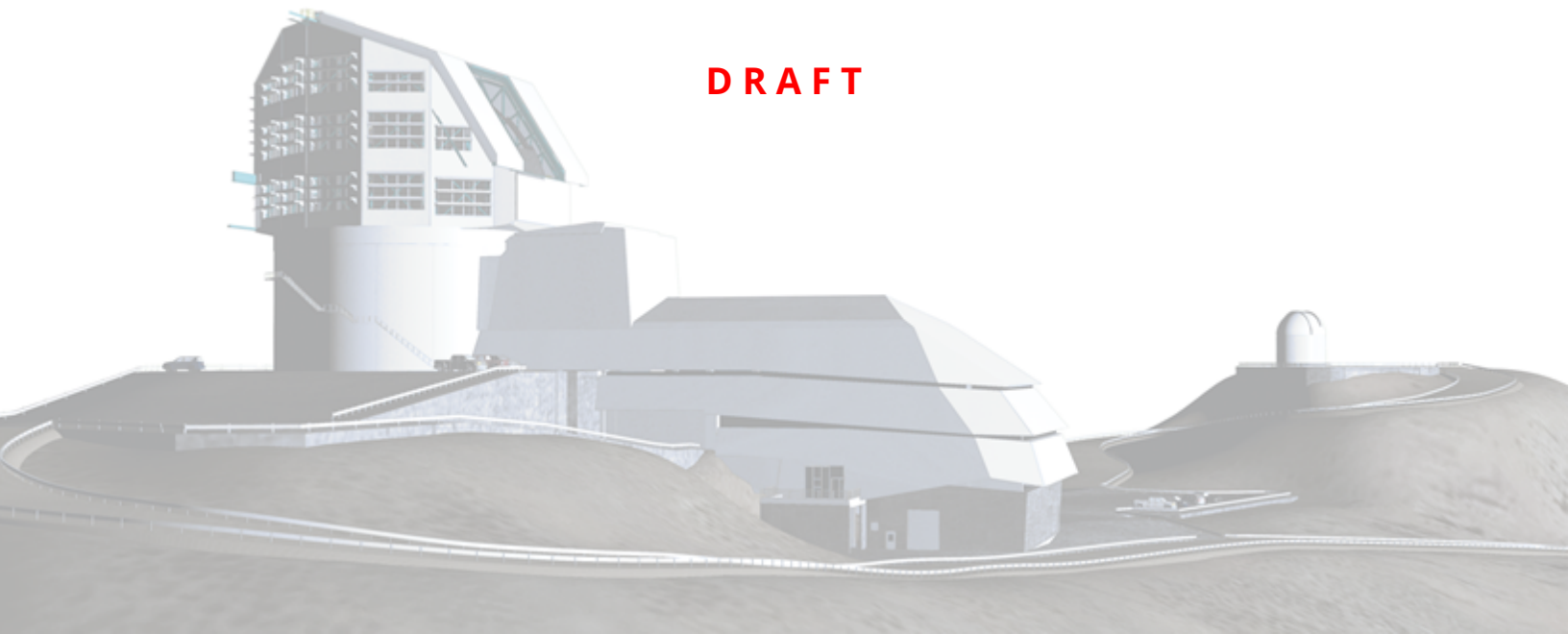**Vera C. Rubin Observatory**
Data Management

LDM-503-14a: RSP redeployed on the Interim Data Facility (IDF), ready for DP0.1 Test Plan and Report

Gregory Dubois-Felsmann

DMTR-301

Latest Revision: 2021-10-04

D R A F T

Abstract

This is the test plan and report for **RSP redeployed on the Interim Data Facility (IDF), ready for DP0.1** (LDM-503-14a), an LSST milestone pertaining to the Data Management Subsystem.

This document is based on content automatically extracted from the Jira test database on 2021-10-04 . The most recent change to the document repository was on 2021-10-04.

