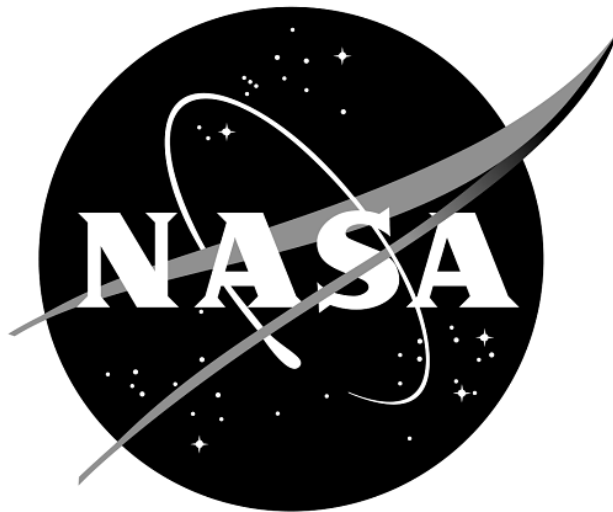

Plan Document

NASA Planetary Data System

PDS4 System

Build 4a Node Test Document



Change Log

Revision	Date	Description	Author
Draft		Initial draft release.	
1	Sep 15, 2013	Initial release	Richard Chen, Emily Law
4a	Dec 05, 2013	Addressed PDS4ORR-RFA1 and incorporated its recommendations partly by folding the test plan into the test procedures document	Richard Chen, Emily Law

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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

PDS previously maintained two separate documents:

- the Integration and Test Plan
- the Test Procedures and Report

Because the latter document grew to encompass most of the former, this document merges the two.

1.1 Purpose

This Test Document, together with the PDS4 System Build 4a Test Document (<http://pds-engineering.jpl.nasa.gov/index.cfm?pid=145&cid=188>), describes the plan for verification and validation of Build 4a of the PDS4 system and standards. This document 1) defines specific tests to be performed by the PDS Discipline Nodes that demonstrate the PDS4 Build 4a system deployed at the Nodes by EN, and 2) reports results of the tests to verify that the PDS4 system deployed for Build 4a is free of critical defects. The integration and test activities described herein consist of test cases that demonstrate compliance to requirements. The test scenarios verify and validate the system components and data products in an integrated manner. A test traceability matrix in Section 5 traces these scenarios to the new PDS4 system design requirements, which in turn can be traced to high-level PDS requirements..

1.2 Scope

For PDS4 Build 4a, the following software will be deployed at the Discipline Nodes:

- Ingest: Harvest 1.5.0
- Preparation: Core 1.4.1, Design (oxygen 14.1), Validate 1.4.1
- Registry 1.5.0

Detailed release description documents will facilitate and detail the deployment activities.

The scope of this build is to support data providers and Discipline Nodes in developing and distributing PDS4 data products both for new missions and data migration. Previous releases of PDS4 have been scoped to support the LADEE and MAVEN missions as early adopters as well as internal testing by PDS and the IPDA. Future, incremental releases will target data users as PDS4 data is available within the PDS.

This document focuses on PDS4 end-to-end processing, from registration of a Node's data bundle/product to its discovery and access via a Node search interface. Test resources will include DN staff to perform the test cases.

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. Previous versions of this document can be accessed through the use of that tool.

1.4 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 4a testing includes two sets of testing:

1. Generic Testing
2. Node-specific Testing

The EN Integration and Test team performed the first set of generic tests, posted at <http://pds-engineering.jpl.nasa.gov/index.cfm?pid=145&cid=188> as “System Test Documentation”. Those tests cover all PDS4 tools and services.

The Nodes perform the second set of Node specific tests. The tests described here cover testing of specific tools and services required to support PDS4 data products validation, registration, and search by the Nodes.

1.5 Applicable Documents

1.5.1 Controlling Documents

- [1] Planetary Data System Strategic Roadmap 2006 - 2016, February 2006.
- [2] Planetary Data System Level 1, 2 and 3 Requirements, March 26, 2010.

1.5.2 Referenced Documents

- [3] [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, 2013

2 Executive Summary

The testing documented herein substantiates that all tested tools and services meet Build 4a requirements as specified in their Software Requirements and Design documents.

# of tests performed	# of tests passed	# of tests failed	# of high priority anomalies
4	4	0	0

Section 3.2 has one sequence of four tests that represent the most likely operating scenario for PDS4 products: creation, validation, ingestion, search. This sequence tested the software successfully.

Section 4 lists all issues raised from the tests in this document. There were none.

Section 5 shows the traceability of the test cases to the level 5 requirements (and level 4 if no level 5 requirement applies). Note that many requirements will not be tested by the test cases specified in this test document. Those testing are covered by test cases specified in the Build 4a Test Document, which is performed by the EN Integration and Test team.

3 Test Procedures

The following section defines the tests and their results. These tests will be run as necessary to re-test the system after software changes.

Section 3.2 below contains a sequence of tests that demonstrates how a bundle of products passes through the PDS4 software. The tests were performed using analogous MAVEN and LADEE data products

3.1 Setup

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

- **Harvest**, <http://pds-engineering.jpl.nasa.gov/pds2010/development/4.0.0/ingest/harvest>
- **Validate**, <http://pds-engineering.jpl.nasa.gov/pds2010/development/4.0.0/preparation/validate>
- an **XML editor**, e.g. Oxygen. This can be skipped, though not recommended.
- an XML-friendly web **browser**, e.g. firefox

The tester might install and configure a registry if 1) no registry is available for testing, or 2) the tester wants more control over the registry, e.g. after a test step fails, the tester may wish to reset the registry. However, installation and configuration of that software and of the required Apache Tomcat server might be difficult. If so desired, install:

- **Registry**, <http://pds-engineering.jpl.nasa.gov/pds2010/development/4.0.0/registry/registry-service>
- **Registry UI**, <http://pds-engineering.jpl.nasa.gov/pds2010/development/4.0.0/registry/registry-ui>

Please follow the installation instructions carefully. For more help, the file NOTES.txt, included in PDS4test.build4a.zip (see SETUP below), details one tester's configuration experience, particularly regarding the registry.

In the tests in the rest of this document, replace

<i>testDir</i>	directory where input files are extracted
<i>binDir</i>	directory where the PDS4 software are installed
Harvest	If the registry is uncontrolled (a choice made during installation), do not replace. Else: <pre>harvest -uusername -ppassword</pre> Also add " <code>-k keystorePassword</code> " depending on the registry configuration, especially if Harvest gives error "Keystore password must be specified"
http://localhost:8080	the URL of the registry
http://pdsbeta.jpl.nasa.gov	the URL of the search service working off the EN's registry

Note that the tests are written for Unix, but running on other platforms requires simple changes.

