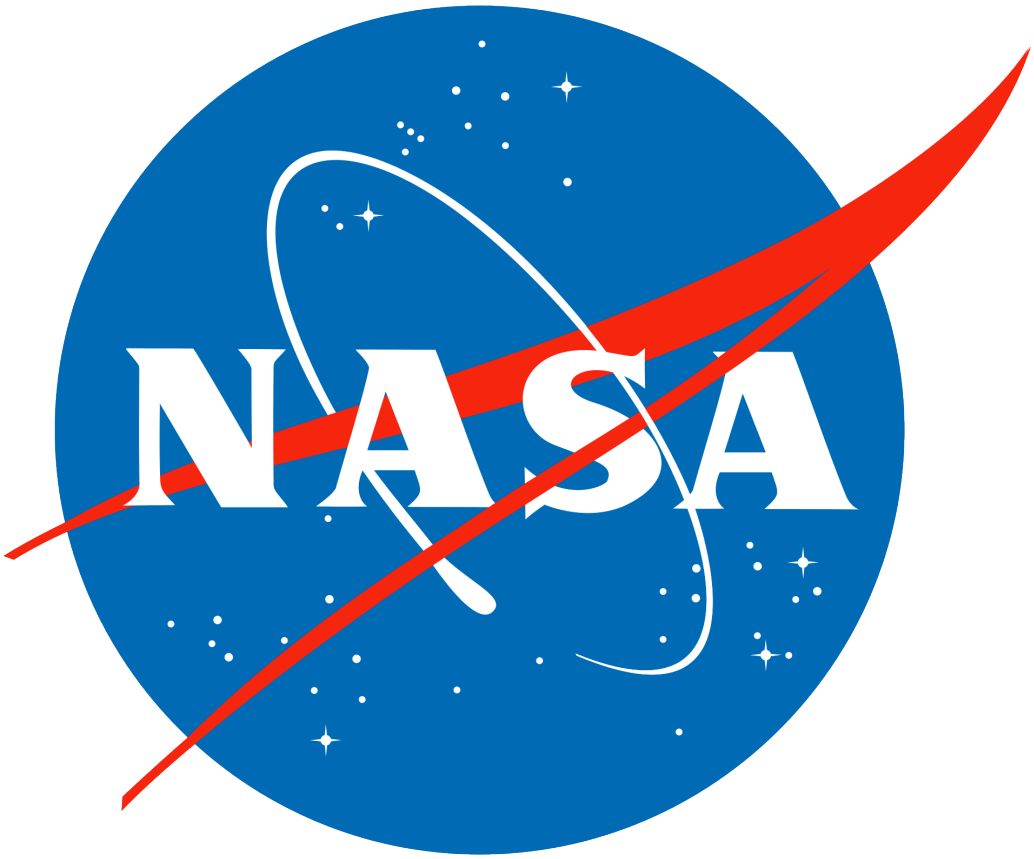
Plan Document

NASA Planetary Data System
PDS4 Build 3b
Node Testing Plan



Change Log

Revision	Date	Description	Author
1	July 29, 2013	Initial Release	Richard Chen, Emily Law

Contents

1 Introduction

For over fifteen years, the Planetary Data System (PDS) has been NASA's official data system for archiving and distribution of data from planetary exploration missions. It has been a leader in defining data standards, working with missions and instrument teams, and developing data system technologies. The PDS has been instrumental in changing the scientific culture by working with the planetary science community to publicly release and peer review the data it captures. It has also been used as a model by other science data systems interested in establishing distributed scientific networks organized by independent discipline nodes at facilities that are doing leading-edge scientific research.

While PDS has been a leader in developing and exploiting new technologies and ideas, an increasing workload and substantial increases in the volume of delivered data are now threatening the system's ability to accomplish its primary missions of both archiving planetary science data and distributing it to working scientists. PDS identified these challenges in its Roadmap published in 2006. In addition to these challenges, the ten year Roadmap outlined several goals including improving the PDS data standards, increasing user services by leveraging newer technologies and technical standards, and re-architecting PDS to ensure efficient operations of the system while supporting the increasing demands on PDS by both the data providers and end users.

In response to these challenges and goals, PDS has developed a plan for the next generation. The vision, as defined by the PDS Management Council at its April 2008 meeting, includes:

- Simplified, but rigorous, archiving standards that are consistent, easy to learn, and easy to use
- Adaptable tools for designing archives, preparing data, and delivering the results efficiently to PDS
- On-line services allowing users to access and transform data quickly from anywhere in the system
- A highly reliable, scalable computing infrastructure that protects the integrity of data, links the nodes into an integrated data system, and provides the best service to both data providers and users

1.1 Purpose

The purpose of this plan is to ensure that the new system and the new Standards called "PDS4" are compliant with requirements, meet customers' needs and are free of major defects. This document describes the test activities and contains test cases that demonstrate compliance to requirements. It documents the test scenarios for verification and validation of the system

components and data products in an integrated manner. These scenarios are traced to the new PDS4 system design requirements that in turn are traced to high level of PDS requirements.