Change Record

Version	Date	Description	Owner name
	2021-03-29	First draft	Gregory Dubois-Felsmann
	2021-09-28	Requirements test coverage added	Gregory Dubois-Felsmann
1.0	2021-09-28	Final test plan approved by Leanne Guy; test cases set to "Approved" in Jira	Gregory Dubois-Felsmann
	2021-10-01	Docgen test results	Gregory Dubois-Felsmann
1.1	2021-10-04	Final test report approved by Leanne Guy and Wil O'Mullane; VIs set to "SE Review" in Jira as appropriate	Gregory Dubois-Felsmann

Document curator: Gregory Dubois-Felsmann

Document source location: `https://github.com/lsst-dm/DMTR-301`

Version from source repository: 692d8cd

Contents

LDM-503-14a: RSP redeployed on the Interim Data Facility (IDF), ready for DP0.1 Test Plan and Report

1 Introduction

1.1 Objectives

Demonstrate that the end-of-FY2020 capabilities of the Rubin Science Platform have been made available on the Interim Data Facility, and that DP0.1, based on ingested externally-provided DC2 data, can be supported.   May be demonstrated with the DC2 DP0.1 dataset itself or with a dataset of equivalent complexity.

DP0.1 expectations are as described in RTN-001 and RTN-004 .

1.2 System Overview

1.3 Document Overview

This document was generated from Jira, obtaining the relevant information from the LVV-P79 Jira Test Plan and related Test Cycles (LVV-C166).

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

Section 4 provides a summary of the test results, including an overview in Table 3, an over-all assessment statement and suggestions for possible improvements. Section 5 provides detailed results for each step in each test case.

The current status of test plan LVV-P79 in Jira is **Approved** .

1.4 References

[1] **[DMTN-178]**, Comoretto, G., 2021, *Docsteady Usecases for Rubin Observatory Construction*, DMTN-178, URL `http://DMTN-178.lsst.io`

[2] **[DMTN-140]**, Comoretto, G., Guy, L.P., et al., 2020, *Documentation Automation for the Verification and Validation of Rubin Observatory Software*, DMTN-140, URL `https://dmtn-140.lsst.io/`

[3] **[LSE-160]**, Selvy, B., 2013, *Verification and Validation Process*, LSE-160, URL `https://ls.st/LSE-160`

2 Test Plan Details

2.1 Data Collection

Observing is not required for this test campaign.

2.2 Verification Environment

Must be executed in a well-documented controlled state of the IDF.

2.3 Related Documentation

Jira Attachments	
To LVV-C166 results	ScreenShot2021-10-01at08.09.52.png
To LVV-C166 results	ScreenShot2021-10-01at08.06.45.png
To LVV-C166 results	LDM-503-14a-portal-plot.png
To LVV-C166 results	ScreenShot2021-10-01at07.33.59.png
To LVV-C166 results	xz1o60x1tpg1vvv6.xml

All documents provided as attachments in Jira are downloaded to Github and linked here for convenience. However, since they are not properly versioned, they should be considered informal and therefore not be part of the verification baseline.

2.4 PMCS Activity

Primavera milestones related to the test campaign:

- LDM-503-14a

3   Personnel

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

T. Plan LVV-P79 owner:	**Gregory Dubois-Felsmann**		
T. Cycle LVV-C166 owner:	**Gregory Dubois-Felsmann**		
Test Cases	**Assigned to**	**Executed by**	**Additional Test Personnel**
LVV-T2171	Gregory Dubois-Felsmann	Gregory Dubois-Felsmann	Someone with credentials allowing access to the instance of the RSP at the IDF on which the data are deployed.
LVV-T2172	Gregory Dubois-Felsmann	Gregory Dubois-Felsmann	

4 Test Campaign Overview

4.1 Summary

T. Plan LVV-P79:	**LDM-503-14a: RSP redeployed on the Interim Data Facility (IDF), ready for DP0.1**	Approved
T. Cycle LVV-C166:	**LDM-503-14a: Test RSP capabilities on IDF for DP0.1 readiness**	Done

Test Cases	Ver.	Status	Comment	Issues

Of the requirements covered by this test case, the following should be regarded as substantively verified:

- DMS-NB-REQ-0007 (Pre-installed Containerized Software Releases)
- DMS-NB-REQ-0017 (Access to the API and Portal Aspects) - This test demonstrates that the connections can be made conveniently to the other Aspects (to TAP and to Firefly image visualization, respectively), and that is sufficient to verify the requirement. The details of what services are then usable is a matter for the requirements on those services themselves.
- DMS-NB-REQ-0030 (Access to Portal Visualization API)
- DMS-NB-REQ-0032 (Image Visualization)
- DMS-PRTL-REQ-0098 (Overlay Catalog of Sources and Objects on Images) - Verified as far as its use via Portal APIs from the Notebook Aspect is concerned.