The tests require this:

Test Case ID	SETUP
Description	This is not a test. This sets up test data.
Test Steps	<p>Get the latest “Test Data (.zip)” from http://pds-engineering.jpl.nasa.gov/index.cfm?pid=145&cid=188, then</p> <ul style="list-style-type: none"> • <code>mkdir testDir</code> • <code>cd testDir</code> • <code>unzip PDS4test.build4a.zip</code> <p>The ATMOS node provides this sample bundle, with context products:</p> <ul style="list-style-type: none"> • In browser: http://atmos.nmsu.edu/pub/PDS4/Version_1.1.0.0 • Download “MET_bundle_1100.tar.gz” • <code>tar xzf MET_bundle_1100.tar.gz</code> • <code>mv MET_bundle_1100.tar.gz testDir/bundle_atm_met</code> <p>The Data Provider’s Handbook provides sample products that utilize the types needed for LADEE and MAVEN. Originally at http://pds.nasa.gov/pds4/orr0913, the PDS4 Example Products, downloaded above, includes a version modified for PDS schema 1.1.0.0 in directory <code>bundle_en_dph/</code>.</p>

Many test sequences in this document assume a local registry, which may get corrupted during testing. The following step resets the registry:

Test Case ID	RESETREGISTRY
Description	This is not a test. This wipes the database clean. <i>dbDir</i> is the directory for the database, set during the initialization of Tomcat.
Test Steps	<pre> \$CATALINA_HOME/bin/shutdown.sh rm \$CATALINA_HOME/logs/* rm -f -r dbDir/registry cd binDir/registry-service java -Djava.ext.dirs=lib/ org.apache.derby.tools.ij connect 'jdbc:derby:registry;create=true;user=registry'; run 'conf/derby-registry-schema.ddl'; exit; mv registry dbDir/registry rm derby.log \$CATALINA_HOME/bin/startup.sh # usually a pause is needed here cd binDir/registry-service/bin; ./registry-config </pre>
Test Results	<pre> startup.sh: Using CATALINA_BASE: /Library/apache-tomcat-7.0.30 Using CATALINA_HOME: /Library/apache-tomcat-7.0.30 Using CATALINA_TMPDIR: /Library/apache-tomcat-7.0.30/temp Using JRE_HOME: /Library/Java/Home Using CLASSPATH: /PDS4tools/search-service/lib/saxon-9.jar:/Library/apache-tomcat-7.0.30/bin/bootstrap.jar:/Library/apache-tomcat-7.0.30/bin/tomcat-juli.jar registry-config: * About to connect() to localhost port 8080 (#0) * Trying ::1... * connected * Connected to localhost (::1) port 8080 (#0) </pre>

	<pre> > POST /registry/configure?name=Core+Objects&description=This+configures+the+core+set+of+registry+objects HTTP/1.1 > User-Agent: curl/7.24.0 (x86_64-apple-darwin12.0) libcurl/7.24.0 OpenSSL/0.9.8x zlib/1.2.5 > Host: localhost:8080 > Accept: */* > Content-type:application/xml > Content-Length: 6201 > Expect: 100-continue > < HTTP/1.1 100 Continue < HTTP/1.1 201 Created < Server: Apache-Coyote/1.1 < Location: http://localhost:8080/registry/packages/urn:uuid:78b6e869-f384-49f3-8b44-5ffbb0999f43 < Content-Type: text/plain < Transfer-Encoding: chunked < Date: Tue, 26 Nov 2013 19:21:56 GMT < * Connection #0 to host localhost left intact urn:uuid:78b6e869-f384-49f3-8b44-5ffbb0999f43* Closing connection #0 * About to connect() to localhost port 8080 (#0) * Trying ::1... * connected * Connected to localhost (::1) port 8080 (#0) > POST /registry/configure?name=PDS+Objects&description=This+configures+PDS+object+types HTTP/1.1 > User-Agent: curl/7.24.0 (x86_64-apple-darwin12.0) libcurl/7.24.0 OpenSSL/0.9.8x zlib/1.2.5 > Host: localhost:8080 > Accept: */* > Content-type:application/xml > Content-Length: 13063 > Expect: 100-continue > < HTTP/1.1 100 Continue < HTTP/1.1 201 Created < Server: Apache-Coyote/1.1 < Location: http://localhost:8080/registry/packages/urn:uuid:1cfdc98d-7fc2-49dd-b4f4-c9461b1cf1b6 < Content-Type: text/plain < Transfer-Encoding: chunked < Date: Tue, 26 Nov 2013 19:21:56 GMT < * Connection #0 to host localhost left intact urn:uuid:1cfdc98d-7fc2-49dd-b4f4-c9461b1cf1b6* Closing connection #0 * About to connect() to localhost port 8080 (#0) * Trying ::1... * connected * Connected to localhost (::1) port 8080 (#0) > POST /registry/configure?name=Core+Associations&description=This+configures+the+core+set+of+associations HTTP/1.1 > User-Agent: curl/7.24.0 (x86_64-apple-darwin12.0) libcurl/7.24.0 OpenSSL/0.9.8x zlib/1.2.5 > Host: localhost:8080 > Accept: */* > Content-type:application/xml > Content-Length: 544 > * upload completely sent off: 544 out of 544 bytes < HTTP/1.1 201 Created < Server: Apache-Coyote/1.1 < Location: http://localhost:8080/registry/packages/urn:uuid:733f014c-401f-43e6-8683-a812ca5d5f3f < Content-Type: text/plain < Transfer-Encoding: chunked < Date: Tue, 26 Nov 2013 19:21:56 GMT < * Connection #0 to host localhost left intact urn:uuid:733f014c-401f-43e6-8683-a812ca5d5f3f* Closing connection #0 * About to connect() to localhost port 8080 (#0) * Trying ::1... * connected * Connected to localhost (::1) port 8080 (#0) > POST /registry/configure?name=PDS+Associations&description=This+configures+PDS+association+types </pre>
--	---

	<pre> HTTP/1.1 > User-Agent: curl/7.24.0 (x86_64-apple-darwin12.0) libcurl/7.24.0 OpenSSL/0.9.8x zlib/1.2.5 > Host: localhost:8080 > Accept: */* > Content-type:application/xml > Content-Length: 7952 > Expect: 100-continue > < HTTP/1.1 100 Continue < HTTP/1.1 201 Created < Server: Apache-Coyote/1.1 < Location: http://localhost:8080/registry/packages/urn:uuid:0114422b-441b-4de2-a0b3-4aa53730b56a < Content-Type: text/plain < Transfer-Encoding: chunked < Date: Tue, 26 Nov 2013 19:21:56 GMT < * Connection #0 to host localhost left intact urn:uuid:0114422b-441b-4de2-a0b3-4aa53730b56a* Closing connection #0 </pre>
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3.2 Testing of Bundle Processing

The NODESTEST sequence tests the PDS4 software’s handling of products representative of LADEE’s and MAVEN’s products from creation to registration to retrieval. The two sets of data used for this testing, downloaded in the SETUP test above, are:

1. a PHX product bundle (Table_character) created by the ATMOS node as representative for LADEE , referred to as the PHX bundle from here on.
2. a MAVEN and LADEE analogous product bundle (Table_character, Table_Binary, Array_1D and Array_2D etc), created by EN, referred to as the EN bundle from here on.

