



PDS4 Build 6a

Engineering Node

September 2015

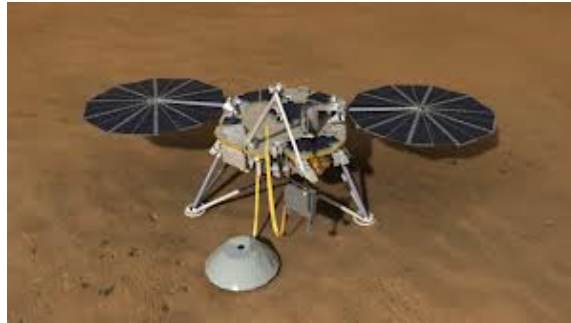
PDS4 MC Topics

- Build 6a
- CCB
- Software Tools
- DDWG Updates
- IPDA
- FY16 Planning

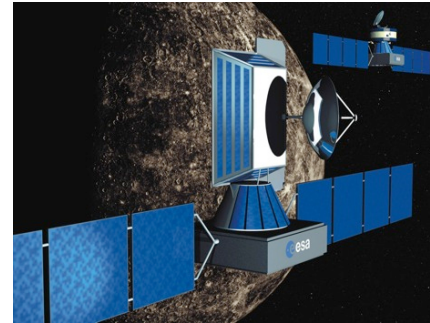
PDS4 Planned Mission Support



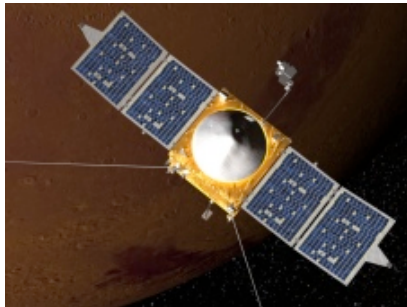
LADEE (NASA)



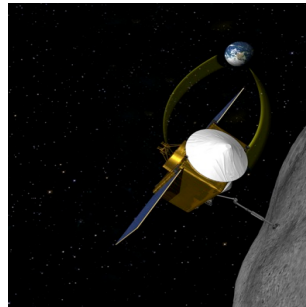
InSight (NASA)



BepiColumbo (ESA/JAXA)



MAVEN (NASA)



Osiris-REx (NASA)




























**ExoMars
(ESA/Russia)**



**JUICE
(ESA)**

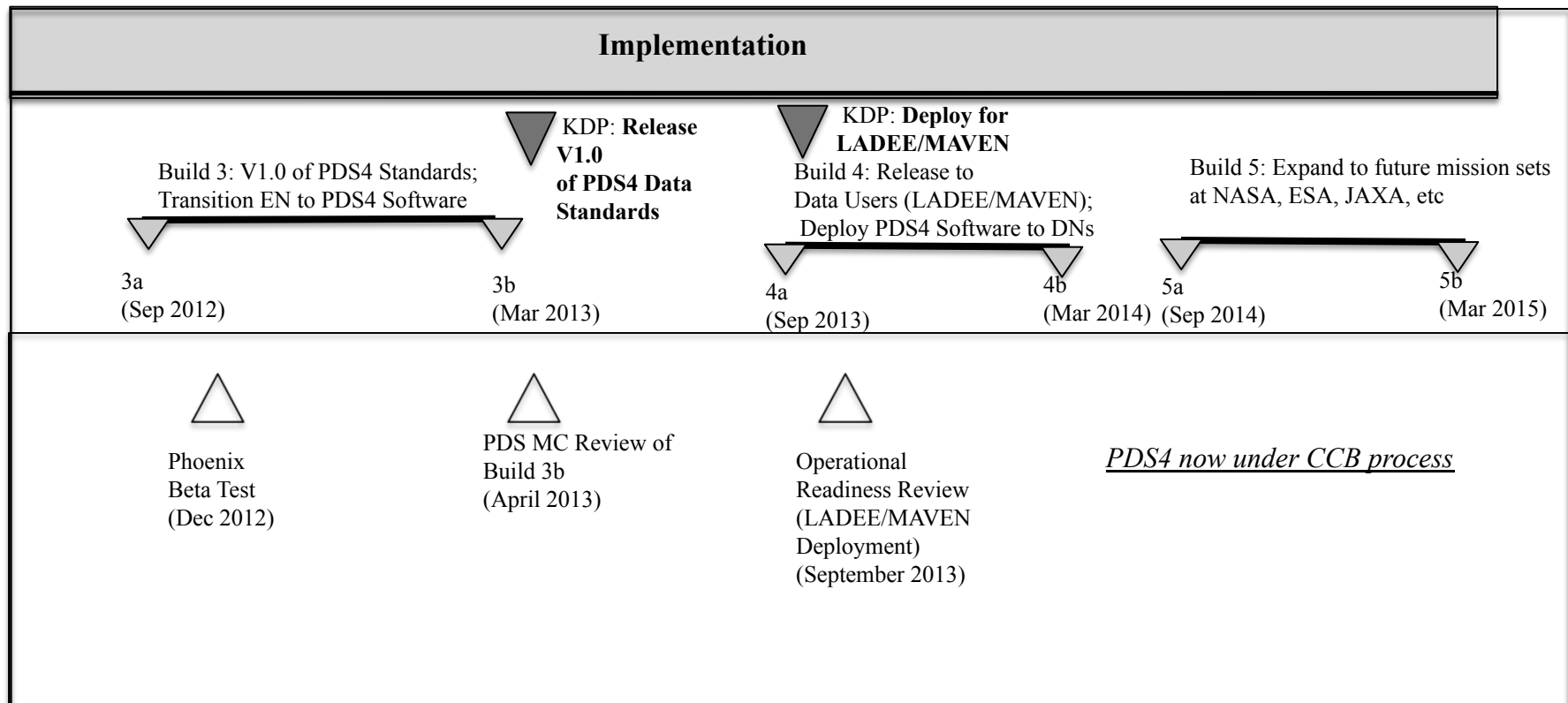
...also Hyabussa-2, Chandryaan-2, Mars 2020