The remainder should be regarded as partially verified, successfully as far as this test could determine, but still needing more comprehensive testing:

- DMS-NB-REQ-0001 (Secure Protocol) - Additional tests should more directly verify that the Notebook Aspect is *consistently* using secure connections
- DMS-NB-REQ-0005 (Interactive Python Environment) - A further test should verify that a Python shell is available in addition to the notebook interface
- DMS-NB-REQ-0009 (Data Access Middleware Availability) - A further test should verify the usability of the Butler to *write* output datasets in the Notebook Aspect

LVV-T2171	1	Pass		DM-32003 DM-32004 DM-32003 DM-32004

Portal version 2.3.3, executed on Safari 14.1.2 from a Mac on the public Internet, no VPN.

Of the requirements covered by this test case, the following should be regarded as substantively verified:

- DMS-PRTL-REQ-0015 (Generic Query)
- DMS-PRTL-REQ-0016 (Generic Query - Form Based)
- DMS-PRTL-REQ-0020 (Positional Query: Position on the Sky) - NB: Since only equatorial coordinates were tested, the related DMS-PRTL-REQ-0022, which is about the range of coordinate systems accepted, was not verified.
- DMS-PRTL-REQ-0026 (Positional Query by Region: Cone-Search)
- DMS-PRTL-REQ-0049 (Display of Tabular Data)
- DMS-PRTL-REQ-0050 (Column Selection of Tabular Data)
- DMS-PRTL-REQ-0054 (Paging of Tabular Data)
- DMS-PRTL-REQ-0055 (XY Scatter Plots)
- DMS-PRTL-REQ-0098 (Overlay Catalog of Sources and Objects on Images) - Also covered by LVV-T2171 in this same test cycle.
- DMS-PRTL-REQ-0106 (Linked Tables, Plots, and Images)

The following should be regarded as partially verified, successfully as far as this test could determine, but still needing more comprehensive testing:

- DMS-LSP-REQ-0010 (Transfer of Portal Data References to Notebook) - Only the Portal side of this was covered by this test case. However, note that the tests done under LDM-503-10a (test cycle LVV-C85) already provided a more comprehensive verification of this requirement.
- DMS-LSP-REQ-0014 (Download Data) - Only verified as far as downloading a tabular data result from the Portal Aspect is concerned. Downloading data from the Notebook Aspect should also be checked, and downloading data, regardless of Aspect, from the User File Workspace and User Database Workspace, should also be checked.
- DMS-PRTL-REQ-0076 (Image Plot Overlays) - Ver-

LVV-T2172	1	Pass	DM-31999
			DM-32000
			DM-32001
			DM-31999
			DM-32000
			DM-32001

Table 3: Test Campaign Summary

4.2 Overall Assessment

Not yet available.

4.3 Recommended Improvements

Not yet available.

5   Detailed Test Results

5.1   Test Cycle LVV-C166

Open test cycle *LDM-503-14a: Test RSP capabilities on IDF for DP0.1 readiness* in Jira.

Test Cycle name: LDM-503-14a: Test RSP capabilities on IDF for DP0.1 readiness
Status: Done

This test cycle contains the tests necessary to verify the readiness of the RSP as redeployed on the IDF to meet the needs of the DP0.1 exercise, essentially repeating tests previously carried out on the NCSA RSP deployments.

5.1.1   Software Version/Baseline

Not provided.

5.1.2   Configuration

Not provided.

5.1.3   Test Cases in LVV-C166 Test Cycle

5.1.3.1   LVV-T2171 - LDM-503-14a: Notebook Aspect access to a DP0.1 dataset in the IDF-deployed RSP

Version **1**. Open *LVV-T2171*   test case in Jira.

Verify the availability through the Notebook Aspect of the DP0.1 test dataset or an equivalent, including access to both catalogs and images via the Butler.

Preconditions:

Creation of the DP0.1 dataset or a stand-in, in the form of a Butler repository accessible from the Notebook Aspect and with associated catalog data in a TAP service in the same RSP instance at the IDF.

Execution status: **Pass**

Final comment:

Of the requirements covered by this test case, the following should be regarded as substantively verified:

- DMS-NB-REQ-0007 (Pre-installed Containerized Software Releases)
- DMS-NB-REQ-0017 (Access to the API and Portal Aspects) - This test demonstrates that the connections can be made conveniently to the other Aspects (to TAP and to Firefly image visualization, respectively), and that is sufficient to verify the requirement. The details of what services are then usable is a matter for the requirements on those services themselves.
- DMS-NB-REQ-0030 (Access to Portal Visualization API)
- DMS-NB-REQ-0032 (Image Visualization)
- DMS-PRTL-REQ-0098 (Overlay Catalog of Sources and Objects on Images) - Verified as far as its use via Portal APIs from the Notebook Aspect is concerned.

