide real-time information sufficient for a client to make real-time predictions of behavior.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0001 Client Interface

**2.408 [LVV-6946] CPT-OCS-INT-ICD-0008-V-07: Real-time Information\_DM\_7**

Jira Link	Assignee	Status	Test Cases
LVV-6946	Leanne Guy	Not Covered	

**Verification Element Description:**

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0008
Requirement Description	<b>Specification:</b> Each component shall provide real-time information sufficient for a client to make real-time predictions of behavior.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0001 Client Interface

## 2.409 [LVV-6951] CPT-OCS-INT-ICD-0040-V-06: Control Commander Commandee relationship\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6951	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0040
Requirement Description	<b>Specification:</b> Requirement states that the system shall allow commands only accordingly to the Commander-Commandee relationships.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	

## 2.410 [LVV-6952] CPT-OCS-INT-ICD-0040-V-07: Control Commander Commandee relationship\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6952	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0040
Requirement Description	<b>Specification:</b> Requirement states that the system shall allow commands only accordingly to the Commander-Commandee relationships.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	

## 2.411 [LVV-6957] CPT-OCS-INT-ICD-0041-V-06: Exclusive Control\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6957	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0041
Requirement Description	<b>Specification:</b> The system shall allow for a commander to have exclusive control access of a commandee.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0042 Update of relationship



## 2.412 [LVV-6958] CPT-OCS-INT-ICD-0041-V-07: Exclusive Control\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6958	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0041
Requirement Description	<b>Specification:</b> The system shall allow for a commander to have exclusive control access of a commandee.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0042 Update of relationship

### 2.413 [LVV-6963] CPT-OCS-INT-ICD-0042-V-06: Update of relationship\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6963	Leanne Guy	Not Covered	

#### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0042
Requirement Description	<b>Specification:</b> The system shall provide an interface to update the Commander - Commandee relationships.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0040 Control Commander Commandee relationship

**2.414 [LVV-6964] CPT-OCS-INT-ICD-0042-V-07: Update of relationship\_DM\_7**

Jira Link	Assignee	Status	Test Cases
LVV-6964	Leanne Guy	Not Covered	

**Verification Element Description:**

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0042
Requirement Description	<b>Specification:</b> The system shall provide an interface to update the Commander - Commandee relationships.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0040 Control Commander Commandee relationship

## 2.415 [LVV-6969] CPT-OCS-INT-ICD-0002-V-06: Common Summary States\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6969	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0002
Requirement Description	<b>Specification:</b> The component shall incorporate summary component states and transitions that conform to the definition in Perform Top Level Functions. In this way all event-driven components will present a common base set of behaviors to clients.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0009 State Machine Description

## 2.416 [LVV-6970] CPT-OCS-INT-ICD-0002-V-07: Common Summary States\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6970	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0002
Requirement Description	<b>Specification:</b> The component shall incorporate summary component states and transitions that conform to the definition in Perform Top Level Functions. In this way all event-driven components will present a common base set of behaviors to clients.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0009 State Machine Description

## 2.417 [LVV-6975] CPT-OCS-INT-ICD-0003-V-06: Component Name in Namespace\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6975	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0003
Requirement Description	<b>Specification:</b> The component name shall define a namespace.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0012 Unique Names for States

## 2.418 [LVV-6976] CPT-OCS-INT-ICD-0003-V-07: Component Name in Namespace\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6976	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0003
Requirement Description	<b>Specification:</b> The component name shall define a namespace.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0012 Unique Names for States

## 2.419 [LVV-6981] CPT-OCS-INT-ICD-0009-V-06: State Machine Description\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6981	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0009
Requirement Description	<b>Specification:</b> The state machine definition shall explicitly and formally define all transitions (external and internal), States, and behaviors. [Options: UML State Machine diagram (preferred), table-based states definition.]
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0010 State-based Behavior



## 2.420 [LVV-6982] CPT-OCS-INT-ICD-0009-V-07: State Machine Description\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6982	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0009
Requirement Description	<b>Specification:</b> The state machine definition shall explicitly and formally define all transitions (external and internal), States, and behaviors. [Options: UML State Machine diagram (preferred), table-based states definition.]
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0010 State-based Behavior

## 2.421 [LVV-6987] CPT-OCS-INT-ICD-0072-V-06: State Machine Extension\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6987	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0072
Requirement Description	<b>Specification:</b> The state machine description shall incorporate any extensions to the top-level state machine, in terms of additional triggers and substates, in a detailed state machine that describes behaviors (and variations to these) in response to external triggers.
Requirement Discussion	<b>Discussion:</b> The Detailed State generally varies between components. The Detailed State machine may be orthogonal to the Top-Level State machine.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0002 Common Summary States

## 2.422 [LVV-6988] CPT-OCS-INT-ICD-0072-V-07: State Machine Extension\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6988	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0072
Requirement Description	<b>Specification:</b> The state machine description shall incorporate any extensions to the top-level state machine, in terms of additional triggers and substates, in a detailed state machine that describes behaviors (and variations to these) in response to external triggers.
Requirement Discussion	<b>Discussion:</b> The Detailed State generally varies between components. The Detailed State machine may be orthogonal to the Top-Level State machine.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0002 Common Summary States

## 2.423 [LVV-6993] CPT-OCS-INT-ICD-0010-V-06: State-based Behavior\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6993	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0010
Requirement Description	<b>Specification:</b> For any component that is, at least in part, a reactive (state-based) system, the interface shall define the state-based behaviors of the finite state machine. More formally, the interface shall include a state machine definition as part of the interface definition.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0006 Interface Elements

## 2.424 [LVV-6994] CPT-OCS-INT-ICD-0010-V-07: State-based Behavior\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-6994	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0010
Requirement Description	<b>Specification:</b> For any component that is, at least in part, a reactive (state-based) system, the interface shall define the state-based behaviors of the finite state machine. More formally, the interface shall include a state machine definition as part of the interface definition.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0006 Interface Elements

## 2.425 [LVV-6999] CPT-OCS-INT-ICD-0012-V-06: Unique Names for States\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-6999	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0012
Requirement Description	<b>Specification:</b> The triggers and states shall have names that are unique within the component.
Requirement Discussion	<b>Discussion:</b> Commonality of design, including names, between components is desirable.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0009 State Machine Description

## 2.426 [LVV-7000] CPT-OCS-INT-ICD-0012-V-07: Unique Names for States\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7000	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0012
Requirement Description	<b>Specification:</b> The triggers and states shall have names that are unique within the component.
Requirement Discussion	<b>Discussion:</b> Commonality of design, including names, between components is desirable.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0009 State Machine Description

**2.427 [LVV-7005] CPT-OCS-INT-ICD-0004-V-06: Detailed State Publishing\_DM\_6**

Jira Link	Assignee	Status	Test Cases
LVV-7005	Leanne Guy	Not Covered	

**Verification Element Description:**

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0004
Requirement Description	<b>Specification:</b> The component state machine definition shall publish its leaf state ("Detailed State") upon start-up and when this value changes.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0007 Publish State Information



## 2.428 [LVV-7006] CPT-OCS-INT-ICD-0004-V-07: Detailed State Publishing\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7006	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0004
Requirement Description	<b>Specification:</b> The component state machine definition shall publish its leaf state ("Detailed State") upon start-up and when this value changes.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0007 Publish State Information

**2.429 [LVV-7011] CPT-OCS-INT-ICD-0007-V-06: Publish State Information\_DM\_6**

Jira Link	Assignee	Status	Test Cases
LVV-7011	Leanne Guy	Not Covered	

**Verification Element Description:**

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0007
Requirement Description	<b>Specification:</b> Each component shall publish its current State (in terms of a unique operational state) information.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0008 Real-time Information

## 2.430 [LVV-7012] CPT-OCS-INT-ICD-0007-V-07: Publish State Information\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7012	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0007
Requirement Description	<b>Specification:</b> Each component shall publish its current State (in terms of a unique operational state) information.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0008 Real-time Information

## 2.431 [LVV-7017] CPT-OCS-INT-ICD-0011-V-06: Summary State Publishing\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7017	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0011
Requirement Description	<b>Specification:</b> Every interactive component shall publish its Summary State (major branch on the state hierarchy tree) upon start-up and when this value changes.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0007 Publish State Information

## 2.432 [LVV-7018] CPT-OCS-INT-ICD-0011-V-07: Summary State Publishing\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7018	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0011
Requirement Description	<b>Specification:</b> Every interactive component shall publish its Summary State (major branch on the state hierarchy tree) upon start-up and when this value changes.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0007 Publish State Information

## 2.433 [LVV-7023] CPT-OCS-INT-ICD-0049-V-06: Apply settings\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7023	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0049
Requirement Description	<b>Specification:</b> The component shall use a set of settings on demand.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0071 Manage settings

## 2.434 [LVV-7024] CPT-OCS-INT-ICD-0049-V-07: Apply settings\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7024	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0049
Requirement Description	<b>Specification:</b> The component shall use a set of settings on demand.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0071 Manage settings

## 2.435 [LVV-7029] CPT-OCS-INT-ICD-0071-V-06: Manage settings\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7029	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0071
Requirement Description	<b>Specification:</b> The component shall manage settings.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	



## 2.436 [LVV-7030] CPT-OCS-INT-ICD-0071-V-07: Manage settings\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7030	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0071
Requirement Description	<b>Specification:</b> The component shall manage settings.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	

## 2.437 [LVV-7035] CPT-OCS-INT-ICD-0046-V-06: Notify that settings differ from start values\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7035	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0046
Requirement Description	<b>Specification:</b> The component shall publish an event once one or more settings differ from the settings applied on the Start transition.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0048 Support limited apply settings while enabled

## 2.438 [LVV-7036] CPT-OCS-INT-ICD-0046-V-07: Notify that settings differ from start values\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7036	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0046
Requirement Description	<b>Specification:</b> The component shall publish an event once one or more settings differ from the settings applied on the Start transition.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0048 Support limited apply settings while enabled

## 2.439 [LVV-7041] CPT-OCS-INT-ICD-0045-V-06: Record applied settings\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7041	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0045
Requirement Description	<b>Specification:</b> When a component applies a set of settings, the component shall record this event, along with the applied settings set.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	

## 2.440 [LVV-7042] CPT-OCS-INT-ICD-0045-V-07: Record applied settings\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7042	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0045
Requirement Description	<b>Specification:</b> When a component applies a set of settings, the component shall record this event, along with the applied settings set.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	

## 2.441 [LVV-7047] CPT-OCS-INT-ICD-0048-V-06: Support limited apply settings while enabled\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7047	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0048
Requirement Description	<b>Specification:</b> The component shall support applying a subset of editable settings while in Enabled State.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0049 Apply settings CPT-OCS-INT-ICD-0060 Support partial editing while enabled

## 2.442 [LVV-7048] CPT-OCS-INT-ICD-0048-V-07: Support limited apply settings while enabled\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7048	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0048
Requirement Description	<b>Specification:</b> The component shall support applying a subset of editable settings while in Enabled State.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0049 Apply settings CPT-OCS-INT-ICD-0060 Support partial editing while enabled

## 2.443 [LVV-7053] CPT-OCS-INT-ICD-0043-V-06: Publish large file object settings reference to SAL topic\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7053	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0043
Requirement Description	<b>Specification:</b> For settings captured in Large File Objects, the component shall publish the data using the Large File Object mechanism in LTS-210 ("Engineering and Facility Database Design Document").
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0044 Publish settings to SAL topic



## 2.444 [LVV-7054] CPT-OCS-INT-ICD-0043-V-07: Publish large file object settings reference to SAL topic\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7054	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0043
Requirement Description	<b>Specification:</b> For settings captured in Large File Objects, the component shall publish the data using the Large File Object mechanism in LTS-210 ("Engineering and Facility Database Design Document").
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0044 Publish settings to SAL topic

## 2.445 [LVV-7059] CPT-OCS-INT-ICD-0044-V-06: Publish settings to SAL topic\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7059	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0044
Requirement Description	<b>Specification:</b> The component shall include the full set of values in the event topic.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0045 Record applied settings

## 2.446 [LVV-7060] CPT-OCS-INT-ICD-0044-V-07: Publish settings to SAL topic\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7060	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0044
Requirement Description	<b>Specification:</b> The component shall include the full set of values in the event topic.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0045 Record applied settings

## 2.447 [LVV-7065] CPT-OCS-INT-ICD-0047-V-06: Reset setting difference\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7065	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0047
Requirement Description	<b>Specification:</b> On the Start transition, the component shall publish an event marking that the settings are identical to those on the Start transition.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0046 Notify that settings differ from start values

## 2.448 [LVV-7066] CPT-OCS-INT-ICD-0047-V-07: Reset setting difference\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7066	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0047
Requirement Description	<b>Specification:</b> On the Start transition, the component shall publish an event marking that the settings are identical to those on the Start transition.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0046 Notify that settings differ from start values

## 2.449 [LVV-7071] CPT-OCS-INT-ICD-0061-V-06: Edit editable settings\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7071	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0061
Requirement Description	<b>Specification:</b> A user shall be able to edit editable settings.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0071 Manage settings

## 2.450 [LVV-7072] CPT-OCS-INT-ICD-0061-V-07: Edit editable settings\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7072	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0061
Requirement Description	<b>Specification:</b> A user shall be able to edit editable settings.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0071 Manage settings

## 2.451 [LVV-7077] CPT-OCS-INT-ICD-0057-V-06: Editor user interface\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7077	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details							
Requirement ID	CPT-OCS-INT-ICD-0057						
Requirement Description	<b>Specification:</b> The component shall provide a user interface to support editing editable settings.						
Requirement Discussion	<b>Discussion:</b>						
Requirement Priority							
Upper Level Requirement	<table border="0"> <tr> <td>CPT-OCS-INT-ICD-0061</td> <td>Edit editable settings</td> </tr> <tr> <td>CPT-OCS-INT-ICD-0058</td> <td>Support editing settings in quiescent states</td> </tr> <tr> <td>CPT-OCS-INT-ICD-0060</td> <td>Support partial editing while enabled</td> </tr> </table>	CPT-OCS-INT-ICD-0061	Edit editable settings	CPT-OCS-INT-ICD-0058	Support editing settings in quiescent states	CPT-OCS-INT-ICD-0060	Support partial editing while enabled
CPT-OCS-INT-ICD-0061	Edit editable settings						
CPT-OCS-INT-ICD-0058	Support editing settings in quiescent states						
CPT-OCS-INT-ICD-0060	Support partial editing while enabled						



## 2.452 [LVV-7078] CPT-OCS-INT-ICD-0057-V-07: Editor user interface\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7078	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details							
Requirement ID	CPT-OCS-INT-ICD-0057						
Requirement Description	<b>Specification:</b> The component shall provide a user interface to support editing editable settings.						
Requirement Discussion	<b>Discussion:</b>						
Requirement Priority							
Upper Level Requirement	<table border="0"> <tr> <td>CPT-OCS-INT-ICD-0061</td> <td>Edit editable settings</td> </tr> <tr> <td>CPT-OCS-INT-ICD-0058</td> <td>Support editing settings in quiescent states</td> </tr> <tr> <td>CPT-OCS-INT-ICD-0060</td> <td>Support partial editing while enabled</td> </tr> </table>	CPT-OCS-INT-ICD-0061	Edit editable settings	CPT-OCS-INT-ICD-0058	Support editing settings in quiescent states	CPT-OCS-INT-ICD-0060	Support partial editing while enabled
CPT-OCS-INT-ICD-0061	Edit editable settings						
CPT-OCS-INT-ICD-0058	Support editing settings in quiescent states						
CPT-OCS-INT-ICD-0060	Support partial editing while enabled						

## 2.453 [LVV-7083] CPT-OCS-INT-ICD-0052-V-06: Local store\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7083	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0052
Requirement Description	<b>Specification:</b> Each component shall maintain its own store for setting values.
Requirement Priority	
Upper Level Requirement	

## 2.454 [LVV-7084] CPT-OCS-INT-ICD-0052-V-07: Local store\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7084	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0052
Requirement Description	<b>Specification:</b> Each component shall maintain its own store for setting values.
Requirement Priority	
Upper Level Requirement	

## 2.455 [LVV-7089] CPT-OCS-INT-ICD-0050-V-06: Modify setting values\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7089	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0050
Requirement Description	<b>Specification:</b> The component shall provide a mechanism for a user to change the values of editable settings.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	

## 2.456 [LVV-7090] CPT-OCS-INT-ICD-0050-V-07: Modify setting values\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7090	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0050
Requirement Description	<b>Specification:</b> The component shall provide a mechanism for a user to change the values of editable settings.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	

## 2.457 [LVV-7095] CPT-OCS-INT-ICD-0053-V-06: Publish store list on change\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7095	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0053
Requirement Description	<b>Specification:</b> While the component is connected to SAL/DDS, the component shall publish a list of recommended setting versions when the versions in the store change.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0054 Publish store list on start-up

## 2.458 [LVV-7096] CPT-OCS-INT-ICD-0053-V-07: Publish store list on change\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7096	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0053
Requirement Description	<b>Specification:</b> While the component is connected to SAL/DDS, the component shall publish a list of recommended setting versions when the versions in the store change.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0054 Publish store list on start-up

## 2.459 [LVV-7101] CPT-OCS-INT-ICD-0054-V-06: Publish store list on start-up\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7101	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0054
Requirement Description	<b>Specification:</b> The component shall publish a list of recommended versions of setting values upon connecting to SAL/DDS.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0055 Publish version list in store



**2.460 [LVV-7102] CPT-OCS-INT-ICD-0054-V-07: Publish store list on start-up\_DM\_7**

Jira Link	Assignee	Status	Test Cases
LVV-7102	Leanne Guy	Not Covered	

**Verification Element Description:**

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0054
Requirement Description	<b>Specification:</b> The component shall publish a list of recommended versions of setting values upon connecting to SAL/DDS.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0055 Publish version list in store

**2.461 [LVV-7107] CPT-OCS-INT-ICD-0055-V-06: Publish version list in store\_DM\_6**

Jira Link	Assignee	Status	Test Cases
LVV-7107	Leanne Guy	Not Covered	

**Verification Element Description:**

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0055
Requirement Description	<b>Specification:</b> The component shall publish a list of recommended versions of setting sets.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0052 Local store

**2.462 [LVV-7108] CPT-OCS-INT-ICD-0055-V-07: Publish version list in store\_DM\_7**

Jira Link	Assignee	Status	Test Cases
LVV-7108	Leanne Guy	Not Covered	

**Verification Element Description:**

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0055
Requirement Description	<b>Specification:</b> The component shall publish a list of recommended versions of setting sets.
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0052 Local store

## 2.463 [LVV-7113] CPT-OCS-INT-ICD-0051-V-06: Store settings\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7113	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0051
Requirement Description	<b>Specification:</b> The component shall store setting values.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0050 Modify setting values

## 2.464 [LVV-7114] CPT-OCS-INT-ICD-0051-V-07: Store settings\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7114	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0051
Requirement Description	<b>Specification:</b> The component shall store setting values.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0050 Modify setting values

## 2.465 [LVV-7119] CPT-OCS-INT-ICD-0073-V-06: Support editing labels\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7119	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0073
Requirement Description	<b>Specification:</b> The component shall support editing of settings labels (rather than fixing these in a release).
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0067 Recall using label

## 2.466 [LVV-7120] CPT-OCS-INT-ICD-0073-V-07: Support editing labels\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7120	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0073
Requirement Description	<b>Specification:</b> The component shall support editing of settings labels (rather than fixing these in a release).
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0067 Recall using label

## 2.467 [LVV-7125] CPT-OCS-INT-ICD-0058-V-06: Support editing settings in quiescent states\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7125	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0058
Requirement Description	<b>Specification:</b> The component shall support editing all editable settings while in Standby or Offline States.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0061 Edit editable settings



## 2.468 [LVV-7126] CPT-OCS-INT-ICD-0058-V-07: Support editing settings in quiescent states\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7126	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0058
Requirement Description	<b>Specification:</b> The component shall support editing all editable settings while in Standby or Offline States.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0061 Edit editable settings

## 2.469 [LVV-7131] CPT-OCS-INT-ICD-0059-V-06: Support partial editing by external client\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7131	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0059
Requirement Description	<b>Specification:</b> The component shall support editing a subset of editable settings while in EnabledState or DisabledState via commands from an external client.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0060 Support partial editing while enabled

## 2.470 [LVV-7132] CPT-OCS-INT-ICD-0059-V-07: Support partial editing by external client\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7132	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0059
Requirement Description	<b>Specification:</b> The component shall support editing a subset of editable settings while in EnabledState or DisabledState via commands from an external client.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0060 Support partial editing while enabled

## 2.471 [LVV-7137] CPT-OCS-INT-ICD-0060-V-06: Support partial editing while enabled\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7137	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0060
Requirement Description	<b>Specification:</b> The component shall support editing a subset of editable settings while in Enabled State.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0061 Edit editable settings

## 2.472 [LVV-7138] CPT-OCS-INT-ICD-0060-V-07: Support partial editing while enabled\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7138	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0060
Requirement Description	<b>Specification:</b> The component shall support editing a subset of editable settings while in Enabled State.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0061 Edit editable settings

## 2.473 [LVV-7143] CPT-OCS-INT-ICD-0056-V-06: Validate editable settings\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7143	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0056
Requirement Description	<b>Specification:</b> The component shall validate editable setting values.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0050 Modify setting values

## 2.474 [LVV-7144] CPT-OCS-INT-ICD-0056-V-07: Validate editable settings\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7144	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0056
Requirement Description	<b>Specification:</b> The component shall validate editable setting values.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0050 Modify setting values

## 2.475 [LVV-7149] CPT-OCS-INT-ICD-0063-V-06: Publish labels and version mapping\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7149	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0063
Requirement Description	<b>Specification:</b> The component shall publish a mapping of the presently active labels and the setting set versions associated with each of these.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0067 Recall using label



## 2.476 [LVV-7150] CPT-OCS-INT-ICD-0063-V-07: Publish labels and version mapping\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7150	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0063
Requirement Description	<b>Specification:</b> The component shall publish a mapping of the presently active labels and the setting set versions associated with each of these.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0067 Recall using label

## 2.477 [LVV-7155] CPT-OCS-INT-ICD-0064-V-06: Publish mapping on change\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7155	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0064
Requirement Description	<b>Specification:</b> While the component is connected to SAL/DDS, the component shall publish a mapping of the presently active labels and the setting set versions associated with each of these when the mapping changes.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0065 Publish mapping on start-up

## 2.478 [LVV-7156] CPT-OCS-INT-ICD-0064-V-07: Publish mapping on change\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7156	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0064
Requirement Description	<b>Specification:</b> While the component is connected to SAL/DDS, the component shall publish a mapping of the presently active labels and the setting set versions associated with each of these when the mapping changes.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0065 Publish mapping on start-up

## 2.479 [LVV-7161] CPT-OCS-INT-ICD-0065-V-06: Publish mapping on start-up\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7161	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0065
Requirement Description	<b>Specification:</b> The component shall publish a mapping of the presently active labels and the setting set versions associated with each of these upon connecting to SAL/DDS.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0063 Publish labels and version mapping

## 2.480 [LVV-7162] CPT-OCS-INT-ICD-0065-V-07: Publish mapping on start-up\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7162	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0065
Requirement Description	<b>Specification:</b> The component shall publish a mapping of the presently active labels and the setting set versions associated with each of these upon connecting to SAL/DDS.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0063 Publish labels and version mapping

**2.481 [LVV-7167] CPT-OCS-INT-ICD-0066-V-06: Recall preset editable settings\_DM\_6**

Jira Link	Assignee	Status	Test Cases
LVV-7167	Leanne Guy	Not Covered	

**Verification Element Description:**

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0066
Requirement Description	<b>Specification:</b> The component shall recall preset editable settings values on demand.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0069 Recall values

## 2.482 [LVV-7168] CPT-OCS-INT-ICD-0066-V-07: Recall preset editable settings\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7168	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0066
Requirement Description	<b>Specification:</b> The component shall recall preset editable settings values on demand.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0069 Recall values

## 2.483 [LVV-7173] CPT-OCS-INT-ICD-0062-V-06: Recall settings\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7173	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details					
Requirement ID	CPT-OCS-INT-ICD-0062				
Requirement Description	<b>Specification:</b> The component shall recall stored setting values on demand.				
Requirement Discussion	<b>Discussion:</b>				
Requirement Priority					
Upper Level Requirement	<table border="0"> <tr> <td>CPT-OCS-INT-ICD-0061</td> <td>Edit editable settings</td> </tr> <tr> <td>CPT-OCS-INT-ICD-0049</td> <td>Apply settings</td> </tr> </table>	CPT-OCS-INT-ICD-0061	Edit editable settings	CPT-OCS-INT-ICD-0049	Apply settings
CPT-OCS-INT-ICD-0061	Edit editable settings				
CPT-OCS-INT-ICD-0049	Apply settings				



**2.484 [LVV-7174] CPT-OCS-INT-ICD-0062-V-07: Recall settings\_DM\_7**

Jira Link	Assignee	Status	Test Cases
LVV-7174	Leanne Guy	Not Covered	

**Verification Element Description:**

Undefined

Requirement Details					
Requirement ID	CPT-OCS-INT-ICD-0062				
Requirement Description	<b>Specification:</b> The component shall recall stored setting values on demand.				
Requirement Discussion	<b>Discussion:</b>				
Requirement Priority					
Upper Level Requirement	<table> <tr> <td>CPT-OCS-INT-ICD-0061</td> <td>Edit editable settings</td> </tr> <tr> <td>CPT-OCS-INT-ICD-0049</td> <td>Apply settings</td> </tr> </table>	CPT-OCS-INT-ICD-0061	Edit editable settings	CPT-OCS-INT-ICD-0049	Apply settings
CPT-OCS-INT-ICD-0061	Edit editable settings				
CPT-OCS-INT-ICD-0049	Apply settings				

## 2.485 [LVV-7179] CPT-OCS-INT-ICD-0067-V-06: Recall using label\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7179	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0067
Requirement Description	<b>Specification:</b> The component shall support recalling stored setting values associated with a label. Note that the specific setting values associated with a particular label may vary over time.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0069 Recall values

## 2.486 [LVV-7180] CPT-OCS-INT-ICD-0067-V-07: Recall using label\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7180	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0067
Requirement Description	<b>Specification:</b> The component shall support recalling stored setting values associated with a label. Note that the specific setting values associated with a particular label may vary over time.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0069 Recall values

## 2.487 [LVV-7185] CPT-OCS-INT-ICD-0068-V-06: Recall using version identifier\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7185	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0068
Requirement Description	<b>Specification:</b> The component shall recall a specific version of settings values when provided a unique identifier for the version.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0069 Recall values

**2.488 [LVV-7186] CPT-OCS-INT-ICD-0068-V-07: Recall using version identifier\_DM\_7**

Jira Link	Assignee	Status	Test Cases
LVV-7186	Leanne Guy	Not Covered	

**Verification Element Description:**

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0068
Requirement Description	<b>Specification:</b> The component shall recall a specific version of settings values when provided a unique identifier for the version.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0069 Recall values

## 2.489 [LVV-7191] CPT-OCS-INT-ICD-0069-V-06: Recall values\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7191	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0069
Requirement Description	<b>Specification:</b> The component shall recall stored settings values on demand.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	

## 2.490 [LVV-7192] CPT-OCS-INT-ICD-0069-V-07: Recall values\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7192	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0069
Requirement Description	<b>Specification:</b> The component shall recall stored settings values on demand.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	

## 2.491 [LVV-7197] CPT-OCS-INT-ICD-0070-V-06: Support recall by external client\_DM\_6

Jira Link	Assignee	Status	Test Cases
LVV-7197	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0070
Requirement Description	<b>Specification:</b> The system shall support recall and apply functionality via a command from an external client.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0062 Recall settings



## 2.492 [LVV-7198] CPT-OCS-INT-ICD-0070-V-07: Support recall by external client\_DM\_7

Jira Link	Assignee	Status	Test Cases
LVV-7198	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CPT-OCS-INT-ICD-0070
Requirement Description	<b>Specification:</b> The system shall support recall and apply functionality via a command from an external client.
Requirement Discussion	<b>Discussion:</b>
Requirement Priority	
Upper Level Requirement	CPT-OCS-INT-ICD-0062 Recall settings

## 2.493 [LVV-9637] DMS-REQ-0372-V-01: Archiving Camera Test Data

Jira Link	Assignee	Status	Test Cases
LVV-9637	Leanne Guy	Not Covered	LVV-T1264

### Verification Element Description:

Demonstrate that a subset of camera test data is available via Butler repos.

Requirement Details	
Requirement ID	DMS-REQ-0372
Requirement Description	<b>Specification:</b> The DMS shall be able to archive a designated subset of Camera test data and make it available in an environment matching the data backbone interfaces.
Requirement Discussion	<b>Discussion:</b> This requirement describes a capability needed primarily in construction.
Requirement Priority	1a
Upper Level Requirement	

### 2.493.1 Test Cases Summary

LVV-T1264	Verify implementation of archiving camera test data			
Owner	Status	Version	Critical Event	Verification Type
Robert Gruendl	Defined	1	false	Test

#### Objective:

Verify that a subset of camera test data has been ingested into Butler repos and is available through standard data access tools.

## 2.494 [LVV-9740] DMS-REQ-0004-V-02: Latency of reporting optical transients

Jira Link	Assignee	Status	Test Cases
LVV-9740	Leanne Guy	Not Covered	LVV-T1276

### Verification Element Description:

Verify that optical transients are reported within  $\hat{\text{OTT1}} = \mathbf{1[\text{minute}]}$  of readout of the last visit image. \*\*

Associated element (LVV-175) satisfies the maximum time allotted for public release of L1 Data Products.

Associated element (LVV-9803) satisfies the availability of Solar System Object orbits.

### Requirement Details

Requirement ID	DMS-REQ-0004
Requirement Description	<p><b>Specification:</b> With the exception of alerts and Solar System Objects, all Level 1 Data Products shall be made public within time <b>L1PublicT</b> of the acquisition of the raw image data.</p> <p>LSST shall not release image or catalog data resulting from a visit, except for the content of the public alert stream, sooner than time <b>L1PublicTMin</b> following the acquisition of the raw image data from that visit.</p> <p>For visits resulting in fewer than <b>nAlertVisitPeak</b>, LSST shall be capable of supporting the distribution of at least <b>OTR1</b> per cent of alerts via the LSST alert distribution system within time <b>OTT1</b> from the conclusion of the camera's readout of the raw exposures used to generate each alert.</p> <p>Solar System Object orbits will, on average, be calculated before the following night's observing finishes and the results shall be made available within time <b>L1PublicT</b> of those calculations being completed.</p>
Requirement Parameters	<p><b>[OTR1 = 98[percent]]</b> Fraction of detectable alerts for which an alert is actually transmitted within latency OTT1 (see LSR-REQ-0101), <b>OTT1 = 1[minute]</b> The latency of reporting optical transients following the completion of readout of the last image of a visit, <b>nAlertVisitPeak = 40000[integer]</b> The instantaneous peak number of alerts per standard visit., <b>L1PublicTMin = 6[hour]</b> Time images and other products (except alerts) will be embargoed before release to the consortium (or the public), <b>L1PublicT = 24[hour]</b> Maximum time from the acquisition of science data to the release of associated Level 1 Data Products (except alerts)]</p>

Requirement Discussion	<b>Discussion:</b> Because of the processing flow of SSOBJECT orbit determination, meeting the base <b>L1PublicT</b> -after-data-acquisition requirement would be far more challenging than for the other L1 Data Products, but the system throughput has to be good enough such that a back log can not build up.	
Requirement Priority	1b	
Upper Level Requirement	DMS-REQ-0003	Create and Maintain Science Data Archive
	OSS-REQ-0127	Level 1 Data Product Availability

## 2.494.1 Test Cases Summary

LVV-T1276	Verify implementation of latency of reporting optical transients			
<b>Owner</b>	<b>Status</b>	<b>Version</b>	<b>Critical Event</b>	<b>Verification Type</b>
Eric Bellm	Draft	1	false	Test

### Objective:

Verify that alerts are generated for optical transients within **OTT1 = 1 minute** of the completion of the readout of the last image.

## 2.495 [LVV-9742] DMS-REQ-0271-V-02: Max nearby stars associated with DIA-Source

Jira Link	Assignee	Status	Test Cases
LVV-9742	Leanne Guy	Not Covered	

### Verification Element Description:

Verify that no more than **diaNearbyObjMaxStar = 3** stars are associated with each DIA-Source.

Associated element (LVV-9743) satisfies the radius within which an Object is considered coincident with a DIASource.

Associated element (LVV-102) satisfies the maximum number of galaxies that can be associated with a DIASource.

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Requirement Details	
Requirement ID	DMS-REQ-0271
Requirement Description	<b>Specification:</b> The DMS shall construct a catalog of all astrophysical objects identified through difference image analysis (DIAObjects). The DIAObject entries shall include metadata attributes including at least: a unique identifier; the identifiers of the <b>diaNearbyObjMaxStar</b> nearest stars and <b>diaNearbyObjMaxGalaxy</b> nearest galaxies in the Object catalog lying within <b>diaNearbyObjRadius</b> , the probability that the DIAObject is the same as the nearby Object; and a set of DIAObject properties.
Requirement Parameters	[ <b>diaNearbyObjMaxGalaxy = 3[integer]</b> Maximum number of nearby galaxies that can be associated with a DIASource., <b>diaNearbyObjRadius = 60[arcsecond]</b> Radius within which an Object is considered to be near, and possibly coincident with, the DIASource., <b>diaNearbyObjMaxStar = 3[integer]</b> Maximum number of stars that can be associated with a DIASource.]
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0130 Catalogs (Level 1)

## 2.496 [LVV-9744] DMS-REQ-0344-V-02: Latency of reporting optical transients

Jira Link	Assignee	Status	Test Cases
LVV-9744	Leanne Guy	Not Covered	LVV-T1866

### Verification Element Description:

Verify that optical transients (Level 1 data products) are reported within OTT1 = 1 minute of last image readout.

Associated element (LVV-175) satisfies the maximum time allotted for public release of L1 Data Products.

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Requirement Details	
Requirement ID	DMS-REQ-0344
Requirement Description	<b>Specification:</b> The publishing of Level 1 data products from Special Programs shall be subject to the same performance requirements of the standard Level 1 system. In particular <b>L1PublicT</b> and <b>OTT1</b> .
Requirement Parameters	<b>[OTT1 = 1[minute]</b> The latency of reporting optical transients following the completion of readout of the last image of a visit, <b>L1PublicT = 24[hour]</b> Maximum time from the acquisition of science data to the release of associated Level 1 Data Products (except alerts)]
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0392 Data Products Handling for Special Programs

### 2.496.1 Test Cases Summary

LVV-T1866	Verify latency of reporting optical transients from Special Programs			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

Verify that optical transients (Level 1 data products) are reported within OTT1 = 1 minute of last image readout for Special Programs.

## 2.497 [LVV-9748] DMS-REQ-0343-V-02: Number of simultaneous users

Jira Link	Assignee	Status	Test Cases
LVV-9748	Leanne Guy	Not Covered	LVV-T1252

### Verification Element Description:

Verify that the LSST alert filtering system supports at least 100 simultaneous users.

Additional element (LVV-174) satisfies the constraint on the number of alerts received per user.

Requirement Details	
Requirement ID	DMS-REQ-0343
Requirement Description	<b>Specification:</b> The LSST alert filtering service shall support <b>numBrokerUsers</b> simultaneous users with each user allocated a bandwidth capable of receiving the equivalent of <b>numBrokerAlerts</b> alerts per visit.
Requirement Parameters	[ <b>numBrokerUsers</b> = 100[integer] Supported number of simultaneous users connected to the LSST alert filtering system., <b>numBrokerAlerts</b> = 20[integer] Number of full-sized alerts that can be received per visit per user.]
Requirement Discussion	<b>Discussion:</b> The constraint on number of alerts is specified for the full VOEvent alert content, but could also be satisfied by all alerts being received with minimal alert content.
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0193 Alerts per Visit OSS-REQ-0184 Transient Alert Publication

### 2.497.1 Test Cases Summary

LVV-T1252	Verify number of simultaneous alert filter users			
Owner	Status	Version	Critical Event	Verification Type
Eric Bellm	Defined	1	false	Test

#### Objective:

Verify that the DMS alert filter service supports **numBrokerUsers** = 100 simultaneous brokers.

## 2.498 [LVV-9749] DMS-REQ-0341-V-02: Min number of precovery service connections

Jira Link	Assignee	Status	Test Cases
LVV-9749	Leanne Guy	Not Covered	

### Verification Element Description:

Submit multiple precovery requests and verify that at least the minimum number of connections is supported.

Associated element (LVV-172) satisfies the maximum elapsed time for availability of precovery service results.

Requirement Details	
Requirement ID	DMS-REQ-0341
Requirement Description	<b>Specification:</b> A "precovery service" shall be available to end-users to request precovery for a provided sky location across all previous visits, making the results available within <b>precoveryServiceElapsed</b> hours of the request and supporting at least <b>precoveryServicePeakUsers</b> submissions per hour.
Requirement Parameters	[ <b>precoveryServiceElapsed</b> = 24[hour] Maximum time between submitting a request and receiving the results., <b>precoveryServicePeakUsers</b> = 10[integer] Minimum number of precovery service connections to be supported per hour.]
Requirement Discussion	<b>Discussion:</b> This is forced photometry on difference images from each visit. This will include a web interface and scriptable APIs.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0126 Level 1 Data Products



## 2.499 [LVV-9750] DMS-REQ-0364-V-02: Length of survey

Jira Link	Assignee	Status	Test Cases
LVV-9750	Leanne Guy	Not Covered	

### Verification Element Description:

The survey length shall be **surveyYears = 10** years.

Associated element (LVV-190) satisfies the requirement on number of data releases over the survey.

Requirement Details	
Requirement ID	DMS-REQ-0364
Requirement Description	<b>Specification:</b> The data access services shall be designed to permit, and their software implementation shall support, the service of at least <b>nDRTot</b> Data Releases accumulated over the (find the actual survey-length parameter) <b>surveyYears</b> -year planned survey.
Requirement Parameters	[ <b>nDRTot = 11[integer]</b> Total number of data releases over the survey., <b>surveyYears = 10[integer]</b> Length of the survey in years]
Requirement Discussion	<b>Discussion:</b> It is an operations-era decision to choose the actual number of releases to be served, and to allocate hardware resources accordingly. The requirement is that the system delivered at the close of the MREFC construction period be capable of handling ten years of releases if the operations project chooses to allocate adequate hardware resources.
Requirement Priority	3
Upper Level Requirement	OSS-REQ-0396 Data Access Services

## 2.500 [LVV-9784] DMS-REQ-0355-V-02: Min number of simultaneous Prompt Products query users

Jira Link	Assignee	Status	Test Cases
LVV-9784	Leanne Guy	Not Covered	

### Verification Element Description:

A minimum of **I1QueryUsers = 20** users must be able to simultaneously execute Prompt Products Database queries.

The associated element DMS-REQ-0355-V-01 (LVV-186) satisfies the additional constraint on the maximum time to return Prompt Products Database query results.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0355
Requirement Description	<b>Specification:</b> The live Prompt Products Database shall support at least <b>I1QueryUsers</b> simultaneous queries, assuming each query lasts no more than <b>I1QueryTime</b> .
Requirement Parameters	[ <b>I1QueryTime = 10[second]</b> Maximum time allowed for retrieving results of a query of the Prompt Products Database., <b>I1QueryUsers = 20[integer]</b> Minimum number of simultaneous users querying the Prompt Products Database.]
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

## 2.501 [LVV-9785] DMS-REQ-0356-V-02: Max size of low-volume query results

Jira Link	Assignee	Status	Test Cases
LVV-9785	Leanne Guy	Not Covered	

### Verification Element Description:

For a query to be defined as “low-volume,” the maximum size of its results must be no more than **IvMaxReturnedResults = 0.5 gigabytes**.

The associated element DMS-REQ-0356-V-01 (LVV-187) satisfies the additional constraint on the radius of low volume queries.

The associated element DMS-REQ-0356-V-03 (LVV-9786) satisfies the additional constraint on the number of simultaneous users.

The associated element DMS-REQ-0356-V-04 (LVV-9787) satisfies the additional constraint on the maximum time to return low volume query results.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0356
Requirement Description	<b>Specification:</b> Low volume queries, queries that are spatially restricted to a circle of radius <b>IvSkyRadius</b> and return at most <b>IvMaxReturnedResults</b> of data, shall respond within <b>IvQueryTime</b> under a load of <b>IvQueryUsers</b> simultaneous queries.
Requirement Parameters	<b>[IvSkyRadius = 60[arcsecond]]</b> Radius to be used for a low-volume query on the sky., <b>IvMaxReturnedResults = 0.5[gigabyte]</b> Maximum size of a results set for a query to be defined to be “low-volume”, <b>IvQueryUsers = 100[integer]</b> Minimum number of simultaneous users performing low volume queries., <b>IvQueryTime = 10[second]</b> Maximum time allowed for retrieving results of a low-volume query.]
Requirement Discussion	<b>Discussion:</b> We are evaluating whether the latency requirements of low-volume queries can also be met for certain categories of temporal queries or queries on indexed attributes which limit the scope of per-row operations in the query (such as non-indexed WHERE evaluations) to a comparable fraction of the total dataset. The low-volume query requirements also apply to queries selecting data by the primary key of any data product table, or by the associated Object-like primary key for the ForcedSource and DIASource tables.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

## 2.502 [LVV-9786] DMS-REQ-0356-V-03: Min number of simultaneous low-volume query users

Jira Link	Assignee	Status	Test Cases
LVV-9786	Leanne Guy	Not Covered	LVV-T1089 LVV-T1090

### Verification Element Description:

A minimum of **lvQueryUsers = 100** users must be able to simultaneously execute low volume queries.

The associated element DMS-REQ-0356-V-01 (LVV-187) satisfies the additional constraint on the radius of low volume queries.

The associated element DMS-REQ-0356-V-02 (LVV-9785) satisfies the additional constraint on the maximum size of low volume queries.

The associated element DMS-REQ-0356-V-04 (LVV-9787) satisfies the additional constraint on the maximum time to return low volume query results.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0356
Requirement Description	<b>Specification:</b> Low volume queries, queries that are spatially restricted to a circle of radius <b>lvSkyRadius</b> and return at most <b>lvMaxReturnedResults</b> of data, shall respond within <b>lvQueryTime</b> under a load of <b>lvQueryUsers</b> simultaneous queries.
Requirement Parameters	[ <b>lvSkyRadius = 60[arcsecond]</b> Radius to be used for a low-volume query on the sky., <b>lvMaxReturnedResults = 0.5[gigabyte]</b> Maximum size of a results set for a query to be defined to be "low-volume", <b>lvQueryUsers = 100[integer]</b> Minimum number of simultaneous users performing low volume queries., <b>lvQueryTime = 10[second]</b> Maximum time allowed for retrieving results of a low-volume query.]
Requirement Discussion	<b>Discussion:</b> We are evaluating whether the latency requirements of low-volume queries can also be met for certain categories of temporal queries or queries on indexed attributes which limit the scope of per-row operations in the query (such as non-indexed WHERE evaluations) to a comparable fraction of the total dataset. The low-volume query requirements also apply to queries selecting data by the primary key of any data product table, or by the associated Object-like primary key for the ForcedSource and DIASource tables.
Requirement Priority	1b

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Upper Level Re-requirement    OSS-REQ-0181    Data Products Query and Download Infrastructure

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### 2.502.1 Test Cases Summary

LVV-T1089	Load Test			
Owner	Status	Version	Critical Event	Verification Type
Fritz Mueller	Approved	1	false	Test

**Objective:**

This test will check that Qserv is able to meet average query completion time targets per query class under a representative load of simultaneous high and low volume queries while running against an appropriately scaled test catalog.

LVV-T1090	Heavy Load Test			
Owner	Status	Version	Critical Event	Verification Type
Fritz Mueller	Approved	1	false	Test

**Objective:**

This test will check that Qserv is able to meet average query completion time targets per query class under a higher than average load of simultaneous high and low volume queries while running against an appropriately scaled test catalog.

## 2.503 [LVV-9787] DMS-REQ-0356-V-04: Max time to retrieve low-volume query results

Jira Link	Assignee	Status	Test Cases
			LVV-T1085
LVV-9787	Leanne Guy	Not Covered	LVV-T1089
			LVV-T1090

### Verification Element Description:

Low volume query results shall be retrievable in a maximum time of **lvQueryTime = 10 seconds**.