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	<p>PASS L5.PRP.DE.1: The tool shall initiate a design session as follows...</p> <p>PASS L5.PRP.DE.2: The tool shall accept the following as input for specifying a schema file...</p> <p>PASS L5.PRP.DE.3: The tool shall facilitate modification of a schema file as follows...</p> <p>PASS L5.PRP.DE.4: The tool shall provide standard editing features as follows...</p> <p>PASS L5.PRP.DE.5: The tool shall indicate when a schema is not valid.</p> <p>PASS L5.PRP.DE.6: The tool shall generate an XML instance file from a schema.</p> <p>PASS L5.PRP.DE.7: The tool shall export the schema for use outside the tool.</p>
Success Criteria	Design tool produces a syntactically valid PDS Product Label else indicates where the label is invalid.
Test Steps	In general, consult Appendix D of the Data Providers’ Handbook (DPH), Version 1.0.0
Test Results	Creation of one PDS4 label per product and delivery to EN test staff.
Comments	Results met test successful criteria
Date of Testing	2013.12.05
Test Personnel	Richard Chen

Test Case ID	NODESTEST.2
Description	Validate PDS4 product labels generated in NODESTEST.1 using the PDS4 Validate Tool.

Requirements	<p>PASS L5.PRP.VA.1: The tool shall accept the following as input for specifying the product(s) to be validated...</p> <p>PASS L5.PRP.VA.2: The tool shall traverse a directory tree and validate products</p> <p>PASS L5.PRP.VA.3: The tool shall validate aggregate products and all products referenced by such products.</p> <p>PASS L5.PRP.VA.5: The tool shall verify that a product label is well-formed XML.</p> <p>PASS L5.PRP.VA.6: The tool shall verify that a product label conforms to its associated schema file(s).</p> <p>PASS L5.PRP.VA.7: The tool shall accept the following as input for specifying the associated schema file(s)...</p> <p>PASS L5.PRP.VA.9: The tool shall indicate the schema(s) utilized during validation.</p>
Success Criteria	<p>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. Also validate for content as well as syntax.</p>
Test Steps	<p>In general:</p> <ul style="list-style-type: none"> • validate <i>directoryOrFile</i> -e "*.xml" <p>To test the PHX bundle (see step SETUP above)</p> <ol style="list-style-type: none"> 1. cd <i>testDir</i> 2. curl http://pds.nasa.gov/pds4/schema/released/pds/v1/PDS4_PDS_1100.xsd > PDS4_PDS_1100.xsd 3. curl http://pds.nasa.gov/pds4/schema/released/pds/v1/PDS4_PDS_1100.sch > PDS4_PDS_1100.sch 4. validate bundle_atm_met -x PDS4_PDS_1100.xsd -S PDS4_PDS_1100.sch -x bundle_atm_met/xml_schema/PHXMD_1100.xsd -e "*.xml" > v.out 5. grep -v "PASS: file" v.out uniq <p>To test the EN bundle (see step SETUP above)</p> <ol style="list-style-type: none"> 1. cd <i>testDir</i> 2. validate -x PDS4_PDS_1100.xsd bundle_en_dph/xml_schema/dph_example_dict_0100.xsd -S PDS4_PDS_1100.sch -e "*.xml" -t bundle_en_dph
Test Results	<p>PHX bundle test step 4: v.out has 1732 lines, mostly "PASS: file:..." followed by a blank line.</p> <p>PHX bundle test step 5:</p> <pre> PDS Validate Tool Report Configuration: Version 1.4.1 Date 2013-12-05T21:50:35Z Parameters: Targets [file:testDir/bundle_atm_met/] User Specified Schemas [PDS4_PDS_1100.xsd, bundle_atm_met/xml_schema/PHXMD_1100.xsd] User Specified Schematrons [PDS4_PDS_1100.sch] Severity Level WARNING Recurse Directories true File Filters Used [*.xml] Validation Details: Summary: 855 of 855 file(s) processed, 0 skipped 855 of 855 file(s) passed validation End of Report </pre> <p>EN bundle test step 2:</p> <pre> PDS Validate Tool Report Configuration: Version 1.4.1 Date 2013-12-05T21:55:20Z Parameters: Targets [file: testDir/bundle_en_dph/] User Specified Schemas [PDS4_PDS_1100.xsd, bundle_en_dph/xml_schema/dph_example_dict_0100.xsd] User Specified Schematrons [PDS4_PDS_1100.sch] Severity Level WARNING Recurse Directories true File Filters Used [*.xml] Validation Details: PASS: file: testDir/bundle_en_dph/ingest_dd/Ingest_LDD_telemetry.xml </pre>