The remainder should be regarded as partially verified, successfully as far as this test could determine, but still needing more comprehensive testing:

- DMS-NB-REQ-0001 (Secure Protocol) - Additional tests should more directly verify that the Notebook Aspect is *consistently* using secure connections
- DMS-NB-REQ-0005 (Interactive Python Environment) - A further test should verify that a Python shell is available in addition to the notebook interface
- DMS-NB-REQ-0009 (Data Access Middleware Availability) - A further test should verify the usability of the Butler to *write* output datasets in the Notebook Aspect

Issues found during the execution of LVV-T2171 test case:

- DM-32003 Document that using Step numbers in test cases can be misleading

- DM-32004 Firefly "slate" in JupyterLab positions uploaded table off-screen

Detailed steps results:

Step 1	Step Execution Status: **Pass**

Description

In the following step:

1. Note that the URL for the IDF-deployed RSP, provided as test data here, is not the NCSA one in the included-by-reference test case LVV-T837.
2. Please record the options for available releases presented when the Notebook Aspect is starting up.

— —

Test Data

https://data.lsst.cloud/

— —

Expected Result

Availability of a set of predefined releases is relevant to the verification of DMS-NB-REQ-0007 (Pre-installed Containerized Software Releases).

— —

Actual Result

Step 2	Step Execution Status: **Pass**

Description

Authenticate to the notebook aspect of the LSST Science Platform (NB-LSP). This is currently at https://lsst-lsp-stable.ncsa.illinois.edu/nb.

— —

Expected Result

Redirection to the spawner page of the NB-LSP allowing selection of the containerized stack version and machine flavor.

— —

Actual Result

Authenticated to data.lsst.cloud using GitHub credentials.

Step 3   Step Execution Status: **Pass**

Description

Spawn a container by:

1) choosing an appropriate stack version: e.g. the latest weekly.

2) choosing an appropriate machine flavor: e.g. medium

3) click "Spawn"

— —

Expected Result

Redirection to the JupyterLab environment served from the chosen container containing the correct stack version.

— —

Actual Result

Used "Recommended (Weekly 2021_33)". Other available versions in attached image.

Step 4   Step Execution Status: **Pass**

Description

Record the full URL including scheme of the Notebook Aspect interface in the browser.

— —

Expected Result

The URL should begin with "https:". This addresses requirement DMS-NB-REQ-0001 (Secure Protocol).

— —

Actual Result

"https://data.lsst.cloud/nb/user/gpdf/lab?"

Step 5   Step Execution Status: **Pass**

Description

Use the file browser on the left of the JupyterLab UI to open the "LSST Catalog Access Tutorial" notebook.

— —

Expected Result

Execution of this notebook and the one in Step 5 provide test coverage for the "notebook interface" part of the requirement DMS-NB-REQ-0005 (Interactive Python Environment).

— —

Actual Result

Note error in instructions - the correct notebook is "DC2_catalog_access", from the system-test directory, modified for the DC2 dataset.

Note that the reference to "Step 5" above is to a step in the as-written script, but in the as-displayed-in-test-runner script, it's Step 7 because of the expansion of a nested test case.

— —

Issues found executing this step:

- DM-32003 Document that using Step numbers in test cases can be misleading

Step 6	Step Execution Status: **Pass**

Description

Execute the notebook. Take note of any errors encountered along the way.

Record explicitly that API Aspect TAP queries were performed.

— —

Expected Result

Access to the API Aspect's TAP service provides partial test coverage for DMS-NB-REQ-0017 (Access to the API and Portal Aspects).

— —

Actual Result

In cell 1's output, the text

```
Patching auth into notebook.base.handlers.IPythonHandler(notebook.base.handlers.AuthenticatedHandler) -> IPythonHandler(ju
```

is shown with a red background as if it were an error, but it is a normal part of the operation of the code.

The expected schemas, including "dp01_dc2_catalogs", are shown in cells 2 and 3.
The five expected DP0.1 tables are shown in cell 4.
The cone and polygon searches were successful.
The async search was successful. Full pass.

