

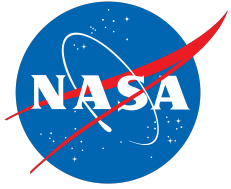


Core Tools

Label Design, Label Generation, Validation and Transformation

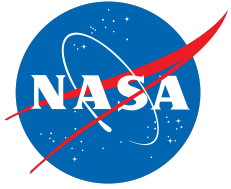
PDS Technical Session
Pasadena, California
September 21-23, 2016

Sean Hardman



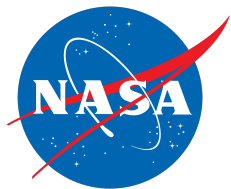
Topics

- Overview
- Lifecycle
- Approach/Architecture
- Core Tools
 - Design
 - Generation
 - Validation
 - Transformation
- Next Steps

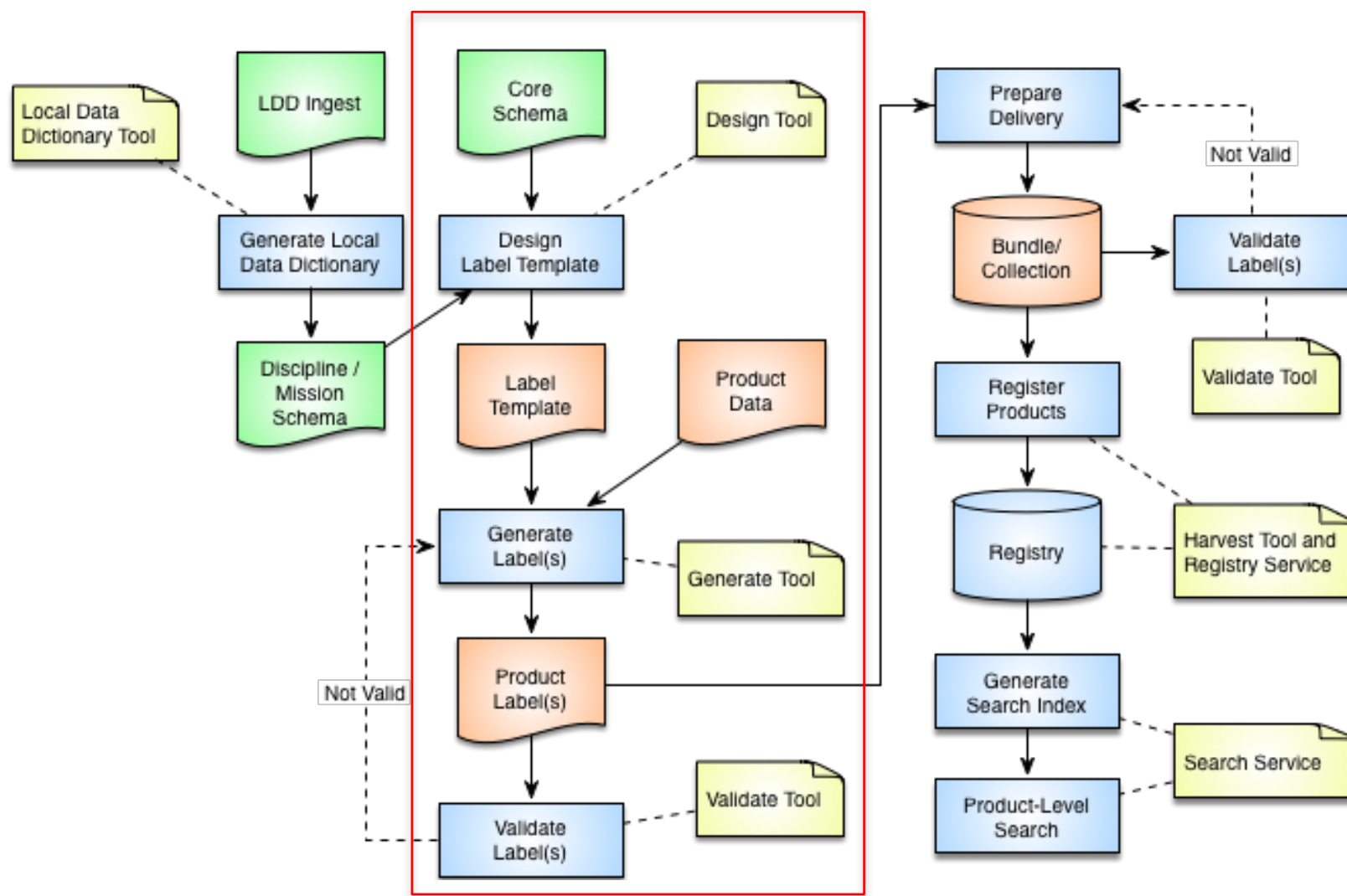


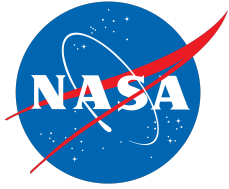
Overview

- EN strives to provide tools and libraries that satisfy the PDS 1.5.X and 3.3.X requirements.
- Starting with PDS4, a larger emphasis has been placed on Open Source software.
- In addition, there are a number of other sources for software as well:
 - Discipline Nodes
 - JPL MIPL/MGSS
 - Etc.