The associated element DMS-REQ-0356-V-01 (LVV-187) satisfies the additional constraint on the radius of low volume queries.

The associated element DMS-REQ-0356-V-02 (LVV-9785) satisfies the additional constraint on the maximum size of low volume queries.

The associated element DMS-REQ-0356-V-03 (LVV-9786) satisfies the additional constraint on the number of simultaneous users.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0356
Requirement Description	<b>Specification:</b> Low volume queries, queries that are spatially restricted to a circle of radius <b>lvSkyRadius</b> and return at most <b>lvMaxReturnedResults</b> of data, shall respond within <b>lvQueryTime</b> under a load of <b>lvQueryUsers</b> simultaneous queries.
Requirement Parameters	<b>[lvSkyRadius = 60[arcsecond]]</b> Radius to be used for a low-volume query on the sky., <b>lvMaxReturnedResults = 0.5[gigabyte]</b> Maximum size of a results set for a query to be defined to be "low-volume", <b>lvQueryUsers = 100[integer]</b> Minimum number of simultaneous users performing low volume queries., <b>lvQueryTime = 10[second]</b> Maximum time allowed for retrieving results of a low-volume query.]
Requirement Discussion	<b>Discussion:</b> We are evaluating whether the latency requirements of low-volume queries can also be met for certain categories of temporal queries or queries on indexed attributes which limit the scope of per-row operations in the query (such as non-indexed WHERE evaluations) to a comparable fraction of the total dataset. The low-volume query requirements also apply to queries selecting data by the primary key of any data product table, or by the associated Object-like primary key for the ForcedSource and DIASource tables.

Requirement Pri- 1b  
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Upper Level Re- OSS-REQ-0181 Data Products Query and Download Infrastructure  
quirement

### 2.503.1 Test Cases Summary

LVV-T1085	Short Queries Functional Test			
Owner	Status	Version	Critical Event	Verification Type
Fritz Mueller	Approved	1	false	Test

**Objective:**

The objective of this test is to ensure that the short queries are performing as expected and establish a timing baseline benchmark for these types of queries.

LVV-T1089	Load Test			
Owner	Status	Version	Critical Event	Verification Type
Fritz Mueller	Approved	1	false	Test

**Objective:**

This test will check that Qserv is able to meet average query completion time targets per query class under a representative load of simultaneous high and low volume queries while running against an appropriately scaled test catalog.

LVV-T1090	Heavy Load Test			
Owner	Status	Version	Critical Event	Verification Type
Fritz Mueller	Approved	1	false	Test

**Objective:**

This test will check that Qserv is able to meet average query completion time targets per query class under a higher than average load of simultaneous high and low volume queries while running against an appropriately scaled test catalog.

## 2.504 [LVV-9788] DMS-REQ-0358-V-02: Max time to retrieve DM EFD query results

Jira Link	Assignee	Status	Test Cases
LVV-9788	Leanne Guy	Not Covered	LVV-T1251

### Verification Element Description:

DM EFD query results shall be retrievable in a maximum time of **dmEfdQueryTime = 10 seconds**.

The associated element DMS-REQ-0358-V-01 (LVV-3400) satisfies the additional constraint on the number of simultaneous users.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0358
Requirement Description	<b>Specification:</b> The DM copy of the EFD shall support at least <b>dmEfdQueryUsers</b> simultaneous queries, assuming each query lasts no more than <b>dmEfdQueryTime</b> .
Requirement Parameters	[ <b>dmEfdQueryTime = 10[second]</b> Maximum time allowed for retrieving results of a DM EFD query., <b>dmEfdQueryUsers = 5[integer]</b> Minimum number of simultaneous users querying the DM EFD.]
Requirement Priority	1a
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

### 2.504.1 Test Cases Summary

LVV-T1251	Verify implementation of maximum time to retrieve DM EFD query results			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

### Objective:

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.

Draft

## 2.505 [LVV-9789] DMS-REQ-0373-V-02: Max time to retrieve large-area coadd image

Jira Link	Assignee	Status	Test Cases
LVV-9789	Leanne Guy	Not Covered	

### Verification Element Description:

Large-area coadds shall be retrievable in a maximum time of **fplaneRetrievalTime = 60 seconds**.

The associated element DMS-REQ-0373-V-01 (LVV-3397) satisfies the additional constraint on the number of simultaneous users.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0373
Requirement Description	<b>Specification:</b> A 10 square degree coadd, including mask and variance planes, shall be retrievable using the IVOA SODA protocol within <b>fplaneRetrievalTime</b> with <b>fplaneRetrievalUsers</b> simultaneous requests for distinct areas of the sky.
Requirement Parameters	[ <b>fplaneRetrievalTime = 60[second]</b> Maximum time allowed for retrieving a focal-plane sized coadd., <b>fplaneRetrievalUsers = 10[integer]</b> Number of simultaneous users retrieving a single large area coadd.]
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

## 2.506 [LVV-9790] DMS-REQ-0374-V-02: Min number of simultaneous PVI image users

Jira Link	Assignee	Status	Test Cases
LVV-9790	Leanne Guy	Not Covered	

### Verification Element Description:

At least **pviRetrievalUsers = 20** simultaneous users shall be able to retrieve single, distinct PVI images.

Associated element DMS-REQ-0374-V-01 (LVV-3395) satisfies the constraint on retrieval time for PVI images.

Associated element DMS-REQ-0374-V-03 (LVV-9791) satisfies the expected lifetime of Level-1 data products.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0374
Requirement Description	<b>Specification:</b> A Processed Visit Image of a single CCD shall be retrievable using the VO SIAv2 protocol within <b>pviRetrievalTime</b> with <b>pviRetrievalUsers</b> simultaneous requests for distinct single-CCD PVIs.
Requirement Parameters	<b>[pviRetrievalTime = 10[second]</b> Maximum time allowed for retrieving a PVI image of a single CCD from a single visit, <b>l1CacheLifetime = 30[day]</b> Lifetime in the cache of un-archived Level-1 data products., <b>pviRetrievalUsers = 20[integer]</b> Minimum number of simultaneous users retrieving a single PVI image.]
Requirement Discussion	<b>Discussion:</b> The performance targets for this requirement assume the PVIs are available as files on a file system. For example, this could be those files present in the <b>l1CacheLifetime</b> cache.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

## 2.507 [LVV-9791] DMS-REQ-0374-V-03: Uncached L1 data product lifetime - single-CCD

Jira Link	Assignee	Status	Test Cases
LVV-9791	Leanne Guy	Not Covered	

### Verification Element Description:

The PVIs must be available as files on the files system for **l1CacheLifetime = 30 days**.

Associated element DMS-REQ-0374-V-01 (LVV-3395) satisfies the constraint on retrieval time for PVI images.

Associated element DMS-REQ-0374-V-02 (LVV-9790) satisfies the additional constraint on the number of simultaneous users.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0374
Requirement Description	<b>Specification:</b> A Processed Visit Image of a single CCD shall be retrievable using the VO SIAv2 protocol within <b>pviRetrievalTime</b> with <b>pviRetrievalUsers</b> simultaneous requests for distinct single-CCD PVIs.
Requirement Parameters	<b>[pviRetrievalTime = 10[second]</b> Maximum time allowed for retrieving a PVI image of a single CCD from a single visit, <b>l1CacheLifetime = 30[day]</b> Lifetime in the cache of un-archived Level-1 data products., <b>pviRetrievalUsers = 20[integer]</b> Minimum number of simultaneous users retrieving a single PVI image.]
Requirement Discussion	<b>Discussion:</b> The performance targets for this requirement assume the PVIs are available as files on a file system. For example, this could be those files present in the <b>l1CacheLifetime</b> cache.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

## 2.508 [LVV-9792] DMS-REQ-0375-V-02: Min size of postage stamp cutout

Jira Link	Assignee	Status	Test Cases
LVV-9792	Leanne Guy	Not Covered	

### Verification Element Description:

Postage stamp cutouts from images must be at least **postageStampSize = 51 pixels** in size.

Associated element DMS-REQ-0375-V-01 (LVV-3398) satisfies the maximum retrieval time for postage stamp images.

Associated element DMS-REQ-0375-V-03 (LVV-9793) satisfies the expected lifetime of Level-1 data products.

The associated element DMS-REQ-0375-V-04 (LVV-9794) satisfies the additional constraint on the number of simultaneous users retrieving postage stamp images.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0375
Requirement Description	<b>Specification:</b> Postage stamp cutouts, of size <b>postageStampSize</b> square, of all observations of a single Object shall be retrievable within <b>postageStampRetrievalTime</b> , with <b>postageStampRetrievalUsers</b> simultaneous requests of distinct Objects.
Requirement Parameters	[ <b>postageStampRetrievalUsers = 10[integer]</b> Minimum number of simultaneous users retrieving a set of postage stamp images., <b>postageStampRetrievalTime = 10[second]</b> Maximum time allowed for retrieving a set of postage stamp images of a single Object., <b>postageStampSize = 51[pixel]</b> Minimum square size of a postage stamp cutout from an image., <b>l1CacheLifetime = 30[day]</b> Lifetime in the cache of un-archived Level-1 data products.]
Requirement Discussion	<b>Discussion:</b> The performance targets for this requirement assume the PVIS are available as files on a file system. For example, this could be those files present in the <b>l1CacheLifetime</b> cache.
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

## 2.509 [LVV-9793] DMS-REQ-0375-V-03: Uncached L1 data product lifetime - postage stamp

Jira Link	Assignee	Status	Test Cases
LVV-9793	Leanne Guy	Not Covered	

### Verification Element Description:

The PVIs must be available as files on the files system for **I1CacheLifetime = 30 days**.

Associated element DMS-REQ-0375-V-01 (LVV-3398) satisfies the maximum retrieval time for postage stamp images.

The associated element DMS-REQ-0375-V-02 (LVV-9792) satisfies the additional constraint on the minimum size of a postage stamp cutout.

The associated element DMS-REQ-0375-V-04 (LVV-9794) satisfies the additional constraint on the number of simultaneous users retrieving postage stamp images.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0375
Requirement Description	<b>Specification:</b> Postage stamp cutouts, of size <b>postageStampSize</b> square, of all observations of a single Object shall be retrievable within <b>postageStampRetrievalTime</b> , with <b>postageStampRetrievalUsers</b> simultaneous requests of distinct Objects.
Requirement Parameters	<b>[postageStampRetrievalUsers = 10[integer]</b> Minimum number of simultaneous users retrieving a set of postage stamp images., <b>postageStampRetrievalTime = 10[second]</b> Maximum time allowed for retrieving a set of postage stamp images of a single Object., <b>postageStampSize = 51[pixel]</b> Minimum square size of a postage stamp cutout from an image., <b>I1CacheLifetime = 30[day]</b> Lifetime in the cache of un-archived Level-1 data products.]
Requirement Discussion	<b>Discussion:</b> The performance targets for this requirement assume the PVIs are available as files on a file system. For example, this could be those files present in the <b>I1CacheLifetime</b> cache.
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

## 2.510 [LVV-9794] DMS-REQ-0375-V-04: Min number of simultaneous postage stamp users

Jira Link	Assignee	Status	Test Cases
LVV-9794	Leanne Guy	Not Covered	

### Verification Element Description:

A minimum of **postageStampRetrievalUsers = 10** users must be able to simultaneously retrieve distinct sets of postage stamp cutouts.

Associated element DMS-REQ-0375-V-01 (LVV-3398) satisfies the maximum retrieval time for postage stamp images.

The associated element DMS-REQ-0375-V-02 (LVV-9792) satisfies the additional constraint on the minimum size of a postage stamp cutout.

Associated element DMS-REQ-0375-V-03 (LVV-9793) satisfies the expected lifetime of Level-1 data products.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0375
Requirement Description	<b>Specification:</b> Postage stamp cutouts, of size <b>postageStampSize</b> square, of all observations of a single Object shall be retrievable within <b>postageStampRetrievalTime</b> , with <b>postageStampRetrievalUsers</b> simultaneous requests of distinct Objects.
Requirement Parameters	[ <b>postageStampRetrievalUsers = 10[integer]</b> Minimum number of simultaneous users retrieving a set of postage stamp images., <b>postageStampRetrievalTime = 10[second]</b> Maximum time allowed for retrieving a set of postage stamp images of a single Object., <b>postageStampSize = 51[pixel]</b> Minimum square size of a postage stamp cutout from an image., <b>I1CacheLifetime = 30[day]</b> Lifetime in the cache of un-archived Level-1 data products.]
Requirement Discussion	<b>Discussion:</b> The performance targets for this requirement assume the PVIS are available as files on a file system. For example, this could be those files present in the <b>I1CacheLifetime</b> cache.
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

## 2.511 [LVV-9795] DMS-REQ-0376-V-02: Min number of simultaneous users retrieving all PVI images

Jira Link	Assignee	Status	Test Cases
LVV-9795	Leanne Guy	Not Covered	

### Verification Element Description:

The minimum number of simultaneous users retrieving distinct focal-plane PVI sets shall be **allPviRetrievalUsers = 10**.

Associated element DMS-REQ-0376-V-01 (LVV-3396) satisfies the maximum retrieval time.

Associated element DMS-REQ-0376-V-03 (LVV-9796) satisfies the expected lifetime of Level-1 data products.

*These requirements should be satisfied both separately and together.*

Requirement Details	
Requirement ID	DMS-REQ-0376
Requirement Description	<b>Specification:</b> All Processed Visit Images for a single visit that are available in cache, including mask and variance planes, shall be identifiable with a single IVOA SIAv2 service query and retrievable, using the link(s) provided in the response, within <b>allPviRetrievalTime</b> . This requirement shall be met for up to <b>allPviRetrievalUsers</b> simultaneous requests for distinct focal-plane PVI sets.
Requirement Parameters	[ <b>allPviRetrievalUsers = 10[integer]</b> Minimum number of simultaneous users retrieving all PVI images for a visit., <b>allPviRetrievalTime = 60[second]</b> Maximum time allowed for retrieving all PVI images of a single visit., <b>I1CacheLifetime = 30[day]</b> Lifetime in the cache of unarchived Level-1 data products.]
Requirement Discussion	<b>Discussion:</b> The performance targets for this requirement assume the PVIs are available as files on a file system. For example, this could be those files present in the <b>I1CacheLifetime</b> cache.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure



## 2.512 [LVV-9796] DMS-REQ-0376-V-03: Uncached L1 data product lifetime - focal-plane

Jira Link	Assignee	Status	Test Cases
LVV-9796	Leanne Guy	Not Covered	

### Verification Element Description:

The PVI's must be available as files on the files system for **I1CacheLifetime = 30 days**.

Associated element DMS-REQ-0376-V-01 (LVV-3396) satisfies the maximum retrieval time.

The associated element DMS-REQ-0376-V-02 (LVV-9795) satisfies the additional constraint on the number of simultaneous users.

*These requirements should be satisfied both separately and together.*

Requirement Details	
Requirement ID	DMS-REQ-0376
Requirement Description	<b>Specification:</b> All Processed Visit Images for a single visit that are available in cache, including mask and variance planes, shall be identifiable with a single IVOA SIAv2 service query and retrievable, using the link(s) provided in the response, within <b>allPviRetrievalTime</b> . This requirement shall be met for up to <b>allPviRetrievalUsers</b> simultaneous requests for distinct focal-plane PVI sets.
Requirement Parameters	[ <b>allPviRetrievalUsers = 10[integer]</b> Minimum number of simultaneous users retrieving all PVI images for a visit., <b>allPviRetrievalTime = 60[second]</b> Maximum time allowed for retrieving all PVI images of a single visit., <b>I1CacheLifetime = 30[day]</b> Lifetime in the cache of un-archived Level-1 data products.]
Requirement Discussion	<b>Discussion:</b> The performance targets for this requirement assume the PVI's are available as files on a file system. For example, this could be those files present in the <b>I1CacheLifetime</b> cache.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

## 2.513 [LVV-9797] DMS-REQ-0377-V-02: Max time to retrieve single-CCD coadd cutout image

Jira Link	Assignee	Status	Test Cases
LVV-9797	Leanne Guy	Not Covered	LVV-T1332

### Verification Element Description:

Maximum time allowed for retrieving a CCD-sized coadd cutout using the IVOA SODA protocol must be **ccdRetrievalTime = 15 seconds**.

The associated element DMS-REQ-0377-V-01 (LVV-3394) satisfies the additional simultaneous users constraint.

*These requirements should be satisfied together.*

Requirement Details	
Requirement ID	DMS-REQ-0377
Requirement Description	<b>Specification:</b> A CCD-sized cutout of a coadd, including mask and variance planes, shall be retrievable using the IVOA SODA protocol within <b>ccdRetrievalTime</b> with <b>ccdRetrievalUsers</b> simultaneous requests for distinct areas of the sky.
Requirement Parameters	[ <b>ccdRetrievalTime = 15[second]</b> Maximum time allowed for retrieving a CCD-sized coadd cutout., <b>ccdRetrievalUsers = 20[integer]</b> Minimum number of simultaneous users retrieving a single CCD-sized coadd cutout.]
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0181 Data Products Query and Download Infrastructure

### 2.513.1 Test Cases Summary

LVV-T1332	Verify implementation of maximum time for retrieval of CCD-sized coadd cutouts			
Owner	Status	Version	Critical Event	Verification Type
Leanne Guy	Defined	1	false	Test

#### Objective:

Verify that at least **ccdRetrievalUsers = 20** users can retrieve CCD-sized coadd cutouts using the IVOA SODA protocol within a

maximum retrieval time of `ccdRetrievalTime = 15 seconds`.

Draft

## 2.514 [LVV-9803] DMS-REQ-0004-V-03: Time to availability of Solar System Object orbits

Jira Link	Assignee	Status	Test Cases
LVV-9803	Leanne Guy	Not Covered	LVV-T102

### Verification Element Description:

Verify that Solar System Object orbits are calculated and made available within **L1PublicT = 24 hours**.

Associated element (LVV-175) satisfies the maximum time allotted for public release of L1 Data Products.

Associated element (LVV-9740) satisfies the latency of reporting transients.

Requirement Details	
Requirement ID	DMS-REQ-0004
Requirement Description	<p><b>Specification:</b> With the exception of alerts and Solar System Objects, all Level 1 Data Products shall be made public within time <b>L1PublicT</b> of the acquisition of the raw image data.</p> <p>LSST shall not release image or catalog data resulting from a visit, except for the content of the public alert stream, sooner than time <b>L1PublicTMin</b> following the acquisition of the raw image data from that visit.</p> <p>For visits resulting in fewer than <b>nAlertVisitPeak</b>, LSST shall be capable of supporting the distribution of at least <b>OTR1</b> per cent of alerts via the LSST alert distribution system within time <b>OTT1</b> from the conclusion of the camera's readout of the raw exposures used to generate each alert.</p> <p>Solar System Object orbits will, on average, be calculated before the following night's observing finishes and the results shall be made available within time <b>L1PublicT</b> of those calculations being completed.</p>
Requirement Parameters	<p><b>[OTR1 = 98[percent]]</b> Fraction of detectable alerts for which an alert is actually transmitted within latency OTT1 (see LSR-REQ-0101), <b>OTT1 = 1[minute]</b> The latency of reporting optical transients following the completion of readout of the last image of a visit, <b>nAlertVisitPeak = 40000[integer]</b> The instantaneous peak number of alerts per standard visit., <b>L1PublicTMin = 6[hour]</b> Time images and other products (except alerts) will be embargoed before release to the consortium (or the public), <b>L1PublicT = 24[hour]</b> Maximum time from the acquisition of science data to the release of associated Level 1 Data Products (except alerts)]</p>

Requirement Discussion	<b>Discussion:</b> Because of the processing flow of SSOobject orbit determination, meeting the base <b>L1PublicT</b> -after-data-acquisition requirement would be far more challenging than for the other L1 Data Products, but the system throughput has to be good enough such that a back log can not build up.	
Requirement Priority	1b	
Upper Level Requirement	DMS-REQ-0003	Create and Maintain Science Data Archive
	OSS-REQ-0127	Level 1 Data Product Availability

### 2.514.1 Test Cases Summary

LVV-T102	Verify implementation of Solar System Objects Available Within Specified Time			
<b>Owner</b>	<b>Status</b>	<b>Version</b>	<b>Critical Event</b>	<b>Verification Type</b>
Kian-Tat Lim	Draft	1	false	Test

#### Objective:

Execute single-day operations rehearsal, observe data products generated in time

## 2.515 [LVV-9806] DMS-LSP-REQ-0007-V-01: Abide by the Data Access Policies\_1

Jira Link	Assignee	Status	Test Cases
LVV-9806	Gregory Dubois-Felsmann	Not Covered	LVV-T605

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0007
Requirement Description	The LSP shall comply with the public data access policy and access restrictions defined by the LSST Project and operations organization.
Requirement Discussion	This includes both the enforcement of Project-level data rights (e.g., to the Level 1 and Level 2 data) and user-provided access controls to user-created data (e.g., Level 3 data products).
Requirement Priority	
Upper Level Requirement	

### 2.515.1 Test Cases Summary

LVV-T605	Verify that LSP complies with LSST data access policies			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

Verify that the LSP complies with the public data access policy and access restrictions defined by the LSST Project.

## 2.516 [LVV-9807] DMS-LSP-REQ-0001-V-01: Access to All Released or Authorized Data Products\_1

Jira Link	Assignee	Status	Test Cases
LVV-9807	Gregory Dubois-Felsmann	Not Covered	LVV-T2 LVV-T598

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0001
Requirement Description	The LSP shall provide the capability to access all the Project's released data products, including, but not limited to, the data products enumerated in the DPDD (LSE-163), as well as all user data products to which a user has access.
Requirement Priority	
Upper Level Requirement	

### 2.516.1 Test Cases Summary

LVV-T2	LSP-00-00: Verification of the presence of the expected WISE data			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will check:

- That the expected tables are present in the database and accessible via the API Aspect and the Portal Aspect;
- That the tables are present with the expected schema as documented in the IPAC- provided WISE documentation;
- That the row counts in the tables are as expected;
- That the tables cover essentially the entire sky, as expected from the characteristics of the WISE mission.

**Requirements (to be removed when Reqs are synchronized from magic draw)**

- DMS-LSP-REQ-0001
- DMS-LSP-REQ-0005

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LVV-T598	Verify access to All Released or Authorized Data Products			
<b>Owner</b>	<b>Status</b>	<b>Version</b>	<b>Critical Event</b>	<b>Verification Type</b>
Jeffrey Carlin	Draft	1	false	Inspection

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**Objective:**

Verify that the LSP can access all data products defined in the DPDD, and additional data products.

Draft



## 2.517 [LVV-9808] DMS-LSP-REQ-0004-V-01: API (Data Access) Aspect\_1

Jira Link	Assignee	Status	Test Cases
			LVV-T3
LVV-9808	Gregory Dubois-Felsmann	Not Covered	LVV-T602
			LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0004
Requirement Description	The LSP shall provide a Web API for access to all the LSST data products and the user storage resources.
Requirement Discussion	The Web API will use VO standards as much as is practical and supported by community expectations; see DMS-LSP-REQ-0006 below. It may also include additional APIs to provide services unique to LSST.
Requirement Priority	
Upper Level Requirement	

### 2.517.1 Test Cases Summary

LVV-T3	LSP-00-05: Demonstration of low-volume and/or indexed queries against the WISE data via API			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will check that the following low-volume queries can be performed against the WISE catalogs via the API Aspect.

- Small cone searches against the Object-like, ForcedSource-like, and Source-like tables; and
- Searches by exact ID matching against the Object-like, ForcedSource-like, and Source-like tables

The tests will record their performance for comparison against similar queries in the production WISE archive at IRSA, and the returned data will be compared to that for similar queries against the API services provided by IRSA.

**Requirement (to remove once requirements are synchronized from magic draw)**

DMS-LSP-REQ-004

LVV-T602	Verify LSP provides web API				
<b>Owner</b>	<b>Status</b>	<b>Version</b>	<b>Critical Event</b>	<b>Verification Type</b>	
Michael Wood-Vasey	Draft	1	false	Test	

**Objective:**

Verify that the LSP provides a web API for access to LSST data products and user storage resources.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone				
<b>Owner</b>	<b>Status</b>	<b>Version</b>	<b>Critical Event</b>	<b>Verification Type</b>	
Gregory Dubois-Felsmann	Defined	1	false	Test	

**Objective:**

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.518 [LVV-9809] DMS-LSP-REQ-0005-V-01: Linkage of Aspects\_1

Jira Link	Assignee	Status	Test Cases
LVV-9809	Gregory Dubois-Felsmann	Not Covered	LVV-T2
			LVV-T603
			LVV-T1334
			LVV-T1436
			LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0005
Requirement Description	The LSP shall facilitate access to the same LSST and user data through multiple aspects. It should be possible to identify or create data in one aspect and retrieve it in another.
Requirement Discussion	This requirement is satisfied principally by building the various aspects over the same underlying data services.
Requirement Priority	
Upper Level Requirement	

### 2.518.1 Test Cases Summary

Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will check:

- That the expected tables are present in the database and accessible via the API Aspect and the Portal Aspect;
- That the tables are present with the expected schema as documented in the IPAC- provided WISE documentation;
- That the row counts in the tables are as expected;
- That the tables cover essentially the entire sky, as expected from the characteristics of the WISE mission.

**Requirements (to be removed when Reqs are synchronized from magic draw)**

- DMS-LSP-REQ-0001
- DMS-LSP-REQ-0005

LVV-T603	Verify data access through multiple linked aspects			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

**Objective:**

Verify that the LSP facilitates access of the same LSST or user data through multiple aspects.

LVV-T1334	LDM-503-10a: Portal Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Portal Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from the Portal Aspect UI.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0002, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-PRTL-REQ-0001, DMS-PRTL-REQ-0015, DMS-PRTL-REQ-0016, DMS-PRTL-REQ-0017, DMS-PRTL-REQ-0020, DMS-PRTL-REQ-0026, DMS-PRTL-REQ-0049, and DMS-PRTL-REQ-0095, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

LVV-T1436	LDM-503-10a: Notebook Aspect tests for LSP with Authentication and TAP milestone			
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Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Notebook Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from Python code in the Notebook Aspect.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0003, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-NB-REQ-0001, DMS-NB-REQ-0002, DMS-NB-REQ-0005, DMS-NB-REQ-0006, DMS-NB-REQ-0013, DMS-NB-REQ-0017, and DMS-NB-REQ-0029, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

Draft

## 2.519 [LVV-9810] DMS-LSP-REQ-0003-V-01: Notebook Aspect\_1

Jira Link	Assignee	Status	Test Cases
LVV-9810	Gregory Dubois-Felsmann	Not Covered	LVV-T601 LVV-T1436

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0003
Requirement Description	The LSP shall provide an interactive Python computing environment, accessible through a Web browser, with access to all the LSST data products and to user computing and storage resources.
Requirement Discussion	The term "Notebook aspect" (and, a fortiori, "Jupyter[Lab] aspect", which has also been used in DM discussions) refers to the reference implementation of this aspect of the LSP in terms of Jupyter notebooks and the forthcoming JupyterLab successor to that technology, with an IPython kernel back end. For the purposes of this requirements document, however, it seems preferable to avoid using an external brand name in the normative text.
Requirement Priority	
Upper Level Requirement	

### 2.519.1 Test Cases Summary

LVV-T601	Verify LSP provides a notebook aspect				
Owner	Status	Version	Critical Event	Verification Type	
Michael Wood-Vasey	Draft	1	false	Inspection	

#### Objective:

Verify that the LSP provides an interactive Python computing environment, accessible via web browser, with access to LSST data products and user storage resources.

LVV-T1436	LDM-503-10a: Notebook Aspect tests for LSP with Authentication and TAP milestone
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Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Notebook Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from Python code in the Notebook Aspect.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0003, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-NB-REQ-0001, DMS-NB-REQ-0002, DMS-NB-REQ-0005, DMS-NB-REQ-0006, DMS-NB-REQ-0013, DMS-NB-REQ-0017, and DMS-NB-REQ-0029, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.



## 2.520 [LVV-9811] DMS-LSP-REQ-0002-V-01: Portal Aspect\_1

Jira Link	Assignee	Status	Test Cases
			LVV-T5
LVV-9811	Gregory Dubois-Felsmann	Not Covered	LVV-T600
			LVV-T1334

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0002
Requirement Description	The LSP shall provide a Web-based "Portal" means of access to all the LSST data products, and to user storage resources.
Requirement Discussion	The Portal is defined by further requirements.
Requirement Priority	
Upper Level Requirement	

### 2.520.1 Test Cases Summary

LVV-T5	LSP-00-15: Execution of basic catalog queries in the Portal			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will test the functional requirements to be able to perform a range of basic queries through the Portal Aspect of the LSP:

- Cone searches on the Object-like, ForcedSource-like, and Source-like WISE tables;
- Multi-target cone searches;
- Form-based searches for exact equality, e.g., for row IDs; and
- Form-based searches for sets of object attributes.

In addition, it tests the ability to download tabular query results from the Portal Aspect.

LVV-T600	Verify LSP provides a portal aspect				
Owner	Status	Version	Critical Event	Verification Type	
Michael Wood-Vasey	Draft	1	false	Inspection	

**Objective:**

Verify that the LSP provides a web-based “Portal” to access LSST data products and user storage resources.

The Portal is defined by further requirements.

LVV-T1334	LDM-503-10a: Portal Aspect tests for LSP with Authentication and TAP milestone				
Owner	Status	Version	Critical Event	Verification Type	
Gregory Dubois-Felsmann	Defined	1	false	Test	

**Objective:**

This test case verifies that the Portal Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from the Portal Aspect UI.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0002, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-PRTL-REQ-0001, DMS-PRTL-REQ-0015, DMS-PRTL-REQ-0016, DMS-PRTL-REQ-0017, DMS-PRTL-REQ-0020, DMS-PRTL-REQ-0026, DMS-PRTL-REQ-0049, and DMS-PRTL-REQ-0095, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.521 [LVV-9812] DMS-LSP-REQ-0006-V-01: Use of VO Standards\_1

Jira Link	Assignee	Status	Test Cases
			LVV-T604
LVV-9812	Gregory Dubois-Felsmann	Not Covered	LVV-T1334
			LVV-T1436
			LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0006
Requirement Description	The LSP shall utilize stable and accepted Virtual Observatory standards for publicly offered APIs wherever feasible.
Requirement Discussion	The intent is to establish a "VO First" posture, and require explicit exception be requested for any APIs needing to deviate from this requirement. This requirement applies most importantly to the API Aspect's externally-facing data access APIs, but also in other areas. E.g., from this requirement we may derive that the Portal must support access to externally-source reference catalog via VO-compliant queries, or that a Portal service for pushing data to user applications should support SAMP.
Requirement Priority	
Upper Level Requirement	

### 2.521.1 Test Cases Summary

LVV-T604	Verify use of VO standards			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the LSP utilizes stable and accepted Virtual Observatory standards for public APIs.

LVV-T1334 LDM-503-10a: Portal Aspect tests for LSP with Authentication and TAP milestone

Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Portal Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from the Portal Aspect UI.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0002, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-PRTL-REQ-0001, DMS-PRTL-REQ-0015, DMS-PRTL-REQ-0016, DMS-PRTL-REQ-0017, DMS-PRTL-REQ-0020, DMS-PRTL-REQ-0026, DMS-PRTL-REQ-0049, and DMS-PRTL-REQ-0095, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

LVV-T1436 LDM-503-10a: Notebook Aspect tests for LSP with Authentication and TAP milestone

Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Notebook Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from Python code in the Notebook Aspect.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0003, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024

- DMS-NB-REQ-0001, DMS-NB-REQ-0002, DMS-NB-REQ-0005, DMS-NB-REQ-0006, DMS-NB-REQ-0013, DMS-NB-REQ-0017, and DMS-NB-REQ-0029, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.522 [LVV-9813] DMS-LSP-REQ-0009-V-01: Semantic Linkage: Uncertainties\_1

Jira Link	Assignee	Status	Test Cases
LVV-9813	Gregory Dubois-Felsmann	Not Covered	LVV-T607

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0009
Requirement Description	The LSP shall support the identification of relationships between data items (notably database columns) that represent a quantity and its uncertainty(ies). This should extend to relationships between groups of quantities and other quantities that represent their covariances, but this is not an open-ended requirement to support all such cases.
Requirement Discussion	These relationships should be expressed as appropriate to the LSP aspect, and require "upstream" support at the point of definition or creation of the data.
Requirement Priority	
Upper Level Requirement	

### 2.522.1 Test Cases Summary

LVV-T607	Verify semantic linkages between data items and uncertainties			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

Verify that the LSP provides methods to identify uncertainties associated with a given quantity.

## 2.523 [LVV-9814] DMS-LSP-REQ-0008-V-01: Semantic Linkage\_1

Jira Link	Assignee	Status	Test Cases
			LVV-T8
LVV-9814	Gregory Dubois-Felsmann	Not Covered	LVV-T9
			LVV-T606

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0008
Requirement Description	The LSP shall support the identification of linkages between data items that reflect their provenance and data dependencies.
Requirement Discussion	For instance, from a calibrated image it should be possible to identify the raw image from which it was generated, and the calibration data used in its processing; from a catalog entry it should be possible to identify the image(s) on which the measurement was made. In practice this has DM system-level implications. For the LSP it relies on upstream components recording the appropriate provenance metadata. At the DAX level it mainly just requires exposing the tables and columns containing this metadata, and identifying them as such (e.g., by reporting foreign-key relationships) in the Reflection APIs. At the Notebook level this is largely satisfied by providing Butler-level access to this information.
Requirement Priority	
Upper Level Requirement	

### 2.523.1 Test Cases Summary

LVV-T8	LSP-00-30: Linkage of catalog query results with associated images			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will check for the ability, in the Portal Aspect of the LSST Science Platform, to match catalog data with the image data on which the measurements were performed, specifically:

- Navigating from a catalog query result to the associated images; and
- Overlaying catalog query results on associated images.

Because of limited staff resources, these tests will be based on the original PDAC dataset, the LSST Summer 2013 processing of the SDSS Stripe 82 data. The image data for the WISE and NEOWISE missions have not been loaded into PDAC.

LVV-T9	LSP-00-35: Linkage of catalog query results to related catalog data			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

**Objective:**

This test will check for the ability, in the Portal Aspect of the LSST Science Platform, to match catalog data with related catalog data. Specifically, the test verifies the ability to navigate from a coadded source catalog entry to the associated forced photometry.

**Requirements (to be removed when Reqs are synchronized from magic draw)**

- DMS-LSP-REQ-0008

LVV-T606	Verify semantic linkages between data items			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

**Objective:**

Verify that the LSP provides access to linkages between data items that reflect their provenance and data dependencies.



## 2.524 [LVV-9815] DMS-LSP-REQ-0010-V-01: Transfer of Portal Data References to Notebook\_1

Jira Link	Assignee	Status	Test Cases
LVV-9815	Gregory Dubois-Felsmann	Not Covered	LVV-T608

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0010
Requirement Description	The LSP shall facilitate the transfer to the Notebook aspect of references allowing retrieval in a notebook of the data explored in the Portal session.
Requirement Discussion	This allows a user to locate and preview data in the Portal environment and then readily transfer their work to the Notebook aspect for detailed analysis.
Requirement Priority	
Upper Level Requirement	

### 2.524.1 Test Cases Summary

LVV-T608	Verify transfer of Portal data references to Notebook aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

### Objective:

Verify that data references derived from Portal exploration can be transferred and used in to retrieve the same data in the Notebook aspect.

## 2.525 [LVV-9816] DMS-LSP-REQ-0012-V-01: User Database Workspace\_1

Jira Link	Assignee	Status	Test Cases
LVV-9816	Gregory Dubois-Felsmann	Not Covered	LVV-T610

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0012
Requirement Description	The LSP shall provide for the creation, use, and management of user databases (User Generated tabular data products), and shall enable interaction with user databases with the same facilities as for Project-created database to the extent feasible. Some database-related capabilities of the LSP rely on the availability of detailed metadata on the Project-created databases that goes beyond the normal content of a database schema (e.g., IVOA UCDS for table columns). Users will be enabled, but not required, to supply such metadata for their own databases (and they may do so incorrectly), so LSP functionality that depends on it may not be available for user databases.
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

### 2.525.1 Test Cases Summary

LVV-T610	Verify providing user generated database in LSP			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

Verify that the LSP allows for creation, use, and management of User Generated databases, and interaction with user databases by the same facilities as Project databases, where feasible.

## 2.526 [LVV-9817] DMS-LSP-REQ-0011-V-01: User File Workspace\_1

Jira Link	Assignee	Status	Test Cases
LVV-9817	Gregory Dubois-Felsmann	Not Covered	LVV-T609

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0011
Requirement Description	The LSP shall provide a "User File Workspace": resources for the storage of file oriented User Generated data, which shall be accessible from all three aspects.
Requirement Discussion	All users with data rights will have a "birthright" quota of User File Workspace storage. A proposal-based process will be available for requests for additional storage. The Workspace will not, in general, place constraints on the format of the data stored. It may be used for image data as well as for tabular data in file-oriented storage forms. User databases are a separate mechanism. The Workspace is expected to be made available through an implementation of the IVOA VOspace standard.
Requirement Priority	
Upper Level Requirement	

### 2.526.1 Test Cases Summary

LVV-T609	Verify providing user file storage in LSP			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

Verify that the LSP provides a user file workspace for storage of user generated data files. These shall be accessible from all three aspects.

## 2.527 [LVV-9818] DMS-LSP-REQ-0013-V-01: User Workspace Access Controls\_1

Jira Link	Assignee	Status	Test Cases
LVV-9818	Gregory Dubois-Felsmann	Not Covered	LVV-T611

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0013
Requirement Description	The LSP shall permit users to place access restrictions on data in the User File and Database Workspaces, based on both user and user-group identities, and shall enforce these restrictions in all its aspects.
Requirement Priority	
Upper Level Requirement	

### 2.527.1 Test Cases Summary

LVV-T611	Verify access controls in user workspace			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

Verify that LSP users can place access restrictions on data in the User File and Database workspaces, and that these restrictions are enforced across all aspects.

## 2.528 [LVV-9819] DMS-LSP-REQ-0014-V-01: Download Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9819	Gregory Dubois-Felsmann	Not Covered	LVV-T5
			LVV-T6
			LVV-T7
			LVV-T612

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0014
Requirement Description	The LSP shall provide means for downloading data resulting from queries or other operations, or from the Workspace, to the user's system.
Requirement Discussion	In general the API aspect can be used to retrieve data to remote sites. Additional mechanisms will be provided as appropriate to the various aspects, and are described in lower-level requirements. For the DAC instances of the LSP, the "user's system" will generally be on the public Internet; for other instances it may be on project-internal systems.
Requirement Priority	
Upper Level Requirement	

### 2.528.1 Test Cases Summary

LVV-T5	LSP-00-15: Execution of basic catalog queries in the Portal			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will test the functional requirements to be able to perform a range of basic queries through the Portal Aspect of the LSP:

- Cone searches on the Object-like, ForcedSource-like, and Source-like WISE tables;
- Multi-target cone searches;
- Form-based searches for exact equality, e.g., for row IDs; and

- Form-based searches for sets of object attributes.

In addition, it tests the ability to download tabular query results from the Portal Aspect.

LVV-T6	LSP-00-20: Operation of the UI for interaction with tabular data results			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

**Objective:**

This test will test the functional requirements to be able to perform certain basic exploratory data analysis functions on tabular data results in the Portal Aspect UI:

- Sort tabular results;
- Filter tabular results based on the contents of columns;
- Perform per-row selections from a table;
- Display 1D histograms of selected attributes;
- Display 2D scatter plots of selected attributes;
- Perform graphical selections of rows from plots; and
- Download tabular query results reflecting sorting and selection.

This test does not address the limits of scaling of these capabilities to large query results. That will be addressed in future test specifications. The test report should include notes on the sizes of results that were used.

LVV-T7	LSP-00-25: Image metadata, image, and image cutout queries			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

**Objective:**

This test will check basic functionality related to image search and retrieval, via both the API Aspect and the Portal Aspect of the LSST Science Platform:

- Searching for images containing a specified point;
- Displaying selected images;
- Obtaining and displaying image cutouts at a specified point; and

- Downloading selected images and image cutouts.

Because of limited staff resources, these tests will be based on the original PDAC dataset, the LSST Summer 2013 processing of the SDSS Stripe 82 data. The image data for the WISE and NEOWISE missions have not been loaded into PDAC.

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LVV-T612	Verify ability to download data from LSP			
<b>Owner</b>	<b>Status</b>	<b>Version</b>	<b>Critical Event</b>	<b>Verification Type</b>
Jeffrey Carlin	Draft	1	false	Test

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**Objective:**

Verify that the LSP provides a means to download data from queries, user workspaces, or other operations, to the user's system.

## 2.529 [LVV-9820] DMS-LSP-REQ-0018-V-01: Image Data Download File Format\_1

Jira Link	Assignee	Status	Test Cases
LVV-9820	Gregory Dubois-Felsmann	Not Covered	LVV-T7 LVV-T616

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0018
Requirement Description	The LSP shall allow LSST image data products to be downloaded or saved to the workspace as FITS files including the appropriate metadata.
Requirement Discussion	This needs some discussion as to what other formats we may want and must be readable by future releases.
Requirement Priority	
Upper Level Requirement	

### 2.529.1 Test Cases Summary

LVV-T7	LSP-00-25: Image metadata, image, and image cutout queries			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will check basic functionality related to image search and retrieval, via both the API Aspect and the Portal Aspect of the LSST Science Platform:

- Searching for images containing a specified point;
- Displaying selected images;
- Obtaining and displaying image cutouts at a specified point; and
- Downloading selected images and image cutouts.



Because of limited staff resources, these tests will be based on the original PDAC dataset, the LSST Summer 2013 processing of the SDSS Stripe 82 data. The image data for the WISE and NEOWISE missions have not been loaded into PDAC.

LVV-T616	Verify file formats provided for image data download			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

**Objective:**

Verify that LSST image data products can be downloaded via the LSP in FITS format, with appropriate metadata included.

## 2.530 [LVV-9821] DMS-LSP-REQ-0017-V-01: Tabular Data Download File Formats\_1

Jira Link	Assignee	Status	Test Cases
LVV-9821	Gregory Dubois-Felsmann	Not Covered	LVV-T6 LVV-T615

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0017
Requirement Description	The LSP shall allow tabular search results, including but not limited to data from the source and object tables and the image metadata tables, to be downloaded or saved to the workspace in at least the following formats: FITS table, VOTable, and ASCII delimiter-separated table (e.g., CSV).
Requirement Discussion	A final set of formats needs to be discussed and approved by the Project. This is primarily a requirement on the API aspect and the DAX services.
Requirement Priority	
Upper Level Requirement	

### 2.530.1 Test Cases Summary

LVV-T6	LSP-00-20: Operation of the UI for interaction with tabular data results			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will test the functional requirements to be able to perform certain basic exploratory data analysis functions on tabular data results in the Portal Aspect UI:

- Sort tabular results;
- Filter tabular results based on the contents of columns;
- Perform per-row selections from a table;
- Display 1D histograms of selected attributes;

- Display 2D scatter plots of selected attributes;
- Perform graphical selections of rows from plots; and
- Download tabular query results reflecting sorting and selection.

This test does not address the limits of scaling of these capabilities to large query results. That will be addressed in future test specifications. The test report should include notes on the sizes of results that were used.

LVV-T615	Verify file formats provided for tabular data download			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

**Objective:**

Verify that the LSP allows tabular data from search results to be downloaded in FITS, VOTable, and ASCII delimiter-separated tables (e.g., CSV).

## 2.531 [LVV-9822] DMS-LSP-REQ-0016-V-01: Transfer Data to Workspace\_1

Jira Link	Assignee	Status	Test Cases
LVV-9822	Gregory Dubois-Felsmann	Not Covered	LVV-T614

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0016
Requirement Description	Transfer of data to and from the Workspace shall be usable as an alternative in all features of the LSP where download or upload, respectively, are available.
Requirement Discussion	The user can "download" data, e.g., a query result, to the Workspace, and can "upload" data from the Workspace into other functions of the LSP, e.g., to use as a target list in a multi-object search.
Requirement Priority	
Upper Level Requirement	

### 2.531.1 Test Cases Summary

LVV-T614	Verify ability to transfer data to and from the Workspace			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

Verify that users can transfer data between all features of the LSP that allow for upload and download of data.