Step 7	Step Execution Status: **Pass**

Description

Use the file browser on the left of the JupyterLab UI to open the "Firefly" notebook.

Expected Result

Actual Result

Opened as expected.

| Step 8 | Step Execution Status: **Pass** |

Description

Execute the notebook. Take note of any errors encountered along the way.

Record explicitly the interaction with the Butler in this test notebook.

Record explicitly the use of afw.display and the observation of images being displayed using the Portal (Firefly) tools.

Expected Result

Successful use of the Butler provides test coverage for DMS-NB-REQ-0009 (Data Access Middleware Availability).

Availability of afw.display in the notebook and its use to visualize an image obtained from the Butler provides test coverage for DMS-NB-REQ-0032 (Image Visualization).

Successful use of the Portal for image visualization provides test coverage for DMS-NB-REQ-0030 (Access to Portal Visualization API).

Actual Result

The Butler provided two test images' dataIds, and the retrieval of the selected one was successful.
afw.display was used to produce an image display in the Firefly extension.
Masks were successfully displayed and the Firefly mask menu matched the output in the notebook.
afw.display was successfully used to overlay catalog data on the image.
Separately, firefly_client was successfully used to overlay a browsable table on the image and create a plot.
The known problem with the initial positioning of the table in the Firefly extension window (cell 19 of the test) was observed. This is not sufficiently severe to merit a "pass with deviation", as this use of the Firefly API is beyond the requirements coverage of this test, but it has been reported as a ticket and will be addressed.

Issues found executing this step:

- DM-32004 Firefly "slate" in JupyterLab positions uploaded table off-screen

---

Step 9	Step Execution Status: **Pass**

Description
Log out of the Notebook Aspect.

‒ ‒

Expected Result

‒ ‒

Actual Result

5.1.3.2   LVV-T2172 - LDM-503-14a: Portal Aspect access to a DP0.1 dataset in the IDF-deployed RSP

Version **1**. Open *LVV-T2172*   test case in Jira.

Verify the availability through the Portal Aspect to catalog data from the DP0.1 test dataset or an equivalent, via an RSP TAP service on the IDF. The emphasis will be on an Object-like catalog.

 Preconditions:
Creation of the DP0.1 dataset or a stand-in, and service of the associated catalog data and schema in a TAP service in the same RSP instance at the IDF.

Execution status: **Pass**

Final comment:

Portal version 2.3.3, executed on Safari 14.1.2 from a Mac on the public Internet, no VPN.

Of the requirements covered by this test case, the following should be regarded as substantively verified:

- DMS-PRTL-REQ-0015 (Generic Query)
- DMS-PRTL-REQ-0016 (Generic Query - Form Based)
- DMS-PRTL-REQ-0020 (Positional Query: Position on the Sky) - NB: Since only equatorial coordinates were tested, the related DMS-PRTL-REQ-0022, which is about the range of coordinate systems accepted, was not verified.
- DMS-PRTL-REQ-0026 (Positional Query by Region: Cone-Search)
- DMS-PRTL-REQ-0049 (Display of Tabular Data)
- DMS-PRTL-REQ-0050 (Column Selection of Tabular Data)
- DMS-PRTL-REQ-0054 (Paging of Tabular Data)
- DMS-PRTL-REQ-0055 (XY Scatter Plots)
- DMS-PRTL-REQ-0098 (Overlay Catalog of Sources and Objects on Images) - Also covered by LVV-T2171 in this same test cycle.
- DMS-PRTL-REQ-0106 (Linked Tables, Plots, and Images)

The following should be regarded as partially verified, successfully as far as this test could determine, but still needing more comprehensive testing:

- DMS-LSP-REQ-0010 (Transfer of Portal Data References to Notebook) - Only the Portal side of this was covered by this test case. However, note that the tests done under LDM-503-10a (test cycle LVV-C85) already provided a more comprehensive verification of this requirement.
- DMS-LSP-REQ-0014 (Download Data) - Only verified as far as downloading a tabular data result from the Portal Aspect is concerned. Downloading data from the Notebook Aspect should also be checked, and downloading data, regardless of Aspect, from the User File Workspace and User Database Workspace, should also be checked.
- DMS-PRTL-REQ-0076 (Image Plot Overlays) - Verified for astrophysical coordinates in both direct Portal usage and in Portal-used-from-Notebook visualization. Not verified

for pixel coordinates in pure Portal usage. Demonstrated via afw.display for pixel coordinates in Portal-used-from-Notebook visualization.