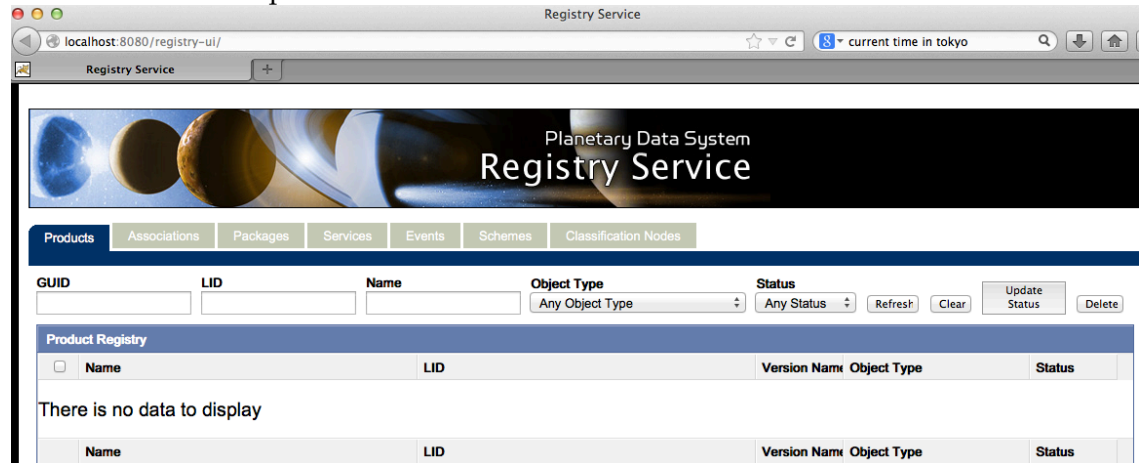
	<p>PASS: file: <i>testDir</i>/bundle_en_dph/product_array_1d/Product_Array_1D.xml PASS: file: <i>testDir</i>/bundle_en_dph/product_array_2d/Product_Array_2D_Image.xml PASS: file: <i>testDir</i>/bundle_en_dph/product_delimited_table/Product_DelimitedTable.xml PASS: file: <i>testDir</i>/bundle_en_dph/product_document/Product_Document.xml PASS: file: <i>testDir</i>/bundle_en_dph/product_header_and_tableChar/Product_Header_and_TableChar.xml PASS: file: <i>testDir</i>/bundle_en_dph/product_table_binary/Product_Table_Binary.xml PASS: file: <i>testDir</i>/bundle_en_dph/product_table_binary_packed/Product_Table_Binary_packed.xml PASS: file: <i>testDir</i>/bundle_en_dph/product_table_character/Product_Table_Character.xml PASS: file: <i>testDir</i>/bundle_en_dph/product_table_character_grouped/Product_Table_Character_Grouped.xml PASS: file: <i>testDir</i>/bundle_en_dph/xml_schema/PDS4_PDS_1100.xml Summary: 11 of 11 file(s) processed, 0 skipped 11 of 11 file(s) passed validation End of Report</p>
Comments	Results met test successful criteria.
Date of Testing	2013.12.05
Test Personnel	Richard Chen

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	<p>PASS L5.HVT.1: The tool shall accept a configuration file specifying policy for tool behavior. PASS L5.HVT.2: The tool shall provide a command-line interface for execution. PASS L5.HVT.4: The tool shall recursively traverse the specified directory or directories... PASS L5.HVT.5: The tool shall determine candidate products for registration through a combination of the following... PASS L5.HVT.6: The tool shall capture metadata for a candidate product specified by the product type. PASS L5.HVT.7: The tool shall submit the associated metadata for a candidate product to the [Registry]. PASS L5.HVT.8: The tool shall track each product registration. PASS L5.REG.1: The service shall accept artifact registrations. PASS L5.REG.2: The service shall provide a means for relating artifact registrations. PASS L5.REG.4: The service shall accept metadata for a registered artifact in a defined format. PASS L5.REG.6: The service shall assign a global unique identifier to a registered artifact. PASS L5.REG.8: The service shall store metadata for a registered artifact in an underlying metadata store.</p>
Success Criteria	Harvest tool, based on criteria given in a user-edited configuration file, executed from the command line, 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, with appropriate metadata, including the guid, which is assigned by the Registry. Tools to view the registry show the associations.
Test Steps	<p>In general:</p> <ol style="list-style-type: none"> 1. In browser, http://localhost:8080/registry-ui/ to see no registrations 2. harvest <i>directoryOrFile</i> -e "*.xml" -c <i>testDir</i>/harvest-policy-master.xml 3. In browser, http://localhost:8080/registry-ui/. You may enter one product's LID (wildcards accepted) to verify the registration and hit "Refresh" <p>To test the PHX bundle:</p> <ol style="list-style-type: none"> 1. cd <i>testDir</i> 2. In browser, http://localhost:8080/registry-ui/ to see no registrations 3. harvest <i>testDir</i>/bundle_atm_met -e "*.xml" -c harvest-policy-master.xml -l h.out 4. grep -v "SUCCESS:\ INFO:" h.out 5. In browser, http://localhost:8080/registry-ui/ <p>To test the EN products:</p> <ol style="list-style-type: none"> 1. cd <i>testDir</i> 2. In browser, http://localhost:8080/registry-ui/ to see no registrations 3. harvest <i>testDir</i>/bundle_en_dph -e "*.xml" -c harvest-policy-master.xml -l h.out 4. grep -v "SUCCESS:\ INFO:" h.out

5. In browser, <http://localhost:8080/registry-ui/>

Test Results

Merge the two sequences above, i.e. the bundle to harvest is test LADEE
 PHX bundle test step 2:



PHX bundle test step 3: h.out has 30865 lines, mostly "SUCCESS:..." or "INFO:..."