## 2.532 [LVV-9823] DMS-LSP-REQ-0015-V-01: Upload Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9823	Gregory Dubois-Felsmann	Not Covered	LVV-T613

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0015
Requirement Description	The LSP shall provide means for uploading data from the user's system for use in the LSP aspects, including for storage in the Workspace.
Requirement Priority	
Upper Level Requirement	

### 2.532.1 Test Cases Summary

LVV-T613	Verify ability to upload data to LSP			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

### Objective:

Verify that LSP users can upload data from their system for use in the LSP aspects and storage in their user workspace.

## 2.533 [LVV-9824] DMS-LSP-REQ-0028-V-01: Peak Volume for Moderate-Sized Queries\_1

Jira Link	Assignee	Status	Test Cases
LVV-9824	Gregory Dubois-Felsmann	Not Covered	LVV-T4 LVV-T617

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0028
Requirement Description	The LSP shall handle at peak usage 50 simultaneous queries without degradation, with the following properties: input selection of up to 1E7 objects in the catalog, result data set of up to 0.1GB, and a response time of 10 seconds.
Requirement Discussion	This requirement flows down from several requirements in the DMSR (LSE-61) which constrain both the performance of the database systems (via LDM-555) and the Science Platform. In the Science Platform context, this requirement implies that the LSP will not degrade the performance supported by the underlying database systems. This applies to queries originating from any of the Aspects, and covers all of the stages of the query: query generation, query running, results generation, display of results, and downloading and saving of results.
Requirement Priority	
Upper Level Requirement	

### 2.533.1 Test Cases Summary

LVV-T4	LSP-00-10: Demonstration of table-scan queries against the WISE data via API			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test exercises a range of table-scan-type queries against the WISE data. Queries shall be performed against the Object-like table, the Forced-Source-like table, and against at least one of the Source-like tables. A range of query result sizes should be exercised, and shall include at least:

- Queries returning a very small amount of data, fewer than 100 rows, and a small subset of columns;
- Queries matching a scaled version of the “low volume” query definition from the Data Access White Paper; and
- Queries matching a scaled version of the “high volume” query definition from the Data Access White Paper.

The scaling of the “low volume” query definition (“50 simultaneous queries against 10 million objects in the catalog, response 10 sec, result data set: 0.1 GB”) is based on a assumption that the “against 10 million objects” is applied against the O(20 billion) rows anticipated in the Object table, and that it contemplates reducing the scope of any non-indexed portion of the WHERE clause of the query to that fraction of one in  $\approx 2000$  of the rows in the table. Scaled to the  $\approx 750$  million rows in the WISE Object-like (AllWISE “Source Catalog”) table, this would be  $\approx 375,000$  rows. Similarly scaling the result set size suggests a result set of  $\approx 3.7$  MB.

Successful completion will be evaluated based on the system’s ability to perform the query at all and to return a result with characteristics corresponding to plausible estimates or extrapolations from scaled-down queries against the IRSA WISE archive. Exact verification may not be realistic because of the lack of a system capable of performing the equivalent queries in the production WISE archive.

At a later date it may be possible to attempt equivalent queries using a non-database system and verify the exact correspondence of results, but the non-database system does not presently exist<sup>1</sup>.

#### Requirements (to be removed when Reqs are synchronized from magic draw)

- DMS-LSP-REQ-0028
- DMS-LSP-REQ-0029

LVV-T617	Verify support for peak volume of moderate-sized queries			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

Verify that the LSP can handle a peak usage of 50 simultaneous queries without degradation, where the queries include input selection of up to 1E7 objects in the catalog, result data set of up to 0.1GB, and a response time of 10 seconds.

## 2.534 [LVV-9825] DMS-LSP-REQ-0029-V-01: Peak Volume for Queries on all Objects\_1

Jira Link	Assignee	Status	Test Cases
LVV-9825	Gregory Dubois-Felsmann	Not Covered	LVV-T4 LVV-T618

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0029
Requirement Description	The LSP shall handle at peak usage 20 simultaneous queries without degradation, with the following properties: input selection of up the entire object database, result data set of up to 6 GB, and a response time of one hour.
Requirement Discussion	This requirement flows down from several requirements in the DMSR (LSE-61) which constrain both the performance of the database systems (via LDM-555) and the Science Platform. In the Science Platform context, this requirement implies that the LSP will not degrade the performance supported by the underlying database systems. This applies to queries originating from any of the Aspects, and covers all of the stages of the query: query generation, query running, results generation, display of results, and downloading and saving of results.
Requirement Priority	
Upper Level Requirement	

### 2.534.1 Test Cases Summary

LVV-T4	LSP-00-10: Demonstration of table-scan queries against the WISE data via API			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test exercises a range of table-scan-type queries against the WISE data. Queries shall be performed against the Object-like table, the Forced-Source-like table, and against at least one of the Source-like tables. A range of query result sizes should be exercised, and shall include at least:



- Queries returning a very small amount of data, fewer than 100 rows, and a small subset of columns;
- Queries matching a scaled version of the “low volume” query definition from the Data Access White Paper; and
- Queries matching a scaled version of the “high volume” query definition from the Data Access White Paper.

The scaling of the “low volume” query definition (“50 simultaneous queries against 10 million objects in the catalog, response 10 sec, result data set: 0.1 GB”) is based on a assumption that the “against 10 million objects” is applied against the O(20 billion) rows anticipated in the Object table, and that it contemplates reducing the scope of any non-indexed portion of the WHERE clause of the query to that fraction of one in  $\approx 2000$  of the rows in the table. Scaled to the  $\approx 750$  million rows in the WISE Object-like (AllWISE “Source Catalog”) table, this would be  $\approx 375,000$  rows. Similarly scaling the result set size suggests a result set of  $\approx 3.7$  MB.

Successful completion will be evaluated based on the system’s ability to perform the query at all and to return a result with characteristics corresponding to plausible estimates or extrapolations from scaled-down queries against the IRSA WISE archive. Exact verification may not be realistic because of the lack of a system capable of performing the equivalent queries in the production WISE archive.

At a later date it may be possible to attempt equivalent queries using a non-database system and verify the exact correspondence of results, but the non-database system does not presently exist<sup>1</sup>.

#### Requirements (to be removed when Reqs are synchronized from magic draw)

- DMS-LSP-REQ-0028
- DMS-LSP-REQ-0029

LVV-T618	Verify support for peak volume of queries on all Objects			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

Verify that the LSP can handle a peak usage of 20 simultaneous queries without degradation, where the queries include input selection of up to the entire object database, result data set of up to 6 GB, and a response time of 1 hour.

## 2.535 [LVV-9826] DMS-LSP-REQ-0030-V-01: Peak Volume of In-process Queries\_1

Jira Link	Assignee	Status	Test Cases
LVV-9826	Gregory Dubois-Felsmann	Not Covered	LVV-T619

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0030
Requirement Description	The LSP shall simultaneously handle at peak usage $20 * 6 \text{ GB} = 120 \text{ GB}$ downloads
Requirement Discussion	This requirement flows down from several requirements in the DMSR (LSE-61) which constrain both the performance of the database systems (via LDM-555) and the Science Platform. In the Science Platform context, this requirement implies that the LSP will not degrade the performance supported by the underlying database systems. This applies to queries originating from any of the Aspects, and covers all of the stages of the query: query generation, query running, results generation, display of results, and downloading and saving of results.
Requirement Priority	
Upper Level Requirement	

### 2.535.1 Test Cases Summary

LVV-T619	Verify LSP handles peak volume of queries			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

Verify that the LSP can simultaneously handle peak usage of  $20*6 \text{ GB} = 120 \text{ GB}$  of downloads.

## 2.536 [LVV-9827] DMS-LSP-REQ-0031-V-01: Query Result Download Bandwidth\_1

Jira Link	Assignee	Status	Test Cases
LVV-9827	Gregory Dubois-Felsmann	Not Covered	LVV-T620

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0031
Requirement Description	The LSP shall support a download rate of 6 Gbps for query results including results tables and images.
Requirement Discussion	This requirement flows down from several requirements in the DMSR (LSE-61) which constrain both the performance of the database systems (via LDM-555) and the Science Platform. In the Science Platform context, this requirement implies that the LSP will not degrade the performance supported by the underlying database systems. This applies to queries originating from any of the Aspects, and covers all of the stages of the query: query generation, query running, results generation, display of results, and downloading and saving of results.
Requirement Priority	
Upper Level Requirement	

### 2.536.1 Test Cases Summary

LVV-T620	Verify LSP supports required download bandwidth			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

Verify that the LSP supports a download rate of at least 6 Gbps for query results including tables and images.

## 2.537 [LVV-9828] DMS-LSP-REQ-0019-V-01: Documentation\_1

Jira Link	Assignee	Status	Test Cases
LVV-9828	Gregory Dubois-Felsmann	Not Covered	LVV-T621

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0019
Requirement Description	The LSP shall provide user and reference documentation for all its aspects.
Requirement Priority	
Upper Level Requirement	

### 2.537.1 Test Cases Summary

LVV-T621	Verify LSP user reference and documentation			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the LSP provides user reference and documentation for all of its aspects.

## 2.538 [LVV-9829] DMS-LSP-REQ-0025-V-01: Acceptable Use Policy\_1

Jira Link	Assignee	Status	Test Cases
LVV-9829	Gregory Dubois-Felsmann	Not Covered	LVV-T627

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0025
Requirement Description	Non-project staff users of the LSP shall be required to agree to and abide by an Acceptable Use Policy, to be determined by the LSST project or its operations organization, as a condition of access to any Project instance of the LSP.
Requirement Discussion	The policies for project staff are set in other documents.
Requirement Priority	
Upper Level Requirement	

### 2.538.1 Test Cases Summary

LVV-T627	Verify implementation of Acceptable Use Policy			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that non-Project users of the LSP are required to agree to and abide by an Acceptable Use Policy.

## 2.539 [LVV-9830] DMS-LSP-REQ-0020-V-01: Authenticated User Access\_1

Jira Link	Assignee	Status	Test Cases
LVV-9830	Gregory Dubois-Felsmann	Not Covered	LVV-T622
			LVV-T1334
			LVV-T1436
			LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0020
Requirement Description	The functions and services of the LSP, including all three aspects, shall be available only to authenticated users, except where other requirements or other change-controlled specifications authorize or mandate otherwise.
Requirement Priority	
Upper Level Requirement	

### 2.539.1 Test Cases Summary

LVV-T622	Verify LSP only available to authenticated users			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Defined	1	false	Inspection

#### Objective:

Verify that the functions and services of all three aspects of the LSP are accessible only to authenticated users.

LVV-T1334	LDM-503-10a: Portal Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Portal Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from the Portal Aspect UI.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0002, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-PRTL-REQ-0001, DMS-PRTL-REQ-0015, DMS-PRTL-REQ-0016, DMS-PRTL-REQ-0017, DMS-PRTL-REQ-0020, DMS-PRTL-REQ-0026, DMS-PRTL-REQ-0049, and DMS-PRTL-REQ-0095, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

LVV-T1436	LDM-503-10a: Notebook Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Notebook Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from Python code in the Notebook Aspect.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0003, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-NB-REQ-0001, DMS-NB-REQ-0002, DMS-NB-REQ-0005, DMS-NB-REQ-0006, DMS-NB-REQ-0013, DMS-NB-REQ-0017, and DMS-NB-REQ-0029, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone			
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Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.



## 2.540 [LVV-9831] DMS-LSP-REQ-0022-V-01: Common Identity\_1

Jira Link	Assignee	Status	Test Cases
			LVV-T624
LVV-9831	Gregory Dubois-Felsmann	Not Covered	LVV-T1334
			LVV-T1436
			LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0022
Requirement Description	A user shall be able to use the same credentials to authenticate to all aspects of the LSP, and to receive access to any personal data or other state that is available cross-aspects.
Requirement Discussion	This does not explicitly mandate "strong single-sign-on" in the sense that someone who has logged in to the Portal aspect can then proceed to the Notebook aspect without a separate login. (TBR: This behavior would be highly desirable and we may wish to adopt this as a requirement after all.) It does require "weak single-sign-on" - the same credentials work everywhere.
Requirement Priority	
Upper Level Requirement	

### 2.540.1 Test Cases Summary

LVV-T624	Verify implementation of common identity across LSP aspects			
Owner	Status	Version	Critical Event	Verification Type
Leanne Guy	Draft	1	false	Inspection

#### Objective:

Verify that users can authenticate and access all three aspects of the LSP using the same credentials.

LVV-T1334	LDM-503-10a: Portal Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type

Gregory Dubois-Felsmann	Defined	1	false	Test
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**Objective:**

This test case verifies that the Portal Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from the Portal Aspect UI.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0002, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-PRTL-REQ-0001, DMS-PRTL-REQ-0015, DMS-PRTL-REQ-0016, DMS-PRTL-REQ-0017, DMS-PRTL-REQ-0020, DMS-PRTL-REQ-0026, DMS-PRTL-REQ-0049, and DMS-PRTL-REQ-0095, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

LVV-T1436	LDM-503-10a: Notebook Aspect tests for LSP with Authentication and TAP milestone			
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Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Notebook Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from Python code in the Notebook Aspect.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0003, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-NB-REQ-0001, DMS-NB-REQ-0002, DMS-NB-REQ-0005, DMS-NB-REQ-0006, DMS-NB-REQ-0013, DMS-NB-REQ-0017, and DMS-NB-REQ-0029, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.541 [LVV-9832] DMS-LSP-REQ-0021-V-01: New-user Support\_1

Jira Link	Assignee	Status	Test Cases
LVV-9832	Gregory Dubois-Felsmann	Not Covered	LVV-T623

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0021
Requirement Description	The Portal and Notebook aspects shall provide guidance to unauthenticated users as to how to establish an identity as usable for authentication to the LSP.
Requirement Discussion	This could be as simple as a link to a "register for LSST access" page from the login screens of the Portal and Notebook.
Requirement Priority	
Upper Level Requirement	

### 2.541.1 Test Cases Summary

LVV-T623	Verify support for new LSP users			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that guidance is provided to new users about how to become authenticated users of the LSP.

## 2.542 [LVV-9833] DMS-LSP-REQ-0027-V-01: Privacy of User Activities\_1

Jira Link	Assignee	Status	Test Cases
LVV-9833	Gregory Dubois-Felsmann	Not Covered	LVV-T629

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0027
Requirement Description	The LSP shall ensure that a user's activities on the LSP are not visible to other users without the originating user's explicit authorization.
Requirement Discussion	Users will expect, for instance, that the queries they perform are not revealed to other users without their consent.
Requirement Priority	
Upper Level Requirement	

### 2.542.1 Test Cases Summary

LVV-T629	Verify privacy of users' activities			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that users' activities on the LSP are not visible to other users without the originating user's explicit permission.

## 2.543 [LVV-9834] DMS-LSP-REQ-0023-V-01: Use of External Identity Providers\_1

Jira Link	Assignee	Status	Test Cases
			LVV-T625
LVV-9834	Gregory Dubois-Felsmann	Not Covered	LVV-T1334
			LVV-T1436
			LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0023
Requirement Description	The LSP shall permit users to authenticate to the system using external credentials, from identity providers determined to be trusted by the LSST project or its operations organization.
Requirement Discussion	This means that a user should be able to authenticate to an instance of the LSP using, for example, Github credentials, or credentials from a home institution. The policies for how LSST determines that an external user, with external credentials, has data rights and may establish an identity in LSST systems are set forth in other documents.
Requirement Priority	
Upper Level Requirement	

### 2.543.1 Test Cases Summary

LVV-T625	Verify authentication via external identity providers			
Owner	Status	Version	Critical Event	Verification Type
Leanne Guy	Draft	1	false	Inspection

#### Objective:

Verify that LSP users can be authenticated using external credentials from trusted identity providers.

LVV-T1334	LDM-503-10a: Portal Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type

Gregory Dubois-Felsmann	Defined	1	false	Test
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**Objective:**

This test case verifies that the Portal Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from the Portal Aspect UI.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0002, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-PRTL-REQ-0001, DMS-PRTL-REQ-0015, DMS-PRTL-REQ-0016, DMS-PRTL-REQ-0017, DMS-PRTL-REQ-0020, DMS-PRTL-REQ-0026, DMS-PRTL-REQ-0049, and DMS-PRTL-REQ-0095, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

LVV-T1436	LDM-503-10a: Notebook Aspect tests for LSP with Authentication and TAP milestone			
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Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Notebook Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from Python code in the Notebook Aspect.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0003, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-NB-REQ-0001, DMS-NB-REQ-0002, DMS-NB-REQ-0005, DMS-NB-REQ-0006, DMS-NB-REQ-0013, DMS-NB-REQ-0017, and DMS-NB-REQ-0029, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.



## 2.544 [LVV-9835] DMS-LSP-REQ-0024-V-01: Use of Multiple Sets of Credentials\_1

Jira Link	Assignee	Status	Test Cases
			LVV-T626
LVV-9835	Gregory Dubois-Felsmann	Not Covered	LVV-T1334
			LVV-T1436
			LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0024
Requirement Description	The LSP shall permit users to associate multiple sets of credentials, from different providers, with the same identity within the LSP.
Requirement Priority	
Upper Level Requirement	

### 2.544.1 Test Cases Summary

LVV-T626	Verify LSP identity can have multiple associated credentials			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that an LSP user can have multiple credentials, from different providers, associated with the same identity within the LSP.

LVV-T1334	LDM-503-10a: Portal Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Portal Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from the Portal Aspect UI.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0002, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-PRTL-REQ-0001, DMS-PRTL-REQ-0015, DMS-PRTL-REQ-0016, DMS-PRTL-REQ-0017, DMS-PRTL-REQ-0020, DMS-PRTL-REQ-0026, DMS-PRTL-REQ-0049, and DMS-PRTL-REQ-0095, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

LVV-T1436	LDM-503-10a: Notebook Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Notebook Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from Python code in the Notebook Aspect.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0003, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-NB-REQ-0001, DMS-NB-REQ-0002, DMS-NB-REQ-0005, DMS-NB-REQ-0006, DMS-NB-REQ-0013, DMS-NB-REQ-0017, and DMS-NB-REQ-0029, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone			
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Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.545 [LVV-9836] DMS-LSP-REQ-0026-V-01: Using secure protocols\_1

Jira Link	Assignee	Status	Test Cases
LVV-9836	Gregory Dubois-Felsmann	Not Covered	LVV-T628 LVV-T1436

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0026
Requirement Description	All external connections to the LSP shall be encrypted using protocols and cipher suites compliant with LSST cybersecurity policy.
Requirement Discussion	All connections from remote clients to LSST servers (including any web sockets to enable AJAX-like functionality) will be encrypted. It is expected that this will mean general use of "https:" protocols. Connections back out to external archives that do not support secure communications may be left unencrypted.
Requirement Priority	
Upper Level Requirement	

### 2.545.1 Test Cases Summary

LVV-T628	Verify LSP connections encrypted			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that all external connections to the LSP are encrypted in accordance with LSST cybersecurity policy.

LVV-T1436	LDM-503-10a: Notebook Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Notebook Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from Python code in the Notebook Aspect.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0003, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-NB-REQ-0001, DMS-NB-REQ-0002, DMS-NB-REQ-0005, DMS-NB-REQ-0006, DMS-NB-REQ-0013, DMS-NB-REQ-0017, and DMS-NB-REQ-0029, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.546 [LVV-9837] DMS-LSP-REQ-0033-V-01: Internet-Accessible (IPv4)\_1

Jira Link	Assignee	Status	Test Cases
LVV-9837	Gregory Dubois-Felsmann	Not Covered	LVV-T631

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0033
Requirement Description	The LSP shall support access from the public Internet using IPv4 protocols.
Requirement Discussion	This covers all three aspects of the LSP and thus both browser and other Web-API access.
Requirement Priority	
Upper Level Requirement	

### 2.546.1 Test Cases Summary

LVV-T631	Verify LSP access from the public Internet (IPv4)			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the LSP is accessible from the public Internet using IPv4 protocols.

## 2.547 [LVV-9838] DMS-LSP-REQ-0034-V-01: Internet-Accessible (IPv6)\_1

Jira Link	Assignee	Status	Test Cases
LVV-9838	Gregory Dubois-Felsmann	Not Covered	LVV-T632

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0034
Requirement Description	The LSP shall support access from the public Internet using IPv6 protocols.
Requirement Discussion	This covers all three aspects of the LSP and thus both browser and other Web-API access.
Requirement Priority	
Upper Level Requirement	

### 2.547.1 Test Cases Summary

LVV-T632	Verify LSP access from the public Internet (IPv6)			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the LSP is accessible from the public Internet using IPv6 protocols.

## 2.548 [LVV-9839] DMS-LSP-REQ-0032-V-01: Multiple installations\_1

Jira Link	Assignee	Status	Test Cases
LVV-9839	Gregory Dubois-Felsmann	Not Covered	LVV-T630

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0032
Requirement Description	The LSP design shall facilitate the installation and maintenance of multiple instances of the LSP and shall support both instances that are accessible from the public Internet and instances that are accessible only within the LSST Project.
Requirement Discussion	In addition to the public instances at the Project-provided Data Access Centers, it is expected that additional instances will be used to support internal processes such as commissioning. It is also desirable that the LSP be designed and implemented so that its components can readily be installed outside the Project-provided facilities (e.g., at IN2P3), but (TBR) this is not a formal requirement.
Requirement Priority	
Upper Level Requirement	

### 2.548.1 Test Cases Summary

LVV-T630	Verify multiple LSP instances			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that separate instances of the LSP accessible to the public, and only within the LSST Project, are available and maintained.



## 2.549 [LVV-9840] DMS-LSP-REQ-0035-V-01: System-Availability Indication\_1

Jira Link	Assignee	Status	Test Cases
LVV-9840	Gregory Dubois-Felsmann	Not Covered	LVV-T633

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-LSP-REQ-0035
Requirement Description	The LSP aspects shall provide means to inform users when their services are unavailable, including for reasons of maintenance or excessive load.
Requirement Discussion	This is a DM requirement, not just a Science Platform requirement, as it interacts with lower-level system-availability issues. Even at LSP level this is a complicated problem, as availability of query services through the Portal, for instance, involves time budgeting and resource management for the all of the stages of the query: query generation, query running, results generation, display of results, and downloading and saving of results.
Requirement Priority	
Upper Level Requirement	

### 2.549.1 Test Cases Summary

LVV-T633	Verify indication of system availability			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the LSP informs users when services are unavailable due to maintenance or excessive load.

## 2.550 [LVV-9841] DMS-PRTL-REQ-0001-V-01: Portal is a Web Application\_1

Jira Link	Assignee	Status	Test Cases
LVV-9841	Gregory Dubois-Felsmann	Not Covered	LVV-T634 LVV-T1334

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0001
Requirement Description	The Portal aspect shall be accessible through commonly used desktop web browsers without requiring users to download and install local software packages.
Requirement Discussion	The supported browsers will be documented by the Project.
Requirement Priority	
Upper Level Requirement	

### 2.550.1 Test Cases Summary

LVV-T634	Verify Portal is a web application			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal is a web application that is accessible to users via common web browsers and without downloading and installing local software.

LVV-T1334	LDM-503-10a: Portal Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Portal Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from the Portal Aspect UI.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0002, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-PRTL-REQ-0001, DMS-PRTL-REQ-0015, DMS-PRTL-REQ-0016, DMS-PRTL-REQ-0017, DMS-PRTL-REQ-0020, DMS-PRTL-REQ-0026, DMS-PRTL-REQ-0049, and DMS-PRTL-REQ-0095, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.551 [LVV-9842] DMS-PRTL-REQ-0005-V-01: Access to Calibration Products\_1

Jira Link	Assignee	Status	Test Cases
LVV-9842	Gregory Dubois-Felsmann	Not Covered	LVV-T638

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0005
Requirement Description	The Portal aspect shall enable access to Project calibration data products, both directly and via linkages from science data products generated using them.
Requirement Discussion	This is a sub-requirement of "Semantic Linkage: Portal" that carries forward a specific requirement originating from early SUIT specifications.
Requirement Priority	
Upper Level Requirement	

### 2.551.1 Test Cases Summary

LVV-T638	Verify access to calibration products via Portal			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that calibration products are accessible from the Portal aspect, both directly and via linkages from science data products that use them. This is a sub-requirement of DMS-PRTL-REQ-0004 (associated test case: LVV-T637).

## 2.552 [LVV-9843] DMS-PRTL-REQ-0007-V-01: Access to External Archives\_1

Jira Link	Assignee	Status	Test Cases
LVV-9843	Gregory Dubois-Felsmann	Not Covered	LVV-T640

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0007
Requirement Description	The Portal aspect shall provide an interface to outside catalog and image data services that are available via standard astronomical VO interfaces to enable a user to determine what external astronomical data are associated with a given location on the sky and return that data for use within the Portal.
Requirement Discussion	The purpose of this requirement is to help users connect LSST data with other data already available in community archives (e.g., IRSA, NED, MAST, HEASARC), and should support any VO-compliant archive. If access to a non-VO compliant archive is critical for the needs of the LSST project that could be considered here.
Requirement Priority	
Upper Level Requirement	

### 2.552.1 Test Cases Summary

LVV-T640	Verify access to external archives from Portal			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that an interface to outside catalog and image data is available, that allows a user to determine what external astronomical data are associated with a given location on the sky and return those data for use within the Portal.

## 2.553 [LVV-9844] DMS-PRTL-REQ-0008-V-01: API for Access to Portal Session State\_1

Jira Link	Assignee	Status	Test Cases
LVV-9844	Gregory Dubois-Felsmann	Not Covered	LVV-T641

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0008
Requirement Description	The Portal aspect shall provide a network API that allows authenticated remote access by a user to aspects of their session state in the Portal. The minimal requirement is for access to the list of queries performed in that session.
Requirement Discussion	Access to the list of queries allows user code in the Notebook aspect to use those query references to retrieve the data which was being explored in the Portal.
Requirement Priority	
Upper Level Requirement	

### 2.553.1 Test Cases Summary

LVV-T641	Verify API for Access to Portal Session State			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect provides a network API that allows authenticated remote access by a user to aspects of their session state in the Portal. The minimal requirement is for access to the list of queries performed in that session.

## 2.554 [LVV-9845] DMS-PRTL-REQ-0006-V-01: Coadded Image to Single-Epoch Image Associations\_1

Jira Link	Assignee	Status	Test Cases
LVV-9845	Gregory Dubois-Felsmann	Not Covered	LVV-T639

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0006
Requirement Description	The Portal aspect shall facilitate users following the associations between coadded images and the single epoch images that were used to generate them.
Requirement Discussion	This is a sub-requirement of "Semantic Linkage: Portal" that carries forward a specific requirement originating from early SUIT specifications.
Requirement Priority	
Upper Level Requirement	

### 2.554.1 Test Cases Summary

LVV-T639	Verify associations between single images and coadds			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that users can discover the associations between coadded images and the single-epoch images that contributed to the coadds. This is a sub-requirement of DMS-PRTL-REQ-0004 (associated test case: LVV-T637).

## 2.555 [LVV-9846] DMS-PRTL-REQ-0003-V-01: Portal Access to Workspace\_1

Jira Link	Assignee	Status	Test Cases
LVV-9846	Gregory Dubois-Felsmann	Not Covered	LVV-T636 LVV-T1818

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0003
Requirement Description	The Portal aspect shall have the capability to discover all data in the user's Workspace.
Requirement Discussion	This will allow for data and images to be retrieved from the environment for use within the portal.
Requirement Priority	
Upper Level Requirement	

### 2.555.1 Test Cases Summary

LVV-T636	Verify Portal access to Workspace			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that users can discover and retrieve data and images within their Workspace.

LVV-T1818	DM-SUIT-8: Verify Portal integration with workspace (via WebDAV)			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Demonstration

#### Objective:

This test case verifies that the Portal Aspect software is capable of accessing a file-oriented workspace via the WebDAV protocol.



In so doing, it partially verifies several Portal Aspect requirements that relate to this capability - “partially” because some of these requirements depend on workspace capabilities which were not present in the prototype WebDAV service delivered by the DAX group, because some of the requirements also cover the User Database Workspace (not relevant to this milestone, and not yet available), and also because the milestone was not envisioned as an exhaustive test covering edge cases:

- DMS-PRTL-REQ-0003 (LVV-9846, Portal access to workspace) is covered at “demonstration” level, with basic tests of saving image and tabular data to the workspace, and only for the User File Workspace (there is currently no User Database Workspace prototype available);
- DMS-PRTL-REQ-0046 (LVV-9886, Visualization of workspace data) is covered at “demonstration” level for a couple of FITS image and table files, and only for the User File Workspace;
- DMS-PRTL-REQ-0110 (LVV-9954, Tabular data download) is covered at “demonstration” level, only for catalog data (there was no image metadata in the LSP deployment at the time of test), and only for the User File Workspace;
- DMS-PRTL-REQ-0095 (LVV-9932, Saving Displayed Tabular Data) is covered at “demonstration” level for a simple subset operation in the table browser; and
- DMS-PRTL-REQ-0111 (LVV-9951, Image data download) is covered at “demonstration” level, and only for download from an image display screen itself (as LSST-style image metadata services, e.g., ObsTAP, were not available in the LSP at the time of testing).

## 2.556 [LVV-9847] DMS-PRTL-REQ-0002-V-01: Portal Discovery of all Data Products\_1

Jira Link	Assignee	Status	Test Cases
LVV-9847	Gregory Dubois-Felsmann	Not Covered	LVV-T635

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0002
Requirement Description	The Portal aspect shall provide the capability to discover and access all the Project's released data products, including, but not limited to, the data products enumerated in the DPDD (LSE-163), the calibration database, and the Reformatted EFD, as well as all user data products to which a user has access.
Requirement Discussion	The Portal's workflows should allow a user to learn what data exist: what data releases are available, what image and catalog data they contain, the names of all databases, tables, and columns, etc. For all tabular data products the Generic Query requirements below cover the basic level of access provided.
Requirement Priority	
Upper Level Requirement	

### 2.556.1 Test Cases Summary

LVV-T635	Verify Portal discovery of all data products			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal enables discovery of all data products released by the Project, including all products enumerated in the DPDD, the calibration database, and the reformatted EFD, as well as user data products to which the user has access.

## 2.557 [LVV-9848] DMS-PRTL-REQ-0004-V-01: Semantic Linkage: Portal Workflows\_1

Jira Link	Assignee	Status	Test Cases
LVV-9848	Gregory Dubois-Felsmann	Not Covered	LVV-T8 LVV-T637

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0004
Requirement Description	The Portal aspect shall provide for the identification and retrieval of semantically linked data.  The Portal should provide straightforward UI workflows for starting from a selected data item (image or catalog entry) and identifying related data, including both direct data-dependency and provenance linkages and more scientifically oriented linkages such as the ability to navigate from an Object to its associated ForcedSources.
Requirement Discussion	Some of these linkages will be supported by the automatic exploitation of metadata exposed through the underlying data access APIs; others will be specifically designed workflows reflecting scientific understanding of the relationships among LSST data products and their processing.
Requirement Priority	
Upper Level Requirement	

### 2.557.1 Test Cases Summary

LVV-T8	LSP-00-30: Linkage of catalog query results with associated images			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will check for the ability, in the Portal Aspect of the LSST Science Platform, to match catalog data with the image data on which the measurements were performed, specifically:

- Navigating from a catalog query result to the associated images; and

- Overlaying catalog query results on associated images.

Because of limited staff resources, these tests will be based on the original PDAC dataset, the LSST Summer 2013 processing of the SDSS Stripe 82 data. The image data for the WISE and NEOWISE missions have not been loaded into PDAC.

LVV-T637	Verify Portal provides semantic linkages between data products			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

**Objective:**

Verify that the Portal aspect provides users the means to identify and retrieve semantically linked data. The Portal should provide straightforward UI workflows for starting from a selected data item (image or catalog entry) and identifying related data, including both direct data-dependency and provenance linkages and more scientifically oriented linkages such as the ability to navigate from an Object to its associated ForcedSources.

## 2.558 [LVV-9849] DMS-PRTL-REQ-0010-V-01: Long Query Backgrounding\_1

Jira Link	Assignee	Status	Test Cases
LVV-9849	Gregory Dubois-Felsmann	Not Covered	LVV-T643

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0010
Requirement Description	The Portal aspect shall notify the user if a query is estimated to take longer than 60 seconds and will allow the user to put the query in background if desired.
Requirement Discussion	This requirement arose from user panel feedback and the original SUIT requirements review. It requires support from DAX/database for query estimation and that is still TBD. Having the query "in the background" refers to the user's perspective of being able to proceed with other work while waiting for it to complete, and may or may not involve a truly asynchronous DAX query.
Requirement Priority	
Upper Level Requirement	

### 2.558.1 Test Cases Summary

LVV-T643	Verify capability to run long queries in the background			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect will notify the user if a query is estimated to take longer than 60 seconds, and will allow the user to put the query in background if desired.

## 2.559 [LVV-9850] DMS-PRTL-REQ-0013-V-01: Query History Inspection\_1

Jira Link	Assignee	Status	Test Cases
LVV-9850	Gregory Dubois-Felsmann	Not Covered	LVV-T646

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0013
Requirement Description	The Portal aspect shall provide a user interface for browsing the history of LSST project and user database queries performed by the user, for re-executing a selected query on demand, and, for recent queries, re-retrieving their results. The implementation of this capability is assumed to rest on the API aspect, and the underlying database systems, supporting this functionality. The Portal interface to this is a thin UI. This should be imagined as a CASJobs-like query history. Note that because the API aspect is shared between the Portal and Notebook, this capability can be used to retrieve in the Portal the results of queries recently executed in the Notebook aspect; this allows complex ADQL queries to be formulated programmatically in the Notebook while still permitting their results to be inspected in the Portal. Because of the reliance on the API aspect, the Portal is not required to provide this capability for external archives.
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

### 2.559.1 Test Cases Summary

LVV-T646	Verify ability to browse query history			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that a user interface exists where users can browse the history of queries they have performed, and subsequently re-execute them if desired.

## 2.560 [LVV-9851] DMS-PRTL-REQ-0012-V-01: Query Results Size Limitation\_1

Jira Link	Assignee	Status	Test Cases
LVV-9851	Gregory Dubois-Felsmann	Not Covered	LVV-T645

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0012
Requirement Description	The Portal aspect shall have a mechanism to notify a user that a query result is predicted to exceed, or has exceeded, threshold(s) for the maximum results size allowed and that the query has been disallowed or terminated as a result.
Requirement Discussion	If the size limitation is applied at run time as query results accumulate, this is an important concrete sub-case of the DMS-PRTL-REQ-0011 requirement; if it is applied earlier, it is a separate mechanism.
Requirement Priority	The underlying DAX capabilities required to support this remain to be specified in detail.
Upper Level Requirement	

### 2.560.1 Test Cases Summary

LVV-T645	Verify limitation of query results size			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

Verify that the Portal aspect estimates query results size, and notifies user if the query result exceeds thresholds and has been disallowed or terminated as a result.

## 2.561 [LVV-9852] DMS-PRTL-REQ-0014-V-01: Query Saving - Portal\_1

Jira Link	Assignee	Status	Test Cases
LVV-9852	Gregory Dubois-Felsmann	Not Covered	LVV-T647

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0014
Requirement Description	The Portal aspect shall provide a UI for the saving of a specification artifact for a user-performed query, either for downloading or for saving to the Workspace, and a UI for re-executing a saved query found in the Workspace or uploaded remotely.
Requirement Priority	
Upper Level Requirement	

### 2.561.1 Test Cases Summary

LVV-T647	Verify implementation of saving of queries			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

The Portal aspect shall provide a UI for the saving of a specification artifact for a user-performed query, either for downloading or for saving to the Workspace, and a UI for re-executing a saved query found in the Workspace or uploaded remotely.



## 2.562 [LVV-9853] DMS-PRTL-REQ-0011-V-01: Query Status and Termination Notification\_1

Jira Link	Assignee	Status	Test Cases
LVV-9853	Gregory Dubois-Felsmann	Not Covered	LVV-T644

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0011
Requirement Description	The Portal aspect shall notify the user of the status of user-initiated database queries, including whether the query has been terminated for any reason.
Requirement Discussion	There needs to be an operations discussion about when and why database queries are terminated, and what sorts of notifications will be generated by DAX in such cases. How the Portal Aspect will notify the user is not specified by this requirement; it might be by email to a registered address, or it might be through a notification mechanism in the Portal UI, or something else.
Requirement Priority	
Upper Level Requirement	

### 2.562.1 Test Cases Summary

LVV-T644	Verify user notification of query status			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal notifies the user of the status of user-initiated queries, including whether the query has been terminated for any reason.

## 2.563 [LVV-9854] DMS-PRTL-REQ-0009-V-01: Support Synchronous and Asynchronous Queries\_1

Jira Link	Assignee	Status	Test Cases
LVV-9854	Gregory Dubois-Felsmann	Not Covered	LVV-T642

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0009
Requirement Description	The Portal aspect shall provide UI models for both synchronous and asynchronous queries, based on user preference, loading, and resource capabilities.  This Portal capability should include an interface to initiate, monitor, and control the execution of both sync and async queries, as well as browse their results. Long running queries may be forced to be asynchronous.
Requirement Discussion	There is not a 1:1 relationship between this Portal capability and the analogous capability in the API aspect; for instance, the Portal may provide UI support for placing a long-running, technically synchronous (from the DAX perspective), query into the background from the user's perspective.
Requirement Priority	
Upper Level Requirement	

### 2.563.1 Test Cases Summary

LVV-T642	Verify Portal supports both synchronous and asynchronous queries			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect provides UI models for both synchronous and asynchronous queries. This Portal capability should include an interface to initiate, monitor, and control the execution of both sync and async queries, as well as browse their results. Long running queries may be forced to be asynchronous.

## 2.564 [LVV-9855] DMS-PRTL-REQ-0017-V-01: Generic Query - ADQL-based\_1

Jira Link	Assignee	Status	Test Cases
LVV-9855	Gregory Dubois-Felsmann	Not Covered	LVV-T650 LVV-T1334

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0017
Requirement Description	The Portal aspect shall provide a means for entering a query against any table directly in ADQL. This facility shall be available for every table, including user-supplied tables.
Requirement Discussion	This is essentially a pass-through to the underlying API aspect TAP service. UI support for selecting from available identifiers (e.g. table or column names) for use in the ADQL, based on the Discovery and Reflection API, would be highly desirable. UI support for the specification of coordinate values for use in the ADQL, based on the Spatial Query Parameters requirements below, would also be desirable.
Requirement Priority	
Upper Level Requirement	

### 2.564.1 Test Cases Summary

LVV-T650	Verify implementation of ADQL-based generic query in API aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

The Portal aspect shall provide a means for entering a query against any table directly in ADQL. This facility shall be available for every table, including user-supplied tables.

LVV-T1334	LDM-503-10a: Portal Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type

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Gregory Dubois- Felsmann	Defined	1	false	Test
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**Objective:**

This test case verifies that the Portal Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from the Portal Aspect UI.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0002, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-PRTL-REQ-0001, DMS-PRTL-REQ-0015, DMS-PRTL-REQ-0016, DMS-PRTL-REQ-0017, DMS-PRTL-REQ-0020, DMS-PRTL-REQ-0026, DMS-PRTL-REQ-0049, and DMS-PRTL-REQ-0095, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.565 [LVV-9856] DMS-PRTL-REQ-0016-V-01: Generic Query - Form-based\_1

Jira Link	Assignee	Status	Test Cases
			LVV-T5
LVV-9856	Gregory Dubois-Felsmann	Not Covered	LVV-T649
			LVV-T1334

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0016
Requirement Description	The Portal aspect shall provide a search-builder form-based interface for generic table queries. This facility may have reduced functionality for user tables for which the user has not provided full, or accurate, metadata.
Requirement Discussion	The Discovery and Reflection API will be used to construct a form allowing query against any attribute of a table, taking the column metadata provided by the Reflection API into account to display units and other information that will help the user construct a meaningful query. We wish to allow and facilitate, but not require, users to provide detailed metadata for the tables they create; when they do, the system will take advantage of it.
Requirement Priority	
Upper Level Requirement	

### 2.565.1 Test Cases Summary

LVV-T5	LSP-00-15: Execution of basic catalog queries in the Portal			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will test the functional requirements to be able to perform a range of basic queries through the Portal Aspect of the LSP:

- Cone searches on the Object-like, ForcedSource-like, and Source-like WISE tables;
- Multi-target cone searches;

- Form-based searches for exact equality, e.g., for row IDs; and
- Form-based searches for sets of object attributes.

In addition, it tests the ability to download tabular query results from the Portal Aspect.

LVV-T649	Verify implementation of form-based generic query in API aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

**Objective:**

The Portal aspect shall provide a search-builder form-based interface for generic table queries. This facility may have reduced functionality for user tables for which the user has not provided full, or accurate, metadata.

LVV-T1334	LDM-503-10a: Portal Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Portal Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from the Portal Aspect UI.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0002, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-PRTL-REQ-0001, DMS-PRTL-REQ-0015, DMS-PRTL-REQ-0016, DMS-PRTL-REQ-0017, DMS-PRTL-REQ-0020, DMS-PRTL-REQ-0026, DMS-PRTL-REQ-0049, and DMS-PRTL-REQ-0095, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.566 [LVV-9857] DMS-PRTL-REQ-0015-V-01: Generic Query\_1

Jira Link	Assignee	Status	Test Cases
LVV-9857	Gregory Dubois-Felsmann	Not Covered	LVV-T648 LVV-T1334

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0015
Requirement Description	The Portal aspect shall enable the generation of queries against any tabular data exposed in the API aspect.
Requirement Discussion	Provision of this relies on the Discovery and Reflection API requirement. The idea is that some level of query will automatically be provided for every table even for tables for which no deliberately-designed custom search screens are available. Note that image metadata is tabular data, so a basic level of ability to query for lists of images is available through "generic queries", though more image-specific workflows will be provided.
Requirement Priority	
Upper Level Requirement	

### 2.566.1 Test Cases Summary

LVV-T648	Verify implementation of generic queries in API aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

The Portal aspect shall enable the generation of queries against any tabular data exposed in the API aspect.

LVV-T1334	LDM-503-10a: Portal Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type

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Gregory Dubois- Felsmann	Defined	1	false	Test
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**Objective:**

This test case verifies that the Portal Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from the Portal Aspect UI.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0002, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-PRTL-REQ-0001, DMS-PRTL-REQ-0015, DMS-PRTL-REQ-0016, DMS-PRTL-REQ-0017, DMS-PRTL-REQ-0020, DMS-PRTL-REQ-0026, DMS-PRTL-REQ-0049, and DMS-PRTL-REQ-0095, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.



## 2.567 [LVV-9858] DMS-PRTL-REQ-0018-V-01: Query Result Size\_1

Jira Link	Assignee	Status	Test Cases
LVV-9858	Gregory Dubois-Felsmann	Not Covered	LVV-T651

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0018
Requirement Description	The Portal aspect shall provide UI support for any mechanism provided by the API Aspect for determining or estimating the number of rows matching the query criteria without generating a full return set.
Requirement Discussion	What level of support for this will be provided by the DAX services remains to be determined, so the requirement has been written to accommodate that uncertainty. A proper implementation would rely on row-counting in the ADQL submitted to the DAX services.
Requirement Priority	
Upper Level Requirement	

### 2.567.1 Test Cases Summary

LVV-T651	Verify estimation of query result size			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that UI support exists to estimate (or determine exactly) the size of results that would be returned by a query without returning the full set of results.

## 2.568 [LVV-9859] DMS-PRTL-REQ-0028-V-01: Query by Identifier\_1

Jira Link	Assignee	Status	Test Cases
LVV-9859	Gregory Dubois-Felsmann	Not Covered	LVV-T5 LVV-T652

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0028
Requirement Description	The Portal aspect shall provide UI support for performing queries for data on any LSST data product entity with a unique ID by that ID.
Requirement Discussion	Given, e.g., an Object ID or a Visit ID, it should be possible to perform a query by that ID and retrieve all, or a selection of, the data for the corresponding Object or Visit. This requirement is limited to the direct content of the corresponding table row; the following requirements add semantic workflows returning additional data. It is desirable for this capability to be available wherever such a unique ID is displayed in the UI, though the mandatory requirement is only for a dedicated form for such a query.
Requirement Priority	
Upper Level Requirement	

### 2.568.1 Test Cases Summary

LVV-T5	LSP-00-15: Execution of basic catalog queries in the Portal			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will test the functional requirements to be able to perform a range of basic queries through the Portal Aspect of the LSP:

- Cone searches on the Object-like, ForcedSource-like, and Source-like WISE tables;
- Multi-target cone searches;
- Form-based searches for exact equality, e.g., for row IDs; and
- Form-based searches for sets of object attributes.