- DMS-PRTL-REQ-0090 (Simple Filtering of Tabular Data) - Partially covered by the basic tests done, but should be subjected to a test more focused on this particular behavior.
- DMS-PRTL-REQ-0092 (Filtering of Tabular Data by Multiple Columns) - Partially covered by the basic tests done, but should be subjected to a test more focused on this particular behavior.
- DMS-PRTL-REQ-0095 (Saving Displayed Tabular Data) - Partially covered by this test case. More comprehensively covered previously by LDM-503-10a (LVV-C85) and ready for review based on that.
- DMS-PRTL-REQ-0107 (Data Selection from a Plot or Image) - Verified but only for rectangular selections, not arbitrary polygons.

The following requirements were not found to be fully satisfied by this test case at this time, and will need re-verification at a future date:

- DMS-LSP-REQ-0017 (Tabular Data Download File Formats) - Only checked against Portal Aspect table downloads; in this usage, no option for FITS binary table download was presented (except as the payload of a VOTable with FITS as its internal format). Not checked for direct API Aspect (i.e., TAP) access.

Issues found during the execution of LVV-T2172 test case:

- DM-31999 Fix nested utility test cases with explicit references to the NCSA RSP

- DM-32000 Firefly: incorrect double-click for negative floating-point numbers

- DM-32001 Investigate VOTable output format versions available in Firefly

Detailed steps results:

Step 1	Step Execution Status: **Pass**
Description	

Navigate to the Portal Aspect endpoint. The stable version should be used for this test and is currently located at: https://lsst-lsp-stable.ncsa.illinois.edu/portal/app/ .

— —

Expected Result
A credential-entry screen should be displayed.

— —

Actual Result
Used https://data.lsst.cloud for this - the NCSA URL was in a old nested test case used for this test without realizing the address was embedded.

— —

Issues found executing this step:

- DM-31999 Fix nested utility test cases with explicit references to the NCSA RSP

Step 2	Step Execution Status: **Pass**

Description
Enter a valid set of credentials for an LSST user with LSP access on the instance under test.

— —

Expected Result
The Portal Aspect UI should be displayed following authentication.

— —

Actual Result
Used the tester's GitHub credentials for IDF login.

Step 3	Step Execution Status: **Pass**

Description
Navigate to the TAP Search screen

— —

Expected Result

— —

Actual Result
TAP search remains the default screen.

Step 4   Step Execution Status: **Pass**

Description

Ensure that the TAP service internal to the RSP instance is selected. (This should be the default choice.)

Record the list of available table collections ("schemas").

— —

Expected Result

A list of "schemas" available on that service should be displayed, along with a list of tables in the default schema.

— —

Actual Result

RSP-internal TAP service was indeed the default (https://data.lsst.cloud/api/tap).
Schemas:

- dp01_dc2_catalogs (default selection), with tables:
    - object (default selection)
    - truth_match
    - position
    - reference
    - forced_photometry

- tap_schema
- uws

Step 5   Step Execution Status: **Pass**

Description

Select the TAP table collection / "schema" for the data to be queried (see test parameter).

Record the list of available tables in that schema.

— —

Test Data

dp01_dc2_catalogs

— —

Expected Result

A list of tables in the selected schema should be displayed.

The ability to query any table from the list of schemas and tables is intended to satisfy DMS-PRTL-REQ-0015 (Generic Query).

— —

Actual Result

As an experiment, was able to switch to tap_schema schema and see the standard five tables.

Switched back to the required schema and saw the same tables noted in step 4 above.

Step 6	Step Execution Status: **Pass**

Description

Select the catalog table to be queried (see test parameter).

— —

Test Data

object

— —

Expected Result

A search interface for the selected table should be presented.

This interface is intended to satisfy DMS-PRTL-REQ-0016 (Generic Query - Form-Based).

— —

Actual Result

"object" selected.

"Spatial" query form displayed unchecked but expanded (correct); "Temporal" unexpanded (correct).

Column-selection-and-constraint form displayed with a subset of columns preselected, as expected.

Step 7	Step Execution Status: **Pass**

Description

Enter the sky coordinates of the location to be tested (see test parameter) in the "Spatial" query-builder element on the left of the screen.

(Note that the test dataset is likely to be of limited extent on the sky.) Enter 100 arcseconds as the search radius.