PHX bundle test step 4:

```

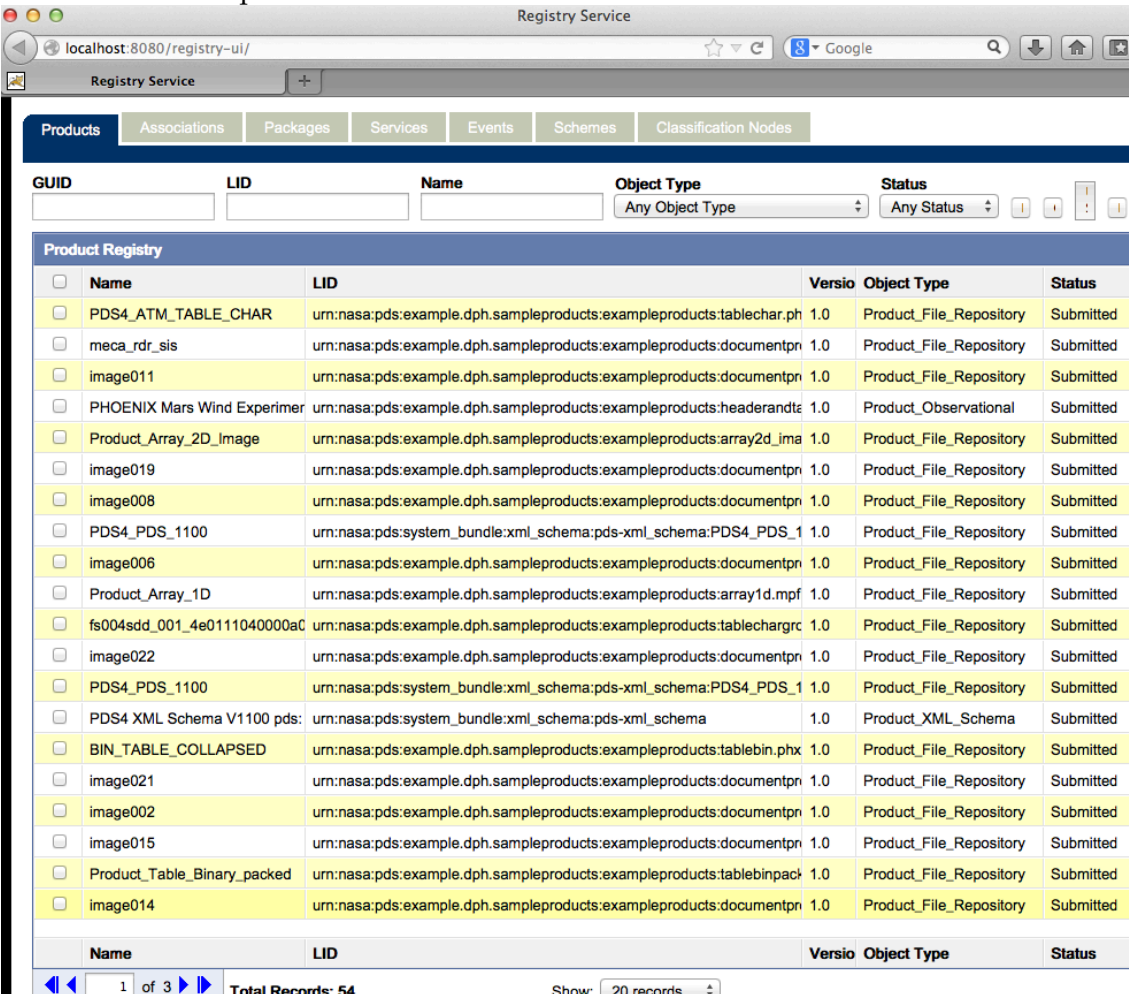
PDS Harvest Tool Log
Version          Version 1.5.0
Time             Tue, Nov 26 2013 at 01:39:59 PM
Target(s)        [testDir/bundle_atm_met]
File Inclusions  [*.*xml]
Severity Level   INFO
Registry Location http://localhost:8080/registry
Registry Package Name Harvest-Package_20131126133959
Registration Package GUID urn:uuid:12028e2b-8840-4fda-9415-7898819a0a26
WARNING: [testDir/bundle_atm_met/xml_schema/collection_xml_schema.xml] Product not found in
registry for reference: urn:nasa:pds:system_bundle:xml_schema:pds-xml_schema::1.0. LIDVID will be
used as the target reference for the association.
WARNING: [testDir/bundle_atm_met/context/collection_met_context.xml] Product not found in
registry for reference: urn:nasa:pds:context:investigation:mission.phoenix::1.0. LIDVID will be the
target reference for the association.
WARNING: [testDir/bundle_atm_met/context/collection_met_context.xml] Product not found in
registry for reference: urn:nasa:pds:context:instrument_host:instrument_host.phx::1.0. LIDVID will be
used as the target reference for the association.
WARNING: [testDir/bundle_atm_met/context/collection_met_context.xml] Product not found in
registry for reference: urn:nasa:pds:context:target:planet.mars::1.0. LIDVID will be used as the target
reference for the association.
WARNING: [testDir/bundle_atm_met/context/collection_met_context.xml] Product not found in
registry for reference: urn:nasa:pds:context:instrument:instrument.met_phx::1.0. LIDVID will be used as
the target reference for the association.
Summary:
855 of 855 file(s) processed, 0 other file(s) skipped
0 error(s), 5 warning(s)
855 of 855 products registered.
1734 of 1734 ancillary products registered.
Product Types Registered:
5 Product_Document
843 Product_Observational
1 Product_XML_Schema
1 Product_Bundle
5 Product_Collection
1734 Product_File_Repository
2588 of 2588 associations registered.
End of Log
    
```

PHX bundle test step 5:

EN bundle test step 2 is the same as PHX bundle test step 2
 EN bundle test step 3: h.out has 551 lines, mostly "SUCCESS:..." or "INFO:..."
 EN bundle test step 4:

```

PDS Harvest Tool Log
Version          Version 1.5.0
Time            Tue, Nov 26 2013 at 03:58:56 PM
Target(s)       [testDir/bundle_en_dph]
File Inclusions [*.*xml]
Severity Level  INFO
Registry Location http://localhost:8080/registry
Registry Package Name Harvest-Package_20131126155855
Registration Package GUID urn:uuid:7d2f1b47-af4e-4b4e-b832-8dc44bdccdd
SKIP: [testDir/bundle_en_dph/ingest_dd/Ingest_LDD_telemetry.xml] No product_class element found.
Summary:
10 of 10 file(s) processed, 1 other file(s) skipped
0 error(s), 0 warning(s)
10 of 10 products registered.
44 of 44 ancillary products registered.
Product Types Registered:
1 Product_Document
8 Product_Observational
1 Product_XML_Schema
44 Product_File_Repository
44 of 44 associations registered.
End of Log
    
```