In addition, it tests the ability to download tabular query results from the Portal Aspect.

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LVV-T652	Verify query by unique identifier			
<b>Owner</b>	<b>Status</b>	<b>Version</b>	<b>Critical Event</b>	<b>Verification Type</b>
Jeffrey Carlin	Draft	1	false	Test

---

**Objective:**

Verify that queries can be performed to find data on any LSST data product with a unique ID by that ID.

Draft

## 2.569 [LVV-9860] DMS-PRTL-REQ-0029-V-01: Query by LSST Object and Source Identifiers: Specific Match to Identifier\_1

Jira Link	Assignee	Status	Test Cases
LVV-9860	Gregory Dubois-Felsmann	Not Covered	LVV-T653

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0029
Requirement Description	The Portal aspect shall provide UI support to query and return data associated with a specific LSST (DIA)Object, (DIA)Source, or ForcedSource identifier, including catalog data associated with the entity as well as the image data and metadata directly associated with the measurement.
Requirement Discussion	For example, for an Object ID query, the Portal will, upon request, return information on the coadded images on which the Object was observed. For a ForcedSource ID, the Portal should return information on the associated Object and on the single-epoch image on which the ForcedSource measurement was made.
Requirement Priority	
Upper Level Requirement	

### 2.569.1 Test Cases Summary

LVV-T653	Verify query by object or source identifier			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that queries can be performed for a given object or source ID (e.g., (DIA)Object, (DIA)Source, ForcedSource), and return catalog, image, and metadata associated with measurements of the object/source.

## 2.570 [LVV-9861] DMS-PRTL-REQ-0030-V-01: Query by Solar System Objects: Specific Match to Identifier\_1

Jira Link	Assignee	Status	Test Cases
LVV-9861	Gregory Dubois-Felsmann	Not Covered	LVV-T654

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0030
Requirement Description	The Portal aspect shall provide UI support to query and return data specifically associated with a Solar System Object.
Requirement Discussion	The Portal will need to be able to return the data (catalog and images) associated with a specific solar system identifier and that cover the time range wanted. This requires that the SSO database will have identified known solar objects that have been observed.
Requirement Priority	
Upper Level Requirement	

### 2.570.1 Test Cases Summary

LVV-T654	Verify query by Solar System object identifier			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the UI supports queries and returns data associated with a specific Solar System Object.

## 2.571 [LVV-9862] DMS-PRTL-REQ-0022-V-01: Positional Query: Astrophysical Coordinate Systems\_1

Jira Link	Assignee	Status	Test Cases
LVV-9862	Gregory Dubois-Felsmann	Not Covered	LVV-T5 LVV-T657

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0022
Requirement Description	The Portal aspect shall support positional queries based on the following astrophysical coordinate systems: equatorial, ecliptic, and galactic.
Requirement Discussion	The UI should include information on (and possibly selection of) the particular definition of each available coordinate system.
Requirement Priority	
Upper Level Requirement	

### 2.571.1 Test Cases Summary

LVV-T5	LSP-00-15: Execution of basic catalog queries in the Portal			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will test the functional requirements to be able to perform a range of basic queries through the Portal Aspect of the LSP:

- Cone searches on the Object-like, ForcedSource-like, and Source-like WISE tables;
- Multi-target cone searches;
- Form-based searches for exact equality, e.g., for row IDs; and
- Form-based searches for sets of object attributes.

In addition, it tests the ability to download tabular query results from the Portal Aspect.

LVV-T657	Verify implementation of astrophysical coordinate systems			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

**Objective:**

Verify that the Portal aspect supports positional queries based on equatorial, ecliptic, and Galactic astrophysical coordinate systems.

Draft

## 2.572 [LVV-9863] DMS-PRTL-REQ-0023-V-01: Positional Query: Astrophysical Source Name Lookup\_1

Jira Link	Assignee	Status	Test Cases
LVV-9863	Gregory Dubois-Felsmann	Not Covered	LVV-T658

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0023
Requirement Description	The Portal aspect shall support the specification of coordinates for use within all positional queries by the use of source names in common community-established astrophysical source name lookup services.
Requirement Discussion	Services include, but are not limited to, NED, SIMBAD, and Horizons
Requirement Priority	
Upper Level Requirement	

### 2.572.1 Test Cases Summary

LVV-T658	Verify positional query by astrophysical source name			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect supports queries based on the use of source names in commonly-used astrophysical source name lookup services (e.g., NED, Simbad, Horizons).



## 2.573 [LVV-9864] DMS-PRTL-REQ-0024-V-01: Positional Query: LSST Object and Source Identifiers\_1

Jira Link	Assignee	Status	Test Cases
LVV-9864	Gregory Dubois-Felsmann	Not Covered	LVV-T659

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0024
Requirement Description	The Portal aspect shall support the specification of coordinates for use within all positional queries by the use of specific LSST catalog entry identifiers, including those for the Object, DIAObject, Source, and DIASource tables. The default choice of coordinate columns within these tables to use for the ID-to-coordinate translation shall be documented and shall be able to be determined from the UI.
Requirement Discussion	LSST object and source identifiers are not necessarily associated with previously known astrophysical sources. The Portal will need to be able to interpret source and object names and return positions that can be used in positional-based searches.
Requirement Priority	
Upper Level Requirement	

### 2.573.1 Test Cases Summary

LVV-T659	Verify positional query by Source or Object name			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

Verify that positional queries can be performed for coordinates based on a given object or source ID (e.g., (DIA)Object, (DIA)Source, ForcedSource).

## 2.574 [LVV-9865] DMS-PRTL-REQ-0021-V-01: Positional Query: Multiple Positions/Objects\_1

Jira Link	Assignee	Status	Test Cases
LVV-9865	Gregory Dubois-Felsmann	Not Covered	LVV-T5 LVV-T656

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0021
Requirement Description	The Portal aspect shall support list-based positional queries, with the coordinates used specified by any of the means of specifying positions required elsewhere herein.
Requirement Discussion	Lists of positions may be uploaded or taken from the Workspace. Efficient implementation of list-based queries requires a corresponding API aspect / DAX service, to avoid the submission of large numbers of separate queries. The system is not required to, but may, accept lists in which different elements are specified in more than one of the supported means of specifying positions; e.g., it is not required to support a list that is partially in equatorial coordinates and partially in LSST object IDs, because of the parsing and interpretation complexities involved. The implementation should not preclude adding the ability to mix specification types later one, guided by feedback from the user community as to what is most useful.
Requirement Priority	
Upper Level Requirement	

### 2.574.1 Test Cases Summary

LVV-T5	LSP-00-15: Execution of basic catalog queries in the Portal			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will test the functional requirements to be able to perform a range of basic queries through the Portal Aspect of the LSP:

- Cone searches on the Object-like, ForcedSource-like, and Source-like WISE tables;
- Multi-target cone searches;
- Form-based searches for exact equality, e.g., for row IDs; and
- Form-based searches for sets of object attributes.

In addition, it tests the ability to download tabular query results from the Portal Aspect.

LVV-T656	Verify query by list of positions			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

**Objective:**

Verify that the Portal supports queries based on a list of object positions. The coordinates may be specified by any of the supported means of specifying positions.

## 2.575 [LVV-9866] DMS-PRTL-REQ-0020-V-01: Positional Query: Position on the Sky\_1

Jira Link	Assignee	Status	Test Cases
LVV-9866	Gregory Dubois-Felsmann	Not Covered	LVV-T655 LVV-T1334

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0020
Requirement Description	The Portal aspect shall support queries based on an astrophysical position (i.e., coordinates) on the sky.
Requirement Discussion	The intent of this requirement is to enable users to search for data at or near locations in equatorial, ecliptic or galactic coordinates and not a specific astrophysical object. The Portal is responsible for any conversion required to put the coordinate query parameters into the forms accepted by the underlying API aspect / DAX services.
Requirement Priority	
Upper Level Requirement	

### 2.575.1 Test Cases Summary

LVV-T655	Verify query by position on the sky			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect supports queries based on astrophysical coordinates on the sky.

LVV-T1334	LDM-503-10a: Portal Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Portal Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from the Portal Aspect UI.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0002, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-PRTL-REQ-0001, DMS-PRTL-REQ-0015, DMS-PRTL-REQ-0016, DMS-PRTL-REQ-0017, DMS-PRTL-REQ-0020, DMS-PRTL-REQ-0026, DMS-PRTL-REQ-0049, and DMS-PRTL-REQ-0095, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.576 [LVV-9868] DMS-PRTL-REQ-0027-V-01: Positional Query by Region: Box-Search\_1

Jira Link	Assignee	Status	Test Cases
LVV-9868	Gregory Dubois-Felsmann	Not Covered	LVV-T5 LVV-T662

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0027
Requirement Description	The Portal aspect shall support position-based queries based on a coordinate-system box search.
Requirement Priority	
Upper Level Requirement	

### 2.576.1 Test Cases Summary

LVV-T5	LSP-00-15: Execution of basic catalog queries in the Portal			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will test the functional requirements to be able to perform a range of basic queries through the Portal Aspect of the LSP:

- Cone searches on the Object-like, ForcedSource-like, and Source-like WISE tables;
- Multi-target cone searches;
- Form-based searches for exact equality, e.g., for row IDs; and
- Form-based searches for sets of object attributes.

In addition, it tests the ability to download tabular query results from the Portal Aspect.

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LVV-T662	Verify query by box search			
<b>Owner</b>	<b>Status</b>	<b>Version</b>	<b>Critical Event</b>	<b>Verification Type</b>
Jeffrey Carlin	Draft	1	false	Test

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**Objective:**

Verify that the Portal supports positional queries based on a coordinate system box search.

Draft

## 2.577 [LVV-9870] DMS-PRTL-REQ-0019-V-01: Query by Date and Time: Time Range of Observation\_1

Jira Link	Assignee	Status	Test Cases
LVV-9870	Gregory Dubois-Felsmann	Not Covered	LVV-T663

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0019
Requirement Description	The Portal aspect shall support queries based on times and ranges of date/time values in both UT and (barycentric) Julian date.  The intent of this requirement is to enable users to search for an event within a range of times/dates and is akin to a positional box search of images that overlap that time range or are fully enveloped in that time range.
Requirement Discussion	This type of query should be available for all time-point based tables in the LSST data products (e.g., Visit, Source, ForcedSource, DIASource, and EFD), and more generally for all tables with columns indicated as times by their metadata (e.g., by UCDS).  The Portal is responsible for conversion of user-supplied times to the appropriate form for use in the underlying API aspect and database queries.
Requirement Priority	
Upper Level Requirement	

### 2.577.1 Test Cases Summary

LVV-T663	Verify query by time of observation			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

#### Objective:

Verify that the Portal supports queries based on time or ranges of date/time values in both UT and (barycentric) Julian date.



## 2.578 [LVV-9871] DMS-PRTL-REQ-0034-V-01: Access to Original Alert State\_1

Jira Link	Assignee	Status	Test Cases
LVV-9871	Gregory Dubois-Felsmann	Not Covered	LVV-T668

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0034
Requirement Description	The Portal aspect shall provide access to the alerts as they were originally raised.
Requirement Discussion	This is in the context of features elsewhere in the system that may allow for a chain of annotations of alerts.
Requirement Priority	
Upper Level Requirement	

### 2.578.1 Test Cases Summary

LVV-T668	Verify access to original alert state			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that alerts as they were originally raised are accessible via the Portal.

## 2.579 [LVV-9872] DMS-PRTL-REQ-0033-V-01: Queries on the Alerts Database\_1

Jira Link	Assignee	Status	Test Cases
LVV-9872	Gregory Dubois-Felsmann	Not Covered	LVV-T667

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0033
Requirement Description	The Portal aspect shall provide a query interface to the Alert Database, allowing searches based on parameters which shall include, but may not be limited to, Alert ID, time of alert, position on the sky, filter, and alert characteristics.
Requirement Discussion	This capability, as all others in this section, is limited to data rights holders. Non-data-rights holders have access to alerts only through the alerts stream(s) sent to public brokers.
Requirement Priority	
Upper Level Requirement	

### 2.579.1 Test Cases Summary

LVV-T667	Verify queries on the alerts database			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal supports queries on parameters in the Alerts Database.

## 2.580 [LVV-9873] DMS-PRTL-REQ-0032-V-01: Query Tabular Data based upon Image MetaData\_1

Jira Link	Assignee	Status	Test Cases
LVV-9873	Gregory Dubois-Felsmann	Not Covered	LVV-T666

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0032
Requirement Description	The Portal aspect shall be able to support queries of catalog data that include constraints on the properties of the images on which the catalog measurements were made.
Requirement Discussion	This allows, for instance, limiting the return of Source catalog entries to measurements made on images taken with constraints on airmass, moon angle, etc.
Requirement Priority	
Upper Level Requirement	

### 2.580.1 Test Cases Summary

LVV-T666	Verify query by image metadata			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

### Objective:

Verify that the Portal supports queries on image metadata (e.g., airmass, moon angle, etc.) from the images the catalog measurements were made from.

## 2.581 [LVV-9874] DMS-PRTL-REQ-0031-V-01: Tabular Data Query Specifications\_1

Jira Link	Assignee	Status	Test Cases
LVV-9874	Gregory Dubois-Felsmann	Not Covered	LVV-T664

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0031
Requirement Description	The Portal aspect shall provide a user interface to execute queries of the (DIA)Object and (DIA)Source tables, driven by the data dictionary associated with the tables.
Requirement Discussion	This should be satisfied almost completely by the "Generic Query - Form-Based" requirement above, but with some additional work on the UI to produce a more friendly workflow.
Requirement Priority	
Upper Level Requirement	

### 2.581.1 Test Cases Summary

LVV-T664	Verify implementation of user-friendly tabular query			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

The Portal aspect shall provide a user interface to execute queries of the (DIA)Object and (DIA)Source tables, driven by the data dictionary associated with the tables.

## 2.582 [LVV-9875] DMS-PRTL-REQ-0039-V-01: Coadded Image Query Specifications\_1

Jira Link	Assignee	Status	Test Cases
LVV-9875	Gregory Dubois-Felsmann	Not Covered	LVV-T673

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0039
Requirement Description	The Portal aspect shall provide UI support for queries for coadded images based on the image metadata that describe the provenance of the images (e.g., filters, position on the sky, date, number of single-epoch images, coverage, survey depth).
Requirement Priority	
Upper Level Requirement	

### 2.582.1 Test Cases Summary

LVV-T673	Verify query for coadds by image metadata			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect supports queries based on image metadata describing the provenance of the contributing images, that return the corresponding coadd image(s).

## 2.583 [LVV-9876] DMS-PRTL-REQ-0037-V-01: Query for Single Epoch CCD Image\_1

Jira Link	Assignee	Status	Test Cases
LVV-9876	Gregory Dubois-Felsmann	Not Covered	LVV-T671

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0037
Requirement Description	The Portal aspect shall enable a user to limit the list of images selected by a single-epoch visit image query to those from a specified CCD.
Requirement Discussion	The intent is to enable the return of every image from CCD X as a function of time or filter to enable viewing just that CCD.
Requirement Priority	
Upper Level Requirement	

### 2.583.1 Test Cases Summary

LVV-T671	Verify query for single-epoch CCD images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that users of the single-epoch query service (LVV-9878) can limit the returned visit images to only a specified CCD.

## 2.584 [LVV-9877] DMS-PRTL-REQ-0036-V-01: Query for Single Epoch Raft Images\_1

Jira Link	Assignee	Status	Test Cases
LVV-9877	Gregory Dubois-Felsmann	Not Covered	LVV-T670

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0036
Requirement Description	The Portal aspect shall enable a user to limit the list of images selected by a single-epoch visit image query to those from a specified raft.
Requirement Discussion	The intent is to enable the return of every image from RAFT X as a function of time or filter to enable viewing just that raft.
Requirement Priority	
Upper Level Requirement	

### 2.584.1 Test Cases Summary

LVV-T670	Verify query for single-epoch raft images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that users of the single-epoch query service (LVV-9878) can limit the returned visit images to only a specified raft.

## 2.585 [LVV-9878] DMS-PRTL-REQ-0035-V-01: Query for Single Epoch Visit Images\_1

Jira Link	Assignee	Status	Test Cases
LVV-9878	Gregory Dubois-Felsmann	Not Covered	LVV-T669

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0035
Requirement Description	The Portal aspect shall enable a user to proceed from a visit-selection query or a list of visits and return a list of all single-epoch images of a specified type corresponding to those visits.
Requirement Discussion	The common image types will be raw, PVI (processed, i.e., calibrated, visit image), and difference image.
Requirement Priority	
Upper Level Requirement	

### 2.585.1 Test Cases Summary

LVV-T669	Verify query for single-epoch visit images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that users with a list of visits (either directly, or from a visit-selection query) can query for single-epoch images corresponding to those visits.



## 2.586 [LVV-9879] DMS-PRTL-REQ-0038-V-01: Single-Epoch Image Query Specifications\_1

Jira Link	Assignee	Status	Test Cases
LVV-9879	Gregory Dubois-Felsmann	Not Covered	LVV-T672

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0038
Requirement Description	The Portal aspect shall provide UI support for queries for visits and their single-epoch images of specified type, based on image metadata parameters including pointing, time and date, and filter selection, as well as on parameters from the Reformatted EFD. The parameters specifically named are expected to be highlighted in the UI, rather than requiring the user to scroll through a long generic-table-query form to find the appropriate fields. The UI will provide support for generating a join query including tables from the R-EFD, and for selecting the R-EFD tables and columns to use.
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

### 2.586.1 Test Cases Summary

LVV-T672	Verify metadata query for single-epoch images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal provides an option to query for visits and single-epoch images of a certain type based on image metadata or parameters from the reformatted EFD.

## 2.587 [LVV-9880] DMS-PRTL-REQ-0041-V-01: Query for Coadded Image Cutouts\_1

Jira Link	Assignee	Status	Test Cases
LVV-9880	Gregory Dubois-Felsmann	Not Covered	LVV-T7 LVV-T674

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0041
Requirement Description	The Portal aspect shall enable a user to perform a coadded image query, as above, and additionally return a list of sub-images (i.e., cutouts) from the all-sky co-added images based upon user-specified center position and image size, including the appropriate metadata for describing the image cut-outs.
Requirement Discussion	This is a front end to a cutout capability in the API aspect.
Requirement Priority	
Upper Level Requirement	

### 2.587.1 Test Cases Summary

LVV-T7	LSP-00-25: Image metadata, image, and image cutout queries			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will check basic functionality related to image search and retrieval, via both the API Aspect and the Portal Aspect of the LSST Science Platform:

- Searching for images containing a specified point;
- Displaying selected images;
- Obtaining and displaying image cutouts at a specified point; and
- Downloading selected images and image cutouts.

Because of limited staff resources, these tests will be based on the original PDAC dataset, the LSST Summer 2013 processing of the SDSS Stripe 82 data. The image data for the WISE and NEOWISE missions have not been loaded into PDAC.

LVV-T674	Verify query for coadd image cutouts			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

**Objective:**

Verify that Portal users can query based on image metadata for coadds, then obtain a list of sub-images (cutouts) with a specified center position and size.

## 2.588 [LVV-9881] DMS-PRTL-REQ-0040-V-01: Query for Single Epoch Image Cutouts\_1

Jira Link	Assignee	Status	Test Cases
LVV-9881	Gregory Dubois-Felsmann	Not Covered	LVV-T7 LVV-T675

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0040
Requirement Description	The Portal aspect shall enable a user to perform a single-epoch image query, as above, and additionally return a list of sub-images (i.e., cutouts) from them based upon a specified center position, time range, and image size, including the appropriate metadata for describing the image cut-outs.
Requirement Discussion	This is a front end to a cutout capability in the API aspect.
Requirement Priority	
Upper Level Requirement	

### 2.588.1 Test Cases Summary

LVV-T7	LSP-00-25: Image metadata, image, and image cutout queries			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will check basic functionality related to image search and retrieval, via both the API Aspect and the Portal Aspect of the LSST Science Platform:

- Searching for images containing a specified point;
- Displaying selected images;
- Obtaining and displaying image cutouts at a specified point; and
- Downloading selected images and image cutouts.

Because of limited staff resources, these tests will be based on the original PDAC dataset, the LSST Summer 2013 processing of the SDSS Stripe 82 data. The image data for the WISE and NEOWISE missions have not been loaded into PDAC.

LVV-T675	Verify query for single-epoch image cutouts			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

**Objective:**

Verify that Portal users can query based on image metadata for single-epoch images, then obtain a list of sub-images (cutouts) with a specified center position and size.

## 2.589 [LVV-9882] DMS-PRTL-REQ-0044-V-01: Linking Visualization of Image Data to Tabular Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9882	Gregory Dubois-Felsmann	Not Covered	LVV-T679

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0044
Requirement Description	The Portal aspect shall provide the capability for the user to navigate between visualized tabular data and visualized image data.
Requirement Discussion	For instance, there should be very simple UI support to display an image based on a row in an image metadata table, or to navigate from a selected source overplotted on an image to further information about that source.
Requirement Priority	
Upper Level Requirement	

### 2.589.1 Test Cases Summary

LVV-T679	Verify visualization linking image and tabular data			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect provides a capability for users to navigate between visualization and tabular data for a given tabular entry.

## 2.590 [LVV-9883] DMS-PRTL-REQ-0043-V-01: Visualization of Ancillary Information\_1

Jira Link	Assignee	Status	Test Cases
LVV-9883	Gregory Dubois-Felsmann	Not Covered	LVV-T678

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0043
Requirement Description	The Portal aspect shall include the ability to visualize selected ancillary information produced by the LSST pipeline including, but not limited to, image regions, image bit-planes, survey footprints, focal-plane footprints and PSF representations. The intent here is to call attention to the fact there is more than just the survey images and coadds that are have a 2D-dimension? form that need to be visualized and presented to the user in the interface. The specific ancillary data products to visualize will be determined during construction, based in part on feedback received during PDAC operation and the use of the Portal tools by developers.
Requirement Discussion	It is desirable that custom visualizations be available for important and frequently used ones such as Footprints (which can readily be displayed as pixel overlays). Where dedicated Portal visualizations are not available, however, users should be able to use either LSST-provided or community libraries in the Notebook aspect to create custom visualizations.
Requirement Priority	
Upper Level Requirement	

### 2.590.1 Test Cases Summary

LVV-T678	Verify visualization of ancillary information			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal provides the ability to visualize certain ancillary information produced by the LSST pipeline, including, but not limited to, image regions, image bit-planes, survey footprints, focal-plane footprints and PSF representations.

## 2.591 [LVV-9884] DMS-PRTL-REQ-0042-V-01: Visualization of Tabular and Image Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9884	Gregory Dubois-Felsmann	Not Covered	LVV-T677

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0042
Requirement Description	The Portal aspect shall provide the capability to visualize all tabular and image data products in the DPDD, as well as user data products.
Requirement Discussion	The products in the DPDD are the primary data products for use by the LSST users. The “tabular and image” qualification indicates that the Portal is not required to provide a dedicated visualization for all data products that do not naturally fall into one of those categories. For user data products, the amount of detail and labeling, and the amount of UI support, will be less if they lack the full level of metadata that comes with the Project’s own data products.
Requirement Priority	
Upper Level Requirement	

### 2.591.1 Test Cases Summary

LVV-T677	Verify Portal provides visualization of tabular and image data			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect provides the capability to visualize all tabular and image data defined in the DPDD, as well as user data products.



## 2.592 [LVV-9885] DMS-PRTL-REQ-0045-V-01: Visualization of Uploaded Tabular and Image Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9885	Gregory Dubois-Felsmann	Not Covered	LVV-T680

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0045
Requirement Description	The Portal aspect shall support a convenient workflow for the visualization of uploaded tabular and image data products.
Requirement Discussion	The idea is to provide something close to a one-button "show me this" workflow.
Requirement Priority	
Upper Level Requirement	

### 2.592.1 Test Cases Summary

LVV-T680	Verify visualization tool for uploaded tabular or image data			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal provides a means of visualizing uploaded tables or images.

## 2.593 [LVV-9886] DMS-PRTL-REQ-0046-V-01: Visualization of Workspace Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9886	Gregory Dubois-Felsmann	Not Covered	LVV-T681 LVV-T1818

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0046
Requirement Description	The Portal aspect shall support a convenient workflow for the visualization of data selected in a workspace browser.
Requirement Discussion	This should appear as a standard "select and open" workflow, with the Portal determining a reasonable action to take based on its determination of the type of Workspace data selected.
Requirement Priority	
Upper Level Requirement	

### 2.593.1 Test Cases Summary

LVV-T681	Verify visualization of workspace data			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that data selected in a workspace browser can be conveniently visualized.

LVV-T1818	DM-SUIT-8: Verify Portal integration with workspace (via WebDAV)			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Demonstration

#### Objective:

This test case verifies that the Portal Aspect software is capable of accessing a file-oriented workspace via the WebDAV protocol.

In so doing, it partially verifies several Portal Aspect requirements that relate to this capability - “partially” because some of these requirements depend on workspace capabilities which were not present in the prototype WebDAV service delivered by the DAX group, because some of the requirements also cover the User Database Workspace (not relevant to this milestone, and not yet available), and also because the milestone was not envisioned as an exhaustive test covering edge cases:

- DMS-PRTL-REQ-0003 (LVV-9846, Portal access to workspace) is covered at “demonstration” level, with basic tests of saving image and tabular data to the workspace, and only for the User File Workspace (there is currently no User Database Workspace prototype available);
- DMS-PRTL-REQ-0046 (LVV-9886, Visualization of workspace data) is covered at “demonstration” level for a couple of FITS image and table files, and only for the User File Workspace;
- DMS-PRTL-REQ-0110 (LVV-9954, Tabular data download) is covered at “demonstration” level, only for catalog data (there was no image metadata in the LSP deployment at the time of test), and only for the User File Workspace;
- DMS-PRTL-REQ-0095 (LVV-9932, Saving Displayed Tabular Data) is covered at “demonstration” level for a simple subset operation in the table browser; and
- DMS-PRTL-REQ-0111 (LVV-9951, Image data download) is covered at “demonstration” level, and only for download from an image display screen itself (as LSST-style image metadata services, e.g., ObsTAP, were not available in the LSP at the time of testing).

## 2.594 [LVV-9887] DMS-PRTL-REQ-0048-V-01: Alert Visualization\_1

Jira Link	Assignee	Status	Test Cases
LVV-9887	Gregory Dubois-Felsmann	Not Covered	LVV-T683

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0048
Requirement Description	The Portal aspect shall provide for the users a "property sheet" for the contents of an alert packet including, but not necessarily limited to, the alert postage stamp image, the postage stamp time series, the photometric time series, the source and object information (e.g., position, brightness). This display is based on a query performed on the alert database. It may also be desirable to provide this functionality based on an actual published alert packet, e.g., by permitting the upload of such a packet for display.
Requirement Discussion	The alert property sheet should facilitate further exploration based on, e.g., the associated Object IDs in the alert.
Requirement Priority	
Upper Level Requirement	

### 2.594.1 Test Cases Summary

LVV-T683	Verify visualization of alerts			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect provides for the users a "property sheet" for the contents of an alert packet including, but not necessarily limited to, the alert postage stamp image, the postage stamp time series, the photometric time series, the source and object information (e.g., position, brightness).

## 2.595 [LVV-9888] DMS-PRTL-REQ-0047-V-01: Table Row Property Sheet\_1

Jira Link	Assignee	Status	Test Cases
LVV-9888	Gregory Dubois-Felsmann	Not Covered	LVV-T682

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0047
Requirement Description	The Portal aspect shall permit the inspection of all the data in a single row of a tabular data query result as a "property sheet" for that row, taking advantage of available metadata to supply units and other semantic information for each column value.
Requirement Discussion	Resources permitting, the property sheet may be elaborated to provide additional functionality (typically, further queries) associated with particular data items displayed. Property sheets should, where enabled by metadata, appropriately exhibit relationships between columns, such by displaying a value and its uncertainty together. The system must provide a generic property sheet functionality for any table for which full metadata is available. It may also provide custom property sheets for commonly-queried tables such as Object, ForcedSource, Visit, etc. that provide a more scientifically useful layout, and additional available workflows, than possible just from the metadata.
Requirement Priority	
Upper Level Requirement	

### 2.595.1 Test Cases Summary

LVV-T682	Verify availability of property sheets for table rows			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal permits inspection of a row in tabular data query results, summarizing metadata such as units, semantic information, and relationships between columns.

## 2.596 [LVV-9889] DMS-PRTL-REQ-0050-V-01: Column Selection of Tabular Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9889	Gregory Dubois-Felsmann	Not Covered	LVV-T6 LVV-T685

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0050
Requirement Description	The Portal aspect shall provide the capability to select, for display and downloading, specific columns within the tabular data viewer.
Requirement Discussion	The intent of this requirement is to enable users to decide which columns are desired for display and download.
Requirement Priority	
Upper Level Requirement	

### 2.596.1 Test Cases Summary

LVV-T6	LSP-00-20: Operation of the UI for interaction with tabular data results			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will test the functional requirements to be able to perform certain basic exploratory data analysis functions on tabular data results in the Portal Aspect UI:

- Sort tabular results;
- Filter tabular results based on the contents of columns;
- Perform per-row selections from a table;
- Display 1D histograms of selected attributes;
- Display 2D scatter plots of selected attributes;
- Perform graphical selections of rows from plots; and

- Download tabular query results reflecting sorting and selection.

This test does not address the limits of scaling of these capabilities to large query results. That will be addressed in future test specifications. The test report should include notes on the sizes of results that were used.

LVV-T685	Verify column selection from tables			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

**Objective:**

Verify that the Portal provides the capability to select specific columns from tabular data, for display and download.

## 2.597 [LVV-9890] DMS-PRTL-REQ-0052-V-01: Copying of Tabular Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9890	Gregory Dubois-Felsmann	Not Covered	LVV-T687

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0052
Requirement Description	The Portal aspect shall provide the capability of interactively selecting and copying data within a displayed data table.
Requirement Discussion	The intent of this requirement is to enable users to use the mouse to select fields within a displayed table and utilize standard copy mechanisms.
Requirement Priority	
Upper Level Requirement	

### 2.597.1 Test Cases Summary

LVV-T687	Verify capability of copying data in tables			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that data can be interactively selected and copied from displayed tables in the Portal aspect.



## 2.598 [LVV-9891] DMS-PRTL-REQ-0049-V-01: Display of Tabular Data\_1

Jira Link	Assignee	Status	Test Cases
			LVV-T6
LVV-9891	Gregory Dubois-Felsmann	Not Covered	LVV-T684
			LVV-T1334

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0049
Requirement Description	The Portal aspect provide the capability to display tabular data in an interactive environment which displays the tables by columns and rows.
Requirement Discussion	The intent of this requirement is to capture that the database query returns are displayed.
Requirement Priority	
Upper Level Requirement	

### 2.598.1 Test Cases Summary

LVV-T6	LSP-00-20: Operation of the UI for interaction with tabular data results			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will test the functional requirements to be able to perform certain basic exploratory data analysis functions on tabular data results in the Portal Aspect UI:

- Sort tabular results;
- Filter tabular results based on the contents of columns;
- Perform per-row selections from a table;
- Display 1D histograms of selected attributes;
- Display 2D scatter plots of selected attributes;

- Perform graphical selections of rows from plots; and
- Download tabular query results reflecting sorting and selection.

This test does not address the limits of scaling of these capabilities to large query results. That will be addressed in future test specifications. The test report should include notes on the sizes of results that were used.

LVV-T684	Verify display of tabular data			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

**Objective:**

Verify that the Portal provides an interactive environment that displays table data by columns and rows.

LVV-T1334	LDM-503-10a: Portal Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Portal Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from the Portal Aspect UI.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0002, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-PRTL-REQ-0001, DMS-PRTL-REQ-0015, DMS-PRTL-REQ-0016, DMS-PRTL-REQ-0017, DMS-PRTL-REQ-0020, DMS-PRTL-REQ-0026, DMS-PRTL-REQ-0049, and DMS-PRTL-REQ-0095, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.599 [LVV-9892] DMS-PRTL-REQ-0051-V-01: Display Order of Columns of Tabular Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9892	Gregory Dubois-Felsmann	Not Covered	LVV-T686

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0051
Requirement Description	The Portal aspect shall provide the capability to change the display order of the columns for tabular data.
Requirement Discussion	The intent of this requirement is to enable users to decide which order to view the columns.
Requirement Priority	
Upper Level Requirement	

### 2.599.1 Test Cases Summary

LVV-T686	Verify capability to re-order columns in displayed tabular data			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal provides capability to change the order in which columns of tabular data are displayed.

## 2.600 [LVV-9893] DMS-PRTL-REQ-0054-V-01: Paging of Tabular Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9893	Gregory Dubois-Felsmann	Not Covered	LVV-T6 LVV-T689

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0054
Requirement Description	The Portal aspect shall provide the capability to display tabular data in a paged format.
Requirement Discussion	The intent of this requirement is to capture that the database query returns may be too large to display all at once to the user and a form of paging will be necessary.
Requirement Priority	
Upper Level Requirement	

### 2.600.1 Test Cases Summary

LVV-T6	LSP-00-20: Operation of the UI for interaction with tabular data results			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will test the functional requirements to be able to perform certain basic exploratory data analysis functions on tabular data results in the Portal Aspect UI:

- Sort tabular results;
- Filter tabular results based on the contents of columns;
- Perform per-row selections from a table;
- Display 1D histograms of selected attributes;
- Display 2D scatter plots of selected attributes;
- Perform graphical selections of rows from plots; and

- Download tabular query results reflecting sorting and selection.

This test does not address the limits of scaling of these capabilities to large query results. That will be addressed in future test specifications. The test report should include notes on the sizes of results that were used.

LVV-T689	Verify capability to display tabular data in paged format			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

**Objective:**

Verify that the Portal aspect provides the capability to display tabular data in a paged format, in the case that database queries return results too large to display on a single page.

## 2.601 [LVV-9894] DMS-PRTL-REQ-0053-V-01: Row Selection of Tabular Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9894	Gregory Dubois-Felsmann	Not Covered	LVV-T6 LVV-T688

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0053
Requirement Description	The Portal aspect shall provide the capability to select, for display and downloading, specific rows within the tabular data.
Requirement Discussion	The intent of this requirement is to enable users to decide which rows are desired for display and download and these may be different from the filtered rows (see filtering requirement below).
Requirement Priority	
Upper Level Requirement	

### 2.601.1 Test Cases Summary

LVV-T6	LSP-00-20: Operation of the UI for interaction with tabular data results			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will test the functional requirements to be able to perform certain basic exploratory data analysis functions on tabular data results in the Portal Aspect UI:

- Sort tabular results;
- Filter tabular results based on the contents of columns;
- Perform per-row selections from a table;
- Display 1D histograms of selected attributes;
- Display 2D scatter plots of selected attributes;
- Perform graphical selections of rows from plots; and

- Download tabular query results reflecting sorting and selection.

This test does not address the limits of scaling of these capabilities to large query results. That will be addressed in future test specifications. The test report should include notes on the sizes of results that were used.

LVV-T688	Verify row selection from tables			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

**Objective:**

Verify that the Portal provides the capability to select specific rows from tabular data, for display and download.

## 2.602 [LVV-9895] DMS-PRTL-REQ-0056-V-01: Histograms\_1

Jira Link	Assignee	Status	Test Cases
LVV-9895	Gregory Dubois-Felsmann	Not Covered	LVV-T6 LVV-T691

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0056
Requirement Description	The Portal aspect shall enable the creation and display of 1-dimensional and 2-dimensional histograms of tabular data.
Requirement Discussion	This requirement is about producing traditional histograms in 1 and 2 dimensions where the number of items within a bin are reported
Requirement Priority	
Upper Level Requirement	

### 2.602.1 Test Cases Summary

LVV-T6	LSP-00-20: Operation of the UI for interaction with tabular data results			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

#### Objective:

This test will test the functional requirements to be able to perform certain basic exploratory data analysis functions on tabular data results in the Portal Aspect UI:

- Sort tabular results;
- Filter tabular results based on the contents of columns;
- Perform per-row selections from a table;
- Display 1D histograms of selected attributes;
- Display 2D scatter plots of selected attributes;
- Perform graphical selections of rows from plots; and



- Download tabular query results reflecting sorting and selection.

This test does not address the limits of scaling of these capabilities to large query results. That will be addressed in future test specifications. The test report should include notes on the sizes of results that were used.

LVV-T691	Verify creation and display of histogram plots			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

**Objective:**

Verify that the Portal provides the capability to create and display 1-dimensional and 2-dimensional histogram plots from tabular data.

## 2.603 [LVV-9896] DMS-PRTL-REQ-0061-V-01: Multiple XY-Plots on the Same Display\_1

Jira Link	Assignee	Status	Test Cases
LVV-9896	Gregory Dubois-Felsmann	Not Covered	LVV-T696

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0061
Requirement Description	The Portal aspect shall be able to overlay multiple plots on the same display, differentiated by plotting colors, symbols, line styles, and shading.
Requirement Discussion	The intent of this requirement is enable the plotting of multiple graphs on the same plotting canvas. An example would be RA vs Time and Dec vs Time or u-band mag vs i-z color and r-band mag vs i-z color.
Requirement Priority	
Upper Level Requirement	

### 2.603.1 Test Cases Summary

LVV-T696	Verify visualization of multiple XY plots on the same display			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal provides the capability to display multiple XY plots on a single display canvas.

## 2.604 [LVV-9897] DMS-PRTL-REQ-0059-V-01: Plot Asymmetric Quantitative Uncertainties\_1

Jira Link	Assignee	Status	Test Cases
LVV-9897	Gregory Dubois-Felsmann	Not Covered	LVV-T694

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0059
Requirement Description	The Portal aspect shall be able represent uncertainties in the plotting of data that are unequal in value for the positive and negative directions.
Requirement Discussion	Uncertainties often have different limits in the positive and negative directions and as a result representation of the uncertainties will be different.
Requirement Priority	
Upper Level Requirement	

### 2.604.1 Test Cases Summary

LVV-T694	Verify visualization of asymmetric uncertainties			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal aspect can display uncertainties that are asymmetric (i.e., differ in the positive and negative directions).

## 2.605 [LVV-9898] DMS-PRTL-REQ-0058-V-01: Plot Quantitative Uncertainties\_1

Jira Link	Assignee	Status	Test Cases
LVV-9898	Gregory Dubois-Felsmann	Not Covered	LVV-T693

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0058
Requirement Description	The Portal aspect shall be able represent uncertainties in the plotting of data.
Requirement Discussion	This flows down from higher-level requirements above, and has implications for the creation of the necessary metadata to support this in the first place.
Requirement Priority	
Upper Level Requirement	

### 2.605.1 Test Cases Summary

LVV-T693	Verify visualization of uncertainties in plots			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify the capability to represent uncertainties in plots of tabular data.

## 2.606 [LVV-9899] DMS-PRTL-REQ-0060-V-01: Plot Upper and Lower Quantitative Limits\_1

Jira Link	Assignee	Status	Test Cases
LVV-9899	Gregory Dubois-Felsmann	Not Covered	LVV-T695

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0060
Requirement Description	The Portal aspect shall be able represent upper and lower limits in the plotting of tabular data.
Requirement Discussion	Often the values are non-detections and a limit is estimated on that value. The limit can be an upper limit (e.g., flux) or a lower limit (e.g., magnitude). Typically, the limit is represented by a flat line at the position of the value and an up or down arrow from that position. For tables with full metadata including UCDs this can be handled generically: the "stat.min" and "stat.max" UCDs can be used to trigger the display of the distinctive symbols.
Requirement Priority	
Upper Level Requirement	

### 2.606.1 Test Cases Summary

LVV-T695	Verify visualization of upper and lower limits in plots			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal is capable of displaying quantities that represent upper or lower limits (provided, for example, for non-detections).

## 2.607 [LVV-9900] DMS-PRTL-REQ-0057-V-01: Symbol Size, Shape, and Color Coding in XY(Z) Scatter Plots\_1

Jira Link	Assignee	Status	Test Cases
LVV-9900	Gregory Dubois-Felsmann	Not Covered	LVV-T692

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0057
Requirement Description	The Portal aspect shall enable the use of symbol size, shape, and color as indicators of additional tabular data associated with the XY(Z)-data plotted.
Requirement Discussion	This is a generalized requirement to enable the visualization of multi-dimensional data in a 2-d scatter plot environment.
Requirement Priority	
Upper Level Requirement	

### 2.607.1 Test Cases Summary

LVV-T692	Verify capability to change symbol shapes, sizes, and colors in XY(Z) scatter plots			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that users can change the shape, size, and color of symbols in XY(Z) scatter plots to indicate information from additional dimensions of tabular data.

## 2.608 [LVV-9901] DMS-PRTL-REQ-0055-V-01: XY Scatter Plots\_1

Jira Link	Assignee	Status	Test Cases
LVV-9901	Gregory Dubois-Felsmann	Not Covered	LVV-T6 LVV-T690

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0055
Requirement Description	The Portal aspect shall enable the creation and display of 2-dimensional xy-plots from tabular data.
Requirement Priority	
Upper Level Requirement	

### 2.608.1 Test Cases Summary

LVV-T6	LSP-00-20: Operation of the UI for interaction with tabular data results			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Deprecated	1	false	Test

### Objective:

This test will test the functional requirements to be able to perform certain basic exploratory data analysis functions on tabular data results in the Portal Aspect UI:

- Sort tabular results;
- Filter tabular results based on the contents of columns;
- Perform per-row selections from a table;
- Display 1D histograms of selected attributes;
- Display 2D scatter plots of selected attributes;
- Perform graphical selections of rows from plots; and
- Download tabular query results reflecting sorting and selection.

This test does not address the limits of scaling of these capabilities to large query results. That will be addressed in future test specifications. The test report should include notes on the sizes of results that were used.

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LVV-T690	Verify creation and display of X-Y scatter plots			
<b>Owner</b>	<b>Status</b>	<b>Version</b>	<b>Critical Event</b>	<b>Verification Type</b>
Jeffrey Carlin	Draft	1	false	Inspection

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**Objective:**

Verify that the Portal provides the capability to create and display 2-dimensional X-Y scatter plots from tabular data.

Draft



## 2.609 [LVV-9902] DMS-PRTL-REQ-0067-V-01: Display Calibration Image Data Products\_1

Jira Link	Assignee	Status	Test Cases
LVV-9902	Gregory Dubois-Felsmann	Not Covered	LVV-T701

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0067
Requirement Description	The Portal aspect shall have the capability to display the calibration image data products such as synthetic flats, bias frames, and the like.
Requirement Discussion	Note that these images may not have WCS information.
Requirement Priority	
Upper Level Requirement	

### 2.609.1 Test Cases Summary

LVV-T701	Verify display of calibration images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal is capable of displaying calibration image data products, including synthetic flats, bias frames, etc.

## 2.610 [LVV-9903] DMS-PRTL-REQ-0066-V-01: Display Coadded Image Cutouts / Mosaics\_1

Jira Link	Assignee	Status	Test Cases
LVV-9903	Gregory Dubois-Felsmann	Not Covered	LVV-T700

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0066
Requirement Description	The Portal aspect shall have the capability to display cutouts and mosaics from coadded image data products, as delivered from the API aspect.
Requirement Discussion	Corresponds to the ability to request the generation of cutouts and mosaics. These may cover areas both smaller than and larger than the native "patch" scale.
Requirement Priority	
Upper Level Requirement	

### 2.610.1 Test Cases Summary

LVV-T700	Verify display of coadd cutouts and mosaics			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal aspect has the capability to display cutout or mosaic images created from coadds.

## 2.611 [LVV-9904] DMS-PRTL-REQ-0065-V-01: Display Native Coadded Image Data Products\_1

Jira Link	Assignee	Status	Test Cases
LVV-9904	Gregory Dubois-Felsmann	Not Covered	LVV-T699

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0065
Requirement Description	The Portal aspect shall have the capability to display the native coadded image data products, i.e., the patch-level images.
Requirement Priority	
Upper Level Requirement	

### 2.611.1 Test Cases Summary

LVV-T699	Verify display of native coadd images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal can display native coadd image products (i.e., patch-level images).