— —

Test Data

(60,-35)

— —

Expected Result

The cone-search form query interface tested here is intended to satisfy DMS-PRTL-REQ-0020 (Positional Query: Position on the Sky) and DMS-PRTL-REQ-0026 (Positional Query by Region: Cone-Search).

— —

Actual Result

Coordinate-selection box help changed as expected to show the sexagesimal equivalent of the coordinates entered.

"Spatial" selector checkbox automatically selected once valid coordinates entered, as expected.

Step 8   Step Execution Status: **Pass**

Description

Verify that a list of available columns is displayed on the right of the search screen. Note in the test report whether a subset of the available columns is highlighted with a check mark, and if so which columns they are.

— —

Expected Result

— —

Actual Result

Column list with units and descriptions displayed.

"objectId", "parentObjectId", "ra", and "dec" displayed at the top and selected. Remainder of columns in alphabetical order.

Following subset checked:

- blendedness
- clean
- cModelFlux_flag_*
- extendedness
- good
- mag_*_cModel
- magerr_*_cModel
- patch
- snr_*_cModel
- tract

Step 9   Step Execution Status: **Pass**

Description

Execute the search.

— —

Expected Result

Possibly after the display of an in-progress indication, a search result should be displayed in the "tri-view" - a coverage image on the upper left, a default X-Y plot on the upper right, and the tabular query result on the bottom.

Note that if the dataset is simulated, the coverage image may not correspond to the catalog data. (It is not a requirement of DP0.1 for a coverage image for DESC DC2 to be created or made available in the Portal Aspect.)

The table viewer is intended to satisfy DMS-PRTL-REQ-0049 (Display of Tabular Data).

Overplotting of the table on the coverage image is intended to satisfy DMS-PRTL-REQ-0076 (Image Plot Overlays) and DMS-PRTL-REQ-0098 (Overlay Catalog of Sources and Objects on Images). Additional aspects of this are tested in subsequent steps.

— —

Actual Result

Tri-view displayed as expected. Default plot is ra (x-axis, reversed) versus dec (y-axis).

Step 10	Step Execution Status: **Pass**

Description

Verify that the query result covers the expected region of sky, and that the expected set of columns is included in the query result. Record the number of rows returned by the query.

Record the identity displayed for the coverage image.

— —

Expected Result

— —

Actual Result

1,158 rows in query result.
Table columns displayed correspond to checkboxes in step 8.
"2MASS K_s" atlas image cutout used for coverage. Switching to "HiPS" displays a 2MASS 3-color image.
Table data and image and plot coordinate display confirm the expected circular search region.
Min/max ra, dec: 59.9904647/60.0335178 , -35.0275985/-34.9723076 (obtained via sorting table)
Distance-measuring tool confirms ~200 arcsec diameter.

— —

Issues found executing this step:

- DM-32000 Firefly: incorrect double-click for negative floating-point numbers

---

Step 11   Step Execution Status: **Pass**

Description
Verify that the set of columns displayed in the table can be modified using the Table Options dialog available from the "gears" button in the table toolbar.

— —

Expected Result
The ability to select a subset of the available columns for viewing is intended to satisfy DMS-PRTL-REQ-0050 (Column Selection of Tabular Data).

— —

Actual Result
Used dialog to select (via column filter) all "flag" columns in the dialog, and uncheck them in bulk.   Verified that they disappeared from the displayed table.

Step 12   Step Execution Status: **Pass**

Description
Verify that the table is displayed in a "paged" manner.   Record the initial page size.   Verify that the page size can be changed.

— —

Expected Result
The ability to display a paged view of a table is intended to satisfy DMS-PRTL-REQ-0054 (Paging of Tabular Data).

— —

Actual Result
Displayed with initial page size of 100.   Page size changed to 500 (three pages) and 1500 (displaying table all at once) with the expected results.   No discernable change in table performance with the increased size.

Step 13   Step Execution Status: **Pass**

Description
Verify that the X-Y plot can be modified to display a user-selected pair of columns, using the plot options dialog available from the "gears" button in the plot toolbar.

— —

Expected Result

The scatter plot facility is meant to satisfy DMS-PRTL-REQ-0055 (XY Scatter Plots).

— —

Actual Result

Verified ability to create a plot of (mag_r_cModel - mag_i_cModel) versus mag_r_cModel.

| Step 14 | Step Execution Status: **Pass** |

Description

Verify that highlighted rows in the table, points in the X-Y plot, and marks on the coverage image are connected.