	<p>EN bundle test step 5:</p>  <p>The screenshot shows a web browser window titled 'Registry Service' at the URL 'localhost:8080/registry-ui/'. The application has a navigation bar with tabs for 'Products', 'Associations', 'Packages', 'Services', 'Events', 'Schemes', and 'Classification Nodes'. Below the navigation bar is a search area with fields for 'GUID', 'LID', and 'Name', and dropdown menus for 'Object Type' (set to 'Any Object Type') and 'Status' (set to 'Any Status'). The main content area displays a table titled 'Product Registry' with the following data:</p> <table border="1"> <thead> <tr> <th>Name</th> <th>LID</th> <th>Versio</th> <th>Object Type</th> <th>Status</th> </tr> </thead> <tbody> <tr><td><input type="checkbox"/> PDS4_ATM_TABLE_CHAR</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:tablechar.ph</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> meca_rdr_sis</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:documentpn</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> image011</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:documentpn</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> PHOENIX Mars Wind Experimer</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:headerandt</td><td>1.0</td><td>Product_Observational</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> Product_Array_2D_Image</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:array2d_ima</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> image019</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:documentpn</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> image008</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:documentpn</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> PDS4_PDS_1100</td><td>urn:nasa:pds:system_bundle.xml_schema:pds-xml_schema:PDS4_PDS_1</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> image006</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:documentpn</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> Product_Array_1D</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:array1d.mpf</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> fs004sdd_001_4e011104000a0</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:tablechargrc</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> image022</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:documentpn</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> PDS4_PDS_1100</td><td>urn:nasa:pds:system_bundle.xml_schema:pds-xml_schema:PDS4_PDS_1</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> PDS4 XML Schema V1100 pds:</td><td>urn:nasa:pds:system_bundle.xml_schema:pds-xml_schema</td><td>1.0</td><td>Product_XML_Schema</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> BIN_TABLE_COLLAPSED</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:tablebin.phx</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> image021</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:documentpn</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> image002</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:documentpn</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> image015</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:documentpn</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> Product_Table_Binary_packed</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:tablebinpack</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> <tr><td><input type="checkbox"/> image014</td><td>urn:nasa:pds:example.dph.sampleproducts:exampleproducts:documentpn</td><td>1.0</td><td>Product_File_Repository</td><td>Submitted</td></tr> </tbody> </table> <p>At the bottom of the table, there are navigation controls: '1 of 3', 'Total Records: 54', and 'Show: 20 records'.</p>	Name	LID	Versio	Object Type	Status	<input type="checkbox"/> PDS4_ATM_TABLE_CHAR	urn:nasa:pds:example.dph.sampleproducts:exampleproducts:tablechar.ph	1.0	Product_File_Repository	Submitted	<input type="checkbox"/> meca_rdr_sis	urn:nasa:pds:example.dph.sampleproducts:exampleproducts:documentpn	1.0	Product_File_Repository	Submitted	<input type="checkbox"/> image011	urn:nasa:pds:example.dph.sampleproducts:exampleproducts:documentpn	1.0	Product_File_Repository	Submitted	<input type="checkbox"/> PHOENIX Mars Wind Experimer	urn:nasa:pds:example.dph.sampleproducts:exampleproducts:headerandt	1.0	Product_Observational	Submitted	<input type="checkbox"/> Product_Array_2D_Image	urn:nasa:pds:example.dph.sampleproducts:exampleproducts:array2d_ima	1.0	Product_File_Repository	Submitted	<input type="checkbox"/> image019	urn:nasa:pds:example.dph.sampleproducts:exampleproducts:documentpn	1.0	Product_File_Repository	Submitted	<input type="checkbox"/> image008	urn:nasa:pds:example.dph.sampleproducts:exampleproducts:documentpn	1.0	Product_File_Repository	Submitted	<input type="checkbox"/> PDS4_PDS_1100	urn:nasa:pds:system_bundle.xml_schema:pds-xml_schema:PDS4_PDS_1	1.0	Product_File_Repository	Submitted	<input type="checkbox"/> image006	urn:nasa:pds:example.dph.sampleproducts:exampleproducts:documentpn	1.0	Product_File_Repository	Submitted	<input type="checkbox"/> Product_Array_1D	urn:nasa:pds:example.dph.sampleproducts:exampleproducts:array1d.mpf	1.0	Product_File_Repository	Submitted	<input 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<p>Comments</p>	<p>Results met test successful criteria.</p> <p>PHX bundle test step 4: the 5 warnings indicate that the collections have secondary members that are not yet registered as primary members. That is correct, for those products (the schema for pds, the mission phoenix, the instrument host phoenix, the target mars, and the instrument phoenix/met) would be primary elsewhere. Therefore they are not issues.</p> <p>EN bundle test step 4: the skipped .xml file is a local data dictionary file, not a label for a product. Harvest skips it as it should.</p>																																																																																																									
<p>Date of Testing</p>	<p>2013.11.26</p>																																																																																																									
<p>Test Personnel</p>	<p>Richard Chen</p>																																																																																																									

Upon completion of NODETEST.3 above, wait for EN to register context products (including investigation archive webpage), synchronize registries, and rebuild search indices before proceeding to next Node test step below.

Separate testing of these EN activites is documented in the PDS4 Build 4a Test Document, available at <http://pds-engineering.jpl.nasa.gov/index.cfm?pid=145&cid=188> as "System Test Documentation (.pdf)".

Test Case ID	NODESTEST.4
Description	Find registered products using PDS Home Page Data Search and download products from the Node.
Requirements	<p>PASS L5.SCH.1: The service shall provide a user interface for entering of queries and display of search results...</p> <p>PASS L5.SCH.6: The service shall support searching by accepting criteria as a sequence of open text keywords.</p> <p>PASS L5.SCH.7: The service shall accept criteria as a series of values for constraints on specified indexes.</p> <p>PASS L5.SCH.8: The service shall support narrowing of additional index results based on specifications of terms and/or values on indexes.</p> <p>PASS L5.SCH.10: The service shall provide results to a search as a sequence of matching URIs to resources that contain search desiderata.</p> <p>PASS L5.SCH.11: The service shall annotate each URI of a result with metadata describing the URI.</p>
Success Criteria	After configuration (e.g. regenerating search indices), Search returns the data harvested in the previous step.
Test Steps	<p>In general:</p> <ol style="list-style-type: none"> 1. In browser, http://pdsbeta.jpl.nasa.gov 2. Click "DATA" tab. 3. In the main text box, search for archive pages for investigations, other information (including instrument, instrument_host, target, investigation), and/or any bundles or collections registered in NODESTEST.3 4. Click a search result to get more information. Downloading of <p>To test the PHX bundle:</p> <ol style="list-style-type: none"> 1. same as above 2. same as above 3. In the main text box: investigation:phoenix and instrument:met 4. Click the first Data Set, PHOENIX MARS METEOROLOGICAL PRESSURE / TEMPERATURE EDR V1.0
Test Results	PHX bundle test step 3:

The screenshot shows a web browser window with the URL `pdsbeta.jpl.nasa.gov/tools/data-search/search.jsp?q=investigation:phoenix and instrument:met`. The page title is "PDS: Search Results". The browser's search bar contains "caltech wired". The page header includes the NASA logo and "PDS: The Planetary Data System" with navigation links for "HOME", "ABOUT PDS", "DATA", "TOOLS & DOCUMENTS", "RELATED SITES", "CONTACT US", and "CITING PDS DATA". A secondary navigation bar includes "Data Search", "Form Search", "How to Search", "Data Set Status", and "Data Release Summary".

On the left, a "Refine Your Search" box shows "Type" with "Data Set (4)" and "Search Tool (1)". The main "Search Results" section displays the search query in a text box, a "Search" button, and a "New Search" link. Below this, it indicates "1-5 of 5 results (0.002 seconds)".