Project Lifecycle thru Build 3

Project Lifecycle	Pre-Formulation	Formulation	Implementation			
Project Lifecycle Gates & Major Events	 Begin Study Project  KDP: Study  Study/Concepts	 Project Plan  KDP: Project Plan & Arch  PDS4 Prelim Architecture	 KDP: Prelim Design  PDS4 Design	 1a (Oct 2010)  1b  1c  1d (Aug 2011) Build 1: Prototype build		 KDP: Beta Release for LADEE/ MAVEN  2a (Sept 2011)  2b (Mar 2012) Build 2: Prepare for label design
Project Reviews	 PDS MC Concept Review (Dec 2007)	 PDS MC Impl Review (July 2008)  PDS MC Arch Review (Nov 2008)	 PDS MC Preliminary Design (August 2009)  PDS External System Design Review I (Mar 2010)	 Build 1b PDS Stds Assessment (Dec 2010)  Build 1c IPDA Stds Assessment (April 2011)	 PDS External System Design Review II (June 2011)  Build 1d External Stds Assessment (Aug 2011)	 ORR (Start Label Design) (LADEE/ MAVEN) (November 2011)

Architecture, requirements, design, test, releases posted at:
<http://pds-engineering.jpl.nasa.gov>

Build 4 and 5



We will continue this rhythm for 6a/6b to coordinate between design, deployment and operations...

Build 6a Deliverables

This page lists and provides links to the deliverables for PDS4 Build 6a release (10/05/2015). The Build 6a deliverables consist of the PDS4 documents and the PDS4 system software distribution (including documentation).

Documents, Schemas and Examples

- [Schemas](#)
 - [Documents/Examples](#)
-

Software

System software release [5.X.0](#) represents the software portion of the Build 6a delivery.

Testing

The following documents are artifacts for testing the Build 6a release:

- [Requirements traceability](#) (traces system and node test cases to PDS4 L4/L5 requirements that are derived from PDS L3 requirements).
- [Build 6a system test document](#) (documents test cases, test procedures and test results meeting all requirements implemented in Build 6a system). A traceability of test cases is appended to the end of the document.
- [Test Data \(.zip\)](#)