— —

Expected Result

The linkages between highlighted points in the three panes of the tri-view are intended to satisfy DMS-PRTL-REQ-0106 (Linked Tables, Plots, and Images).

— —

Actual Result

Verified that clicking on points/rows in each view highlighted corresponding points/rows in the other views.

| Step 15 | Step Execution Status: **Pass** |

Description

Verify that selections made in the three panes of the tri-view are reflected in the other panes.

— —

Expected Result

The ability to perform linked selections graphically is intended to satisfy DMS-PRTL-REQ-0107 (Data Selection from a Plot or Image).

The ability to perform selections (by filtering) on a table satisfies DMS-PRTL-REQ-0090 (Simple Filtering of Tabular Data) and DMS-PRTL-REQ-0092 (Filtering of Tabular Data by Multiple Columns).

— —

Actual Result

Verified that rectangular selections in the image and/or plot transferred to checkbox selections in the table after clicking on the "checkmark" icon.
Verified that checkbox selections in the table were reflected by (yellow) highlights in the image and plot.

| Step 16 | Step Execution Status: **Pass** |

Description

Use the "diskette" icon in the table viewer toolbar to save the tabular query result as an attachment to the test

record. Use the VOTable "TableData" format, but record all the download format options presented.

— —

Expected Result

This capability partially satisfies (just for the Portal) DMS-LSP-REQ-0014 (Download Data).

VOTable and CSV should be supported for now. For full coverage of DMS-LSP-REQ-0017 (Tabular Data Download File Formats), FITS must also be an option.

The ability to save a displayed table is intended to satisfy DMS-PRTL-REQ-0095 (Saving DIsplayed Tabular Data).

— —

Actual Result

Verified table saved as VOTable 1.2. Options presented shown in image, and are: IPAC table, CSV, TSV, VOTable-TABLEDATA, VOTable-BINARY2, and VOTable-FITS.

— —

Issues found executing this step:

- DM-32001 Investigate VOTable output format versions available in Firefly

Step 17	Step Execution Status: **Pass**

Description

Click on the 'i'-in-a-circle button in the table viewer. Use the resulting dialog to record the URL for the query job result, and to download the XML file at that URL and save it as an attachment in the test record.

— —

Expected Result

This capability provides a basic implementation of the Portal side of the requirement DMS-LSP-REQ-0010 (Transfer of Portal Data References to Notebook).

— —

Actual Result

Job URL: https://data.lsst.cloud/api/tap/async/xz1o60x1tpg1vvv6

Query text is reflected in the XML:

- SELECT objectId,parentObjectId,ra,dec,blendedness,clean,cModelFlux_flag_g,cModelFlux_flag_i ,cModelFlux_flag_r,cModelFlux_flag_u,cModelFlux_flag_y,cModelFlux_flag_z,extendedness,good ,mag_g_cModel,mag_i_cModel,m ,magerr_i_cModel,magerr_r_cModel,magerr_u_cModel,magerr_y_cModel,magerr_z_cModel,patch ,snr_g_cModel,snr_i_cMo FROM dp01_dc2_catalogs.object WHERE CONTAINS(POINT('ICRS', ra, dec),CIRCLE('ICRS', 60, -35, 0.027777777777777776))=1

A   Documentation

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

B   Acronyms used in this document

Acronym	Description
2MASS	Two-Micron All Sky Survey
API	Application Programming Interface
CSV	Comma Separated Values
DC2	Data Challenge 2 (DESC)
DESC	Dark Energy Science Collaboration
DM	Data Management
DMS	Data Management Subsystem
DMTN	DM Technical Note
DP0	Data Preview 0
FITS	Flexible Image Transport System
IDF	Interim Data Facility
IPAC	No longer an acronym; science and data center at Caltech
LDM	LSST Data Management (Document Handle)
LSE	LSST Systems Engineering (Document Handle)
LSP	LSST Science Platform (now Rubin Science Platform)
LSST	Legacy Survey of Space and Time (formerly Large Synoptic Survey Telescope)
LVV	LSST Verification and Validation
NCSA	National Center for Supercomputing Applications
PMCS	Project Management Controls System
RSP	Rubin Science Platform
RTN	Rubin Technical Note
SE	System Engineering
TAP	Table Access Protocol
UI	User Interface

URL	Universal Resource Locator
VPN	virtual private network
XML	eXtensible Markup Language
arcsec	arcsecond second of arc (unit of angle)