1.2 Scope

This plan, in conjunction with PDS4 Build 3b Test Plan http://pds-engineering.jpl.nasa.gov/pds2010/build3bdeliverables/build3bTestPlanEN.pdf, describes the plan for verification and validation of Build 3b of the PDS4 system and Standards. The scope of the release is to support data providers and Discipline Nodes in developing PDS4 data products both for new missions and data migration. Recent releases of PDS4 have been scoped to support the LADEE and MAVEN missions as early adopters. Future, incremental releases will target data users as PDS4 data is available within the PDS.

This test plan specifically describes the plan for verification and validation that demonstrate the PDS4 Build 3b system deployed at the PDS Discipline Nodes. This test plan document identifies the planned test cases for ensuring that PDS4 is implemented and working correctly end to end from registration of data bundle/product at the Nodes and discoverable and accessible via the PDS portal. The specific test procedures will be documented in the Build 3b Node Testing and Procedures designed to report specific test steps and their results recorded by EN test staff. The Build 3b Node Test Report (http://pds-engineering.jpl.nasa.gov/pds2010/build3bdeliverables/build3bProceduresReportNodes.pdf), will be generated upon completion.

For PDS4 Build 3b, the following software have been deployed at the Discipline Nodes:

- Ingest: Harvest
- Preparation: Design, Validate
- Registry
- Search: Service

Detailed release description documents facilitate and detail the deployment activities.

1.3 Document Revision

Revisions of this document will be held in the PDS Engineering Node website through the use of its document history functionality.

1.4 Applicable Documents

1.4.1 Controlling Documents

[1] Planetary Data System Strategic Roadmap 2006 - 2016, February 2006.

[2] Planetary Data System Level 1, 2 and 3 Requirements, March 2010.

1.4.2 Referenced Documents

[3] PDS4 Project Plan, July 2013.

[4] PDS4 Operations Concept, September 2013.

[4] System Architecture Specification, September 2013.

[5] General System Requirements, September 2013.

[6] Software Requirements and Design, 2013

[7] PDS4 Standards Documents, 2013and Design, 2012

2 Test Approach

The PDS4 build structure is organized such that the system can be tested and verified early on and to ensure that transition will be seamless. The builds will ensure there is a coordinated testing and deployment of functionality coupled with upgrades of the data standards.

Build 3b testing includes two sets of testing:

1. Infrastructure deployed at the EN
2. Functions installed at the Nodes

EN Integration and Test team had performed the first set of generic tests. The test plan and procedures are documented in PDS4 Build 3b Test Plan

(http://pds-engineering.jpl.nasa.gov/pds2010/build3bdeliverables/build3bTestPlanEN.pdf) and PDS4 Build 3b Test Procedures and Report

(http://pds-engineering.jpl.nasa.gov/pds2010/build3bdeliverables/build3bProceduresReportEN.pdf)The tests cover testing of all tools and services to support PDS4 data validation, registration, and search.

EN staff also need to test the PDS4 functions installed at the Node. The tests describe in this plan and associated PDS4 Build 3b Node Test Procedures and Report (posted on

http://pds-engineering.jpl.nasa.gov/pds2010/build3bdeliverables/build3bProceduresReportNodes.pdf)cover testing and test results of specific tools and services required to support PDS4 data products validation, registration, and search used by the Nodes.

3 Test Cases

EN will generate a set of product classes representative of LADEE and MAVEN's usage, including data and labels sufficient to test against PDS4 functions (section 3.1 below).

These tests should be run as regression to re-test the system after software changes.

3.1 Testing

The PDS4 software for this build includes specific tools and services to support PDS4 data validation, registration, and search used by the Nodes. They are deemed sufficient to meet the needs of data providers, focused on the needs of LADEE & MAVEN. The following test cases are designed for testing this set of tools and services.

Test Case ID	NODESTEST.1
Description	Use a design tool to create PDS4 labels for products, and associated context (including bundle, collection, investigation archive webpage, investigations, resources) based on PDS's schema.
Requirements	L5.PRP.DE.1-7
Success Criteria	Design tool produces a syntactically valid PDS Product Label else indicates where the label is invalid.

Test Case ID	NODESTEST.2
Description	Validate Node-developed PDS4 product labels generated in NODESTEST.1 using the PDS4 Validate Tool.
Requirements	L5.PRP.VA.1-.3, L5.PRP.VA.5-9
Success Criteria	Validation tool validates a file or all eligible products in a directory tree, indicates the schemas utilized during the validation, and ensures that a product label is well formed XML and conforms to its schemas.