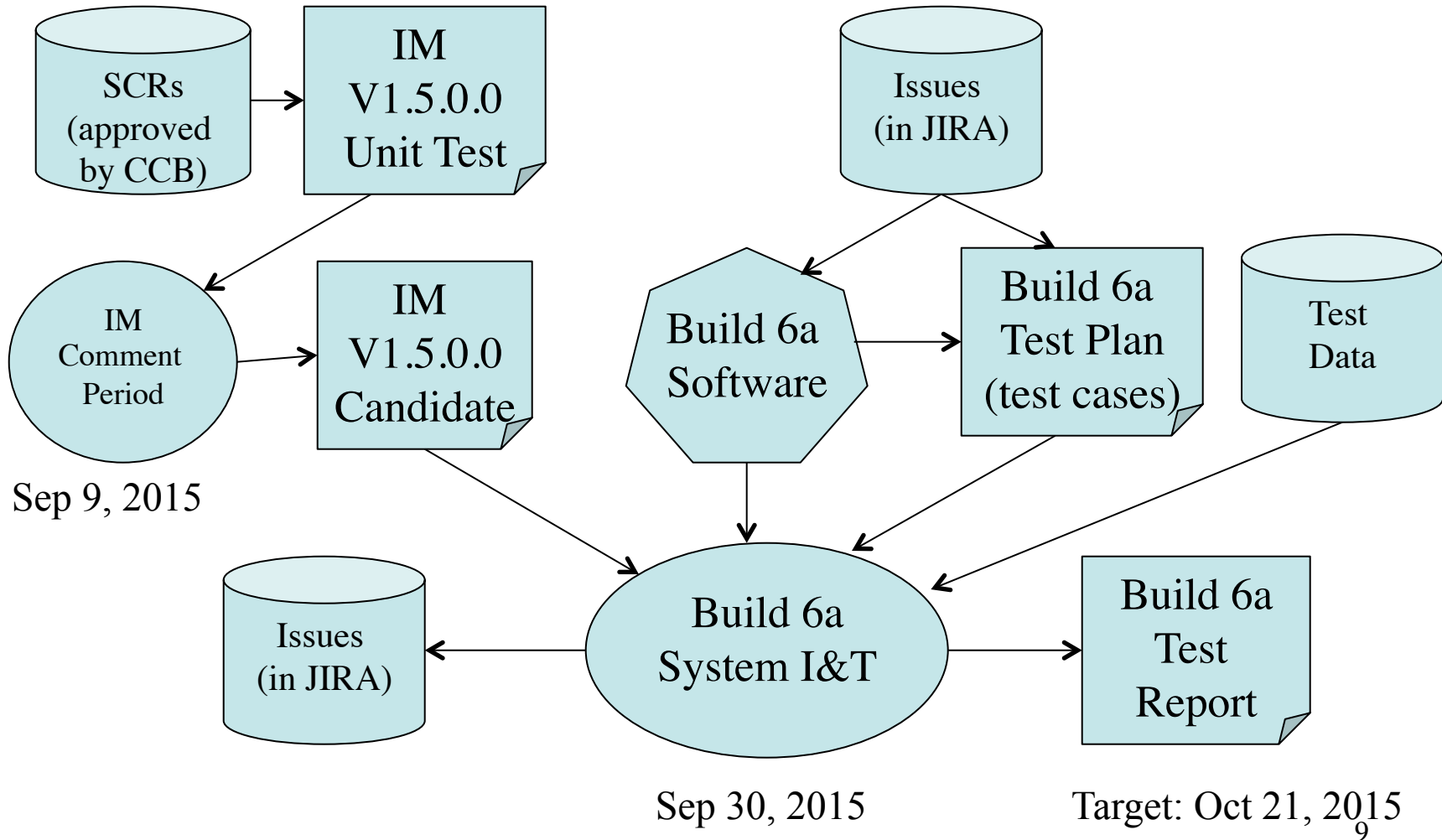
Build 6a System I&T Timeline

- Following the lifecycle we have established, the Build 6a release is in progress.
- Information Model and Software are to be delivered to I&T on September 30, 2015.
- System I&T (that integrates tools, services and IM artifacts) will begin on October 1, 2015.
- New test cases will be added to exercise new capabilities and services in addition to full system regression.
- Target to complete I&T and Test Report by October 21, 2015.
- Build 6a Deliverables webpage will be available on EN web site.

I&T Approach

- System I&T is an iterative process.
- Test cases are derived from requirements.
- Regression testing is mandatory for each build.
- Test cases are used to exercise software and services with example data products delivered with each build.
- All issues found are recorded in the tracking system JIRA.
- Prior to completion of a system build, all show stopper issues found in I&T must be corrected and the fix must be verified, follow by regression testing.
- Only when I&T is completed without major anomaly, then system can be deployed.
- Full details are captured in test report which identifies result of each test case, and their traceability to requirements.