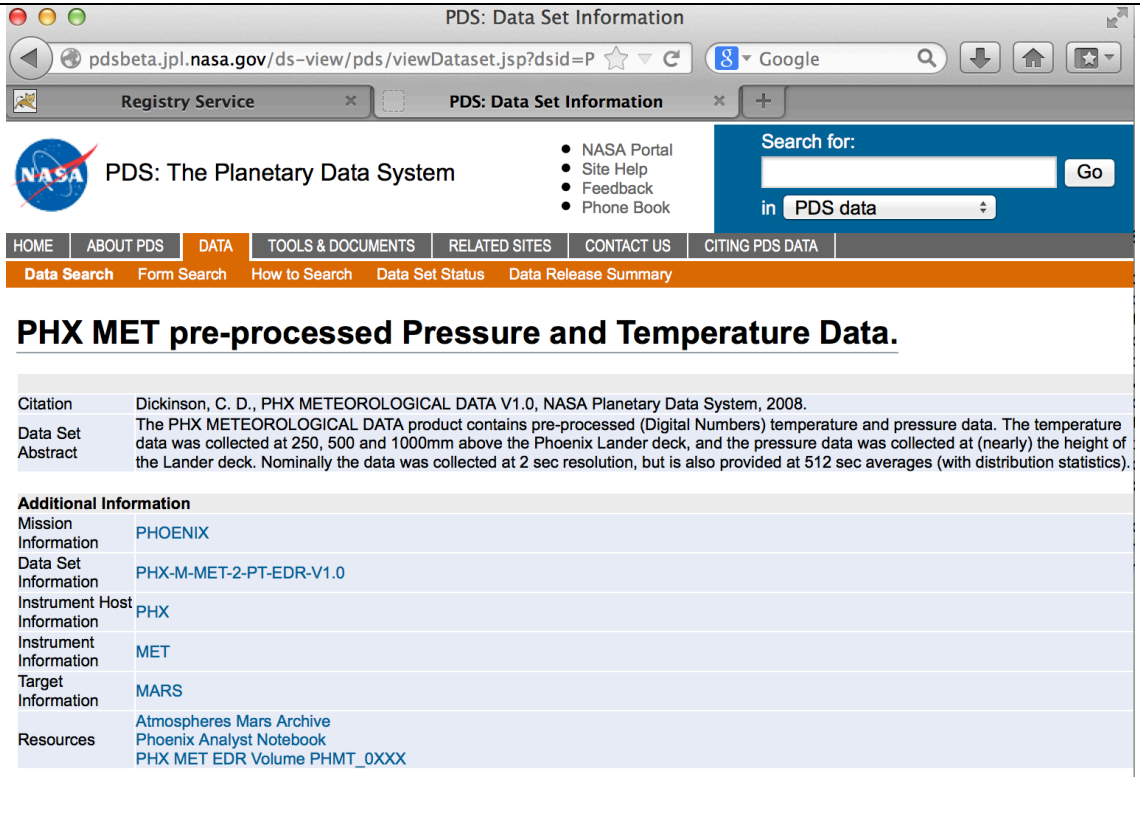
Two highlighted sections are present: "Search Tools" and "Data Sets and Information". The "Search Tools" section contains the text: "These tools let you search for data products matching your query. This is usually the best way to access the data. If no tool looks appropriate, you can browse the matching data sets, below." and a link for "Search Tool: Phoenix Analyst's Notebook" with the subtext "Information about Phoenix Analyst's Notebook".

The "Data Sets and Information" section lists four data sets:

- Data Set: PHOENIX MARS METEOROLOGICAL PRESSURE / TEMPERATURE EDR V1.0**
Information about PHX-M-MET-2-PT-EDR-V1.0
PHOENIX - PHX-M-MET-2-PT-EDR-V1.0 - starting 2008-05-26T00:08:36.308Z
- Data Set: PHOENIX MARS MET LIDAR ATMOSPHERIC PROFILES RDR V1.0**
Information about PHX-M-MET-3-L-RDR-V1.0
PHOENIX - PHX-M-MET-3-L-RDR-V1.0 - starting 2008-05-28T20:35:58.613Z
- Data Set: PHOENIX MARS METEOROLOGICAL PRESSURE / TEMPERATURE RDR V1.0**
Information about PHX-M-MET-3-PT-RDR-V1.0
PHOENIX - PHX-M-MET-3-PT-RDR-V1.0 - starting 2008-05-26T00:08:36.308Z
- Data Set: PHOENIX MARS MET LIDAR ATMOSPHERIC PROFILES EDR V1.0**
Information about PHX-M-MET-2-L-EDR-V1.0
PHOENIX - PHX-M-MET-2-L-EDR-V1.0 - starting 2008-05-28T20:35:58.613Z

The footer contains "Privacy / Copyright" and "Webmaster: PDS Operator".

PHX bundle test step 4:

	 <p>PHX MET pre-processed Pressure and Temperature Data.</p> <p>Citation: Dickinson, C. D., PHX METEOROLOGICAL DATA V1.0, NASA Planetary Data System, 2008.</p> <p>Data Set Abstract: The PHX METEOROLOGICAL DATA product contains pre-processed (Digital Numbers) temperature and pressure data. The temperature data was collected at 250, 500 and 1000mm above the Phoenix Lander deck, and the pressure data was collected at (nearly) the height of the Lander deck. Nominally the data was collected at 2 sec resolution, but is also provided at 512 sec averages (with distribution statistics).</p> <p>Additional Information</p> <table border="1"> <tr> <td>Mission Information</td> <td>PHOENIX</td> </tr> <tr> <td>Data Set Information</td> <td>PHX-M-MET-2-PT-EDR-V1.0</td> </tr> <tr> <td>Instrument Host Information</td> <td>PHX</td> </tr> <tr> <td>Instrument Information</td> <td>MET</td> </tr> <tr> <td>Target Information</td> <td>MARS</td> </tr> <tr> <td>Resources</td> <td> Atmospheres Mars Archive Phoenix Analyst Notebook PHX MET EDR Volume PHMT_0XXX </td> </tr> </table>	Mission Information	PHOENIX	Data Set Information	PHX-M-MET-2-PT-EDR-V1.0	Instrument Host Information	PHX	Instrument Information	MET	Target Information	MARS	Resources	Atmospheres Mars Archive Phoenix Analyst Notebook PHX MET EDR Volume PHMT_0XXX
Mission Information	PHOENIX												
Data Set Information	PHX-M-MET-2-PT-EDR-V1.0												
Instrument Host Information	PHX												
Instrument Information	MET												
Target Information	MARS												
Resources	Atmospheres Mars Archive Phoenix Analyst Notebook PHX MET EDR Volume PHMT_0XXX												
Comments	Results met test successful criteria												
Date of Testing	2013.11.27												
Test Personnel	Richard Chen												

4 Anomalies

PDS uses the JIRA tracking system (<http://www.atlassian.com/software/jira>) to capture issues such as those found during testing. The full list of issues, including those raised by sources other than testing, is located at:

<http://oodt.jpl.nasa.gov/jira/browse/PDS>

4.1 Major Issues

None

4.2 Open anomalies

None

5 Requirements Traceability

This following lists the requirement ID, the system component of the requirement, the ID of the test case in Section 3 that tests the requirement, and the status of the test. Note that many requirements will not be tested by the test cases specified in this test document. Those testing are covered by test cases specified in the Build 4a Test Document, which is performed by the EN Integration and Test team.