Test Case ID	NODESTEST.3
Description	Use Harvest Tool to register PDS4 product labels, bundles, and collections generated in NODESTEST.1. Context products will be registered by EN.
Requirements	L5.HVT.1-2, L5.HVT.4-8, L5.REG.1-4, L5.REG.6, L5.REG.8
Success Criteria	Harvest tool, based on criteria given in a user-edited configuration file, discovers all matching artifacts and for each submits metadata to the Registry service. Tools to view the registry show the metadata of the matching artifacts.

Test Case ID	NODESTEST.4
Description	Find registered products using PDS Home Page Data Search and download products from the Node.

Requirements	L5.SCH.1, L5.SCH.6-8, L5.SCH.10-11
Success Criteria	Search returns the data harvested in the previous step and the data can be downloaded.

4 Requirements Traceability

This following lists the requirement number, the ID of the planned test case that tests the requirement, and the system component that the requirement applies to. The first column of the table is just a count of the requirements. Note that there are a number of requirements that will not be tested against using the test cases specified in this test plan. Those testing are covered by test cases specified in the Build3b Test Plan that are performed by the EN Integration and Test team.

For Test case specific procedures, please refer to the Build 3b Node Testing procedure and report document.

Count	System Component	Requirement #	Test case ID
1	Harvest Tool	L5.HVT.1	NODESTEST.3
2	Harvest Tool	L5.HVT.2	NODESTEST.3
3	Harvest Tool	L5.HVT.4	NODESTEST.3
4	Harvest Tool	L5.HVT.5	NODESTEST.3
5	Harvest Tool	L5.HVT.6	NODESTEST.3
6	Harvest Tool	L5.HVT.7	NODESTEST.3
7	Harvest Tool	L5.HVT.8	NODESTEST.3
8	Prep: Design Tool	L5.PRP.DE.1	NODESTEST.1
9	Prep: Design Tool	L5.PRP.DE.2	NODESTEST.1
10	Prep: Design Tool	L5.PRP.DE.3	NODESTEST.1
11	Prep: Design Tool	L5.PRP.DE.4	NODESTEST.1
12	Prep: Design Tool	L5.PRP.DE.5	NODESTEST.1
13	Prep: Design Tool	L5.PRP.DE.6	NODESTEST.1
14	Prep: Design Tool	L5.PRP.DE.7	NODESTEST.1
15	Prep: Validation Tool	L5.PRP.VA.1	NODESTEST.2
16	Prep: Validation Tool	L5.PRP.VA.2	NODESTEST.2
17	Prep: Validation Tool	L5.PRP.VA.3	NODESTEST.2
18	Prep: Validation Tool	L5.PRP.VA.5	NODESTEST.2
19	Prep: Validation Tool	L5.PRP.VA.6	NODESTEST.2
20	Prep: Validation Tool	L5.PRP.VA.7	NODESTEST.2
21	Prep: Validation Tool	L5.PRP.VA.8	NODESTEST.2
22	Prep: Validation Tool	L5.PRP.VA.9	NODESTEST.2
23	Registry Service	L5.REG.1	NODESTEST.3
24	Registry Service	L5.REG.2	NODESTEST.3
25	Registry Service	L5.REG.3	NODESTEST.3
26	Registry Service	L5.REG.4	NODESTEST.3
27	Registry Service	L5.REG.6	NODESTEST.3
28	Registry Service	L5.REG.8	NODESTEST.3
29	Search Service	L5.SCH.1	NODESTEST.4
30	Search Service	L5.SCH.6	NODESTEST.4
31	Search Service	L5.SCH.7	NODESTEST.4
32	Search Service	L5.SCH.8	NODESTEST.4
33	Search Service	L5.SCH.10	NODESTEST.4
34	Search Service	L5.SCH.11	NODESTEST.4

5 Configuration Management and Issue Tracking

Build 3b release will be uniquely identified and under configuration management. PDS Configuration Management (CM) process will be utilized. It will be followed and maintained by the Operations Team who will act as the configuration management process engineer.

The established PDS JIRA system will be used to capture discrepancies found during testing. The system is located at:

http://oodt.jpl.nasa.gov/jira/

6 Test Environment

Please refer to software installation procedures.

Appendix A: Acronyms

CM – Configuration Management
DN – PDS Discipline or Data Node
GUI – Graphical User Interface
EN – PDS Engineering Node
I&T – Integration and Test
NASA – National Aeronautics and Space Administration
OS – Operating System
PDS – Planetary Data System
PDS3 – Version 3.8 of the PDS Data Standards
PDS4 – Version 4.0 of the PDS Data Standards
PDS MC – PDS Management Council
SDD – Software Design Document
SRD – Software Requirements Document