Build 6a I&T Process



I&T Input/Output

- Input
 - IM V1.5.0.0 produced as a result of node/EN local review and testing of IM based on approved SCRs by CCB (Sept 30)
 - Build 6a system software including upgrades and fixes of issues captured in JIRA
 - Build 6a test plan including new test cases of any new features and regression test cases
 - Build 6a test data
- Output
 - New issues found will be added to JIRA
 - Fixed issues will be closed in JIRA
 - Test result will be documented (including requirement traceability matrix)

Build 6a Software Components

Tools

- Ingest
 - Harvest Tool
 - Catalog Tool
- Preparation
 - Generate Tool
 - PDS4 Tools (Ames)
 - Transform Tool
 - Validate Tool

Services

- Registry
 - Registry Core/Client
 - Registry Service
 - Registry User Interface
- Search
 - Search Core
 - Search Service
 - Search User Interface
- Transport Service
- Report Service

Build 6a Documents

- Information Model 1.5.0.0
 - Specification (HTML and PDF)
 - Release Notes
 - Data Dictionary (HTML and PDF)
 - XML Schema and Schematron
 - Example Products
 - Other Artifacts for System Configuration & Interoperability
- Model Related (Work In Progress)
 - Standards Reference
 - Data Providers' Handbook
 - Context Products
- Software Related
 - Software Release Description
 - I&T Test Plan/Report

Release Description 5.1.0

Example from Build 5b

This release of the PDS4 System represents a point build of Build 5b and is intended as an operational release of the system components to date. The following sections can be found in this document:

- [Reference Documents](#)
- [Capabilities](#)
- [Liens](#)
- [System Requirements](#)
- [Installation/Operation](#)

Reference Documents

This section details the controlling and applicable documents referenced for this release. The controlling documents are as follows:

- PDS Level 1, 2 and 3 Requirements, April 10, 2014.
 - PDS4 Project Plan, July 17, 2013.
 - PDS4 System Architecture Specification, Version 1.3, September 1, 2013.
 - PDS4 Operations Concept, Version 1.0, September 1, 2013.
 - PDS General System Software Requirements Document (SRD), Version 1.1, September 1, 2013.
 - PDS Harvest Tool Software Requirements and Design Document (SRD/SDD), Version 1.2, September 1, 2013.
 - PDS Preparation Tools Software Requirements and Design Document (SRD/SDD), Version 0.3, September 1, 2013.
 - PDS Registry Service Software Requirements and Design Document (SRD/SDD), Version 1.1, September 1, 2013.
 - PDS Report Service Software Requirements and Design Document (SRD/SDD), Version 1.1, September 1, 2013.
 - PDS Search Service Software Requirements and Design Document (SRD/SDD), Version 1.0, September 1, 2013.
 - PDS Search Scenarios, Version 1.0, September 1, 2013.
 - PDS Search Protocol, Version 1.2, March 21, 2014.
 - PDAP Search Protocol, Version 1.0, March 21, 2014.
 - PDS Security Service Software Requirements and Design Document (SRD/SDD), Version 1.1, September 1, 2013.
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Test Report

Plan Document

NASA Planetary Data System

PDS4 System

Build 5b Test Document



The following section defines the tests and their results. All tests below have been run for build 5b (except those written for future builds) and will be run as necessary to re-test the system after software changes.

Section 3.2 below contains one sequence of tests that demonstrates how a bundle of products passes through the PDS4 software, especially the tools and services to support PDS4 data validation, registration, and search.

Section 3.3 contains tests that demonstrate the broader functionality of the PDS4 software.

3.1 Setup

The root URL for all software is <https://pds-engineering.jpl.nasa.gov/development/pds4/5.1.0>.

The tests in section 3.2 require the installation of the following PDS4 software:

- **Harvest**, <https://pds-engineering.jpl.nasa.gov/development/pds4/5.1.0/ingest/harvest>
- **Registry**, <https://pds-engineering.jpl.nasa.gov/development/pds4/5.1.0/registry>
- **Search**, <https://pds-engineering.jpl.nasa.gov/development/pds4/5.1.0/search>
- **Validate**, <https://pds-engineering.jpl.nasa.gov/development/pds4/5.1.0/preparation/validate>
- an XML editor, e.g. Oxygen. This can be skipped, though not recommended.
- an XML-friendly web browser, e.g. firefox

The tests in Section 3.3 require the installation of the software above as well as:

- **Generate**, <https://pds-engineering.jpl.nasa.gov/development/pds4/5.1.0/preparation/generate>
- **Catalog**, <https://pds-engineering.jpl.nasa.gov/development/pds4/5.1.0/ingest/catalog>
- **Data Set View**, <https://pds-engineering.jpl.nasa.gov/development/pds4/5.1.0/portal/ds-view>
- **Storage**, <https://pds-engineering.jpl.nasa.gov/development/pds4/5.1.0/storage>
- **Transform**, <https://pds-engineering.jpl.nasa.gov/development/pds4/5.1.0/preparation/transform>
- **Transport**, <https://pds-engineering.jpl.nasa.gov/development/pds4/5.1.0/transport>
- **curl**, a command-line utility to access a URL, used here to manipulate a registry. The Registry Service Guide has more information. This is native to most versions of unix.

Please follow the installation instructions carefully. For more help, the file NOTES.txt, created during SETUP below, details one tester's configuration experience. Note that the tests are written for Unix, but running on other platforms requires simple changes.

Requirements Traceability

Requirements Derivation from Level 3 to Level 5

Level 3 Requirement	Level 4 Requirement	Level 5 Requirement	Component	Build	EN Test	Node Test	Comment	
2.4.3 PDS will implement peer reviews, coordinated and conducted by the lead node, to ensure completeness, accuracy and scientific usability of content				N/A	N/A	N/A	N/A	Requirement not satisfied with software.
2.4.4 PDS will publish a summary of the results of each peer review				N/A	N/A	N/A	N/A	Requirement not satisfied with software.
2.4.5 PDS will track the status of each peer review				N/A	N/A	N/A	N/A	Requirement not satisfied with software.
2.5.1 PDS will develop and publish procedures for accepting archival data				N/A	N/A	N/A	N/A	Requirement not satisfied with software.
2.5.2 PDS will implement procedures for accepting archival data				N/A	N/A	N/A	N/A	Requirement not satisfied with software.
2.5.3 PDS will inform a data provider why a rejected archival product does not meet archiving standards				N/A	N/A	N/A	N/A	Requirement not satisfied with software.
2.6.1 PDS will develop and publish procedures for cataloging archival data				N/A	N/A	N/A	N/A	Requirement not satisfied with software.
2.6.2 PDS will design and implement a catalog system for managing information about the holdings of the PDS	L4.REG.1 - The system shall maintain distributed registries of products.	L5.REG.3 - The service shall maintain policy regarding the classes of artifacts to be registered.	Registry	Build 2	REG.3			
		L5.HVT.1 - The tool shall accept a configuration file specifying policy for tool behavior.	Harvest	Build 1-2	AAFUNCTION.3 HVT.1 HVT.2 HVT.5	NODESTEST.3		
	L4.REG.3 - The system shall register products of a data delivery into an instance of the registry.	L5.HVT.2 - The tool shall provide a command-line interface for execution.	L5.HVT.3 - The tool shall execute from a scheduler.			AAFUNCTION.3 HVT.1 HVT.2	NODESTEST.3	
		L5.HVT.4 - The tool shall recursively traverse the specified directory or directories in order to identify candidate products for registration.	L5.HVT.5 - The tool shall determine candidate products for registration through a combination of the following...			AAFUNCTION.3 HVT.1 HVT.2 HVT.5	NODESTEST.3	
		L5.HVT.6 - The tool shall capture metadata for a candidate product specified by the product type.	L5.HVT.7 - The tool shall submit the associated metadata for a candidate product to the specified Registry Service instance.			AAFUNCTION.3 HVT.1 HVT.2	NODESTEST.3	
		L5.HVT.8 - The tool shall track each product registration.				AAFUNCTION.3 HVT.1 HVT.2 HVT.5	NODESTEST.3	
		L5.REG.1 - The service shall accept artifact registrations.	L5.REG.2 - The service shall provide a means for relating artifact registrations.	Registry	Build 1-2	AAFUNCTION.3 REG.1 REG.9		
		L5.REG.4 - The service shall accept metadata for a registered artifact in a defined format.	L5.REG.5 - The service shall validate metadata for a registered artifact.			AAFUNCTION.3 REG.1		
		L5.REG.6 - The service shall assign a global unique identifier to a registered artifact.	L5.REG.7 - The service shall assign a version to a registered artifact based on its logical identifier.			AAFUNCTION.3 REG.4		
						REG.5		

Conclusion

- Software process is important for organizing ourselves as a system
 - This is becoming true internationally, as well (more to come)
- Regression tests are added over time.
- Node test data is always welcome!