## 2.612 [LVV-9905] DMS-PRTL-REQ-0062-V-01: Display Native Single-Visit Image Data Products\_1

Jira Link	Assignee	Status	Test Cases
LVV-9905	Gregory Dubois-Felsmann	Not Covered	LVV-T676

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0062
Requirement Description	The Portal aspect shall have the ability to display the native single-visit image data products, including raw images, Processed Visit Images (PVIs), and difference images, as well as the standard single-exposure calibration images used as inputs for flats, bias frames, etc.
Requirement Discussion	The native raw data will contain amplifier-level data with full pre-scan, serial overscan, and parallel overscan. The other native single-visit data products will be at CCD level.
Requirement Priority	
Upper Level Requirement	

### 2.612.1 Test Cases Summary

LVV-T676	Verify display of native single-visit images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect provides a means to display the native single-visit image data products, including raw images, Processed Visit Images (PVIs), and difference images, as well as the standard single-exposure calibration images used as inputs for flats, bias frames, etc.

## 2.613 [LVV-9906] DMS-PRTL-REQ-0063-V-01: Display Raft- and Focal-Plane-Level Single-Visit Image Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9906	Gregory Dubois-Felsmann	Not Covered	LVV-T697

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0063
Requirement Description	The Portal aspect shall have the capability to generate a synthetic display of image data at raft level and at full focal plane (FPA) level.
Requirement Discussion	No such data products will exist per se; the requirement is for the Portal to be able to show, e.g., the coverage of raft-level or FPA-level visit imaging on the sky.
Requirement Priority	
Upper Level Requirement	

### 2.613.1 Test Cases Summary

LVV-T697	Verify display of raft and full focal-plane single-visit images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal aspect has the ability to generate a single-visit image display of a raft and full focal-plane image.

## 2.614 [LVV-9907] DMS-PRTL-REQ-0064-V-01: Display Single Visit Image Cut-Out\_1

Jira Link	Assignee	Status	Test Cases
LVV-9907	Gregory Dubois-Felsmann	Not Covered	LVV-T698

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0064
Requirement Description	The Portal aspect shall have the capability to display a cutout from a single visit image.
Requirement Discussion	Corresponds to the ability to request the generation of cutouts and cross-CCD mosaics.
Requirement Priority	
Upper Level Requirement	

### 2.614.1 Test Cases Summary

LVV-T698	Verify display of cutout from single-visit image			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal is capable of displaying a cutout from a single-visit image.

## 2.615 [LVV-9908] DMS-PRTL-REQ-0068-V-01: Display User-provided Images\_1

Jira Link	Assignee	Status	Test Cases
LVV-9908	Gregory Dubois-Felsmann	Not Covered	LVV-T702

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0068
Requirement Description	The Portal aspect shall have the capability to display user-provided images in widely-used astronomical community formats, including FITS, and shall properly interpret a variety of commonly-used WCS specifications in the image headers.
Requirement Discussion	This would be used, for instance, to allow a user to view LSST catalog data superposed on a user-provided image. FITS is the only currently supported image file format; others will be considered as community usage develops or as part of supporting all-sky visualization.
Requirement Priority	
Upper Level Requirement	

### 2.615.1 Test Cases Summary

LVV-T702	Verify display of user-provided images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal has the capability of displaying user-provided images in widely-used astronomical data formats, and properly interprets commonly-used WCS specifications from the image headers. This includes FITS format, and may be extended to others.

## 2.616 [LVV-9909] DMS-PRTL-REQ-0069-V-01: Image Property Sheet\_1

Jira Link	Assignee	Status	Test Cases
LVV-9909	Gregory Dubois-Felsmann	Not Covered	LVV-T703

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0069
Requirement Description	The Portal shall have the ability to display a property sheet for an image data product or user-provided image, displaying image format and other header data.
Requirement Discussion	This is information on the image artifact itself, e.g., on the contents of FITS headers. It should not be confused with the property sheet associated with an image metadata table entry, though there may be a strong overlap in content, and for UX purposes they may be displayed in combined screens.
Requirement Priority	
Upper Level Requirement	

### 2.616.1 Test Cases Summary

LVV-T703	Verify display of image property sheet			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal has the ability to display a property sheet for an image data product or user-provided image, displaying image format and other header data.



## 2.617 [LVV-9910] DMS-PRTL-REQ-0074-V-01: Image Appearance Manipulation\_1

Jira Link	Assignee	Status	Test Cases
LVV-9910	Gregory Dubois-Felsmann	Not Covered	LVV-T708

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0074
Requirement Description	The Portal aspect shall enable the user to change the view of a displayed image including, but not necessarily limited to, the color table, the stretch function, and the displayed data range.
Requirement Priority	
Upper Level Requirement	

### 2.617.1 Test Cases Summary

LVV-T708	Verify manipulation of image appearance			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal enables users to manipulate the appearance of displayed images, including changing the stretch, color table, or displayed data range.

## 2.618 [LVV-9911] DMS-PRTL-REQ-0071-V-01: Image Pixel Content Display\_1

Jira Link	Assignee	Status	Test Cases
LVV-9911	Gregory Dubois-Felsmann	Not Covered	LVV-T705

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0071
Requirement Description	The Portal aspect shall have the capability to inspect the pixel content of an image at the position of the mouse cursor. This capability shall be integrated with the Point Coordinate Display capability for the image.
Requirement Priority	
Upper Level Requirement	

### 2.618.1 Test Cases Summary

LVV-T705	Verify image pixel content display			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal provides the capability to inspect the pixel contents of an image at the cursor position.

## 2.619 [LVV-9912] DMS-PRTL-REQ-0072-V-01: Image Spatial Manipulation\_1

Jira Link	Assignee	Status	Test Cases
LVV-9912	Gregory Dubois-Felsmann	Not Covered	LVV-T706

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0072
Requirement Description	The Portal aspect shall have the capability to resize, rescale, re-project, zoom, and crop the image display and save or download the current view.
Requirement Priority	
Upper Level Requirement	

### 2.619.1 Test Cases Summary

LVV-T706	Verify spatial manipulation of images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal allows users to spatially manipulate displayed images, including resizing, rescaling, reprojecting, zooming, and cropping.

## 2.620 [LVV-9913] DMS-PRTL-REQ-0073-V-01: Multi-Image Scaling and Aligning\_1

Jira Link	Assignee	Status	Test Cases
LVV-9913	Gregory Dubois-Felsmann	Not Covered	LVV-T707

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0073
Requirement Description	The Portal aspect shall have the capability to display multiple images on a common astrophysical coordinate scale and aligned on the screen in a common astrophysical orientation.
Requirement Discussion	The point behind this requirement is to enable viewing the same part of the sky in different filters aligned to same orientation and scaled to the same screen resolution for both single-frame and coadded images.
Requirement Priority	
Upper Level Requirement	

### 2.620.1 Test Cases Summary

LVV-T707	Verify multi-image scaling and alignment			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal has the capability to display multiple images on a common astrophysical coordinate scale, aligned on the screen in a common orientation.

## 2.621 [LVV-9914] DMS-PRTL-REQ-0070-V-01: Provide Coordinate Display Tools for Images\_1

Jira Link	Assignee	Status	Test Cases
LVV-9914	Gregory Dubois-Felsmann	Not Covered	LVV-T704

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0070
Requirement Description	The Portal shall provide all the capabilities in the Coordinate Display Tools section herein for image displays. Specific capabilities will depend on the availability of WCS information for an image.
Requirement Priority	
Upper Level Requirement	

### 2.621.1 Test Cases Summary

LVV-T704	Verify that coordinate display tools are provided for images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal provides all the capabilities in the Coordinate Display Tools section in LDM-554 for image displays. Specific capabilities will depend on the availability of WCS information for an image.

## 2.622 [LVV-9915] DMS-PRTL-REQ-0075-V-01: Image Mask and Variance Overlays\_1

Jira Link	Assignee	Status	Test Cases
LVV-9915	Gregory Dubois-Felsmann	Not Covered	LVV-T709

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0075
Requirement Description	The Portal aspect shall enable the overlaying of additional pixel-oriented data on an image, including image masks (bit planes) and variance data.
Requirement Discussion	This also enables, but does not require, the overplotting of two-dimensional density plots such as depth maps.
Requirement Priority	
Upper Level Requirement	

### 2.622.1 Test Cases Summary

LVV-T709	Verify display of image mask and variance overlays			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal enables overlaying pixel-based data on top of already displayed images, including image masks (bit planes) and variance data.

## 2.623 [LVV-9916] DMS-PRTL-REQ-0077-V-01: Image Overlays: Adjustment of Colors and Positions\_1

Jira Link	Assignee	Status	Test Cases
LVV-9916	Gregory Dubois-Felsmann	Not Covered	LVV-T711

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0077
Requirement Description	The Portal aspect shall have the capability for a user to configure the annotations, colors, transparency, and positions (where applicable) of any image overlays, including those resulting from the use of the Coordinate Tools.
Requirement Discussion	Often the default color and position of the overlay needs to be changed for clarification.
Requirement Priority	
Upper Level Requirement	

### 2.623.1 Test Cases Summary

LVV-T711	Verify capability to adjust the appearance of plot overlays on images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal enables users to adjust the annotations, colors, transparency, and positions of plot overlays displayed on top of images.

## 2.624 [LVV-9917] DMS-PRTL-REQ-0076-V-01: Image Plot Overlays\_1

Jira Link	Assignee	Status	Test Cases
LVV-9917	Gregory Dubois-Felsmann	Not Covered	LVV-T710

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0076
Requirement Description	The Portal aspect shall enable the overlaying of tabular data on an image, either based on pixel coordinates or astrophysical coordinates, as supported by the availability of coordinate system information.
Requirement Discussion	More generally, this should work for any two-dimensional plot data that shares a coordinate system with an image. The catalog data need not be semantically linked with the image by anything other than the coordinate system used.
Requirement Priority	
Upper Level Requirement	

### 2.624.1 Test Cases Summary

LVV-T710	Verify display of plot overlays on images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal has the capability to overlay tabular data on an image, based on input image or astrophysical coordinates, as supported by availability of coordinate system information.



## 2.625 [LVV-9918] DMS-PRTL-REQ-0078-V-01: Display All-Sky HEALPix Image\_1

Jira Link	Assignee	Status	Test Cases
LVV-9918	Gregory Dubois-Felsmann	Not Covered	LVV-T712

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0078
Requirement Description	The Portal aspect shall be able to display an all-sky image in the HEALPix format.
Requirement Discussion	In addition to flux images such as all-sky coadds, the LSST pipelines and/or quality assessment processes may generate a variety of all-sky metrics, diagnostics, and other artifacts in this format.
Requirement Priority	
Upper Level Requirement	

### 2.625.1 Test Cases Summary

LVV-T712	Verify display all-sky HEALPix image			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal aspect is able to display an all-sky image in the HEALPix format.

## 2.626 [LVV-9919] DMS-PRTL-REQ-0081-V-01: HEALPix Pixel Selection\_1

Jira Link	Assignee	Status	Test Cases
LVV-9919	Gregory Dubois-Felsmann	Not Covered	LVV-T715

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0081
Requirement Description	The Portal aspect shall enable a user to select individual HEALPix pixels or groups of pixels and obtain references to them which can be used in other LSP aspects.
Requirement Discussion	UI selection of pixels, at selectable scales, can be done in the Portal, with the selections then used in other aspects.
Requirement Priority	
Upper Level Requirement	

### 2.626.1 Test Cases Summary

LVV-T715	Verify selection of HEALPix pixels			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that Portal users can select individual HEALPix pixels or groups of pixels and obtain references from them for use in other LSP aspects.

## 2.627 [LVV-9920] DMS-PRTL-REQ-0080-V-01: Pan Around on a HEALPix Image\_1

Jira Link	Assignee	Status	Test Cases
LVV-9920	Gregory Dubois-Felsmann	Not Covered	LVV-T714

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0080
Requirement Description	The Portal aspect shall enable a user to move around within a HEALPix all-sky image when the full image is not displayed on the screen.
Requirement Discussion	The panning is intended to enable a user to move around on the sky with a fixed zoom level. Panning does not apply if the full all-sky image is visible on the screen.
Requirement Priority	
Upper Level Requirement	

### 2.627.1 Test Cases Summary

LVV-T714	Verify panning in HEALPix image display			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal enables panning (i.e., moving around within) a displayed HEALPix image, provided that the entire image is not already displayed.

## 2.628 [LVV-9921] DMS-PRTL-REQ-0082-V-01: Retrieve HEALPix-Associated Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9921	Gregory Dubois-Felsmann	Not Covered	LVV-T716

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0082
Requirement Description	The Portal aspect shall enable a user to retrieve metadata and data associated with selected HEALPixes and display that information as tabular or image data as appropriate.
Requirement Discussion	The HEALPix pixels will be associated with metadata (e.g., which objects are associated with that position on the sky) or data (e.g., what is the FWHM of all of the sources within that pixel on the sky). That metadata/data will be retrievable via a selection of the HEALPix pixels.
Requirement Priority	
Upper Level Requirement	

### 2.628.1 Test Cases Summary

LVV-T716	Verify retrieval of HEALPix-associated data			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal enables users to retrieve metadata and data associated with selected HEALPixes and display that data in tabular or image form as appropriate.

## 2.629 [LVV-9922] DMS-PRTL-REQ-0079-V-01: Zoom In and Out on a HEALPix Image\_1

Jira Link	Assignee	Status	Test Cases
LVV-9922	Gregory Dubois-Felsmann	Not Covered	LVV-T713

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0079
Requirement Description	The Portal aspect shall enable a user to zoom in and out on a HEALPix all-sky image.
Requirement Discussion	The zooming in and out will enable a user to change effective spatial resolution of the image on the screen, transferring across levels of the image hierarchy.
Requirement Priority	
Upper Level Requirement	

### 2.629.1 Test Cases Summary

LVV-T713	Verify ability to zoom in/out on a HEALPix image			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal enables users to zoom in and out on a displayed HEALPix image, adapting the displayed spatial scale and traversing different levels of the image hierarchy.

## 2.630 [LVV-9923] DMS-PRTL-REQ-0087-V-01: Astrophysical Compass Overlay\_1

Jira Link	Assignee	Status	Test Cases
LVV-9923	Gregory Dubois-Felsmann	Not Covered	LVV-T721

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0087
Requirement Description	The Portal aspect shall have the capability to display a North-East Compass on an image or two-dimensional plot with a known astrophysical coordinate system.
Requirement Discussion	So the user knows that the (particularly for the generally randomly rotated single-epoch data) which directions are North and East.
Requirement Priority	
Upper Level Requirement	

### 2.630.1 Test Cases Summary

LVV-T721	Verify astrophysical compass overlay			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal provides the capability to overlay a North-East compass atop images or 2-dimensional plots with known astrophysical coordinate systems.

## 2.631 [LVV-9924] DMS-PRTL-REQ-0083-V-01: Coordinate Display Applicability\_1

Jira Link	Assignee	Status	Test Cases
LVV-9924	Gregory Dubois-Felsmann	Not Covered	LVV-T717

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0083
Requirement Description	The Portal aspect shall have the capability to provide the set of coordinate system display and measurement tools in this section for any two-dimensional data display where both coordinates have a spatial interpretation, except as further specified below.
Requirement Discussion	The knowledge that coordinates in an x-y plot are spatial will in general depend on the availability of suitable metadata to define the coordinates.
Requirement Priority	
Upper Level Requirement	

### 2.631.1 Test Cases Summary

LVV-T717	Verify broad applicability of coordinate display			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect provides the coordinate display and measurement tools for all applicable two-dimensional data displays where the two coordinates have a spatial interpretation.

## 2.632 [LVV-9925] DMS-PRTL-REQ-0086-V-01: Coordinate Grid Overlays\_1

Jira Link	Assignee	Status	Test Cases
LVV-9925	Gregory Dubois-Felsmann	Not Covered	LVV-T720

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0086
Requirement Description	The Portal aspect shall have the capability to display one or more coordinate grids on top of images or two-dimensional plots with a known astrophysical coordinate system.
Requirement Discussion	The point behind this requirement is to enable viewing of equatorial, galactic, and ecliptic coordinates overlays at the same time.
Requirement Priority	
Upper Level Requirement	

### 2.632.1 Test Cases Summary

LVV-T720	Verify coordinate grid overlays			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal provides the capability to overlay one or more coordinate grids atop images or 2-dimensional plots with known coordinate systems. (For example, it should be possible to overlay equatorial, Galactic, and ecliptic coordinate grids simultaneously.)



## 2.633 [LVV-9927] DMS-PRTL-REQ-0088-V-01: Geometric Figure Overlays\_1

Jira Link	Assignee	Status	Test Cases
LVV-9927	Gregory Dubois-Felsmann	Not Covered	LVV-T722

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0088
Requirement Description	The Portal aspect shall enable the drawing, display, and selection of a closed 2-dimensional polygon on any two-dimensional image.
Requirement Discussion	This is a general requirement that enables the overlay of a polygon on an image or a plot. A polygon could be a circle, an ellipse, or an N-vertices polygon. The purpose of this is enable area selection on the images or plots.
Requirement Priority	
Upper Level Requirement	

### 2.633.1 Test Cases Summary

LVV-T722	Verify geometric figure overlays			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect enables the drawing, display, and selection of a closed 2-dimensional polygon on any 2-dimensional image.

## 2.634 [LVV-9928] DMS-PRTL-REQ-0084-V-01: Point Coordinate Display\_1

Jira Link	Assignee	Status	Test Cases
LVV-9928	Gregory Dubois-Felsmann	Not Covered	LVV-T718

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0084
Requirement Description	The Portal aspect shall have the capability to inspect the coordinates in a two-dimensional display that correspond to the position of the mouse cursor. When coordinate system conversion information is available, display of all available coordinates shall be supported. In particular, when available (e.g., for data associated with single-epoch and calibration images) the coordinate display shall include focal plane array electronic as well as spatial coordinates. When available (i.e., for an image, when a WCS is present) the coordinate display shall include astrophysical coordinates.
Requirement Discussion	When applied to images and at high zoom levels, the UI shall make clear whether pixel center coordinates or continuous cursor-location coordinates are being displayed.
Requirement Priority	
Upper Level Requirement	

### 2.634.1 Test Cases Summary

LVV-T718	Verify point coordinate display			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect displays the coordinates corresponding to the position of the mouse cursor. When coordinate conversion information is available, all available coordinates should be displayed.

## 2.635 [LVV-9929] DMS-PRTL-REQ-0091-V-01: Calculated Filtering of Tabular Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9929	Gregory Dubois-Felsmann	Not Covered	LVV-T725

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0091
Requirement Description	The Portal aspect shall provide the capability to filter a table by single column where the filter has simple arithmetic calculations applied to the column values, including but not limited to sqrt, log, log10, exponentials and trigonometric functions.
Requirement Discussion	The intent of this requirement is enable simple arithmetic functions on the values in the columns prior and then do the filtering on that value (e.g., $X^{0.33} < 10$ ).
Requirement Priority	
Upper Level Requirement	

### 2.635.1 Test Cases Summary

LVV-T725	Verify calculated filtering of tabular data			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect provides the capability to filter a table by single column where the filter has simple arithmetic calculations applied to the column values, including but not limited to sqrt, log, log10, exponentials and trigonometric functions.

## 2.636 [LVV-9930] DMS-PRTL-REQ-0093-V-01: Calculated Quantities on Tabular Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9930	Gregory Dubois-Felsmann	Not Covered	LVV-T727

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0093
Requirement Description	The Portal aspect shall provide the capability to add an additional column to the displayed table based upon an arithmetic operations on columns within the displayed table and display the new column.
Requirement Discussion	This intent of this requirement is enable the user to combine columns in the table to form a new column that can be included in the table and used in the same manner as the intrinsic columns.
Requirement Priority	
Upper Level Requirement	

### 2.636.1 Test Cases Summary

LVV-T727	Verify calculated tabular data columns			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal enables the arithmetic calculation and display of new tabular data columns based on existing columns in a table.

## 2.637 [LVV-9931] DMS-PRTL-REQ-0092-V-01: Filtering of Tabular Data by Multiple Columns\_1

Jira Link	Assignee	Status	Test Cases
LVV-9931	Gregory Dubois-Felsmann	Not Covered	LVV-T726

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0092
Requirement Description	The Portal aspect shall provide the capability to filter tabular data by multiple columns within the table and redisplay the filtered table.
Requirement Discussion	Apply filters from various columns.
Requirement Priority	
Upper Level Requirement	

### 2.637.1 Test Cases Summary

LVV-T726	Verify filtering data by multiple table columns			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal aspect provides the capability to filter tabular data by multiple columns within the table and redisplay the filtered table.

## 2.638 [LVV-9932] DMS-PRTL-REQ-0095-V-01: Saving Displayed Tabular Data\_1

Jira Link	Assignee	Status	Test Cases
			LVV-T729
LVV-9932	Gregory Dubois-Felsmann	Not Covered	LVV-T1334
			LVV-T1818

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0095
Requirement Description	The Portal aspect shall provide the capability to save and or download tabular data as it is displayed in the interface maintaining the content, filtering, and sorting.
Requirement Discussion	This intent of this requirement is enable the user to manipulate the table (e.g., sorting, filtering, calculated quantities and save that table to either workspace or in an offline download).
Requirement Priority	
Upper Level Requirement	

### 2.638.1 Test Cases Summary

LVV-T729	Verify saving of displayed tabular data			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect provides the capability to save and or download tabular data as it is displayed in the interface maintaining the content, filtering, and sorting.

LVV-T1334	LDM-503-10a: Portal Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type

Gregory Dubois- Felsmann	Defined	1	false	Test
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**Objective:**

This test case verifies that the Portal Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from the Portal Aspect UI.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0002, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-PRTL-REQ-0001, DMS-PRTL-REQ-0015, DMS-PRTL-REQ-0016, DMS-PRTL-REQ-0017, DMS-PRTL-REQ-0020, DMS-PRTL-REQ-0026, DMS-PRTL-REQ-0049, and DMS-PRTL-REQ-0095, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

LVV-T1818	DM-SUIT-8: Verify Portal integration with workspace (via WebDAV)			
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Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois- Felsmann	Defined	1	false	Demonstration

**Objective:**

This test case verifies that the Portal Aspect software is capable of accessing a file-oriented workspace via the WebDAV protocol.

In so doing, it partially verifies several Portal Aspect requirements that relate to this capability - “partially” because some of these requirements depend on workspace capabilities which were not present in the prototype WebDAV service delivered by the DAX group, because some of the requirements also cover the User Database Workspace (not relevant to this milestone, and not yet available), and also because the milestone was not envisioned as an exhaustive test covering edge cases:

- DMS-PRTL-REQ-0003 (LVV-9846, Portal access to workspace) is covered at “demonstration” level, with basic tests of saving image and tabular data to the workspace, and only for the User File Workspace (there is currently no User Database Workspace prototype available);
- DMS-PRTL-REQ-0046 (LVV-9886, Visualization of workspace data) is covered at “demonstration” level for a couple of FITS image and table files, and only for the User File Workspace;
- DMS-PRTL-REQ-0110 (LVV-9954, Tabular data download) is covered at “demonstration” level, only for catalog data (there was no image metadata in the LSP deployment at the time of test), and only for the User File Workspace;

- DMS-PRTL-REQ-0095 (LVV-9932, Saving Displayed Tabular Data) is covered at “demonstration” level for a simple subset operation in the table browser; and
- DMS-PRTL-REQ-0111 (LVV-9951, Image data download) is covered at “demonstration” level, and only for download from an image display screen itself (as LSST-style image metadata services, e.g., ObsTAP, were not available in the LSP at the time of testing).

Draft



## 2.639 [LVV-9933] DMS-PRTL-REQ-0090-V-01: Simple Filtering of Tabular Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9933	Gregory Dubois-Felsmann	Not Covered	LVV-T724

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0090
Requirement Description	The Portal aspect shall provide the capability to filter tabular data by a single column, including but not limited to less than (<), greater than or equal (>=), equal (=), not equal (≠) (Unable to render embedded object: File (=) and not null () not found.≠null).
Requirement Discussion	The intent of this requirement is enable simple one-dimensional filtering on a single column or a series of columns and-ed together.
Requirement Priority	
Upper Level Requirement	

### 2.639.1 Test Cases Summary

LVV-T724	Verify simple filtering of tabular data			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect provides the capability to filter tabular data by a single column, including but not limited to less than (<), less than or equal (<=), greater than (>), greater than or equal (>=), equal (=), not equal (!=) and not null (!=null).

## 2.640 [LVV-9934] DMS-PRTL-REQ-0089-V-01: Sorting of Tabular Data by Column\_1

Jira Link	Assignee	Status	Test Cases
LVV-9934	Gregory Dubois-Felsmann	Not Covered	LVV-T723

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0089
Requirement Description	The Portal aspect shall provide the capability to sort tabular data by a single column within the table and redisplay the sorted table.
Requirement Discussion	This is the traditional sorting by one column.
Requirement Priority	
Upper Level Requirement	

### 2.640.1 Test Cases Summary

LVV-T723	Verify sorting of tabular data by column			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect enables users to sort tabular data by a single column within the table and redisplay the sorted data.

## 2.641 [LVV-9935] DMS-PRTL-REQ-0094-V-01: Statistical Measurements on Tabular Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-9935	Gregory Dubois-Felsmann	Not Covered	LVV-T728

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0094
Requirement Description	The Portal aspect shall enable the capability to perform a set of statistical measurements (e.g., mean, median, RMS, skew, kurtosis) on tabular data selected by the user.
Requirement Priority	
Upper Level Requirement	

### 2.641.1 Test Cases Summary

LVV-T728	Verify statistical measurements on tabular data			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect enables the capability to perform a set of statistical measurements (e.g., mean, median, RMS, skew, kurtosis) on tabular data selected by the user.

## 2.642 [LVV-9936] DMS-PRTL-REQ-0096-V-01: False-color Images Creation and Display\_1

Jira Link	Assignee	Status	Test Cases
LVV-9936	Gregory Dubois-Felsmann	Not Covered	LVV-T730

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0096
Requirement Description	The Portal aspect shall have the capability to create and display false-color images composed from any user-selectable set of filters from multiple filter views of the same region.
Requirement Priority	
Upper Level Requirement	

### 2.642.1 Test Cases Summary

LVV-T730	Verify creation and display of false-color images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect has the capability to create and display false-color images composed from any user-selectable set of filters from multiple filter views of the same region.

## 2.643 [LVV-9938] DMS-PRTL-REQ-0105-V-01: Brightness Light Curves\_1

Jira Link	Assignee	Status	Test Cases
LVV-9938	Gregory Dubois-Felsmann	Not Covered	LVV-T739

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0105
Requirement Description	The Portal aspect shall have the capability to display graphically the brightness/magnitude of an LSST Object or Source or Forced Source as a function of time.
Requirement Discussion	This is a specific implementation of the xy-plot capabilities
Requirement Priority	
Upper Level Requirement	

### 2.643.1 Test Cases Summary

LVV-T739	Verify display of light curves			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal can display graphically the brightness/flux/magnitude of an LSST Object, Source, or ForcedSource as a function of time.

## 2.644 [LVV-9939] DMS-PRTL-REQ-0107-V-01: Data Selection from a Plot or Image\_1

Jira Link	Assignee	Status	Test Cases
LVV-9939	Gregory Dubois-Felsmann	Not Covered	LVV-T741

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0107
Requirement Description	The Portal aspect shall enable the selection of data contained inside or outside a closed 2-dimensional polygon on an xy-plot, 2-dimensional data structure (e.g., density plot), and a 2-dimensional image.
Requirement Discussion	This is a general requirement that enables the selection of data from inside or outside a polygon.
Requirement Priority	
Upper Level Requirement	

### 2.644.1 Test Cases Summary

LVV-T741	Verify capability to select data from a plot or image			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect enables the selection of data contained inside or outside a closed 2-dimensional polygon on an xy-plot, 2-dimension data structure (e.g., density plot), and a 2-dimensional image.

## 2.645 [LVV-9940] DMS-PRTL-REQ-0102-V-01: Display of Camera Artifacts as Overlays\_1

Jira Link	Assignee	Status	Test Cases
LVV-9940	Gregory Dubois-Felsmann	Not Covered	LVV-T736

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0102
Requirement Description	The Portal aspect shall have the capability to display a camera artifacts including but not limited to image crosstalk matrices, ghost image identifications, saturation, and column bleeding.
Requirement Discussion	The intent of this requirement is to enable the users to be able to see where artifacts may be affecting the data. These artifacts may not be stored in image format and may need to be reconstructed algorithmically.
Requirement Priority	
Upper Level Requirement	

### 2.645.1 Test Cases Summary

LVV-T736	Verify overlay of camera artifacts on images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect has the capability to display as image overlays camera artifacts including but not limited to image crosstalk matrices, ghost image identifications, saturation, and column bleeding.

## 2.646 [LVV-9941] DMS-PRTL-REQ-0106-V-01: Linked Tables, Plots, and Images\_1

Jira Link	Assignee	Status	Test Cases
LVV-9941	Gregory Dubois-Felsmann	Not Covered	LVV-T740

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0106
Requirement Description	The Portal aspect shall have the capability to have tabular data, plots, and images with overlays connected via brushing and linking.
Requirement Discussion	Updates to the data in any one visualization tool (e.g., plot, image, table) creates an update in other visualization tools. For example, selection of a set of photometry points in a color-color plot causes the corresponding rows in an Object table and symbols on an image to be highlighted; or, application of a selection predicate to a table causes the corresponding points in a plot to be highlighted.
Requirement Priority	
Upper Level Requirement	

### 2.646.1 Test Cases Summary

LVV-T740	Verify linked tables, plots, and images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect has the capability to have tabular data, plots, and images with overlays connected via brushing and linking, so that updates to the data in any one visualization tool (e.g., plot, image, table) creates an update in other visualization tools.



## 2.647 [LVV-9942] DMS-PRTL-REQ-0098-V-01: Overlay Catalog of Sources and Objects on Images\_1

Jira Link	Assignee	Status	Test Cases
LVV-9942	Gregory Dubois-Felsmann	Not Covered	LVV-T732

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0098
Requirement Description	The Portal aspect shall be able to overlay the positions of catalog sources and objects on a displayed image based upon astrophysically-based or observatory-based coordinates.
Requirement Priority	
Upper Level Requirement	

### 2.647.1 Test Cases Summary

LVV-T732	Verify overlay of catalog sources/objects on images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect enables the overlay of positions of catalog sources and objects on a displayed image based upon astrophysically-based or observatory-based coordinates.

## 2.648 [LVV-9943] DMS-PRTL-REQ-0099-V-01: Overlay LSST-Derived Orbits\_1

Jira Link	Assignee	Status	Test Cases
LVV-9943	Gregory Dubois-Felsmann	Not Covered	LVV-T733

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0099
Requirement Description	The Portal aspect shall have the capability to overlay predicted positions from the orbits of solar system objects in the LSST catalog on to images.  This is envisioned as the ability to display a specific prediction for a position along an orbit on a single-epoch image, as well as a set of predictions for an orbit on a coadded image or all-sky map.  It would also be useful to support overlay of predicted positions from user-supplied orbits in community-standard forms. The capabilities to be provided in this area will be determined during construction.  It might further be useful to be able to overlay intermediate data products such as tracks and tracklets; whether it is desirable and feasible to provide this will be determined during construction.
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

### 2.648.1 Test Cases Summary

LVV-T733	Verify overlay of LSST-derived orbits on images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect has the capability to overlay predicted positions from the orbits of solar system objects in the LSST catalog on to images.

## 2.649 [LVV-9944] DMS-PRTL-REQ-0100-V-01: Overlay User-provided Catalogs on Images\_1

Jira Link	Assignee	Status	Test Cases
LVV-9944	Gregory Dubois-Felsmann	Not Covered	LVV-T734

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0100
Requirement Description	The Portal aspect shall be able to overlay user-provided source lists or catalogs on images.
Requirement Priority	
Upper Level Requirement	

### 2.649.1 Test Cases Summary

LVV-T734	Verify overlay of user-supplied catalogs on images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal enables users to overlay the positions of objects in user-supplied catalogs on top of images.

## 2.650 [LVV-9945] DMS-PRTL-REQ-0101-V-01: Overlay User-provided Region Files on Images\_1

Jira Link	Assignee	Status	Test Cases
LVV-9945	Gregory Dubois-Felsmann	Not Covered	LVV-T735

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0101
Requirement Description	The Portal aspect shall be able to overlay user-provided region files (e.g., DS9 region files, focal plane outlines) on images.
Requirement Priority	
Upper Level Requirement	

### 2.650.1 Test Cases Summary

LVV-T735	Verify overlay of user-supplied region files on images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that Portal users can upload a region file and overlay the region on a displayed image.

## 2.651 [LVV-9946] DMS-PRTL-REQ-0104-V-01: Position-based Time-Domain Image View\_1

Jira Link	Assignee	Status	Test Cases
LVV-9946	Gregory Dubois-Felsmann	Not Covered	LVV-T738

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0104
Requirement Description	The Portal aspect shall have the capability to view an image time series that maintains the same physical scale, photometric scale, and image size display of a specified position on the sky.
Requirement Discussion	If the object moves, then the images stay centered on the sky and the object appears to move.
Requirement Priority	
Upper Level Requirement	

### 2.651.1 Test Cases Summary

LVV-T738	Verify position-based time-domain image view			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal provides the capability to view an image time series that maintains the same physical scale, photometric scale, and image size display of a specified region on the sky. If the object moves, then the images should stay centered on the sky and the object will appear to move.

## 2.652 [LVV-9947] DMS-PRTL-REQ-0108-V-01: Saving Data Selection from a Plot or Image\_1

Jira Link	Assignee	Status	Test Cases
LVV-9947	Gregory Dubois-Felsmann	Not Covered	LVV-T742

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0108
Requirement Description	The Portal aspect shall enable the saving of data selected via a polygon selection across the linked images, tables, and plots.
Requirement Discussion	An example here is to have an image up; draw a polygon on the image to select the area on the sky. All the tabular data associated with sources and objects in that part of the sky would be selected and saved.
Requirement Priority	
Upper Level Requirement	

### 2.652.1 Test Cases Summary

LVV-T742	Verify saving data selection from a plot or image			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal aspect enables the saving of data selected via a polygon selection across the linked images, tables, and plots.

## 2.653 [LVV-9948] DMS-PRTL-REQ-0103-V-01: Single-Object Time-Domain Image View\_1

Jira Link	Assignee	Status	Test Cases
LVV-9948	Gregory Dubois-Felsmann	Not Covered	LVV-T737

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0103
Requirement Description	The Portal aspect shall have the capability to view an image time series that maintains the same physical scale, photometric scale, and image size display of a cutout area centered on an LSST object
Requirement Discussion	If the object moves, then the images stay centered on the object.
Requirement Priority	
Upper Level Requirement	

### 2.653.1 Test Cases Summary

LVV-T737	Verify single-object time-domain image view			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal provides the capability to view an image time series that maintains the same physical scale, photometric scale, and image size display of a cutout area centered on an LSST object. If the object moves, then the images should stay centered on the object.

## 2.654 [LVV-9949] DMS-PRTL-REQ-0109-V-01: Access to User Databases\_1

Jira Link	Assignee	Status	Test Cases
LVV-9949	Gregory Dubois-Felsmann	Not Covered	LVV-T743

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0109
Requirement Description	The Portal aspect shall provide read/write access to user databases (Level 3 tabular data products) and shall implement any access restrictions placed on such data.
Requirement Priority	
Upper Level Requirement	

### 2.654.1 Test Cases Summary

LVV-T743	Verify access to user databases			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal aspect provides read/write access to user databases (Level 3 tabular data products) and has implemented any access restrictions placed on such data.



## 2.655 [LVV-9950] DMS-PRTL-REQ-0113-V-01: Download Volume Estimation\_1

Jira Link	Assignee	Status	Test Cases
LVV-9950	Gregory Dubois-Felsmann	Not Covered	LVV-T747

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0113
Requirement Description	The Portal aspect shall provide an estimate of the data download volume prior to a user confirming the download option.
Requirement Discussion	The intent of this requirement is to enable the users to understand how large a query result or data set may be prior to the full retrieval and downloading of that data to either the workspace environment or their own local environment.
Requirement Priority	
Upper Level Requirement	

### 2.655.1 Test Cases Summary

LVV-T747	Verify estimation of data download volume			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal provides an estimate of the volume of a data download before the user confirms the download option.

## 2.656 [LVV-9951] DMS-PRTL-REQ-0111-V-01: Image Data Download\_1

Jira Link	Assignee	Status	Test Cases
LVV-9951	Gregory Dubois-Felsmann	Not Covered	LVV-T745 LVV-T1818

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0111
Requirement Description	The Portal aspect shall include mechanisms for a user to download image data to a remote site or to the Workspace, from both screens displaying images and screens displaying lists of image metadata.
Requirement Discussion	Again, this should be implemented as a pass-through to the API aspect.
Requirement Priority	
Upper Level Requirement	

### 2.656.1 Test Cases Summary

LVV-T745	Verify image data download			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect includes mechanisms for a user to download image data to a remote site or to the Workspace, from both screens displaying images and screens displaying lists of image metadata.

LVV-T1818	DM-SUIT-8: Verify Portal integration with workspace (via WebDAV)			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Demonstration

**Objective:**

This test case verifies that the Portal Aspect software is capable of accessing a file-oriented workspace via the WebDAV protocol.

In so doing, it partially verifies several Portal Aspect requirements that relate to this capability - “partially” because some of these requirements depend on workspace capabilities which were not present in the prototype WebDAV service delivered by the DAX group, because some of the requirements also cover the User Database Workspace (not relevant to this milestone, and not yet available), and also because the milestone was not envisioned as an exhaustive test covering edge cases:

- DMS-PRTL-REQ-0003 (LVV-9846, Portal access to workspace) is covered at “demonstration” level, with basic tests of saving image and tabular data to the workspace, and only for the User File Workspace (there is currently no User Database Workspace prototype available);
- DMS-PRTL-REQ-0046 (LVV-9886, Visualization of workspace data) is covered at “demonstration” level for a couple of FITS image and table files, and only for the User File Workspace;
- DMS-PRTL-REQ-0110 (LVV-9954, Tabular data download) is covered at “demonstration” level, only for catalog data (there was no image metadata in the LSP deployment at the time of test), and only for the User File Workspace;
- DMS-PRTL-REQ-0095 (LVV-9932, Saving Displayed Tabular Data) is covered at “demonstration” level for a simple subset operation in the table browser; and
- DMS-PRTL-REQ-0111 (LVV-9951, Image data download) is covered at “demonstration” level, and only for download from an image display screen itself (as LSST-style image metadata services, e.g., ObsTAP, were not available in the LSP at the time of testing).

## 2.657 [LVV-9952] DMS-PRTL-REQ-0114-V-01: Long Download Completion Notification\_1

Jira Link	Assignee	Status	Test Cases
LVV-9952	Gregory Dubois-Felsmann	Not Covered	LVV-T748

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0114
Requirement Description	The Portal aspect shall notify the user with an estimate of how long a download is expected to take. The user can continue to monitor the download; an option shall be provided to notify the user when the download has completed.
Requirement Discussion	DAX requirement for async
Requirement Priority	
Upper Level Requirement	

### 2.657.1 Test Cases Summary

LVV-T748	Verify notification of long download completion			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect notifies the user with an estimate of how long a download is expected to take. The user can continue to monitor the download; verify that an option has been provided to notify the user when the download has completed.

## 2.658 [LVV-9953] DMS-PRTL-REQ-0112-V-01: Selected Image Download\_1

Jira Link	Assignee	Status	Test Cases
LVV-9953	Gregory Dubois-Felsmann	Not Covered	LVV-T746

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0112
Requirement Description	The Portal aspect shall support user selection for download of a subset of the images in an image metadata table or image cutout table.
Requirement Priority	
Upper Level Requirement	

### 2.658.1 Test Cases Summary

LVV-T746	Verify selected image download			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal aspect supports user selection for download of a subset of the images in an image metadata table or image cutout table.

## 2.659 [LVV-9954] DMS-PRTL-REQ-0110-V-01: Tabular Data Download\_1

Jira Link	Assignee	Status	Test Cases
LVV-9954	Gregory Dubois-Felsmann	Not Covered	LVV-T744 LVV-T1818

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0110
Requirement Description	The Portal aspect shall include a mechanism for a user to download to a remote site, Workspace, or to an existing or new user database the tabular results from a database query, including for catalog or image metadata.
Requirement Discussion	This may be implemented as a pass-through to the API aspect when applied to the results of a query against an LSST database.
Requirement Priority	
Upper Level Requirement	

### 2.659.1 Test Cases Summary

LVV-T744	Verify tabular data download			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect includes a mechanism for a user to download to a remote site, Workspace, or to an existing or new user database the tabular results from a database query, including for catalog or image metadata.

LVV-T1818	DM-SUIT-8: Verify Portal integration with workspace (via WebDAV)			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Demonstration

**Objective:**

This test case verifies that the Portal Aspect software is capable of accessing a file-oriented workspace via the WebDAV protocol.

In so doing, it partially verifies several Portal Aspect requirements that relate to this capability - “partially” because some of these requirements depend on workspace capabilities which were not present in the prototype WebDAV service delivered by the DAX group, because some of the requirements also cover the User Database Workspace (not relevant to this milestone, and not yet available), and also because the milestone was not envisioned as an exhaustive test covering edge cases:

- DMS-PRTL-REQ-0003 (LVV-9846, Portal access to workspace) is covered at “demonstration” level, with basic tests of saving image and tabular data to the workspace, and only for the User File Workspace (there is currently no User Database Workspace prototype available);
- DMS-PRTL-REQ-0046 (LVV-9886, Visualization of workspace data) is covered at “demonstration” level for a couple of FITS image and table files, and only for the User File Workspace;
- DMS-PRTL-REQ-0110 (LVV-9954, Tabular data download) is covered at “demonstration” level, only for catalog data (there was no image metadata in the LSP deployment at the time of test), and only for the User File Workspace;
- DMS-PRTL-REQ-0095 (LVV-9932, Saving Displayed Tabular Data) is covered at “demonstration” level for a simple subset operation in the table browser; and
- DMS-PRTL-REQ-0111 (LVV-9951, Image data download) is covered at “demonstration” level, and only for download from an image display screen itself (as LSST-style image metadata services, e.g., ObsTAP, were not available in the LSP at the time of testing).

## 2.660 [LVV-9955] DMS-PRTL-REQ-0115-V-01: APIs for Visualization Components\_1

Jira Link	Assignee	Status	Test Cases
LVV-9955	Gregory Dubois-Felsmann	Not Covered	LVV-T749

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0115
Requirement Description	The Portal aspect shall provide a documented application program interface that allows users and services at any location to access and manipulate the Portal's visualization services. This is intended to be enable API control of the visualization components and tool-level visualization services to be called and controlled through an API.
Requirement Discussion	There will be a Web API as well as a Python wrapper for it.
Requirement Priority	
Upper Level Requirement	

### 2.660.1 Test Cases Summary

LVV-T749	Verify API for visualization components			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect provides a documented application program interface that allows users and services at any location to access and manipulate the Portal's visualization services. This is intended to enable API control of the visualization components and tool-level visualization services to be called and controlled through an API. There will be a Web API as well as a Python wrapper for it.



## 2.661 [LVV-9956] DMS-PRTL-REQ-0117-V-01: Computational Quotas User Interface\_1

Jira Link	Assignee	Status	Test Cases
LVV-9956	Gregory Dubois-Felsmann	Not Covered	LVV-T751

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0117
Requirement Description	The Portal aspect shall provide the user with an understanding of the current status of their allocations.
Requirement Discussion	This requirement is about the SUIT implementing the quotas defined by the DM system. Those requirements need to be defined and work through by the Project and the DM.
Requirement Priority	
Upper Level Requirement	

### 2.661.1 Test Cases Summary

LVV-T751	Verify implementation of computational quotas status			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal aspect provides a summary of the current status of users' allocations of computational resources.