Requirement #	System Component	Test case ID	Test Status
L5.GEN.1	General System	Applicable to System Test only	
L5.GEN.2	General System	Applicable to System Test only	
L5.GEN.3	General System	Applicable to System Test only	
L5.GEN.4	General System	Applicable to System Test only	
L5.GEN.5	General System	Applicable to System Test only	
L5.GEN.6	General System	Applicable to System Test only	
L5.GEN.7	General System	Applicable to System Test only	
L5.GEN.8	General System	Applicable to System Test only	
L5.GEN.9	General System	Applicable to System Test only	
L5.GEN.10	General System	Applicable to System Test only	
L5.GEN.11	General System	Applicable to System Test only	
L5.HVT.1	Harvest Tool	NODESTEST.3	pass
L5.HVT.2	Harvest Tool	NODESTEST.3	pass
L5.HVT.3	Harvest Tool	Applicable to System Test only	
L5.HVT.4	Harvest Tool	NODESTEST.3	pass
L5.HVT.5	Harvest Tool	NODESTEST.3	pass
L5.HVT.6	Harvest Tool	NODESTEST.3	pass
L5.HVT.7	Harvest Tool	NODESTEST.3	pass
L5.HVT.8	Harvest Tool	NODESTEST.3	pass
L5.PRP.DE.1	Prep: Design Tool	NODESTEST.1	pass
L5.PRP.DE.2	Prep: Design Tool	NODESTEST.1	pass
L5.PRP.DE.3	Prep: Design Tool	NODESTEST.1	pass
L5.PRP.DE.4	Prep: Design Tool	NODESTEST.1	pass
L5.PRP.DE.5	Prep: Design Tool	NODESTEST.1	pass
L5.PRP.DE.6	Prep: Design Tool	NODESTEST.1	pass
L5.PRP.DE.7	Prep: Design Tool	NODESTEST.1	pass
L5.PRP.VA.1	Prep: Validation Tool	NODESTEST.2	pass
L5.PRP.VA.2	Prep: Validation Tool	NODESTEST.2	pass
L5.PRP.VA.3	Prep: Validation Tool	NODESTEST.2	pass
L5.PRP.VA.4	Prep: Validation Tool	Applicable to System Test only	
L5.PRP.VA.5	Prep: Validation Tool	NODESTEST.2	pass
L5.PRP.VA.6	Prep: Validation Tool	NODESTEST.2	pass
L5.PRP.VA.7	Prep: Validation Tool	NODESTEST.2	pass
L5.PRP.VA.8	Prep: Validation Tool	Applicable to System Test only	
L5.PRP.VA.9	Prep: Validation Tool	NODESTEST.2	pass
L5.PRP.VA.10	Prep: Validation Tool	Applicable to System Test only	
L5.REG.1	Registry Service	NODESTEST.3	pass
L5.REG.2	Registry Service	NODESTEST.3	pass
L5.REG.3	Registry Service	Applicable to System Test only	

L5.REG.4	Registry Service	NODESTEST.3	pass
L5.REG.5	Registry Service	Applicable to System Test only	
L5.REG.6	Registry Service	NODESTEST.3	pass
L5.REG.7	Registry Service	Applicable to System Test only	
L5.REG.8	Registry Service	NODESTEST.3	pass
L5.REG.9	Registry Service	Applicable to System Test only	
L5.REG.10	Registry Service	Applicable to System Test only	
L5.REG.11	Registry Service	Applicable to System Test only	
L5.REG.12	Registry Service	Applicable to System Test only	
L5.REG.13	Registry Service	Applicable to System Test only	
L5.REG.14	Registry Service	Applicable to System Test only	
L5.REG.15	Registry Service	Applicable to System Test only	
L5.REG.16	Registry Service	Applicable to System Test only	
L5.RPT.1	Report Service	Applicable to System Test only	
L5.RPT.2	Report Service	Applicable to System Test only	
L5.RPT.3	Report Service	Applicable to System Test only	
L5.RPT.4	Report Service	Applicable to System Test only	
L5.RPT.5	Report Service	Applicable to System Test only	
L5.RPT.6	Report Service	Applicable to System Test only	
L5.RPT.7	Report Service	Applicable to System Test only	
L5.RPT.8	Report Service	Applicable to System Test only	
L5.RPT.9	Report Service	Applicable to System Test only	
L5.RPT.10	Report Service	Applicable to System Test only	
L5.RPT.11	Report Service	Applicable to System Test only	
L5.SCH.1	Search Service	NODESTEST.4	pass
L5.SCH.2	Search Service	Applicable to System Test only	
L5.SCH.3	Search Service	Applicable to System Test only	
L5.SCH.4	Search Service	Applicable to System Test only	
L5.SCH.5	Search Service	Applicable to System Test only	
L5.SCH.6	Search Service	NODESTEST.4	pass
L5.SCH.7	Search Service	NODESTEST.4	pass
L5.SCH.8	Search Service	NODESTEST.4	pass
L5.SCH.9	Search Service	Applicable to System Test only	
L5.SCH.10	Search Service	NODESTEST.4	pass
L5.SCH.11	Search Service	NODESTEST.4	pass
L5.SCH.12	Search Service	Applicable to System Test only	
L5.SCH.13	Search Service	Applicable to System Test only	
L5.SEC.1	Security Service	Applicable to System Test only	
L5.SEC.2	Security Service	Applicable to System Test only	
L5.SEC.3	Security Service	Applicable to System Test only	
L5.SEC.4	Security Service	Applicable to System Test only	
L5.SEC.5	Security Service	Applicable to System Test only	
L5.SEC.6	Security Service	Applicable to System Test only	
L5.SEC.7	Security Service	Applicable to System Test only	
L5.TRS.1	Transport Service	Applicable to System Test only	
L5.TRS.2	Transport Service	Applicable to System Test only	
L5.TRS.3	Transport Service	Applicable to System Test only	
L5.TRS.4	Transport Service	Applicable to System Test only	
L5.TRS.5	Transport Service	Applicable to System Test only	
L5.TRS.6	Transport Service	Applicable to System Test only	
4.2.4	Catalog Tool	Applicable to System Test only	

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4.2.4	Catalog Tool	Applicable to System Test only	
4.2.4	Catalog Tool	Applicable to System Test only	
4.2.4	Harvest Tool	Applicable to System Test only	
L4.PRP.2	Prep: Generate Tool	Applicable to System Test only	
L4.PRP.4	Prep: Transform Tool	Applicable to System Test only	
1.3.3	PDS Requirements	Applicable to System Test only	

6 Test Data

Test data has been posted onto <http://pds-engineering.jpl.nasa.gov/index.cfm?pid=145&cid=188> as “PDS4 Example Products (.zip)”

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
PDS4 - PDS4 Project
PDS MC - PDS Management Council
SDD - Software Design Document
SRD - Software Requirements Document