## 2.662 [LVV-9957] DMS-PRTL-REQ-0118-V-01: Portal Display Preferences\_1

Jira Link	Assignee	Status	Test Cases
LVV-9957	Gregory Dubois-Felsmann	Not Covered	LVV-T752

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0118
Requirement Description	The Portal aspect shall enable a user to establish and save viewing preferences, including, but not limited to, which tabular data columns to view, how tables should be sorted by default, which calculated quantities appear within a table, what image stretch and color tables, what types of plots are generated, how data are overlaid on images.
Requirement Discussion	The intent behind this requirement is to enable user to set up a working environment within the default portal or the workspace environment and be able to save the state of the workflow.
Requirement Priority	
Upper Level Requirement	

### 2.662.1 Test Cases Summary

LVV-T752	Verify saved Portal display preferences			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect enables a user to establish and save viewing preferences, including, but not limited to, which tabular data columns to view, how tables should be sorted by default, which calculated quantities appear within a table, what image stretch and color tables, what types of plots are generated, how data are overlaid on images.

## 2.663 [LVV-9958] DMS-PRTL-REQ-0116-V-01: Storage Quotas User Interface\_1

Jira Link	Assignee	Status	Test Cases
LVV-9958	Gregory Dubois-Felsmann	Not Covered	LVV-T750

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0116
Requirement Description	The Portal aspect shall provide the user with an understanding of the current status of their storage allocations
Requirement Discussion	This requirement is about the SUIT implementing the quotas defined by the DM system. Those requirements need to be defined and worked through by the Project and the DM.
Requirement Priority	
Upper Level Requirement	

### 2.663.1 Test Cases Summary

LVV-T750	Verify implementation of storage quotas status			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect provides a summary of the current status of users' storage allocations.

## 2.664 [LVV-9959] DMS-PRTL-REQ-0127-V-01: Alert Subscription Monitoring\_1

Jira Link	Assignee	Status	Test Cases
LVV-9959	Gregory Dubois-Felsmann	Not Covered	LVV-T756

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0127
Requirement Description	The Portal aspect shall report feedback about the status and performance of a user's filters in the alert subscription service.
Requirement Discussion	This is a front end to information exposed by an API provided by the Simple Filtering Service, and is expected to encompass information such as filter status (enabled/disabled, error), statistics on the number of alerts seen and the number transmitted by the filter, and optional debugging log information.
Requirement Priority	
Upper Level Requirement	

### 2.664.1 Test Cases Summary

LVV-T756	Verify monitoring of alert subscription			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal provides feedback about the status and performance of a user's filters in the alert subscription service.

## 2.665 [LVV-9960] DMS-PRTL-REQ-0119-V-01: Alert Subscription Service\_1

Jira Link	Assignee	Status	Test Cases
LVV-9960	Gregory Dubois-Felsmann	Not Covered	LVV-T753

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0119
Requirement Description	The Portal aspect shall provide an interface to the alert subscription service that allows authenticated users with LSST data rights to subscribe to a stream of alert events. This is just a UI for the underlying capability developed under 02C.03.03.
Requirement Discussion	Note that users without data rights will have to subscribe to alerts through brokers external to the LSST project.
Requirement Priority	
Upper Level Requirement	

### 2.665.1 Test Cases Summary

LVV-T753	Verify alert subscription service			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect provides an interface to the alert subscription service that allows authenticated users with LSST data rights to subscribe to a stream of alert events.

## 2.666 [LVV-9961] DMS-PRTL-REQ-0120-V-01: Pre-defined Alert Filters\_1

Jira Link	Assignee	Status	Test Cases
LVV-9961	Gregory Dubois-Felsmann	Not Covered	LVV-T754

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0120
Requirement Description	The Portal aspect shall provide an interface to permit alert subscriptions to be configured with Project-provided alert filters.
Requirement Priority	
Upper Level Requirement	

### 2.666.1 Test Cases Summary

LVV-T754	Verify availability of pre-defined alert filters			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal provides an interface to permit alert subscriptions to be configured with Project-provided alert filters.

## 2.667 [LVV-9962] DMS-PRTL-REQ-0121-V-01: User-defined Alert Filters\_1

Jira Link	Assignee	Status	Test Cases
LVV-9962	Gregory Dubois-Felsmann	Not Covered	LVV-T755

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0121
Requirement Description	The Portal aspect shall provide an interface to permit alert subscriptions to be configured with user-defined alert filters.
Requirement Priority	
Upper Level Requirement	

### 2.667.1 Test Cases Summary

LVV-T755	Verify availability of user-defined alert filters			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal provides an interface to permit alert subscriptions to be configured with user-provided alert filters.

## 2.668 [LVV-9963] DMS-PRTL-REQ-0122-V-01: Access to Observatory Documentation\_1

Jira Link	Assignee	Status	Test Cases
LVV-9963	Gregory Dubois-Felsmann	Not Covered	LVV-T757

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0122
Requirement Description	The Portal aspect shall provide access to Project-provided documentation on the design, construction, and operation of the LSST.
Requirement Discussion	Much of this will be just a link or links to documentation whose creation is out of the scope of DM. The DM documentation will include documentation on the code, on the pipeline processing, and on the delivered data quality. Note that documentation on the Science Platform itself will also be included.
Requirement Priority	
Upper Level Requirement	

### 2.668.1 Test Cases Summary

LVV-T757	Verify access to survey documentation			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal provides access to Project-provided documentation on the design, construction, and operation of the LSST.



## 2.669 [LVV-9964] DMS-PRTL-REQ-0124-V-01: Portal API Documentation\_1

Jira Link	Assignee	Status	Test Cases
LVV-9964	Gregory Dubois-Felsmann	Not Covered	LVV-T759

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0124
Requirement Description	The Portal aspect shall provide reference-manual-style documentation on its public network and programmatic APIs.
Requirement Discussion	This may include network APIs that allow interaction with a Portal session's state, Python APIs including wrappers for the network APIs, and JavaScript APIs for the components of the Portal application. This requirement is somewhat redundant with the general DM requirement that all code be supplied with reference documentation, but emphasizes a coherent presentation of the APIs relevant to the Portal.
Requirement Priority	
Upper Level Requirement	

### 2.669.1 Test Cases Summary

LVV-T759	Verify access to Portal API documentation			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal provides access to reference manual-style documentation of its public network and programmatic APIs.

## 2.670 [LVV-9965] DMS-PRTL-REQ-0123-V-01: Portal User Documentation\_1

Jira Link	Assignee	Status	Test Cases
LVV-9965	Gregory Dubois-Felsmann	Not Covered	LVV-T758

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0123
Requirement Description	The Portal aspect shall provide user-guide-style documentation on the use of the Portal.
Requirement Priority	
Upper Level Requirement	

### 2.670.1 Test Cases Summary

LVV-T758	Verify access to Portal documentation			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Portal provides access to documentation on the use of the Portal (i.e., a user guide, or similar).

## 2.671 [LVV-9966] DMS-PRTL-REQ-0126-V-01: System-Busy Indication\_1

Jira Link	Assignee	Status	Test Cases
LVV-9966	Gregory Dubois-Felsmann	Not Covered	LVV-T761

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0126
Requirement Description	The Portal aspect shall provide a means to inform users when elements of the system are unavailable.
Requirement Discussion	This might be due to maintenance or to excessive load.
Requirement Priority	
Upper Level Requirement	

### 2.671.1 Test Cases Summary

LVV-T761	Verify implementation of system-busy notification			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal provides a means to inform users when the elements of the system are unavailable due to maintenance or excessive load.

## 2.672 [LVV-9967] DMS-PRTL-REQ-0125-V-01: Tolerance of Production Database Changes\_1

Jira Link	Assignee	Status	Test Cases
LVV-9967	Gregory Dubois-Felsmann	Not Covered	LVV-T760

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-PRTL-REQ-0125
Requirement Description	The Portal aspect shall be designed to facilitate accommodation of database expansion and changes and metadata extension and changes associated with the evolution of the Level 1 data, Level 2 data releases, and other planned data sources.
Requirement Discussion	The LSP needs to accommodate the database changes associated with Level 1 and Level 2 updates; this also has implications for DAX - see the "Discovery and Reflection APIs" requirement - and for the availability of the data as they are released with the processing (nightly and annually). This requires stability for the APIs (web and client), and usability of the Portal across releases (and for multiple releases).
Requirement Priority	
Upper Level Requirement	

### 2.672.1 Test Cases Summary

LVV-T760	Verify tolerance of database changes			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Portal aspect facilitates accommodation of database expansion and changes and metadata extension and changes associated with the evolution of the Level 1 data, Level 2 data releases, and other planned data sources.

## 2.673 [LVV-9968] DMS-NB-REQ-0010-V-01: Common Astronomy Package Availability\_1

Jira Link	Assignee	Status	Test Cases
LVV-9968	Gregory Dubois-Felsmann	Not Covered	LVV-T767

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0010
Requirement Description	The Notebook Aspect shall provide select standard astronomy and data analysis packages in the interactive environments.
Requirement Discussion	These may include, for example, astropy, pandas, scipy, scikit-learn, matplotlib, bokeh, and seaborn.
Requirement Priority	
Upper Level Requirement	

### 2.673.1 Test Cases Summary

LVV-T767	Verify availability of standard astronomy software			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Notebook Aspect provides select standard astronomy packages in the interactive environments. These may include, for example, Astropy and S-Extractor.

## 2.674 [LVV-9969] DMS-NB-REQ-0009-V-01: Data Access Middleware Availability\_1

Jira Link	Assignee	Status	Test Cases
LVV-9969	Gregory Dubois-Felsmann	Not Covered	LVV-T766

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0009
Requirement Description	Users of the Notebook Aspect shall be able to make use of the LSST Python I/O middleware layer to perform data discovery, data access and any other supported functions (e.g., provenance information).
Requirement Discussion	Notably, the Data Butler is available in the Notebook Python environment, with full access to all authorized data products available on that instance of the Science Platform.
Requirement Priority	
Upper Level Requirement	

### 2.674.1 Test Cases Summary

LVV-T766	Verify availability of data access middleware			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that users of the Notebook Aspect are able to make use of the LSST Python I/O middleware layer to perform data discovery, data access and any other supported functions (e.g., provenance information). Notably, the Data Butler is available in the Notebook Python environment, with full access to all authorized data products available on that instance of the Science Platform.

## 2.675 [LVV-9970] DMS-NB-REQ-0014-V-01: Documentation\_1

Jira Link	Assignee	Status	Test Cases
LVV-9970	Gregory Dubois-Felsmann	Not Covered	LVV-T771

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0014
Requirement Description	The Notebook Aspect shall provide documentation of each of the constituent features as well as tutorial notebooks demonstrating the use of the Aspect.
Requirement Priority	
Upper Level Requirement	

### 2.675.1 Test Cases Summary

LVV-T771	Verify availability of Notebook aspect documentation			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Notebook Aspect provides documentation of each of the constituent features as well as tutorial notebooks demonstrating the use of the Aspect.

## 2.676 [LVV-9971] DMS-NB-REQ-0005-V-01: Interactive Python Environment\_1

Jira Link	Assignee	Status	Test Cases
LVV-9971	Gregory Dubois-Felsmann	Not Covered	LVV-T762 LVV-T1436

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0005
Requirement Description	The Notebook Aspect shall provide an interactive Python environment through both a notebook interface and via a Python interactive interpreter.
Requirement Priority	
Upper Level Requirement	

### 2.676.1 Test Cases Summary

LVV-T762	Verify availability of interactive Python environment			
Owner	Status	Version	Critical Event	Verification Type
Simon Krughoff	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook aspect provides an interactive Python environment through both a notebook interface and via a Python interactive interpreter.

LVV-T1436	LDM-503-10a: Notebook Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

#### Objective:



This test case verifies that the Notebook Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from Python code in the Notebook Aspect.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0003, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-NB-REQ-0001, DMS-NB-REQ-0002, DMS-NB-REQ-0005, DMS-NB-REQ-0006, DMS-NB-REQ-0013, DMS-NB-REQ-0017, and DMS-NB-REQ-0029, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.677 [LVV-9972] DMS-NB-REQ-0015-V-01: New-User Onboarding\_1

Jira Link	Assignee	Status	Test Cases
LVV-9972	Gregory Dubois-Felsmann	Not Covered	LVV-T772

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0015
Requirement Description	The Notebook Aspect shall provide clear documentation on how to obtain credentials for accessing the Notebook Aspect.
Requirement Priority	
Upper Level Requirement	

### 2.677.1 Test Cases Summary

LVV-T772	Verify new-user onboarding			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Notebook Aspect provides clear documentation on how to obtain credentials for accessing the Notebook Aspect.

## 2.678 [LVV-9973] DMS-NB-REQ-0013-V-01: Persistent User Home File Space\_1

Jira Link	Assignee	Status	Test Cases
LVV-9973	Gregory Dubois-Felsmann	Not Covered	LVV-T770 LVV-T1436

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0013
Requirement Description	The Notebook Aspect shall provide a persistent home space such that per user configuration survives shutdown and restart of the environment.
Requirement Discussion	This space appears as a home directory from Python and in the Unix shell environment. This includes things like .bashrc, .pythonrc, and user installed python libs.
Requirement Priority	
Upper Level Requirement	

### 2.678.1 Test Cases Summary

LVV-T770	Verify availability of persistent user home file space			
Owner	Status	Version	Critical Event	Verification Type
Simon Krughoff	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook Aspect provides a persistent home space such that per user configuration survives shutdown and restart of the environment. This space appears as a home directory from Python and in the Unix shell environment. This includes things like .bashrc, .pythonrc, and user installed python libs.

LVV-T1436	LDM-503-10a: Notebook Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Notebook Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from Python code in the Notebook Aspect.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0003, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-NB-REQ-0001, DMS-NB-REQ-0002, DMS-NB-REQ-0005, DMS-NB-REQ-0006, DMS-NB-REQ-0013, DMS-NB-REQ-0017, and DMS-NB-REQ-0029, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.679 [LVV-9974] DMS-NB-REQ-0007-V-01: Pre-installed Containerized Software Releases\_1

Jira Link	Assignee	Status	Test Cases
LVV-9974	Gregory Dubois-Felsmann	Not Covered	LVV-T764

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0007
Requirement Description	Users of the Notebook Aspect shall be able to choose from a curated list of pre-built containers (including version of LSST stack) for their notebooks (and any other provided interactive environment) to execute in.
Requirement Discussion	The use of the Docker container technology is anticipated.
Requirement Priority	
Upper Level Requirement	

### 2.679.1 Test Cases Summary

LVV-T764	Verify availability of containerized software releases			
Owner	Status	Version	Critical Event	Verification Type
Simon Krughoff	Draft	1	false	Inspection

#### Objective:

Verify that users of the Notebook aspect are able to choose from a curated list of pre-built containers (including version of LSST stack) for their notebooks (and any other provided interactive environment) to execute in.

## 2.680 [LVV-9975] DMS-NB-REQ-0008-V-01: Release Deployment Latency\_1

Jira Link	Assignee	Status	Test Cases
LVV-9975	Gregory Dubois-Felsmann	Not Covered	LVV-T765

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0008
Requirement Description	It shall be possible to add a new environment (with a new version of the LSST stack) to the curated list of available execution environments in less than four hours.
Requirement Priority	
Upper Level Requirement	

### 2.680.1 Test Cases Summary

LVV-T765	Verify latency of release deployment			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Demonstration

### Objective:

Verify that it is possible to add a new environment (with a new version of the LSST stack) to the curated list of available execution environments in less than four hours.

## 2.681 [LVV-9976] DMS-NB-REQ-0006-V-01: Unix Shell Access\_1

Jira Link	Assignee	Status	Test Cases
LVV-9976	Gregory Dubois-Felsmann	Not Covered	LVV-T763 LVV-T1436

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0006
Requirement Description	The Notebook Aspect shall provide command line access to a Unix shell with the same environment as DMS-NB-REQ-0005.
Requirement Priority	
Upper Level Requirement	

### 2.681.1 Test Cases Summary

LVV-T763	Verify availability of Unix shell access			
Owner	Status	Version	Critical Event	Verification Type
Simon Krughoff	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook aspect provides command-line access to a Unix shell with the same environment as the interactive Python environment.

LVV-T1436	LDM-503-10a: Notebook Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

#### Objective:

This test case verifies that the Notebook Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from Python code in the Notebook Aspect.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0003, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-NB-REQ-0001, DMS-NB-REQ-0002, DMS-NB-REQ-0005, DMS-NB-REQ-0006, DMS-NB-REQ-0013, DMS-NB-REQ-0017, and DMS-NB-REQ-0029, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.



## 2.682 [LVV-9977] DMS-NB-REQ-0012-V-01: User Development Environment\_1

Jira Link	Assignee	Status	Test Cases
LVV-9977	Gregory Dubois-Felsmann	Not Covered	LVV-T769

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0012
Requirement Description	The Notebook Aspect environment shall permit a user to edit and build their own version of any LSST science pipeline package in their container.
Requirement Discussion	This implies the availability of both a C++ and a Python development environment.
Requirement Priority	
Upper Level Requirement	

### 2.682.1 Test Cases Summary

LVV-T769	Verify availability of user development environment			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook Aspect environment permits a user to edit and build their own version of any LSST science pipeline package in their container. This implies the availability of both a C++ and a Python development environment.

## 2.683 [LVV-9978] DMS-NB-REQ-0011-V-01: User Package Installation\_1

Jira Link	Assignee	Status	Test Cases
LVV-9978	Gregory Dubois-Felsmann	Not Covered	LVV-T768

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0011
Requirement Description	The Notebook Aspect shall have a process that allows users to add new packages to their environment
Requirement Discussion	It is intended that operations like "pip install" will be usable.
Requirement Priority	
Upper Level Requirement	

### 2.683.1 Test Cases Summary

LVV-T768	Verify availability of user package installation			
Owner	Status	Version	Critical Event	Verification Type
Simon Krughoff	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook Aspect has a process that allows users to add new packages to their environment It is intended that operations like "pip install" will be usable.

## 2.684 [LVV-9979] DMS-NB-REQ-0023-V-01: Access to All Data Products\_1

Jira Link	Assignee	Status	Test Cases
LVV-9979	Gregory Dubois-Felsmann	Not Covered	LVV-T780

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0023
Requirement Description	An authorized user of the Notebook Aspect shall be able to access the Transformed Engineering and Facilities Database (EFD) and and all other LSST released data products.
Requirement Priority	
Upper Level Requirement	

### 2.684.1 Test Cases Summary

LVV-T780	Verify access to all data products from Notebook aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that an authorized user of the Notebook Aspect is able to access the reformatted Engineering and Facilities Database (EFD) and and all other LSST released data products.

## 2.685 [LVV-9980] DMS-NB-REQ-0017-V-01: Access to the API and Portal Aspects\_1

Jira Link	Assignee	Status	Test Cases
LVV-9980	Gregory Dubois-Felsmann	Not Covered	LVV-T774 LVV-T1436

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0017
Requirement Description	The Notebook Aspect shall be able to utilise the data access services provided by other Aspects.
Requirement Discussion	In particular, a Notebook user can use standard VO services to access LSST Data Releases.
Requirement Priority	
Upper Level Requirement	

### 2.685.1 Test Cases Summary

LVV-T774	Verify API and Portal aspects accessible from Notebook			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook Aspect is able to utilise the data access services provided by other Aspects. In particular, a Notebook user can use standard VO services to access LSST Data Releases.

LVV-T1436	LDM-503-10a: Notebook Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Notebook Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from Python code in the Notebook Aspect.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0003, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-NB-REQ-0001, DMS-NB-REQ-0002, DMS-NB-REQ-0005, DMS-NB-REQ-0006, DMS-NB-REQ-0013, DMS-NB-REQ-0017, and DMS-NB-REQ-0029, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.686 [LVV-9981] DMS-NB-REQ-0021-V-01: Batch System Access\_1

Jira Link	Assignee	Status	Test Cases
LVV-9981	Gregory Dubois-Felsmann	Not Covered	LVV-T778

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0021
Requirement Description	The Notebook Aspect shall provide access to a batch processing system via shell access.
Requirement Discussion	This is a cluster of computers scheduled through a standard scheduler like slurm, condor, or pbs.
Requirement Priority	
Upper Level Requirement	

### 2.686.1 Test Cases Summary

LVV-T778	Verify access to batch system			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook aspect provides access to a batch processing system via shell access.

## 2.687 [LVV-9982] DMS-NB-REQ-0022-V-01: Compute and Storage Quotas\_1

Jira Link	Assignee	Status	Test Cases
LVV-9982	Gregory Dubois-Felsmann	Not Covered	LVV-T779

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0022
Requirement Description	The Notebook Aspect shall have a quota system for compute and storage authorized access via an authentication system.
Requirement Priority	
Upper Level Requirement	

### 2.687.1 Test Cases Summary

LVV-T779	Verify implementation of quotas in Notebook aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Notebook Aspect has a quota system for compute and storage authorized access via an authentication system.

## 2.688 [LVV-9983] DMS-NB-REQ-0016-V-01: Shared File Space\_1

Jira Link	Assignee	Status	Test Cases
LVV-9983	Gregory Dubois-Felsmann	Not Covered	LVV-T773

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0016
Requirement Description	The Notebook Aspect shall provide access to a shared read/write filesystem visible to all users of an instance of the Science Platform. In the LDF this is intended to be implemented as .
Requirement Discussion	DMS-REQ-0340 means that permissions will be controlled on a variety of granularity including user and group.
Requirement Priority	
Upper Level Requirement	

### 2.688.1 Test Cases Summary

LVV-T773	Verify availability of shared file space			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook Aspect provides access to a shared read/write filesystem visible to all users of an instance of the Science Platform.



## 2.689 [LVV-9984] DMS-NB-REQ-0020-V-01: User Database Workspace Access\_1

Jira Link	Assignee	Status	Test Cases
LVV-9984	Gregory Dubois-Felsmann	Not Covered	LVV-T777

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0020
Requirement Description	Users will be able to interact with their User Database through the Notebook Aspect to insert, delete, and control access to their tables.
Requirement Discussion	This will be possible via TAP, at least, and possibly through lower-level access.
Requirement Priority	
Upper Level Requirement	

### 2.689.1 Test Cases Summary

LVV-T777	Verify user database workspace access from Notebook aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that users are able to interact with their User Database through the Notebook Aspect to insert, delete, and control access to their tables. This will be possible via TAP, at least, and possibly through lower-level access.

## 2.690 [LVV-9985] DMS-NB-REQ-0018-V-01: User File Workspace Access\_1

Jira Link	Assignee	Status	Test Cases
LVV-9985	Gregory Dubois-Felsmann	Not Covered	LVV-T775

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0018
Requirement Description	The Notebook Aspect shall be able to access the User File Workspace available as a POSIX filesystem from within the Python kernels and shell-prompt sessions it supports.
Requirement Priority	
Upper Level Requirement	

### 2.690.1 Test Cases Summary

LVV-T775	Verify access to User File Workspace			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that users of the Notebook Aspect are able to access the User File Workspace available as a POSIX filesystem from within the Python kernels and shell-prompt sessions it supports.

## 2.691 [LVV-9986] DMS-NB-REQ-0019-V-01: VOspace Access\_1

Jira Link	Assignee	Status	Test Cases
LVV-9986	Gregory Dubois-Felsmann	Not Covered	LVV-T776

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0019
Requirement Description	The Notebook Aspect shall be able to interact with VOspace services available through project or external services.
Requirement Discussion	Users will be able to directly use VOspace APIs within a Notebook. It is not yet decided whether there will be support for user-mode mounting of non-LSP VOspace (or WebDAV) services as virtual POSIX filesystems.
Requirement Priority	
Upper Level Requirement	

### 2.691.1 Test Cases Summary

LVV-T776	Verify access to VOspace services from Notebook aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that users of the Notebook Aspect are able to interact with VOspace services available through project or external services.

Users will be able to directly use VOspace APIs within a Notebook.

## 2.692 [LVV-9987] DMS-NB-REQ-0025-V-01: Deployment Workload in Kubernetes\_1

Jira Link	Assignee	Status	Test Cases
LVV-9987	Gregory Dubois-Felsmann	Not Covered	LVV-T782

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0025
Requirement Description	Given a Kubernetes cluster with a configuration meeting a documented standard set of specifications, it shall take an engineer with admin rights no more than 2 days to deploy the Notebook Aspect in that context.
Requirement Discussion	The specification is expected to constrain factors such as software versions for Kubernetes and related packages, available storage, a shared file system, and an authentication system.
Requirement Priority	
Upper Level Requirement	

### 2.692.1 Test Cases Summary

LVV-T782	Verify workload for deployment in Kubernetes			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Demonstration

#### Objective:

Given a Kubernetes cluster with a configuration meeting a documented standard set of specifications, verify that it takes an engineer with admin rights no more than 2 days to deploy the Notebook Aspect in that context. The specification is expected to constrain factors such as software versions for Kubernetes and related packages, available storage, a shared file system, and an authentication system.

## 2.693 [LVV-9988] DMS-NB-REQ-0024-V-01: Ease of Deployment\_1

Jira Link	Assignee	Status	Test Cases
LVV-9988	Gregory Dubois-Felsmann	Not Covered	LVV-T781

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0024
Requirement Description	The Notebook Aspect shall be deployable to multiple instances and contexts, both private and public.
Requirement Discussion	Such as the Commissioning Cluster and the LDF, but also collaborator clusters, subject to the underlying resources available in the specific instance. (What level of effort? 2 days/week/month; one click deployable on a common standard platform: e.g., Kubernetes.)
Requirement Priority	
Upper Level Requirement	

### 2.693.1 Test Cases Summary

LVV-T781	Verify ease of Notebook aspect deployment			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook Aspect is deployable to multiple instances and contexts, both private and public.

## 2.694 [LVV-9989] DMS-NB-REQ-0026-V-01: System Health Monitoring\_1

Jira Link	Assignee	Status	Test Cases
LVV-9989	Gregory Dubois-Felsmann	Not Covered	LVV-T783

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0026
Requirement Description	The Notebook Aspect shall provide a service health microservice and a dynamic web page hostable on separate resources that provides a view of the health status.
Requirement Priority	
Upper Level Requirement	

### 2.694.1 Test Cases Summary

LVV-T783	Verify monitoring of Notebook system health			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Notebook Aspect provides a service health microservice and a dynamic web page hostable on separate resources that provides a view of the health status.

## 2.695 [LVV-9990] DMS-NB-REQ-0032-V-01: Image Visualization\_1

Jira Link	Assignee	Status	Test Cases
LVV-9990	Gregory Dubois-Felsmann	Not Covered	LVV-T784

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0032
Requirement Description	The Notebook Aspect shall provide a tool for displaying image like datasets produced by LSST stack tools.
Requirement Discussion	This requirement could be satisfied simply by inclusion of <code>afw.display</code> in the pre-installed stack. However, it is anticipated that we will also provide a way to use Portal Aspect Javascript components in JupyterLab.
Requirement Priority	
Upper Level Requirement	

### 2.695.1 Test Cases Summary

LVV-T784	Verify visualization of images in Notebook aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook aspect provides tools for visualization of images produced by the LSST stack tools.

## 2.696 [LVV-9991] DMS-NB-REQ-0033-V-01: Scientific Plotting\_1

Jira Link	Assignee	Status	Test Cases
LVV-9991	Gregory Dubois-Felsmann	Not Covered	LVV-T785

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0033
Requirement Description	The Notebook Aspect shall provide common plotting methods: scatter plots, raster images, histograms, 2D histograms, contours, line traces, polygons, compositions of these (contours on scatter plots), density images
Requirement Discussion	This requirement could be satisfied simply by ensuring that matplotlib is usable within JupyterLab.
Requirement Priority	
Upper Level Requirement	

### 2.696.1 Test Cases Summary

LVV-T785	Verify availability of scientific plotting tools in Notebook aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook Aspect provides common plotting methods including scatter plots, raster images, histograms, 2D histograms, contours, line traces, polygons, compositions of these (contours on scatter plots), density images.



## 2.697 [LVV-9992] DMS-NB-REQ-0035-V-01: Visualization Interactivity\_1

Jira Link	Assignee	Status	Test Cases
LVV-9992	Gregory Dubois-Felsmann	Not Covered	LVV-T787

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0035
Requirement Description	The Notebook Aspect shall provide interactive plots for certain visualizations: Linked axes on multiple plots, zoom, pan, data point selection
Requirement Discussion	(gpdf is concerned that this is too vaguely defined to be verifiable. Should this be in a design document instead?)
Requirement Priority	
Upper Level Requirement	

### 2.697.1 Test Cases Summary

LVV-T787	Verify interactivity of visualizations in Notebook aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook Aspect provides interactive plots for certain visualizations, including linked axes on multiple plots, zoom, pan, and data point selection.

## 2.698 [LVV-9993] DMS-NB-REQ-0034-V-01: Visualization Linkage\_1

Jira Link	Assignee	Status	Test Cases
LVV-9993	Gregory Dubois-Felsmann	Not Covered	LVV-T786

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0034
Requirement Description	The Notebook Aspect shall provide "drill down" functionality in plots: brushing and linking between plots, interactively discover metadata about particular points, drill down to imaging from measurements
Requirement Discussion	Metadata can be visit properties for a measurement, git commits, etc. (gpdf is concerned that this is too vaguely defined to be verifiable. Should this be in a design document instead?)
Requirement Priority	
Upper Level Requirement	

### 2.698.1 Test Cases Summary

LVV-T786	Verify linkage of visualization tools in Notebook aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook Aspect provides "drill down" functionality in plots, including brushing and linking between plots, interactive discovery of metadata about particular points, drill down to imaging from measurements.

## 2.699 [LVV-9994] DMS-NB-REQ-0036-V-01: Visualization Scaling\_1

Jira Link	Assignee	Status	Test Cases
LVV-9994	Gregory Dubois-Felsmann	Not Covered	LVV-T788

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0036
Requirement Description	The Notebook Aspect shall provide interactive plots that scale to include at least 1E6 datapoints.
Requirement Discussion	This may be done through an adaptive refinement scheme like datashader.
Requirement Priority	
Upper Level Requirement	

### 2.699.1 Test Cases Summary

LVV-T788	Verify interactive scaling of visualizations in Notebook aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook Aspect provides interactive plots that scale to include at least 1E6 datapoints. This may be done through an adaptive refinement scheme like datashader.

## 2.700 [LVV-9995] DMS-NB-REQ-0030-V-01: Access to Portal Visualization API\_1

Jira Link	Assignee	Status	Test Cases
LVV-9995	Gregory Dubois-Felsmann	Not Covered	LVV-T790

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0030
Requirement Description	The Notebook Aspect shall provide a mechanism for "pushing" specific types of data to the Portal API.
Requirement Discussion	For instance, this allows a user to plot a catalog of coordinates over an image display using the Portal's Firefly components. This is supported by DMS-PRTL-REQ-0115 on the Portal side.
Requirement Priority	
Upper Level Requirement	

### 2.700.1 Test Cases Summary

LVV-T790	Verify access to Portal visualization API from Notebook aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook Aspect provides a mechanism for "pushing" specific types of data to the Portal API. For instance, this allows a user to plot a catalog of coordinates over an image display using the Portal's Firefly components. This is supported by DMS-PRTL-REQ-0115 on the Portal side.

## 2.701 [LVV-9996] DMS-NB-REQ-0029-V-01: Access to Portal-Initiated Queries\_1

Jira Link	Assignee	Status	Test Cases
LVV-9996	Gregory Dubois-Felsmann	Not Covered	LVV-T789 LVV-T1436

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0029
Requirement Description	A user of the Notebook Aspect shall have access to search queries they performed in the Portal Aspect.
Requirement Discussion	This depends on underlying services from the API Aspect.
Requirement Priority	
Upper Level Requirement	

### 2.701.1 Test Cases Summary

LVV-T789	Verify access to Portal queries from Notebook aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that a user of the Notebook Aspect can access search queries they performed in the Portal Aspect.

LVV-T1436	LDM-503-10a: Notebook Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the Notebook Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from Python code in the Notebook Aspect.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0003, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-NB-REQ-0001, DMS-NB-REQ-0002, DMS-NB-REQ-0005, DMS-NB-REQ-0006, DMS-NB-REQ-0013, DMS-NB-REQ-0017, and DMS-NB-REQ-0029, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.702 [LVV-9997] DMS-NB-REQ-0031-V-01: Notebook-Launching Interface\_1

Jira Link	Assignee	Status	Test Cases
LVV-9997	Gregory Dubois-Felsmann	Not Covered	LVV-T791

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0031
Requirement Description	The Notebook Aspect shall provide a means to trigger the opening of a notebook with access to the results of a query performed in the Portal.
Requirement Discussion	This is intended to permit a Portal user to perform a query and then quickly obtain a Notebook session with that data available for further analysis. The UI element for this might be in either the Portal or Notebook system Uis, depending on implementation issues.
Requirement Priority	
Upper Level Requirement	

### 2.702.1 Test Cases Summary

LVV-T791	Verify ability to launch a notebook with access to Portal query results			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook Aspect provides a means to trigger the opening of a notebook with access to the results of a query performed in the Portal. This is intended to permit a Portal user to perform a query and then quickly obtain a Notebook session with that data available for further analysis.

## 2.703 [LVV-9998] DMS-NB-REQ-0002-V-01: Authentication and Authorization\_1

Jira Link	Assignee	Status	Test Cases
LVV-9998	Gregory Dubois-Felsmann	Not Covered	LVV-T793 LVV-T1436

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0002
Requirement Description	The Notebook Aspect shall authenticate users for the purpose of establishing authorized use and only permit access to authenticated users using the LSST Data Facility authentication and authorisation service.
Requirement Priority	
Upper Level Requirement	

### 2.703.1 Test Cases Summary

LVV-T793	Verify implementation of authentication and authorization service in Notebook aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook Aspect provides a means to authenticate users for the purpose of establishing authorized use and only permit access to authenticated users using the LSST Data Facility authentication and authorization service.

LVV-T1436	LDM-503-10a: Notebook Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test



**Objective:**

This test case verifies that the Notebook Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from Python code in the Notebook Aspect.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0003, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-NB-REQ-0001, DMS-NB-REQ-0002, DMS-NB-REQ-0005, DMS-NB-REQ-0006, DMS-NB-REQ-0013, DMS-NB-REQ-0017, and DMS-NB-REQ-0029, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.704 [LVV-9999] DMS-NB-REQ-0003-V-01: Secure Implementation\_1

Jira Link	Assignee	Status	Test Cases
LVV-9999	Gregory Dubois-Felsmann	Not Covered	LVV-T794

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0003
Requirement Description	The Notebook Aspect shall prevent users from circumventing authorisation controls.
Requirement Discussion	The Notebook Aspect relies on other services, such as authentication, file system permissions etc to prevent access to unauthorized data. It should not be possible for a user to spoof another user in a way that permits access to unauthorized data
Requirement Priority	
Upper Level Requirement	

### 2.704.1 Test Cases Summary

LVV-T794	Verify secure implementation of Notebook aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Notebook aspect does not allow users to circumvent authorizing controls.

## 2.705 [LVV-10000] DMS-NB-REQ-0001-V-01: Secure Protocol\_1

Jira Link	Assignee	Status	Test Cases
LVV-10000	Gregory Dubois-Felsmann	Not Covered	LVV-T792 LVV-T1436

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0001
Requirement Description	The Notebook Aspect shall be accessible through an HTTPS endpoint.
Requirement Priority	
Upper Level Requirement	

### 2.705.1 Test Cases Summary

LVV-T792	Verify implementation of secure protocol for Notebook aspect			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the Notebook Aspect is accessible through an HTTPS endpoint.

LVV-T1436	LDM-503-10a: Notebook Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

#### Objective:

This test case verifies that the Notebook Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed from Python code in the Notebook Aspect.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0003, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-NB-REQ-0001, DMS-NB-REQ-0002, DMS-NB-REQ-0005, DMS-NB-REQ-0006, DMS-NB-REQ-0013, DMS-NB-REQ-0017, and DMS-NB-REQ-0029, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

Draft

## 2.706 [LVV-10001] DMS-NB-REQ-0004-V-01: IPV6 Access\_1

Jira Link	Assignee	Status	Test Cases
LVV-10001	Gregory Dubois-Felsmann	Not Covered	LVV-T795

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-NB-REQ-0004
Requirement Description	Access to the Notebook Aspect shall support access using IPv6 protocols.
Requirement Priority	
Upper Level Requirement	

### 2.706.1 Test Cases Summary

LVV-T795	Verify access to Notebook aspect via IPv6			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the Notebook Aspect supports access using IPv6 protocols.

## 2.707 [LVV-10002] DMS-API-REQ-0023-V-01: Access to Catalog Data Products\_1

Jira Link	Assignee	Status	Test Cases
LVV-10002	Gregory Dubois-Felsmann	Not Covered	LVV-T798 LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0023
Requirement Description	The API Aspect shall provide for retrieval of all Prompt and Data Release catalog data (per LSE-163) via TAP ADQL queries.
Requirement Priority	
Upper Level Requirement	

### 2.707.1 Test Cases Summary

LVV-T798	Verify API access to catalog data products			
Owner	Status	Version	Critical Event	Verification Type
Colin Slater	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect provides for retrieval of all Prompt and Data Release catalog data via TAP ADQL queries.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

#### Objective:

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

Draft

## 2.708 [LVV-10003] DMS-API-REQ-0022-V-01: Access to Image and Visit Metadata\_1

Jira Link	Assignee	Status	Test Cases
LVV-10003	Gregory Dubois-Felsmann	Not Covered	LVV-T797

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0022
Requirement Description	The API Aspect shall provide for retrieval of image and visit metadata via TAP ADQL queries.
Requirement Priority	
Upper Level Requirement	

### 2.708.1 Test Cases Summary

LVV-T797	Verify API access to image and visit metadata			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the API Aspect provides for retrieval of image and visit metadata via TAP ADQL queries.



## 2.709 [LVV-10004] DMS-API-REQ-0028-V-01: Access to Image Data in FITS Format\_1

Jira Link	Assignee	Status	Test Cases
LVV-10004	Gregory Dubois-Felsmann	Not Covered	LVV-T803

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0028
Requirement Description	The API Aspect shall deliver image data in FITS format, and <b>MAY</b> deliver images in additional formats.
Requirement Priority	
Upper Level Requirement	

### 2.709.1 Test Cases Summary

LVV-T803	Verify API access to FITS image data			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect delivers image data in FITS format.

## 2.710 [LVV-10005] DMS-API-REQ-0024-V-01: Access to Observatory Metadata\_1

Jira Link	Assignee	Status	Test Cases
LVV-10005	Gregory Dubois-Felsmann	Not Covered	LVV-T799

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0024
Requirement Description	The API Aspect shall provide for retrieval of observatory metadata (including the Transformed EFD) via TAP ADQL queries.
Requirement Priority	
Upper Level Requirement	

### 2.710.1 Test Cases Summary

LVV-T799	Verify API access to observatory metadata			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the API Aspect provides for retrieval of observatory metadata (including the Transformed EFD) via TAP ADQL queries.

## 2.711 [LVV-10006] DMS-API-REQ-0026-V-01: Access to Reference Catalogs\_1

Jira Link	Assignee	Status	Test Cases
LVV-10006	Gregory Dubois-Felsmann	Not Covered	LVV-T801

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0026
Requirement Description	The API Aspect shall provide for retrieval of all reference catalog data via TAP ADQL queries. For the purposes of this requirement a “reference catalog” is an externally sourced catalog used during data production activities.
Requirement Discussion	Is this a more general provenance requirement? Just reference catalogs? Or also, e.g., relevant calibration images? Or does it just mean that if we have reference catalogs, they'll also be queryable? FM and GPDF: we think the latter was meant - i.e., there's no implication that this requirement mandates linkage.
Requirement Priority	
Upper Level Requirement	

### 2.711.1 Test Cases Summary

LVV-T801	Verify API access to reference catalogs			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect provides for retrieval of all reference catalog data via TAP ADQL queries. For the purposes of this requirement a “reference catalog” is an externally sourced catalog used during data production activities.

## 2.712 [LVV-10007] DMS-API-REQ-0027-V-01: Access to Virtual Data Products\_1

Jira Link	Assignee	Status	Test Cases
LVV-10007	Gregory Dubois-Felsmann	Not Covered	LVV-T802

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0027
Requirement Description	The API Aspect shall provide services to initiate regeneration of, and facilitate retrieval of, virtual data products on demand.
Requirement Discussion	For image data products, this would likely be provided via the SODA endpoint.
Requirement Priority	
Upper Level Requirement	

### 2.712.1 Test Cases Summary

LVV-T802	Verify API access to virtual data products			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect provides services to initiate regeneration of, and facilitate retrieval of, virtual data products on demand.

## 2.713 [LVV-10008] DMS-API-REQ-0030-V-01: Catalog Metadata Service\_1

Jira Link	Assignee	Status	Test Cases
LVV-10008	Gregory Dubois-Felsmann	Not Covered	LVV-T805

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0030
Requirement Description	The API Aspect shall provide complete metadata for all tables within each data release, including per-column a description, IVOA UCD when appropriate, unit when appropriate, and any relationship with other columns
Requirement Priority	
Upper Level Requirement	

### 2.713.1 Test Cases Summary

LVV-T805	Verify API provides catalog metadata			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect provides complete metadata for all tables within each data release, including a per-column description, IVOA UCD when appropriate, units when appropriate, and any relationship with other columns.

## 2.714 [LVV-10009] DMS-API-REQ-0025-V-01: Enforcement of Information Classification\_1

Jira Link	Assignee	Status	Test Cases
LVV-10009	Gregory Dubois-Felsmann	Not Covered	LVV-T800

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0025
Requirement Description	The API Aspect shall <b>NOT</b> allow access to Sensitive or Highly Sensitive (per LPM-122) observatory metadata.
Requirement Discussion	Information classified as "Internal" should only be provided to project staff.
Requirement Priority	
Upper Level Requirement	

### 2.714.1 Test Cases Summary

LVV-T800	Verify API enforcement of information classification			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the API Aspect does NOT allow access to Sensitive or Highly Sensitive (per LPM-122) observatory metadata.

## 2.715 [LVV-10010] DMS-API-REQ-0029-V-01: Multiple Data Releases\_1

Jira Link	Assignee	Status	Test Cases
LVV-10010	Gregory Dubois-Felsmann	Not Covered	LVV-T804

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0029
Requirement Description	The API Aspect Web APIs shall provide unambiguous access to data products and metadata from more than one Data Release simultaneously
Requirement Discussion	The requirement is explicitly silent on the question of whether data from multiple releases will be available from a single endpoint.
Requirement Priority	
Upper Level Requirement	

### 2.715.1 Test Cases Summary

LVV-T804	Verify API access to multiple data releases			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect Web APIs provide unambiguous access to data products and metadata from more than one Data Release simultaneously.

## 2.716 [LVV-10011] DMS-API-REQ-0021-V-01: Use of CAOM2\_1

Jira Link	Assignee	Status	Test Cases
LVV-10011	Gregory Dubois-Felsmann	Not Covered	LVV-T796

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0021
Requirement Description	The API Aspect Web APIs shall present image and visit metadata organized in accordance with the CAOM2 data model.
Requirement Priority	
Upper Level Requirement	

### 2.716.1 Test Cases Summary

LVV-T796	Verify web APIs use CAOM2			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the API Aspect Web APIs present image and visit metadata organized in accordance with the CAOM2 data model.



## 2.717 [LVV-10012] DMS-API-REQ-0009-V-01: ADQL Support\_1

Jira Link	Assignee	Status	Test Cases
LVV-10012	Gregory Dubois-Felsmann	Not Covered	LVV-T809 LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0009
Requirement Description	The API Aspect TAP endpoint shall support IVOA ADQL 2.1 as a query language, <b>BUT</b> supported query syntax for database targets <b>MAY</b> be limited by practical considerations of individual underlying database technologies
Requirement Priority	
Upper Level Requirement	

### 2.717.1 Test Cases Summary

LVV-T809	Verify availability of ADQL for queries			
Owner	Status	Version	Critical Event	Verification Type
Colin Slater	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect TAP endpoint supports IVOA ADQL 2.1 as a query language.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

#### Objective:

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a

login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.718 [LVV-10013] DMS-API-REQ-0008-V-01: Asynchronous TAP Support\_1

Jira Link	Assignee	Status	Test Cases
LVV-10013	Gregory Dubois-Felsmann	Not Covered	LVV-T808 LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0008
Requirement Description	The API Aspect TAP endpoint shall support asynchronous queries as described by the IVOA TAP 1.1 specification.
Requirement Discussion	Asynchronous queries are expected to be the primary means for carrying out user-driven queries from the Portal aspect (so that the query is assigned an ID that enables multiple retrievals of its results, e.g., in both the Portal and Notebook Aspects). (The Portal Aspect implementation will still use synchronous queries for internal functions such as retrieving metadata needed for page configuration, etc.) Asynchronous queries will also be used across all aspects for queries where large result sets and/or long run times are expected.
Requirement Priority	
Upper Level Requirement	

### 2.718.1 Test Cases Summary

LVV-T808	Verify asynchronous TAP queries			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect TAP endpoint supports asynchronous queries as described by the IVOA TAP 1.1 specification.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type

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Gregory Dubois- Felsmann	Defined	1	false	Test
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**Objective:**

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.719 [LVV-10014] DMS-API-REQ-0007-V-01: Synchronous TAP Support\_1

Jira Link	Assignee	Status	Test Cases
LVV-10014	Gregory Dubois-Felsmann	Not Covered	LVV-T807 LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0007
Requirement Description	The API Aspect TAP endpoint shall support synchronous queries as described by the IVOA TAP 1.1 specification.
Requirement Discussion	Synchronous queries are primarily expected to be used for small results. It is TBD whether this mode will be suitable for use with shared-scan queries.
Requirement Priority	
Upper Level Requirement	

### 2.719.1 Test Cases Summary

LVV-T807	Verify synchronous TAP queries			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Defined	1	false	Inspection

#### Objective:

Verify that the API Aspect TAP endpoint supports synchronous queries as described by the IVOA TAP 1.1 specification.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.720 [LVV-10015] DMS-API-REQ-0006-V-01: TAP Service for Tabular Queries\_1

Jira Link	Assignee	Status	Test Cases
LVV-10015	Gregory Dubois-Felsmann	Not Covered	LVV-T806 LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0006
Requirement Description	The API Aspect Web APIs shall include an endpoint conforming to IVOA TAP 1.1 for the purpose of accessing tabularly structured data.
Requirement Priority	
Upper Level Requirement	

### 2.720.1 Test Cases Summary

LVV-T806	Verify availability of TAP service			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect Web APIs include an endpoint conforming to IVOA TAP 1.1 for the purpose of accessing tabularly structured data.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

#### Objective:

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.



## 2.721 [LVV-10016] DMS-API-REQ-0016-V-01: SIA Service for Image Availability\_1

Jira Link	Assignee	Status	Test Cases
LVV-10016	Gregory Dubois-Felsmann	Not Covered	LVV-T810

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0016
Requirement Description	The API Aspect Web APIs shall include an endpoint conforming to IVOA SIA V2 for the purpose of locating available images
Requirement Priority	
Upper Level Requirement	

### 2.721.1 Test Cases Summary

LVV-T810	Verify SIA service for image availability			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the API Aspect Web APIs include an endpoint conforming to IVOA SIA V2 for the purpose of locating available images.

## 2.722 [LVV-10017] DMS-API-REQ-0018-V-01: Cutout Service\_1

Jira Link	Assignee	Status	Test Cases
LVV-10017	Gregory Dubois-Felsmann	Not Covered	LVV-T812

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0018
Requirement Description	The API Aspect SODA endpoint shall support performing cutouts on all released image data types, <b>BUT</b> supported filter predicates <b>MAY</b> exclude POLYGON
Requirement Priority	
Upper Level Requirement	

### 2.722.1 Test Cases Summary

LVV-T812	Verify API SODA cutout image support			
Owner	Status	Version	Critical Event	Verification Type
Colin Slater	Draft	1	false	Inspection

### Objective:

Verify that the API Aspect SODA endpoint supports performing cutouts on all released image data types.

## 2.723 [LVV-10018] DMS-API-REQ-0017-V-01: SODA Service for Image Data\_1

Jira Link	Assignee	Status	Test Cases
LVV-10018	Gregory Dubois-Felsmann	Not Covered	LVV-T811

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0017
Requirement Description	The API Aspect Web APIs shall include an endpoint conforming to IVOA SODA 1.0 for the purpose of retrieving image data.
Requirement Priority	
Upper Level Requirement	

### 2.723.1 Test Cases Summary

LVV-T811	Verify availability of SODA service for image data			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the API Aspect Web APIs include an endpoint conforming to IVOA SODA 1.0 for the purpose of retrieving image data.

## 2.724 [LVV-10019] DMS-API-REQ-0039-V-01: Cached Query Result Retrieval\_1

Jira Link	Assignee	Status	Test Cases
LVV-10019	Gregory Dubois-Felsmann	Not Covered	LVV-T814 LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0039
Requirement Description	The API Aspect shall provide for the caching of results of queries for a limited time, and their retrieval based on information from the query history or on query identifiers previously returned from asynchronous query services.
Requirement Discussion	Caching is subject to resource constraints. The system may use a combination of a central buffer and quota from the user's Workspace to implement caching; the details are still under design.
Requirement Priority	
Upper Level Requirement	

### 2.724.1 Test Cases Summary

LVV-T814	Verify availability of cached query result retrieval			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect provides for the caching of results of queries for a limited time, and their retrieval based on information from the query history or on query identifiers previously returned from asynchronous query services.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

**Objective:**

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.725 [LVV-10020] DMS-API-REQ-0038-V-01: Query History Retrieval\_1

Jira Link	Assignee	Status	Test Cases
LVV-10020	Gregory Dubois-Felsmann	Not Covered	LVV-T813

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0038
Requirement Description	The API aspect shall provide interfaces for retrieving the history of queries for a user.
Requirement Discussion	This capability is essential for cross-Aspect linking, where a query is created in one Aspect and accessed, or re-executed, in another.
Requirement Priority	
Upper Level Requirement	

### 2.725.1 Test Cases Summary

LVV-T813	Verify query history retrieval			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API aspect provides interfaces for retrieving the history of queries for a user.

## 2.726 [LVV-10021] DMS-API-REQ-0040-V-01: Query Specification Retrieval\_1

Jira Link	Assignee	Status	Test Cases
LVV-10021	Gregory Dubois-Felsmann	Not Covered	LVV-T815

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0040
Requirement Description	The API Aspect shall provide interfaces that return an artifact containing a complete specification for a query, and that permit that artifact to be used at a later time to re-execute the same query. The results of re-executing the same query depend on the database(s) being queried. For Level 2 (Data Releases) the content of a data release is nominally frozen upon release and the same query repeated later should always return the same result. (We assume that if a correctable error is found in a data release after its release it will only be repaired, if at all, by adding additional database(s) or table(s) with the corrected data, or just by providing correction recipes that could be applied to the results of a query.)
Requirement Discussion	For the continuously updated Level 1 database(s) update times will be recorded that will permit queries to be repeated precisely, or, optionally, with new data taken into account. For user databases no guarantees can be made.
Requirement Priority	
Upper Level Requirement	

### 2.726.1 Test Cases Summary

LVV-T815	Verify retrieval of query specifications			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect provides interfaces that return an artifact containing a complete specification for a query, and that permit that artifact to be used at a later time to re-execute the same query.

## 2.727 [LVV-10022] DMS-API-REQ-0034-V-01: Butler Interface to Data Products\_1

Jira Link	Assignee	Status	Test Cases
LVV-10022	Gregory Dubois-Felsmann	Not Covered	LVV-T816

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0034
Requirement Description	The API Aspect shall provide connection between the Data Butler (Generation 3) instances within notebooks hosted in a LDF instance and backend file system, database, and object data stores within that same LDF instance, for the purpose of allowing notebook aspect users to access data release data products and user generated data products as Python objects
Requirement Discussion	See LDM-556.
Requirement Priority	
Upper Level Requirement	

### 2.727.1 Test Cases Summary

LVV-T816	Verify Butler interface to data products			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect provides a connection between the Data Butler (Generation 3) instances within notebooks hosted in a LDF instance and backend file system, database, and object data stores within that same LDF instance, for the purpose of allowing notebook aspect users to access data release data products and user generated data products as Python objects.



## 2.728 [LVV-10023] DMS-API-REQ-0019-V-01: VOSpace Service\_1

Jira Link	Assignee	Status	Test Cases
LVV-10023	Gregory Dubois-Felsmann	Not Covered	LVV-T817

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0019
Requirement Description	The API Aspect Web APIs shall include an endpoint conforming to IVOA VOSpace 2.0 for the purpose of persistence and retrieval of user-generated file-oriented data products in the User Workspace defined in DMS-LSP-REQ-0011.
Requirement Priority	
Upper Level Requirement	

### 2.728.1 Test Cases Summary

LVV-T817	Verify availability of VOSpace service			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect Web APIs include an endpoint conforming to IVOA VOSpace 2.0 for the purpose of persistence and retrieval of user-generated file-oriented data products in the User Workspace defined in DMS-LSP-REQ-0011.

## 2.729 [LVV-10024] DMS-API-REQ-0020-V-01: WebDAV Service\_1

Jira Link	Assignee	Status	Test Cases
LVV-10024	Gregory Dubois-Felsmann	Not Covered	LVV-T818

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0020
Requirement Description	The API Aspect Web APIs shall include an endpoint conforming to WebDAV for the purpose of persistence and retrieval of user-generated file-oriented data products in the User Workspace defined in DMS-LSP-REQ-0011.
Requirement Priority	
Upper Level Requirement	

### 2.729.1 Test Cases Summary

LVV-T818	Verify availability of WebDAV service			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect Web APIs include an endpoint conforming to WebDAV for the purpose of persistence and retrieval of user-generated file-oriented data products in the User Workspace defined in DMS-LSP-REQ-0011.

## 2.730 [LVV-10025] DMS-API-REQ-0014-V-01: CSV Output for TAP\_1

Jira Link	Assignee	Status	Test Cases
LVV-10025	Gregory Dubois-Felsmann	Not Covered	LVV-T823

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0014
Requirement Description	The API Aspect TAP endpoint shall support CSV as an alternative available output format. This output format is not required to meet requirements otherwise in force on the return of table and column metadata.
Requirement Discussion	The CSV format inherently is unsuitable for returning rich metadata with a table.
Requirement Priority	
Upper Level Requirement	

### 2.730.1 Test Cases Summary

LVV-T823	Verify CSV support for TAP outputs			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect TAP endpoint supports CSV as an alternative available output format. This output format is not required to meet requirements otherwise in force on the return of table and column metadata.

## 2.731 [LVV-10026] DMS-API-REQ-0013-V-01: JSON Output for TAP\_1

Jira Link	Assignee	Status	Test Cases
LVV-10026	Gregory Dubois-Felsmann	Not Covered	LVV-T822

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0013
Requirement Description	The API Aspect TAP endpoint shall support JSON as an alternative available output format
Requirement Priority	
Upper Level Requirement	

### 2.731.1 Test Cases Summary

LVV-T822	Verify JSON support for TAP outputs			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect TAP endpoint supports JSON as an alternative available output format.

## 2.732 [LVV-10027] DMS-API-REQ-0015-V-01: SQLite Output for TAP\_1

Jira Link	Assignee	Status	Test Cases
LVV-10027	Gregory Dubois-Felsmann	Not Covered	LVV-T824

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0015
Requirement Description	The API Aspect TAP endpoint SHOULD support SQLite as an alternative available output format
Requirement Discussion	The mandatory status of this requirement should be settled one way or the other as soon as possible. It is a candidate for a efficient and readily consumed format for large results with rich metadata.
Requirement Priority	
Upper Level Requirement	

### 2.732.1 Test Cases Summary

LVV-T824	Verify SQLite support for TAP outputs			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the API Aspect TAP endpoint supports SQLite as an alternative available output format.

## 2.733 [LVV-10028] DMS-API-REQ-0012-V-01: VOTable BINARY2 Payload\_1

Jira Link	Assignee	Status	Test Cases
LVV-10028	Gregory Dubois-Felsmann	Not Covered	LVV-T821

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0012
Requirement Description	API Aspect services that support returning results in VOTable format shall support the return of a VOTable data payload in the BINARY2 serialization.
Requirement Discussion	This payload form supports larger tabular results but is most likely still not optimal for the largest queries. The API Aspect team is still investigating additional options, including the use of the FITS serialization, as well as the use of non-VOTable formats, for efficient and metadata-rich tabular results.
Requirement Priority	
Upper Level Requirement	

### 2.733.1 Test Cases Summary

LVV-T821	Verify support for VOTable BINARY2 payload			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect services that support returning results in VOTable format support the return of a VOTable data payload in the BINARY2 serialization.

## 2.734 [LVV-10029] DMS-API-REQ-0010-V-01: VOTable Output for TAP\_1

Jira Link	Assignee	Status	Test Cases
LVV-10029	Gregory Dubois-Felsmann	Not Covered	LVV-T819

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0010
Requirement Description	The API Aspect TAP endpoint shall support IVOA VOTable 1.3 as an available output format
Requirement Priority	
Upper Level Requirement	

### 2.734.1 Test Cases Summary

LVV-T819	Verify VOTable 1.3 support			
Owner	Status	Version	Critical Event	Verification Type
Colin Slater	Draft	1	false	Inspection

### Objective:

Verify that the API Aspect TAP endpoint supports IVOA VOTable 1.3 as an available output format.

## 2.735 [LVV-10030] DMS-API-REQ-0011-V-01: VOTable TABLEDATA Payload\_1

Jira Link	Assignee	Status	Test Cases
LVV-10030	Gregory Dubois-Felsmann	Not Covered	LVV-T820

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0011
Requirement Description	API Aspect services that support returning results in VOTable format shall support the return of a VOTable data payload in the XML-based TABLEDATA serialization.
Requirement Discussion	This payload form is not intended for large tables, but is provided for compatibility with community tools. The API Aspect TAP service may place an upper bound on the size of a table that can be returned in this format.
Requirement Priority	
Upper Level Requirement	

### 2.735.1 Test Cases Summary

LVV-T820	Verify support for VOTable TABLEDATA payload			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that API Aspect services that support returning results in VOTable format support the return of a VOTable data payload in the XML-based TABLEDATA serialization.



## 2.736 [LVV-10031] DMS-API-REQ-0033-V-01: Deletion from Workspace\_1

Jira Link	Assignee	Status	Test Cases
LVV-10031	Gregory Dubois-Felsmann	Not Covered	LVV-T827

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0033
Requirement Description	The API Aspect shall provide a capability for users to drop previously uploaded user catalog data products
Requirement Priority	
Upper Level Requirement	

### 2.736.1 Test Cases Summary

LVV-T827	Verify ability to drop catalogs from Workspace			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the API Aspect provides a capability for users to drop previously uploaded user catalog data products.

## 2.737 [LVV-10032] DMS-API-REQ-0031-V-01: Tabular Result Download to Workspace\_1

Jira Link	Assignee	Status	Test Cases
LVV-10032	Gregory Dubois-Felsmann	Not Covered	LVV-T825

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0031
Requirement Description	The API Aspect shall provide a capability for users to save their query results as VOTables in their allocated VOspace, subject to limitations of a resource quota system
Requirement Discussion	Or any of the other supported formats?
Requirement Priority	
Upper Level Requirement	

### 2.737.1 Test Cases Summary

LVV-T825	Verify support for tabular result download to Workspace			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect provides a capability for users to save their query results as VOTables in their allocated VOspace, subject to limitations of a resource quota system.

## 2.738 [LVV-10033] DMS-API-REQ-0032-V-01: Tabular Upload to Workspace\_1

Jira Link	Assignee	Status	Test Cases
LVV-10033	Gregory Dubois-Felsmann	Not Covered	LVV-T826

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0032
Requirement Description	The API Aspect shall provide a capability for users to upload catalog data products (formatted as VOTables) residing within their allocated VOSpace, such that the catalog products after upload may be joined in queries against data release catalog products, subject to limitations of a resource quota system
Requirement Discussion	Or any of the other supported formats?
Requirement Priority	
Upper Level Requirement	

### 2.738.1 Test Cases Summary

LVV-T826	Verify support for tabular upload to Workspace			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect provides a capability for users to upload catalog data products (formatted as VOTables) residing within their allocated VOSpace, such that the catalog products after upload may be joined in queries against data release catalog products, subject to limitations of a resource quota system.

## 2.739 [LVV-10034] DMS-API-REQ-0003-V-01: Authentication\_1

Jira Link	Assignee	Status	Test Cases
LVV-10034	Gregory Dubois-Felsmann	Not Covered	LVV-T829 LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0003
Requirement Description	The API Aspect Web APIs shall accept authenticated requests for the purpose of establishing user identity.
Requirement Priority	
Upper Level Requirement	

### 2.739.1 Test Cases Summary

LVV-T829	Verify API authentication			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect Web APIs accept authenticated requests for the purpose of establishing user identity.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

#### Objective:

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

Draft

## 2.740 [LVV-10035] DMS-API-REQ-0004-V-01: Authorization\_1

Jira Link	Assignee	Status	Test Cases
LVV-10035	Gregory Dubois-Felsmann	Not Covered	LVV-T830 LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0004
Requirement Description	The API Aspect Web APIs shall interact with project authorization infrastructure for the purpose of establishing authorized use.
Requirement Priority	
Upper Level Requirement	

### 2.740.1 Test Cases Summary

LVV-T830	Verify API uses project authorization infrastructure			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect Web APIs interact with project authorization infrastructure for the purpose of establishing authorized use.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

#### Objective:

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

## 2.741 [LVV-10036] DMS-API-REQ-0005-V-01: Secure Implementation\_1

Jira Link	Assignee	Status	Test Cases
LVV-10036	Gregory Dubois-Felsmann	Not Covered	LVV-T831

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0005
Requirement Description	The API Aspect Web APIs shall prevent users from circumventing authorization controls.
Requirement Priority	
Upper Level Requirement	

### 2.741.1 Test Cases Summary

LVV-T831	Verify secure implementation of APIs			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the API Aspect Web APIs prevent users from circumventing authorization controls.



## 2.742 [LVV-10037] DMS-API-REQ-0001-V-01: Secure Protocols\_1

Jira Link	Assignee	Status	Test Cases
LVV-10037	Gregory Dubois-Felsmann	Not Covered	LVV-T828 LVV-T1437

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0001
Requirement Description	The API Aspect Web APIs shall be accessible through HTTPS endpoints.
Requirement Priority	
Upper Level Requirement	

### 2.742.1 Test Cases Summary

LVV-T828	Verify API uses secure protocols			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

#### Objective:

Verify that the API Aspect Web APIs are accessible through HTTPS endpoints.

LVV-T1437	LDM-503-10a: API Aspect tests for LSP with Authentication and TAP milestone			
Owner	Status	Version	Critical Event	Verification Type
Gregory Dubois-Felsmann	Defined	1	false	Test

#### Objective:

This test case verifies that the TAP service in the API Aspect of the Science Platform is accessible to authorized users through a login process, and that TAP searches can be performed using the IVOA TAP protocol from remote sites.

In so doing and in conjunction with the other LDM-503-10a test cases collected under LVV-P48, it addresses all or part of the following requirements:

- DMS-LSP-REQ-0004, DMS-LSP-REQ-0005, DMS-LSP-REQ-0006, DMS-LSP-REQ-0020, DMS-LSP-REQ-0022, DMS-LSP-REQ-0023, DMS-LSP-REQ-0024
- DMS-API-REQ-0003, DMS-API-REQ-0004, DMS-API-REQ-0006, DMS-API-REQ-0007, DMS-API-REQ-0008, DMS-API-REQ-0009, DMS-API-REQ-0023, and DMS-API-REQ-0039, primarily

Note this test was not designed to perform a full verification of the above requirements, but rather to demonstrate having reached a certain level of partial capability during construction.

Draft

## 2.743 [LVV-10038] DMS-API-REQ-0035-V-01: Containerized Deployment\_1

Jira Link	Assignee	Status	Test Cases
LVV-10038	Gregory Dubois-Felsmann	Not Covered	LVV-T832

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0035
Requirement Description	The API Aspect services shall be delivered as containerized applications.
Requirement Priority	
Upper Level Requirement	

### 2.743.1 Test Cases Summary

LVV-T832	Verify containerized deployment of API services			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the API Aspect services are delivered as containerized applications.

## 2.744 [LVV-10039] DMS-API-REQ-0037-V-01: Logging and Monitoring\_1

Jira Link	Assignee	Status	Test Cases
LVV-10039	Gregory Dubois-Felsmann	Not Covered	LVV-T835

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0037
Requirement Description	The API Aspect services shall provide logging and monitoring capabilities for the purpose of supporting service operators
Requirement Priority	
Upper Level Requirement	

### 2.744.1 Test Cases Summary

LVV-T835	Verify API logging and monitoring			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the API Aspect services provide logging and monitoring capabilities for the purpose of supporting service operators.

## 2.745 [LVV-10040] DMS-API-REQ-0002-V-01: Result Compression\_1

Jira Link	Assignee	Status	Test Cases
LVV-10040	Gregory Dubois-Felsmann	Not Covered	LVV-T833

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0002
Requirement Description	The API Aspect Web APIs shall support gzip HTTP content-encoding for the purpose of returning compressed data.
Requirement Priority	
Upper Level Requirement	

### 2.745.1 Test Cases Summary

LVV-T833	Verify support for compression of API results			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the API Aspect Web APIs support gzip HTTP content-encoding for the purpose of returning compressed data.

## 2.746 [LVV-10041] DMS-API-REQ-0036-V-01: Upgradability\_1

Jira Link	Assignee	Status	Test Cases
LVV-10041	Gregory Dubois-Felsmann	Not Covered	LVV-T834

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-API-REQ-0036
Requirement Description	The API Aspect service software shall be upgradable in place with minimal user downtime.
Requirement Priority	
Upper Level Requirement	

### 2.746.1 Test Cases Summary

LVV-T834	Verify API upgradeability			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that the API Aspect service software are upgradable in place with minimal user downtime.

## 2.747 [LVV-18222] DMS-REQ-0384-V-01: Export MOCs As FITS\_1

Jira Link	Assignee	Status	Test Cases
LVV-18222	Leanne Guy	Not Covered	LVV-T1524

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-REQ-0384
Requirement Description	<b>Specification:</b> The Data Management system shall provide a means for exporting the LSST-generated MOCs in the FITS serialization form defined in the IVOA MOC Recommendation.
Requirement Discussion	<b>Discussion:</b> The external endpoint for this should be designed to be conformant with relevant community practice and any IVOA standards that may emerge in this area.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0391 Data Product Conventions

### 2.747.1 Test Cases Summary

LVV-T1524	Verify Implementation of Exporting MOCs as FITS			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Demonstration

#### Objective:

Verify that the Data Management system provides a means for exporting the LSST-generated MOCs in the FITS serialization form defined in the IVOA MOC Recommendation.

## 2.748 [LVV-18223] DMS-REQ-0381-V-01: HiPS Linkage to Coadds\_1

Jira Link	Assignee	Status	Test Cases
LVV-18223	Leanne Guy	Not Covered	LVV-T1525

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-REQ-0381
Requirement Description	<p><b>Specification:</b> The HiPS maps produced by the Data Management system shall provide for straightforward linkage from the HiPS data to the underlying LSST coadded images. This SHOULD be implemented using a mechanism supported by both the LSST Science Platform and by community tools.</p> <p><b>Discussion:</b> It is intended that this be done using the “HiPS Progenitor” mechanism introduced at the May 2018 IVOA meeting, or an evolution of it that emerges from the IVOA standardization process.</p>
Requirement Discussion	
Requirement Priority	2
Upper Level Requirement	OSS-REQ-0122 Provenance OSS-REQ-0061 Data Visualization

### 2.748.1 Test Cases Summary

LVV-T1525	Verify Implementation of Linkage Between HiPS Maps and Coadded Images			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Demonstration

#### Objective:

Verify that the HiPS maps produced by the Data Management system provide for straightforward linkage from the HiPS data to the underlying LSST coadded images, and that this has been implemented using a mechanism supported by both the LSST Science Platform and by community tools.



## 2.749 [LVV-18224] DMS-REQ-0380-V-01: HiPS Service\_1

Jira Link	Assignee	Status	Test Cases
LVV-18224	Leanne Guy	Not Covered	LVV-T1526

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-REQ-0380
Requirement Description	<p><b>Specification:</b> The Data Management system shall include a secure and authenticated Internet endpoint for an IVOA-compliant HiPS service. This service shall be advertised via Registry as well as in the HiPS community mechanism operated by CDS, or whatever equivalent mechanism may exist in the LSST operations era.</p> <p><b>Discussion:</b> The DM HiPS service will be available only to data rights holders. LSST EPO will also operate a world-public HiPS service, but with its spatial resolution limited to approximately one arcsecond.</p>
Requirement Discussion	
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0176 Data Access

### 2.749.1 Test Cases Summary

LVV-T1526	Verify Availability of Secure and Authenticated HiPS Service			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Demonstration

#### Objective:

Verify that the Data Management system includes a secure and authenticated Internet endpoint for an IVOA-compliant HiPS service. Confirm that this service is advertised via Registry as well as in the HiPS community mechanism operated by CDS, or whatever equivalent mechanism may exist in the LSST operations era.

## 2.750 [LVV-18226] DMS-REQ-0385-V-01: MOC Visualization\_1

Jira Link	Assignee	Status	Test Cases
LVV-18226	Leanne Guy	Not Covered	LVV-T1528

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-REQ-0385
Requirement Description	<b>Specification:</b> The LSST Science Platform shall support the visualization of the LSST-generated MOCs as well as other MOCs which satisfy the IVOA MOC Recommendation.
Requirement Discussion	<b>Discussion:</b> We are considering the provision of services which allow computations based on MOCs, e.g., the use of a MOC from another mission or survey to define a query on the LSST data, but this is not ready for codification at this time.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0033 Survey Planning and Performance Monitoring OSS-REQ-0061 Data Visualization

### 2.750.1 Test Cases Summary

LVV-T1528	Verify Visualization of MOCs via Science Platform			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Demonstration

#### Objective:

Verify that the LSST Science Platform supports the visualization of the LSST-generated MOCs as well as other MOCs which satisfy the IVOA MOC Recommendation.

## 2.751 [LVV-18230] DMS-REQ-0386-V-01: Archive Processing Provenance\_1

Jira Link	Assignee	Status	Test Cases
LVV-18230	Leanne Guy	Not Covered	LVV-T1560

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-REQ-0386
Requirement Description	<b>Specification:</b> The Data Management System shall archive all processing provenance associated with archived data products, including relevant data from other subsystems.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0172 Provenance Archiving

### 2.751.1 Test Cases Summary

LVV-T1560	Verify archiving of processing provenance			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that provenance information related to data processing, including relevant data from other subsystems, has been archived.

## 2.752 [LVV-18231] DMS-REQ-0387-V-01: Serve Archived Provenance\_1

Jira Link	Assignee	Status	Test Cases
LVV-18231	Leanne Guy	Not Covered	LVV-T1561

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-REQ-0387
Requirement Description	<b>Specification:</b> The Data Management System shall make the archived provenance data available to science users together with the associated science data products.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0172 Provenance Archiving

### 2.752.1 Test Cases Summary

LVV-T1561	Verify provenance availability to science users			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Inspection

### Objective:

Verify that archived provenance data is available to science users together with the associated science data products.

## 2.753 [LVV-18232] DMS-REQ-0388-V-01: Provide Re-Run Tools\_1

Jira Link	Assignee	Status	Test Cases
LVV-18232	Leanne Guy	Not Covered	LVV-T1562

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	DMS-REQ-0388
Requirement Description	<b>Specification:</b> The Data Management System shall provide tools to re-run a data processing operation under the same conditions as a previous run of that operation, based on provenance data recorded by the system.
Requirement Discussion	<b>Discussion:</b> The "conditions" include the LSST software, its configuration parameters, and support data such as calibration frames.
Requirement Priority	1b
Upper Level Requirement	OSS-REQ-0122 Provenance OSS-REQ-0123 Reproducibility OSS-REQ-0172 Provenance Archiving

### 2.753.1 Test Cases Summary

LVV-T1562	Verify availability of re-run tools			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Demonstration

#### Objective:

Verify that tools are provided to use the archived provenance data to re-run a data processing operation under the same conditions (including LSST software version, its configuration parameters, and supporting data such as calibration frames) as a previous run of that operation.

## 2.754 [LVV-18271] OCS-EFD-HS-0001-V-01: Fulfill requirements of a Commandable SAL Component (CSC)\_1

Jira Link	Assignee	Status	Test Cases
LVV-18271	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-EFD-HS-0001
Requirement Description	<b>Specification:</b> The Header Service shall behave as a Commandable SAL Component (CSC) following the command patterns described in LSE-70 and LSE-209.
Requirement Discussion	<b>Discussion:</b> The Header Service is not expected to have any CSC-specific commands, only common cross-subsystem commands such as "start" and "enable".
Requirement Priority	
Upper Level Requirement	

## 2.755 [LVV-18272] OCS-EFD-HS-0002-V-01: Critical System\_1

Jira Link	Assignee	Status	Test Cases
LVV-18272	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-EFD-HS-0002
Requirement Description	<b>Specification:</b> The Header Service instances shall be considered a critical system for observatory operations and shall reside within the EFD computer cluster.
Requirement Priority	
Upper Level Requirement	

## 2.756 [LVV-18273] OCS-EFD-HS-0003-V-01: Write Headers for all images taken by all Cameras supported by LSST\_1

Jira Link	Assignee	Status	Test Cases
LVV-18273	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-EFD-HS-0003
Requirement Description	<p><b>Specification:</b> The Header Service instances shall write header files for all (100%) of the images taken and announced by the Camera Control System for the camera for which each instance is configured (LSSTCam, ComCam, AuxTel or Test Stand) while the instance is enabled, including information for every CCD configured for that camera in its observing mode such as science and wavefront CCDs for LSSTCam.</p> <p><b>Discussion:</b> The header files must be generated and written at the cadence required for different observing mode (bias, flats, science).</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	



## 2.757 [LVV-18274] OCS-EFD-HS-0004-V-01: Ability to capture metadata at the beginning of exposure\_1

Jira Link	Assignee	Status	Test Cases
LVV-18274	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-EFD-HS-0004
Requirement Description	<b>Specification:</b> The Header Service shall be able to capture and store Events or Telemetry before the start of an integration.
Requirement Discussion	<b>Discussion:</b> An example is configuration telemetry from other CSCs.
Requirement Priority	
Upper Level Requirement	

## 2.758 [LVV-18275] OCS-EFD-HS-0005-V-01: Ability to capture metadata during of exposure integration\_1

Jira Link	Assignee	Status	Test Cases
LVV-18275	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-EFD-HS-0005
Requirement Description	<b>Specification:</b> The Header Service shall be able to capture and store Events or Telemetry that happen during the image integration time.
Requirement Discussion	<b>Discussion:</b> An example is shutter motion events.
Requirement Priority	
Upper Level Requirement	

## 2.759 [LVV-18276] OCS-EFD-HS-0006-V-01: Ability to capture metadata at end of readout\_1

Jira Link	Assignee	Status	Test Cases
LVV-18276	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-EFD-HS-0006
Requirement Description	<b>Specification:</b> The Header Service shall be able to capture and store Events or Telemetry that happen at or slightly after the end of readout, up to the receipt of the end-of-telemetry event.
Requirement Discussion	<b>Discussion:</b> An example is the end-of-readout time.
Requirement Priority	
Upper Level Requirement	

## 2.760 [LVV-18277] OCS-EFD-HS-0007-V-01: Write header and Publish Event after end of telemetry event\_1

Jira Link	Assignee	Status	Test Cases
LVV-18277	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-EFD-HS-0007
Requirement Description	<p><b>Specification:</b> The Header Service shall begin to write the header file(s) immediately after receiving the end-of-telemetry Event from the Camera Control System and, when complete, emit one or more LargeFileObjectAvailable Events that will notify the EFD of the existence of the new header file(s).</p> <p><b>Discussion:</b> The Event announcing that a Large File Object (LFO) is available will contain the image name, a unique id that will be used to match images (pixels) from the DAQ with the header meta-data.</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.761 [LVV-18278] OCS-EFD-HS-0008-V-01: Write header and Publish Event within specified time of the end-of-telemetry Event\_1

Jira Link	Assignee	Status	Test Cases
LVV-18278	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-EFD-HS-0008
Requirement Description	<b>Specification:</b> The Header Service shall complete the writing of the header file and emit the LFO Event within 200 milliseconds.
Requirement Discussion	<b>Discussion:</b> This constraint is required because the Header Service is in the critical timing path for visualization of images, quality control processes, and the Alert Production. The Header Service must keep up with the image cadence even for bias frames.
Requirement Priority	
Upper Level Requirement	

## 2.762 [LVV-18279] OCS-EFD-HS-0009-V-01: Adherence to the FITS Standard\_1

Jira Link	Assignee	Status	Test Cases
LVV-18279	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-EFD-HS-0009
Requirement Description	<b>Specification:</b> The contents of the file(s) written by the Header Service will be consistent with the data needed to generate compliant FITS headers.
Requirement Discussion	<b>Discussion:</b> Details of the file format and number of files are given in Appendix B.
Requirement Priority	
Upper Level Requirement	

## 2.763 [LVV-18280] OCS-EFD-HS-0010-V-01: Configuration of Header Keywords and source\_1

Jira Link	Assignee	Status	Test Cases
LVV-18280	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-EFD-HS-0010
Requirement Description	<p><b>Specification:</b> The Header Service shall be configurable as to the keywords used to identify metadata that goes into the header as well as configurable as to the source of that metadata. The sources may be Events or Telemetry to which the Header Service will subscribe or elements of the Header Service's own configuration.</p> <p><b>Discussion:</b> This configuration is expected to be performed via YAML files that are easy to read and maintained under version control. Slowly-changing information can be stored statically in these files. Configurations will also vary by the associated camera and the observing mode (science versus calibration).</p>
Requirement Discussion	
Requirement Priority	
Upper Level Requirement	

## 2.764 [LVV-18281] OCS-EFD-HS-0011-V-01: Produce header even if some meta-data not available\_1

Jira Link	Assignee	Status	Test Cases
LVV-18281	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-EFD-HS-0011
Requirement Description	<b>Specification:</b> The Header Service shall write headers even with faulty or missing Telemetry.
Requirement Discussion	<b>Discussion:</b> In the case that some telemetry is missing or not broadcast the Header Service will still write files and use FITS-compliant mechanisms for specifying undefined values for the missing metadata.
Requirement Priority	
Upper Level Requirement	



## 2.765 [LVV-18282] OCS-EFD-HS-0012-V-01: Publish an Event if monitoring detects any failure of the service.\_1

Jira Link	Assignee	Status	Test Cases
LVV-18282	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-EFD-HS-0012
Requirement Description	<b>Specification:</b> The Header Service shall publish an Event message describing the type of problem if it detects that its service is degraded in some way.
Requirement Priority	
Upper Level Requirement	

## 2.766 [LVV-18283] OCS-EFD-HS-0013-V-01: Extract metadata from published configuration\_1

Jira Link	Assignee	Status	Test Cases
LVV-18283	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-EFD-HS-0013
Requirement Description	<b>Specification:</b> The Header Service shall be able to extract metadata from the configuration information published by other CSCs such as the Camera Control System and the Telescope Control System.
Requirement Discussion	<b>Discussion:</b> Some metadata that changes at nightly rate might be easier to acquire via configuration information published by individual CSCs.
Requirement Priority	
Upper Level Requirement	

## 2.767 [LVV-18284] OCS-EFD-HS-0014-V-01: Metadata Capture\_1

Jira Link	Assignee	Status	Test Cases
LVV-18284	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-EFD-HS-0014
Requirement Description	<b>Specification:</b> The Header Service shall capture at a minimum all metadata required by Prompt Processing, Archiving, and any relevant Summit systems.
Requirement Discussion	<b>Discussion:</b> Appendix A includes a list of items to be captured; additional items may be added via normal change control processes.
Requirement Priority	
Upper Level Requirement	

## 2.768 [LVV-18285] OCS-EFD-HS-0015-V-01: Generate on-the-fly additional meta-data requested by the Project Science Team.\_1

Jira Link	Assignee	Status	Test Cases
LVV-18285	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	OCS-EFD-HS-0015
Requirement Description	<b>Specification:</b> The Header Service shall be able to do light-weight computations to generate additional metadata as requested by the project in case it is not directly provided by other CSCs.
Requirement Discussion	<b>Discussion:</b> For example, calculating the exposure time or dark time.
Requirement Priority	
Upper Level Requirement	

## 2.769 [LVV-18849] CA-DM-CON-ICD-0020-V-02: Archiving service availability\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-18849	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0020
Requirement Description	<b>Specification:</b> The archiving service shall be available no later than the start of Observatory commissioning, i.e., supporting the Commissioning Camera.
Requirement Priority	
Upper Level Requirement	

## 2.770 [LVV-18852] CA-DM-CON-ICD-0022-V-02: Archiving service during maintenance\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-18852	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0022
Requirement Description	<b>Specification:</b> Data Management shall archive data from the Camera upon a request from the Camera, as long as Data Management is not performing incompatible maintenance activities of its own.
Requirement Priority	
Upper Level Requirement	

## 2.771 [LVV-18855] CA-DM-CON-ICD-0023-V-02: Archiving service during outages\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-18855	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0023
Requirement Description	<b>Specification:</b> Data Management shall normally provide access to this archiving service for at least part of every day's maintenance time, except during scheduled long outages.
Requirement Priority	
Upper Level Requirement	

## 2.772 [LVV-18858] CA-DM-CON-ICD-0021-V-02: Archiving service storage duration\_DM\_2

Jira Link	Assignee	Status	Test Cases
LVV-18858	Leanne Guy	Not Covered	

### Verification Element Description:

Undefined

Requirement Details	
Requirement ID	CA-DM-CON-ICD-0021
Requirement Description	<b>Specification:</b> The archiving service shall permit the storage of camera image data, covering the entire focal plane including the corner rafts, taken during Camera-specific engineering activities for the life of the survey.
Requirement Priority	
Upper Level Requirement	



## 2.773 [LVV-18911] DMS-REQ-0391-V-02: Alert Stream Distribution Latency

Jira Link	Assignee	Status	Test Cases
LWV-18911	Leanne Guy	Not Covered	LWV-T1868

### Verification Element Description:

This VE satisfies the requirement on OTT1=1 minute. The related VE LVV-81297Â pertains to the number of streams.

Requirement Details	
Requirement ID	DMS-REQ-0391
Requirement Description	<b>Specification:</b> LSST shall be capable of supporting the transmission of at least <b>numStreams</b> full alert streams out of the alert distribution system within <b>OTT1</b> .
Requirement Parameters	<b>[numStreams = 5[integer]]</b> The minimum number of full streams that can be transmitted out of the alert distribution system., <b>OTT1 = 1[minute]</b> The latency of reporting optical transients following the completion of readout of the last image of a visit]
Requirement Priority	
Upper Level Requirement	OSS-REQ-0184 Transient Alert Publication OSS-REQ-0127 Level 1 Data Product Availability

### 2.773.1 Test Cases Summary

LWV-T1868	Verify implementation of alert streams distributed within latency limit			
Owner	Status	Version	Critical Event	Verification Type
Jeffrey Carlin	Draft	1	false	Test

### Objective:

Verify that the LSST system supports the transmission of full alert streams out of the alert distribution system within **OTT1=1 minute**.

## A Traceability

Requirements	Verification Elements	Test Cases
DMS-REQ-0074	LWV-32	LWV-T20 LWV-T37
DMS-REQ-0077	LWV-34	LWV-T150
DMS-REQ-0078	LWV-35	LWV-T151 LWV-T1232
DMS-REQ-0094	LWV-37	LWV-T152
DMS-REQ-0103	LWV-45	LWV-T63
DMS-REQ-0119	LWV-47	LWV-T117
DMS-REQ-0122	LWV-50	LWV-T204
DMS-REQ-0123	LWV-51	LWV-T205
DMS-REQ-0127	LWV-55	LWV-T208
DMS-REQ-0131	LWV-58	LWV-T106
DMS-REQ-0155	LWV-60	Verified By LWV-129 Verified By LWV-130 Verified By LWV-131
DMS-REQ-0156	LWV-61	Verified By LWV-133 Verified By LWV-134 Verified By LWV-135
DMS-REQ-0160	LWV-63	LWV-T131 LWV-T368 LWV-T368
DMS-REQ-0298	LWV-129	LWV-T136 LWV-T368 LWV-T374 LWV-T368
DMS-REQ-0308	LWV-139	LWV-T10 LWV-T17 LWV-T124 LWV-T216 LWV-T362 LWV-T363
DMS-REQ-0312	LWV-143	LWV-T157
DMS-REQ-0313	LWV-144	LWV-T158

DMS-REQ-0320	LVV-151	LVV-T92
DMS-REQ-0340	LVV-171	LVV-T123
DMS-REQ-0341	LVV-172	LVV-T160
DMS-REQ-0341	LVV-9749	
DMS-REQ-0342	LVV-173	LVV-T112 LVV-T218
DMS-REQ-0343	LVV-174	LVV-T113 LVV-T218
	LVV-9748	LVV-T1252
DMS-REQ-0004	LVV-175	LVV-T35 LVV-T95
	LVV-9740	LVV-T1276
	LVV-9803	LVV-T102
DMS-REQ-0346	LVV-177	LVV-T27 LVV-T286
DMS-REQ-0353	LVV-184	LVV-T60
DMS-REQ-0355	LVV-186	
DMS-REQ-0355	LVV-9784	
DMS-REQ-0356	LVV-187	
DMS-REQ-0356	LVV-9785	
	LVV-9786	LVV-T1089 LVV-T1090
	LVV-9787	LVV-T1085 LVV-T1089 LVV-T1090
DMS-REQ-0364	LVV-190	LVV-T163
DMS-REQ-0364	LVV-9750	
DMS-REQ-0365	LVV-191	LVV-T164
DMS-REQ-0366	LVV-192	LVV-T165
DMS-REQ-0368	LVV-194	LVV-T167
DMS-REQ-0369	LVV-195	LVV-T168
DMS-REQ-0370	LVV-196	LVV-T169
DMS-REQ-0371	LVV-197	LVV-T170
DMS-REQ-0377	LVV-3394	LVV-T385

	LVV-9797	LVV-T1332
DMS-REQ-0374	LVV-3395	
DMS-REQ-0374	LVV-9790	
DMS-REQ-0374	LVV-9791	
DMS-REQ-0376	LVV-3396	
DMS-REQ-0376	LVV-9795	
DMS-REQ-0376	LVV-9796	
DMS-REQ-0373	LVV-3397	
DMS-REQ-0373	LVV-9789	
DMS-REQ-0375	LVV-3398	
DMS-REQ-0375	LVV-9792	
DMS-REQ-0375	LVV-9793	
DMS-REQ-0375	LVV-9794	
DMS-REQ-0358	LVV-3400	LVV-T1250
	LVV-9788	LVV-T1251
DMS-REQ-0361	LVV-3403	LVV-T1088
		LVV-T1089
		LVV-T1090
CA-DM-DAQ-ICD-0094	LVV-4669	
CA-DM-DAQ-ICD-0094	LVV-4670	
CA-DM-DAQ-ICD-0082	LVV-4675	
CA-DM-DAQ-ICD-0082	LVV-4676	
CA-DM-DAQ-ICD-0093	LVV-4729	
CA-DM-DAQ-ICD-0093	LVV-4730	
CA-DM-DAQ-ICD-0097	LVV-4735	
CA-DM-DAQ-ICD-0097	LVV-4736	
CA-DM-DAQ-ICD-0059	LVV-4747	
CA-DM-DAQ-ICD-0059	LVV-4748	
CA-DM-DAQ-ICD-0060	LVV-4753	
CA-DM-DAQ-ICD-0060	LVV-4754	
CA-DM-DAQ-ICD-0081	LVV-4759	
CA-DM-DAQ-ICD-0081	LVV-4760	
CA-DM-DAQ-ICD-0047	LVV-4765	

CA-DM-DAQ-ICD-0047	LVV-4766
CA-DM-DAQ-ICD-0098	LVV-4771
CA-DM-DAQ-ICD-0098	LVV-4772
CA-DM-DAQ-ICD-0100	LVV-4777
CA-DM-DAQ-ICD-0100	LVV-4778
CA-DM-DAQ-ICD-0092	LVV-4784
CA-DM-DAQ-ICD-0084	LVV-4789
CA-DM-DAQ-ICD-0084	LVV-4790
CA-DM-DAQ-ICD-0099	LVV-4795
CA-DM-DAQ-ICD-0099	LVV-4796
CA-DM-DAQ-ICD-0085	LVV-4801
CA-DM-DAQ-ICD-0085	LVV-4802
CA-DM-DAQ-ICD-0086	LVV-4807
CA-DM-DAQ-ICD-0086	LVV-4808
CA-DM-DAQ-ICD-0091	LVV-4819
CA-DM-DAQ-ICD-0091	LVV-4820
CA-DM-DAQ-ICD-0075	LVV-4825
CA-DM-DAQ-ICD-0075	LVV-4826
CA-DM-DAQ-ICD-0080	LVV-4831
CA-DM-DAQ-ICD-0080	LVV-4832
CA-DM-CON-ICD-0003	LVV-4843
CA-DM-CON-ICD-0003	LVV-4844
CA-DM-CON-ICD-0004	LVV-4849
CA-DM-CON-ICD-0004	LVV-4850
CA-DM-CON-ICD-0019	LVV-4855
CA-DM-CON-ICD-0019	LVV-4856
CA-DM-CON-ICD-0008	LVV-4861
CA-DM-CON-ICD-0008	LVV-4862
CA-DM-CON-ICD-0002	LVV-4873
CA-DM-CON-ICD-0002	LVV-4874
CA-DM-CON-ICD-0005	LVV-4879
CA-DM-CON-ICD-0005	LVV-4880

CA-DM-CON-ICD-0001	LVV-4885
CA-DM-CON-ICD-0001	LVV-4886
CA-DM-CON-ICD-0018	LVV-4897
CA-DM-CON-ICD-0018	LVV-4898
CA-DM-CON-ICD-0007	LVV-4903
CA-DM-CON-ICD-0007	LVV-4904
CA-DM-CON-ICD-0016	LVV-4909
CA-DM-CON-ICD-0016	LVV-4910
CA-DM-CON-ICD-0014	LVV-4915
CA-DM-CON-ICD-0014	LVV-4916
CA-DM-CON-ICD-0015	LVV-4921
CA-DM-CON-ICD-0015	LVV-4922
OCS-DM-COM-ICD-0040	LVV-5237
OCS-DM-COM-ICD-0040	LVV-5238
OCS-DM-COM-ICD-0009	LVV-5243
OCS-DM-COM-ICD-0009	LVV-5244
OCS-DM-COM-ICD-0013	LVV-5249
OCS-DM-COM-ICD-0013	LVV-5250
OCS-DM-COM-ICD-0015	LVV-5255
OCS-DM-COM-ICD-0015	LVV-5256
OCS-DM-COM-ICD-0014	LVV-5261
OCS-DM-COM-ICD-0014	LVV-5262
OCS-DM-COM-ICD-0038	LVV-5267
OCS-DM-COM-ICD-0038	LVV-5268
OCS-DM-COM-ICD-0039	LVV-5273
OCS-DM-COM-ICD-0039	LVV-5274
OCS-DM-COM-ICD-0037	LVV-5279
OCS-DM-COM-ICD-0037	LVV-5280
OCS-DM-COM-ICD-0036	LVV-5285
OCS-DM-COM-ICD-0036	LVV-5286
OCS-DM-COM-ICD-0012	LVV-5291
OCS-DM-COM-ICD-0012	LVV-5292

OCS-DM-COM-ICD-0003	LVV-5297
OCS-DM-COM-ICD-0003	LVV-5298
OCS-DM-COM-ICD-0034	LVV-5303
OCS-DM-COM-ICD-0034	LVV-5304
OCS-DM-COM-ICD-0032	LVV-5309
OCS-DM-COM-ICD-0032	LVV-5310
OCS-DM-COM-ICD-0006	LVV-5315
OCS-DM-COM-ICD-0006	LVV-5316
OCS-DM-COM-ICD-0004	LVV-5321
OCS-DM-COM-ICD-0004	LVV-5322
OCS-DM-COM-ICD-0008	LVV-5327
OCS-DM-COM-ICD-0008	LVV-5328
OCS-DM-COM-ICD-0033	LVV-5333
OCS-DM-COM-ICD-0033	LVV-5334
OCS-DM-COM-ICD-0005	LVV-5339
OCS-DM-COM-ICD-0005	LVV-5340
OCS-DM-COM-ICD-0035	LVV-5345
OCS-DM-COM-ICD-0035	LVV-5346
OCS-DM-COM-ICD-0007	LVV-5351
OCS-DM-COM-ICD-0007	LVV-5352
OCS-DM-COM-ICD-0048	LVV-5357
OCS-DM-COM-ICD-0048	LVV-5358
OCS-DM-COM-ICD-0055	LVV-5363
OCS-DM-COM-ICD-0055	LVV-5364
OCS-DM-COM-ICD-0054	LVV-5369
OCS-DM-COM-ICD-0054	LVV-5370
OCS-DM-COM-ICD-0019	LVV-5375
OCS-DM-COM-ICD-0019	LVV-5376
OCS-DM-COM-ICD-0017	LVV-5381
OCS-DM-COM-ICD-0017	LVV-5382
OCS-DM-COM-ICD-0018	LVV-5387
OCS-DM-COM-ICD-0018	LVV-5388

OCS-DM-COM-ICD-0021	LVV-5393
OCS-DM-COM-ICD-0021	LVV-5394
OCS-DM-COM-ICD-0020	LVV-5399
OCS-DM-COM-ICD-0020	LVV-5400
OCS-DM-COM-ICD-0047	LVV-5405
OCS-DM-COM-ICD-0047	LVV-5406
OCS-DM-COM-ICD-0046	LVV-5411
OCS-DM-COM-ICD-0046	LVV-5412
OCS-DM-COM-ICD-0045	LVV-5417
OCS-DM-COM-ICD-0045	LVV-5418
OCS-DM-COM-ICD-0043	LVV-5423
OCS-DM-COM-ICD-0043	LVV-5424
OCS-DM-COM-ICD-0044	LVV-5429
OCS-DM-COM-ICD-0044	LVV-5430
OCS-DM-COM-ICD-0052	LVV-5435
OCS-DM-COM-ICD-0052	LVV-5436
OCS-DM-COM-ICD-0051	LVV-5441
OCS-DM-COM-ICD-0051	LVV-5442
OCS-DM-COM-ICD-0056	LVV-5447
OCS-DM-COM-ICD-0056	LVV-5448
OCS-DM-COM-ICD-0050	LVV-5453
OCS-DM-COM-ICD-0050	LVV-5454
OCS-DM-COM-ICD-0053	LVV-5459
OCS-DM-COM-ICD-0053	LVV-5460
OCS-DM-COM-ICD-0022	LVV-5465
OCS-DM-COM-ICD-0022	LVV-5466
OCS-DM-COM-ICD-0049	LVV-5471
OCS-DM-COM-ICD-0049	LVV-5472
OCS-DM-COM-ICD-0023	LVV-5477
OCS-DM-COM-ICD-0023	LVV-5478
OCS-DM-COM-ICD-0025	LVV-5483
OCS-DM-COM-ICD-0025	LVV-5484



OCS-DM-COM-ICD-0029	LVV-5489
OCS-DM-COM-ICD-0029	LVV-5490
OCS-DM-COM-ICD-0042	LVV-5495
OCS-DM-COM-ICD-0042	LVV-5496
OCS-DM-COM-ICD-0030	LVV-5501
OCS-DM-COM-ICD-0030	LVV-5502
OCS-DM-COM-ICD-0028	LVV-5513
OCS-DM-COM-ICD-0028	LVV-5514
OCS-DM-COM-ICD-0041	LVV-5519
OCS-DM-COM-ICD-0041	LVV-5520
OCS-DM-COM-ICD-0031	LVV-5531
OCS-DM-COM-ICD-0031	LVV-5532
OCS-DM-COM-ICD-0002	LVV-5537
OCS-DM-COM-ICD-0002	LVV-5538
OCS-DM-COM-ICD-0001	LVV-5543
OCS-DM-COM-ICD-0001	LVV-5544
DM-TS-CON-ICD-0003	LVV-5628
DM-TS-CON-ICD-0003	LVV-5629
DM-TS-CON-ICD-0010	LVV-5634
DM-TS-CON-ICD-0010	LVV-5635
DM-TS-CON-ICD-0006	LVV-5652
DM-TS-CON-ICD-0006	LVV-5653
DM-TS-CON-ICD-0007	LVV-5658
DM-TS-CON-ICD-0007	LVV-5659
DM-TS-CON-ICD-0009	LVV-5664
DM-TS-CON-ICD-0009	LVV-5665
DM-TS-CON-ICD-0008	LVV-5670
DM-TS-CON-ICD-0008	LVV-5671
DM-TS-CON-ICD-0004	LVV-5676
DM-TS-CON-ICD-0004	LVV-5677
CA-DM-SUP-ICD-0026	LVV-6140
CA-DM-SUP-ICD-0026	LVV-6141

CA-DM-SUP-ICD-0027	LVV-6146
CA-DM-SUP-ICD-0027	LVV-6147
CA-DM-SUP-ICD-0024	LVV-6152
CA-DM-SUP-ICD-0024	LVV-6153
CA-DM-SUP-ICD-0023	LVV-6158
CA-DM-SUP-ICD-0023	LVV-6159
CA-DM-SUP-ICD-0025	LVV-6164
CA-DM-SUP-ICD-0025	LVV-6165
CA-DM-SUP-ICD-0022	LVV-6170
CA-DM-SUP-ICD-0022	LVV-6171
CA-DM-SUP-ICD-0021	LVV-6176
CA-DM-SUP-ICD-0021	LVV-6177
CA-DM-SUP-ICD-0028	LVV-6182
CA-DM-SUP-ICD-0028	LVV-6183
CA-DM-SUP-ICD-0029	LVV-6188
CA-DM-SUP-ICD-0029	LVV-6189
CA-DM-SUP-ICD-0031	LVV-6194
CA-DM-SUP-ICD-0031	LVV-6195
CA-DM-SUP-ICD-0030	LVV-6200
CA-DM-SUP-ICD-0030	LVV-6201
CA-DM-SUP-ICD-0008	LVV-6206
CA-DM-SUP-ICD-0008	LVV-6207
CA-DM-SUP-ICD-0007	LVV-6212
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CA-DM-SUP-ICD-0009	LVV-6218
CA-DM-SUP-ICD-0009	LVV-6219
CA-DM-SUP-ICD-0010	LVV-6224
CA-DM-SUP-ICD-0010	LVV-6225
CA-DM-SUP-ICD-0020	LVV-6230
CA-DM-SUP-ICD-0020	LVV-6231
CA-DM-SUP-ICD-0019	LVV-6236
CA-DM-SUP-ICD-0019	LVV-6237

CA-DM-SUP-ICD-0005	LVV-6242
CA-DM-SUP-ICD-0005	LVV-6243
CA-DM-SUP-ICD-0006	LVV-6248
CA-DM-SUP-ICD-0006	LVV-6249
CA-DM-SUP-ICD-0002	LVV-6254
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CA-DM-SUP-ICD-0004	LVV-6266
CA-DM-SUP-ICD-0004	LVV-6267
CA-DM-SUP-ICD-0016	LVV-6272
CA-DM-SUP-ICD-0016	LVV-6273
CA-DM-SUP-ICD-0015	LVV-6278
CA-DM-SUP-ICD-0015	LVV-6279
CA-DM-SUP-ICD-0017	LVV-6284
CA-DM-SUP-ICD-0017	LVV-6285
CA-DM-SUP-ICD-0014	LVV-6290
CA-DM-SUP-ICD-0014	LVV-6291
CA-DM-SUP-ICD-0013	LVV-6296
CA-DM-SUP-ICD-0013	LVV-6297
CA-DM-SUP-ICD-0011	LVV-6302
CA-DM-SUP-ICD-0011	LVV-6303
CA-DM-SUP-ICD-0012	LVV-6308
CA-DM-SUP-ICD-0012	LVV-6309
CA-DM-SUP-ICD-0018	LVV-6314
CA-DM-SUP-ICD-0018	LVV-6315
CA-DM-SUP-ICD-0001	LVV-6320
CA-DM-SUP-ICD-0001	LVV-6321
EP-DM-CON-ICD-0004	LVV-6324
EP-DM-CON-ICD-0004	LVV-6325
EP-DM-CON-ICD-0021	LVV-6330
EP-DM-CON-ICD-0021	LVV-6331

EP-DM-CON-ICD-0009	LVV-6342
EP-DM-CON-ICD-0009	LVV-6343
EP-DM-CON-ICD-0034	LVV-6348
EP-DM-CON-ICD-0034	LVV-6349
EP-DM-CON-ICD-0031	LVV-6360
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EP-DM-CON-ICD-0019	LVV-6372
EP-DM-CON-ICD-0019	LVV-6373
EP-DM-CON-ICD-0002	LVV-6378
EP-DM-CON-ICD-0002	LVV-6379
EP-DM-CON-ICD-0033	LVV-6384
EP-DM-CON-ICD-0033	LVV-6385
EP-DM-CON-ICD-0032	LVV-6390
EP-DM-CON-ICD-0032	LVV-6391
EP-DM-CON-ICD-0020	LVV-6402
EP-DM-CON-ICD-0020	LVV-6403
DM-TS-AUX-ICD-0020	LVV-6420
DM-TS-AUX-ICD-0020	LVV-6421
DM-TS-AUX-ICD-0029	LVV-6426
DM-TS-AUX-ICD-0029	LVV-6427
DM-TS-AUX-ICD-0027	LVV-6432
DM-TS-AUX-ICD-0027	LVV-6433
DM-TS-AUX-ICD-0025	LVV-6456
DM-TS-AUX-ICD-0025	LVV-6457
DM-TS-AUX-ICD-0026	LVV-6462
DM-TS-AUX-ICD-0026	LVV-6463
DM-TS-AUX-ICD-0024	LVV-6468
DM-TS-AUX-ICD-0024	LVV-6469
DM-TS-AUX-ICD-0037	LVV-6474
DM-TS-AUX-ICD-0037	LVV-6475
DM-TS-AUX-ICD-0002	LVV-6480
DM-TS-AUX-ICD-0002	LVV-6481

DM-TS-AUX-ICD-0001	LVV-6486
DM-TS-AUX-ICD-0001	LVV-6487
DM-TS-AUX-ICD-0007	LVV-6492
DM-TS-AUX-ICD-0007	LVV-6493
DM-TS-AUX-ICD-0008	LVV-6498
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DM-TS-AUX-ICD-0036	LVV-6546
DM-TS-AUX-ICD-0036	LVV-6547
DM-TS-AUX-ICD-0019	LVV-6552
DM-TS-AUX-ICD-0019	LVV-6553
DM-TS-AUX-ICD-0018	LVV-6558
DM-TS-AUX-ICD-0018	LVV-6559
DM-TS-AUX-ICD-0014	LVV-6564
DM-TS-AUX-ICD-0014	LVV-6565
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DM-TS-AUX-ICD-0012	LVV-6571
DM-TS-AUX-ICD-0028	LVV-6576
DM-TS-AUX-ICD-0028	LVV-6577
DM-TS-AUX-ICD-0035	LVV-6594
DM-TS-AUX-ICD-0035	LVV-6595
DM-TS-AUX-ICD-0033	LVV-6600
DM-TS-AUX-ICD-0033	LVV-6601
DM-TS-AUX-ICD-0032	LVV-6606
DM-TS-AUX-ICD-0032	LVV-6607
EP-DM-CON-ICD-0036	LVV-6751
EP-DM-CON-ICD-0036	LVV-6752

EP-DM-CON-ICD-0035	LVV-6757
EP-DM-CON-ICD-0035	LVV-6758
EP-DM-CON-ICD-0037	LVV-6763
EP-DM-CON-ICD-0037	LVV-6764
SYS-ALL-COM-ICD-0047	LVV-6771
SYS-ALL-COM-ICD-0047	LVV-6772
SYS-ALL-COM-ICD-0048	LVV-6777
SYS-ALL-COM-ICD-0048	LVV-6778
SYS-ALL-COM-ICD-0043	LVV-6783
SYS-ALL-COM-ICD-0043	LVV-6784
SYS-ALL-COM-ICD-0046	LVV-6789
SYS-ALL-COM-ICD-0046	LVV-6790
SYS-ALL-COM-ICD-0044	LVV-6795
SYS-ALL-COM-ICD-0044	LVV-6796
SYS-ALL-COM-ICD-0045	LVV-6801
SYS-ALL-COM-ICD-0045	LVV-6802
SYS-ALL-COM-ICD-0042	LVV-6807
SYS-ALL-COM-ICD-0042	LVV-6808
SYS-ALL-COM-ICD-0029	LVV-6813
SYS-ALL-COM-ICD-0029	LVV-6814
SYS-ALL-COM-ICD-0028	LVV-6819
SYS-ALL-COM-ICD-0028	LVV-6820
SYS-ALL-COM-ICD-0005	LVV-6825
SYS-ALL-COM-ICD-0005	LVV-6826
SYS-ALL-COM-ICD-0030	LVV-6831
SYS-ALL-COM-ICD-0030	LVV-6832
SYS-ALL-COM-ICD-0026	LVV-6837
SYS-ALL-COM-ICD-0026	LVV-6838
SYS-ALL-COM-ICD-0027	LVV-6843
SYS-ALL-COM-ICD-0027	LVV-6844
SYS-ALL-COM-ICD-0050	LVV-6849
SYS-ALL-COM-ICD-0050	LVV-6850

SYS-ALL-COM-ICD-0049	LVV-6855
SYS-ALL-COM-ICD-0049	LVV-6856
SYS-ALL-COM-ICD-0031	LVV-6861
SYS-ALL-COM-ICD-0031	LVV-6862
SYS-ALL-COM-ICD-0033	LVV-6867
SYS-ALL-COM-ICD-0033	LVV-6868
SYS-ALL-COM-ICD-0035	LVV-6873
SYS-ALL-COM-ICD-0035	LVV-6874
SYS-ALL-COM-ICD-0037	LVV-6879
SYS-ALL-COM-ICD-0037	LVV-6880
SYS-ALL-COM-ICD-0040	LVV-6885
SYS-ALL-COM-ICD-0040	LVV-6886
SYS-ALL-COM-ICD-0036	LVV-6891
SYS-ALL-COM-ICD-0036	LVV-6892
SYS-ALL-COM-ICD-0041	LVV-6897
SYS-ALL-COM-ICD-0041	LVV-6898
SYS-ALL-COM-ICD-0038	LVV-6903
SYS-ALL-COM-ICD-0038	LVV-6904
SYS-ALL-COM-ICD-0034	LVV-6909
SYS-ALL-COM-ICD-0034	LVV-6910
SYS-ALL-COM-ICD-0032	LVV-6915
SYS-ALL-COM-ICD-0032	LVV-6916
SYS-ALL-COM-ICD-0039	LVV-6921
SYS-ALL-COM-ICD-0039	LVV-6922
CPT-OCS-INT-ICD-0001	LVV-6927
CPT-OCS-INT-ICD-0001	LVV-6928
CPT-OCS-INT-ICD-0005	LVV-6933
CPT-OCS-INT-ICD-0005	LVV-6934
CPT-OCS-INT-ICD-0006	LVV-6939
CPT-OCS-INT-ICD-0006	LVV-6940
CPT-OCS-INT-ICD-0008	LVV-6945
CPT-OCS-INT-ICD-0008	LVV-6946

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CPT-OCS-INT-ICD-0041	LVV-6958
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CPT-OCS-INT-ICD-0003	LVV-6976
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CPT-OCS-INT-ICD-0072	LVV-6988
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CPT-OCS-INT-ICD-0004	LVV-7006
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CPT-OCS-INT-ICD-0011	LVV-7018
CPT-OCS-INT-ICD-0049	LVV-7023
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CPT-OCS-INT-ICD-0071	LVV-7029
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CPT-OCS-INT-ICD-0046	LVV-7035
CPT-OCS-INT-ICD-0046	LVV-7036
CPT-OCS-INT-ICD-0045	LVV-7041
CPT-OCS-INT-ICD-0045	LVV-7042



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CPT-OCS-INT-ICD-0043	LVV-7053
CPT-OCS-INT-ICD-0043	LVV-7054
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CPT-OCS-INT-ICD-0052	LVV-7083
CPT-OCS-INT-ICD-0052	LVV-7084
CPT-OCS-INT-ICD-0050	LVV-7089
CPT-OCS-INT-ICD-0050	LVV-7090
CPT-OCS-INT-ICD-0053	LVV-7095
CPT-OCS-INT-ICD-0053	LVV-7096
CPT-OCS-INT-ICD-0054	LVV-7101
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CPT-OCS-INT-ICD-0055	LVV-7107
CPT-OCS-INT-ICD-0055	LVV-7108
CPT-OCS-INT-ICD-0051	LVV-7113
CPT-OCS-INT-ICD-0051	LVV-7114
CPT-OCS-INT-ICD-0073	LVV-7119
CPT-OCS-INT-ICD-0073	LVV-7120
CPT-OCS-INT-ICD-0058	LVV-7125
CPT-OCS-INT-ICD-0058	LVV-7126
CPT-OCS-INT-ICD-0059	LVV-7131
CPT-OCS-INT-ICD-0059	LVV-7132
CPT-OCS-INT-ICD-0060	LVV-7137
CPT-OCS-INT-ICD-0060	LVV-7138

CPT-OCS-INT-ICD-0056	LVV-7143	
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CPT-OCS-INT-ICD-0064	LVV-7155	
CPT-OCS-INT-ICD-0064	LVV-7156	
CPT-OCS-INT-ICD-0065	LVV-7161	
CPT-OCS-INT-ICD-0065	LVV-7162	
CPT-OCS-INT-ICD-0066	LVV-7167	
CPT-OCS-INT-ICD-0066	LVV-7168	
CPT-OCS-INT-ICD-0062	LVV-7173	
CPT-OCS-INT-ICD-0062	LVV-7174	
CPT-OCS-INT-ICD-0067	LVV-7179	
CPT-OCS-INT-ICD-0067	LVV-7180	
CPT-OCS-INT-ICD-0068	LVV-7185	
CPT-OCS-INT-ICD-0068	LVV-7186	
CPT-OCS-INT-ICD-0069	LVV-7191	
CPT-OCS-INT-ICD-0069	LVV-7192	
CPT-OCS-INT-ICD-0070	LVV-7197	
CPT-OCS-INT-ICD-0070	LVV-7198	
DMS-REQ-0372	LVV-9637	LVV-T1264
DMS-REQ-0271	LVV-9742	
DMS-REQ-0344	LVV-9744	LVV-T1866
DMS-LSP-REQ-0007	LVV-9806	LVV-T605
DMS-LSP-REQ-0001	LVV-9807	LVV-T2 LVV-T598
DMS-LSP-REQ-0004	LVV-9808	LVV-T3 LVV-T602 LVV-T1437
DMS-LSP-REQ-0005	LVV-9809	LVV-T2 LVV-T603 LVV-T1334 LVV-T1436

		LVV-T1437
DMS-LSP-REQ-0003	LVV-9810	LVV-T601
		LVV-T1436
DMS-LSP-REQ-0002	LVV-9811	LVV-T5
		LVV-T600
		LVV-T1334
DMS-LSP-REQ-0006	LVV-9812	LVV-T604
		LVV-T1334
		LVV-T1436
		LVV-T1437
DMS-LSP-REQ-0009	LVV-9813	LVV-T607
DMS-LSP-REQ-0008	LVV-9814	LVV-T8
		LVV-T9
		LVV-T606
DMS-LSP-REQ-0010	LVV-9815	LVV-T608
DMS-LSP-REQ-0012	LVV-9816	LVV-T610
DMS-LSP-REQ-0011	LVV-9817	LVV-T609
DMS-LSP-REQ-0013	LVV-9818	LVV-T611
DMS-LSP-REQ-0014	LVV-9819	LVV-T5
		LVV-T6
		LVV-T7
		LVV-T612
DMS-LSP-REQ-0018	LVV-9820	LVV-T7
		LVV-T616
DMS-LSP-REQ-0017	LVV-9821	LVV-T6
		LVV-T615
DMS-LSP-REQ-0016	LVV-9822	LVV-T614
DMS-LSP-REQ-0015	LVV-9823	LVV-T613
DMS-LSP-REQ-0028	LVV-9824	LVV-T4
		LVV-T617
DMS-LSP-REQ-0029	LVV-9825	LVV-T4
		LVV-T618
DMS-LSP-REQ-0030	LVV-9826	LVV-T619
DMS-LSP-REQ-0031	LVV-9827	LVV-T620
DMS-LSP-REQ-0019	LVV-9828	LVV-T621

DMS-LSP-REQ-0025	LVV-9829	LVV-T627
DMS-LSP-REQ-0020	LVV-9830	LVV-T622
		LVV-T1334
		LVV-T1436
		LVV-T1437
DMS-LSP-REQ-0022	LVV-9831	LVV-T624
		LVV-T1334
		LVV-T1436
		LVV-T1437
DMS-LSP-REQ-0021	LVV-9832	LVV-T623
DMS-LSP-REQ-0027	LVV-9833	LVV-T629
DMS-LSP-REQ-0023	LVV-9834	LVV-T625
		LVV-T1334
		LVV-T1436
		LVV-T1437
DMS-LSP-REQ-0024	LVV-9835	LVV-T626
		LVV-T1334
		LVV-T1436
		LVV-T1437
DMS-LSP-REQ-0026	LVV-9836	LVV-T628
		LVV-T1436
DMS-LSP-REQ-0033	LVV-9837	LVV-T631
DMS-LSP-REQ-0034	LVV-9838	LVV-T632
DMS-LSP-REQ-0032	LVV-9839	LVV-T630
DMS-LSP-REQ-0035	LVV-9840	LVV-T633
DMS-PRTL-REQ-0001	LVV-9841	LVV-T634
		LVV-T1334
DMS-PRTL-REQ-0005	LVV-9842	LVV-T638
DMS-PRTL-REQ-0007	LVV-9843	LVV-T640
DMS-PRTL-REQ-0008	LVV-9844	LVV-T641
DMS-PRTL-REQ-0006	LVV-9845	LVV-T639
DMS-PRTL-REQ-0003	LVV-9846	LVV-T636
		LVV-T1818
DMS-PRTL-REQ-0002	LVV-9847	LVV-T635

DMS-PRTL-REQ-0004	LVV-9848	LVV-T8 LVV-T637
DMS-PRTL-REQ-0010	LVV-9849	LVV-T643
DMS-PRTL-REQ-0013	LVV-9850	LVV-T646
DMS-PRTL-REQ-0012	LVV-9851	LVV-T645
DMS-PRTL-REQ-0014	LVV-9852	LVV-T647
DMS-PRTL-REQ-0011	LVV-9853	LVV-T644
DMS-PRTL-REQ-0009	LVV-9854	LVV-T642
DMS-PRTL-REQ-0017	LVV-9855	LVV-T650 LVV-T1334
DMS-PRTL-REQ-0016	LVV-9856	LVV-T5 LVV-T649 LVV-T1334
DMS-PRTL-REQ-0015	LVV-9857	LVV-T648 LVV-T1334
DMS-PRTL-REQ-0018	LVV-9858	LVV-T651
DMS-PRTL-REQ-0028	LVV-9859	LVV-T5 LVV-T652
DMS-PRTL-REQ-0029	LVV-9860	LVV-T653
DMS-PRTL-REQ-0030	LVV-9861	LVV-T654
DMS-PRTL-REQ-0022	LVV-9862	LVV-T5 LVV-T657
DMS-PRTL-REQ-0023	LVV-9863	LVV-T658
DMS-PRTL-REQ-0024	LVV-9864	LVV-T659
DMS-PRTL-REQ-0021	LVV-9865	LVV-T5 LVV-T656
DMS-PRTL-REQ-0020	LVV-9866	LVV-T655 LVV-T1334
DMS-PRTL-REQ-0027	LVV-9868	LVV-T5 LVV-T662
DMS-PRTL-REQ-0019	LVV-9870	LVV-T663
DMS-PRTL-REQ-0034	LVV-9871	LVV-T668
DMS-PRTL-REQ-0033	LVV-9872	LVV-T667
DMS-PRTL-REQ-0032	LVV-9873	LVV-T666

DMS-PRTL-REQ-0031	LVV-9874	LVV-T664
DMS-PRTL-REQ-0039	LVV-9875	LVV-T673
DMS-PRTL-REQ-0037	LVV-9876	LVV-T671
DMS-PRTL-REQ-0036	LVV-9877	LVV-T670
DMS-PRTL-REQ-0035	LVV-9878	LVV-T669
DMS-PRTL-REQ-0038	LVV-9879	LVV-T672
DMS-PRTL-REQ-0041	LVV-9880	LVV-T7 LVV-T674
DMS-PRTL-REQ-0040	LVV-9881	LVV-T7 LVV-T675
DMS-PRTL-REQ-0044	LVV-9882	LVV-T679
DMS-PRTL-REQ-0043	LVV-9883	LVV-T678
DMS-PRTL-REQ-0042	LVV-9884	LVV-T677
DMS-PRTL-REQ-0045	LVV-9885	LVV-T680
DMS-PRTL-REQ-0046	LVV-9886	LVV-T681 LVV-T1818
DMS-PRTL-REQ-0048	LVV-9887	LVV-T683
DMS-PRTL-REQ-0047	LVV-9888	LVV-T682
DMS-PRTL-REQ-0050	LVV-9889	LVV-T6 LVV-T685
DMS-PRTL-REQ-0052	LVV-9890	LVV-T687
DMS-PRTL-REQ-0049	LVV-9891	LVV-T6 LVV-T684 LVV-T1334
DMS-PRTL-REQ-0051	LVV-9892	LVV-T686
DMS-PRTL-REQ-0054	LVV-9893	LVV-T6 LVV-T689
DMS-PRTL-REQ-0053	LVV-9894	LVV-T6 LVV-T688
DMS-PRTL-REQ-0056	LVV-9895	LVV-T6 LVV-T691
DMS-PRTL-REQ-0061	LVV-9896	LVV-T696
DMS-PRTL-REQ-0059	LVV-9897	LVV-T694
DMS-PRTL-REQ-0058	LVV-9898	LVV-T693

DMS-PRTL-REQ-0060	LVV-9899	LVV-T695
DMS-PRTL-REQ-0057	LVV-9900	LVV-T692
DMS-PRTL-REQ-0055	LVV-9901	LVV-T6 LVV-T690
DMS-PRTL-REQ-0067	LVV-9902	LVV-T701
DMS-PRTL-REQ-0066	LVV-9903	LVV-T700
DMS-PRTL-REQ-0065	LVV-9904	LVV-T699
DMS-PRTL-REQ-0062	LVV-9905	LVV-T676
DMS-PRTL-REQ-0063	LVV-9906	LVV-T697
DMS-PRTL-REQ-0064	LVV-9907	LVV-T698
DMS-PRTL-REQ-0068	LVV-9908	LVV-T702
DMS-PRTL-REQ-0069	LVV-9909	LVV-T703
DMS-PRTL-REQ-0074	LVV-9910	LVV-T708
DMS-PRTL-REQ-0071	LVV-9911	LVV-T705
DMS-PRTL-REQ-0072	LVV-9912	LVV-T706
DMS-PRTL-REQ-0073	LVV-9913	LVV-T707
DMS-PRTL-REQ-0070	LVV-9914	LVV-T704
DMS-PRTL-REQ-0075	LVV-9915	LVV-T709
DMS-PRTL-REQ-0077	LVV-9916	LVV-T711
DMS-PRTL-REQ-0076	LVV-9917	LVV-T710
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DMS-PRTL-REQ-0081	LVV-9919	LVV-T715
DMS-PRTL-REQ-0080	LVV-9920	LVV-T714
DMS-PRTL-REQ-0082	LVV-9921	LVV-T716
DMS-PRTL-REQ-0079	LVV-9922	LVV-T713
DMS-PRTL-REQ-0087	LVV-9923	LVV-T721
DMS-PRTL-REQ-0083	LVV-9924	LVV-T717
DMS-PRTL-REQ-0086	LVV-9925	LVV-T720
DMS-PRTL-REQ-0088	LVV-9927	LVV-T722
DMS-PRTL-REQ-0084	LVV-9928	LVV-T718
DMS-PRTL-REQ-0091	LVV-9929	LVV-T725
DMS-PRTL-REQ-0093	LVV-9930	LVV-T727
DMS-PRTL-REQ-0092	LVV-9931	LVV-T726
DMS-PRTL-REQ-0095	LVV-9932	LVV-T729 LVV-T1334

		LVV-T1818
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DMS-PRTL-REQ-0096	LVV-9936	LVV-T730
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DMS-PRTL-REQ-0102	LVV-9940	LVV-T736
DMS-PRTL-REQ-0106	LVV-9941	LVV-T740
DMS-PRTL-REQ-0098	LVV-9942	LVV-T732
DMS-PRTL-REQ-0099	LVV-9943	LVV-T733
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DMS-PRTL-REQ-0101	LVV-9945	LVV-T735
DMS-PRTL-REQ-0104	LVV-9946	LVV-T738
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DMS-PRTL-REQ-0112	LVV-9953	LVV-T746
DMS-PRTL-REQ-0110	LVV-9954	LVV-T744
		LVV-T1818
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DMS-PRTL-REQ-0117	LVV-9956	LVV-T751
DMS-PRTL-REQ-0118	LVV-9957	LVV-T752
DMS-PRTL-REQ-0116	LVV-9958	LVV-T750
DMS-PRTL-REQ-0127	LVV-9959	LVV-T756
DMS-PRTL-REQ-0119	LVV-9960	LVV-T753
DMS-PRTL-REQ-0120	LVV-9961	LVV-T754
DMS-PRTL-REQ-0121	LVV-9962	LVV-T755
DMS-PRTL-REQ-0122	LVV-9963	LVV-T757
DMS-PRTL-REQ-0124	LVV-9964	LVV-T759
DMS-PRTL-REQ-0123	LVV-9965	LVV-T758



DMS-PRTL-REQ-0126	LVV-9966	LVV-T761
DMS-PRTL-REQ-0125	LVV-9967	LVV-T760
DMS-NB-REQ-0010	LVV-9968	LVV-T767
DMS-NB-REQ-0009	LVV-9969	LVV-T766
DMS-NB-REQ-0014	LVV-9970	LVV-T771
DMS-NB-REQ-0005	LVV-9971	LVV-T762 LVV-T1436
DMS-NB-REQ-0015	LVV-9972	LVV-T772
DMS-NB-REQ-0013	LVV-9973	LVV-T770 LVV-T1436
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DMS-NB-REQ-0006	LVV-9976	LVV-T763 LVV-T1436
DMS-NB-REQ-0012	LVV-9977	LVV-T769
DMS-NB-REQ-0011	LVV-9978	LVV-T768
DMS-NB-REQ-0023	LVV-9979	LVV-T780
DMS-NB-REQ-0017	LVV-9980	LVV-T774 LVV-T1436
DMS-NB-REQ-0021	LVV-9981	LVV-T778
DMS-NB-REQ-0022	LVV-9982	LVV-T779
DMS-NB-REQ-0016	LVV-9983	LVV-T773
DMS-NB-REQ-0020	LVV-9984	LVV-T777
DMS-NB-REQ-0018	LVV-9985	LVV-T775
DMS-NB-REQ-0019	LVV-9986	LVV-T776
DMS-NB-REQ-0025	LVV-9987	LVV-T782
DMS-NB-REQ-0024	LVV-9988	LVV-T781
DMS-NB-REQ-0026	LVV-9989	LVV-T783
DMS-NB-REQ-0032	LVV-9990	LVV-T784
DMS-NB-REQ-0033	LVV-9991	LVV-T785
DMS-NB-REQ-0035	LVV-9992	LVV-T787
DMS-NB-REQ-0034	LVV-9993	LVV-T786
DMS-NB-REQ-0036	LVV-9994	LVV-T788
DMS-NB-REQ-0030	LVV-9995	LVV-T790
DMS-NB-REQ-0029	LVV-9996	LVV-T789

		LVV-T1436
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DMS-NB-REQ-0001	LVV-10000	LVV-T792
		LVV-T1436
DMS-NB-REQ-0004	LVV-10001	LVV-T795
DMS-API-REQ-0023	LVV-10002	LVV-T798
		LVV-T1437
DMS-API-REQ-0022	LVV-10003	LVV-T797
DMS-API-REQ-0028	LVV-10004	LVV-T803
DMS-API-REQ-0024	LVV-10005	LVV-T799
DMS-API-REQ-0026	LVV-10006	LVV-T801
DMS-API-REQ-0027	LVV-10007	LVV-T802
DMS-API-REQ-0030	LVV-10008	LVV-T805
DMS-API-REQ-0025	LVV-10009	LVV-T800
DMS-API-REQ-0029	LVV-10010	LVV-T804
DMS-API-REQ-0021	LVV-10011	LVV-T796
DMS-API-REQ-0009	LVV-10012	LVV-T809
		LVV-T1437
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		LVV-T1437
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		LVV-T1437
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		LVV-T1437
DMS-API-REQ-0016	LVV-10016	LVV-T810
DMS-API-REQ-0018	LVV-10017	LVV-T812
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		LVV-T1437
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DMS-API-REQ-0040	LVV-10021	LVV-T815
DMS-API-REQ-0034	LVV-10022	LVV-T816

DMS-API-REQ-0019	LVV-10023	LVV-T817
DMS-API-REQ-0020	LVV-10024	LVV-T818
DMS-API-REQ-0014	LVV-10025	LVV-T823
DMS-API-REQ-0013	LVV-10026	LVV-T822
DMS-API-REQ-0015	LVV-10027	LVV-T824
DMS-API-REQ-0012	LVV-10028	LVV-T821
DMS-API-REQ-0010	LVV-10029	LVV-T819
DMS-API-REQ-0011	LVV-10030	LVV-T820
DMS-API-REQ-0033	LVV-10031	LVV-T827
DMS-API-REQ-0031	LVV-10032	LVV-T825
DMS-API-REQ-0032	LVV-10033	LVV-T826
DMS-API-REQ-0003	LVV-10034	LVV-T829
		LVV-T1437
DMS-API-REQ-0004	LVV-10035	LVV-T830
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		LVV-T1437
DMS-API-REQ-0035	LVV-10038	LVV-T832
DMS-API-REQ-0037	LVV-10039	LVV-T835
DMS-API-REQ-0002	LVV-10040	LVV-T833
DMS-API-REQ-0036	LVV-10041	LVV-T834
DMS-REQ-0384	LVV-18222	LVV-T1524
DMS-REQ-0381	LVV-18223	LVV-T1525
DMS-REQ-0380	LVV-18224	LVV-T1526
DMS-REQ-0385	LVV-18226	LVV-T1528
DMS-REQ-0386	LVV-18230	LVV-T1560
DMS-REQ-0387	LVV-18231	LVV-T1561
DMS-REQ-0388	LVV-18232	LVV-T1562
OCS-EFD-HS-0001	LVV-18271	
OCS-EFD-HS-0002	LVV-18272	
OCS-EFD-HS-0003	LVV-18273	
OCS-EFD-HS-0004	LVV-18274	
OCS-EFD-HS-0005	LVV-18275	

OCS-EFD-HS-0006	LVV-18276	
OCS-EFD-HS-0007	LVV-18277	
OCS-EFD-HS-0008	LVV-18278	
OCS-EFD-HS-0009	LVV-18279	
OCS-EFD-HS-0010	LVV-18280	
OCS-EFD-HS-0011	LVV-18281	
OCS-EFD-HS-0012	LVV-18282	
OCS-EFD-HS-0013	LVV-18283	
OCS-EFD-HS-0014	LVV-18284	
OCS-EFD-HS-0015	LVV-18285	
CA-DM-CON-ICD-0020	LVV-18849	
CA-DM-CON-ICD-0022	LVV-18852	
CA-DM-CON-ICD-0023	LVV-18855	
CA-DM-CON-ICD-0021	LVV-18858	
DMS-REQ-0391	LVV-18911	LVV-T1868

Note that some of the requirements listed in this traceability table may be related with additional Verification Elements not in the scope of *Service Verification*, and therefore not listed here.

## B References

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## C Acronyms

Acronym	Description
1D	One-dimensional
2D	Two-dimensional
ADC	atmospheric dispersion corrector
ADQL	Astronomical Data Query Language
AOS	Active Optics System
API	Application Programming Interface
ASCII	American Standard Code for Information Interchange
B	Byte (8 bit)
CA	Control (or Cost) Account
CAM	CAMera
CBP	Collimated Beam Projector
CCD	Charge-Coupled Device
CCOB	Camera Calibration Optical Bench
CCS	Camera Control System
CDS	Centre de Données astronomiques de Strasbourg
CSC	Commandable SAL Component
CSV	Comma Separated Values
ComCam	The commissioning camera is a single-raft, 9-CCD camera that will be installed in LSST during commissioning, before the final camera is ready.
DAC	Data Access Center
DAQ	Data Acquisition System
DAX	Data Access Services
DBB	Data Backbone
DDF	Deep Drilling Fields
DDS	Data Distribution System
DIA	Difference Image Analysis
DIMM	Differential Image Motion Monitor
DM	Data Management
DMS	Data Management Subsystem
DMS-REQ	Data Management System Requirements prefix
DMSR	DM System Requirements; LSE-61
DPDD	Data Product Definition Document

DR1	Data Release 1
DR11	Data Release 11
DRP	Data Release Production
DS9	Deep Space 9 (specific astronomical data visualisation application; SAOImage)
EDC	EPO Data Center
EFD	Engineering and Facility Database
EPO	Education and Public Outreach
FIFO	First In First Out
FITS	Flexible Image Transport System
FPA	Focal Plane Array
FWHM	Full Width at Half-Maximum
GB	Gigabyte
GPS	Global Positioning System
HEALPix	Hierarchical Equal-Area iso-Latitude Pixelisation
HEASARC	NASA's Archive of Data on Energetic Phenomena
HTTP	HyperText Transfer Protocol
ICD	Interface Control Document
IN2P3	Institut National de Physique Nucléaire et de Physique des Particules
IPAC	No longer an acronym; science and data center at Caltech
IRSA	Infrared Science Archive
ISO	International Standards Organisation
ISR	Instrument Signal Removal
IT	Information Technology
IVOA	International Virtual-Observatory Alliance
JSON	JavaScript Object Notation
L1	Lens 1
L2	Lens 2
L3	Lens 3
LCA	Document handle LSST camera subsystem controlled documents
LDF	LSST Data Facility
LDM	LSST Data Management (Document Handle)
LPM	LSST Project Management (Document Handle)
LSE	LSST Systems Engineering (Document Handle)



LSP	LSST Science Platform (now Rubin Science Platform)
LSR	LSST System Requirements; LSE-29
LSST	Legacy Survey of Space and Time (formerly Large Synoptic Survey Telescope)
LTS	LSST Telescope and Site (Document Handle)
MAST	Mikulski Archive for Space Telescopes
MB	MegaByte
MOC	Multi Ordered Catalogue
MOPS	Moving Object Processing System (deprecated; see SSP)
MREFC	Major Research Equipment and Facility Construction
NCSA	National Center for Supercomputing Applications
NED	NASA/IPAC Extragalactic Database
NOAA	National Oceanic and Atmospheric Administration
OCS	Observatory Control System
OODS	Observatory Operations Data Service
OSS	Observatory System Specifications; LSE-30
PDAC	Prototype Data Access Center
PI	Principle Investigator
PMCS	Project Management Controls System
POSIX	Portable Operating System Interface
PSF	Point Spread Function
PVI	Processed Visit Image
RA	Right Ascension
RMS	Root-Mean-Square
S3	(Amazon) Simple Storage Service
SAL	Service Abstraction Layer
SAMP	Simple Application Messaging Protocol
SDSS	Sloan Digital Sky Survey
SED	Spectral Energy Distribution
SIA	Simple Image Access
SODA	Server-side Operations for Data Access
SP	System Performance
SUI	Science User Interface (original name for the LSP Portal and API Aspects)

SUIT	Science User Interface and Tools (LSST Data Management WBS element and team, responsible for LSP Portal Aspect)
T&S	Telescope and Site
TAI	International Atomic Time
TAP	Table Access Protocol
TBD	To Be Defined (Determined)
TBR	To Be Resolved
TCS	Telescope Control System
TS	Test Specification
UI	User Interface
UML	unified modeling language
UT	Universal Time
UTC	Coordinated Universal Time
UX	User Experience
VE	vendor estimate
VO	Virtual Observatory
VPN	virtual private network
WCS	World Coordinate System
WFD	Wide Fast Deep
WFS	WaveFront Sensor
WISE	Wide-field Survey Explorer
XML	eXtensible Markup Language
YAML	Yet Another Markup Language
deg	degree; unit of angle