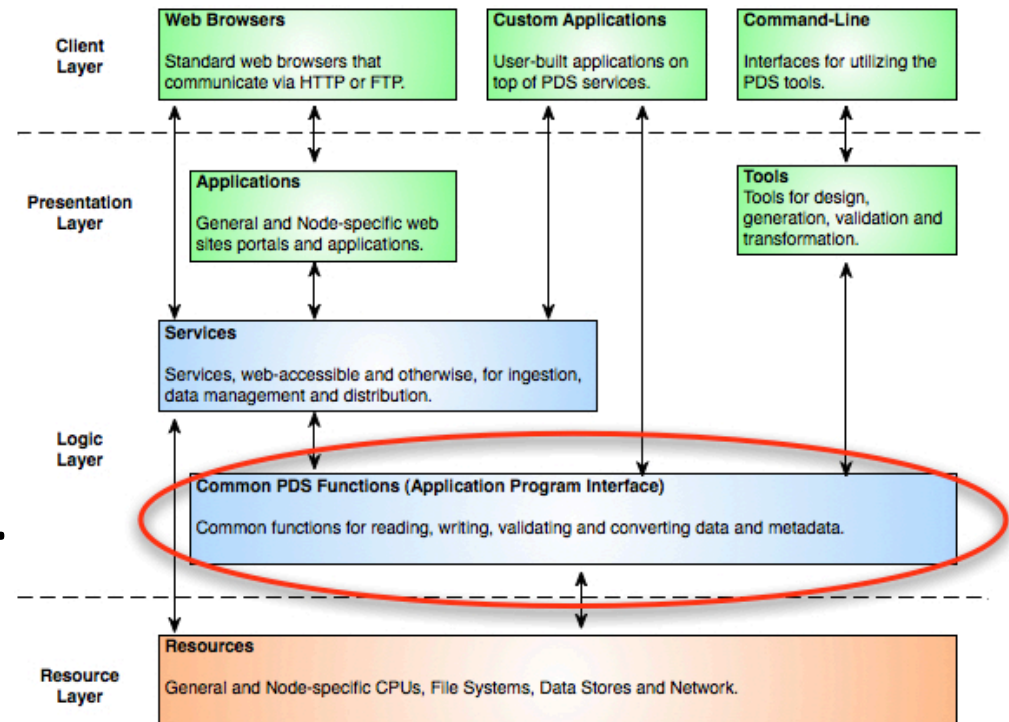
Lifecycle

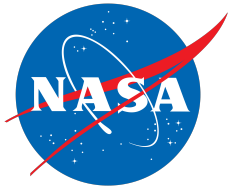




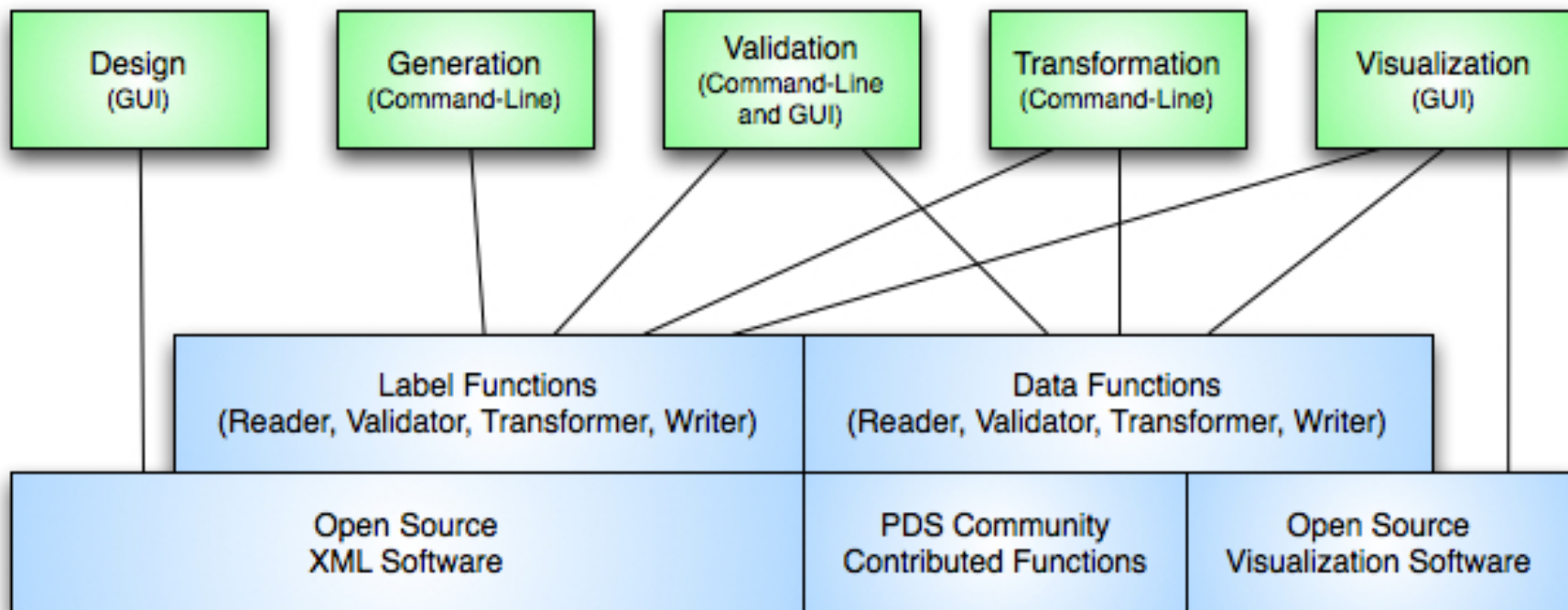
Approach

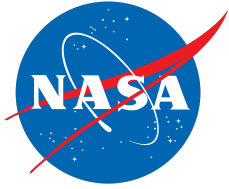
- Develop a common set of functions and make them available in a Java or Python libraries.
- These functions are then available to the tools and services within the system.
- Portions of the library will be open for contributions from the PDS community.





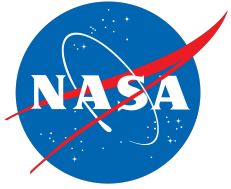
Architecture





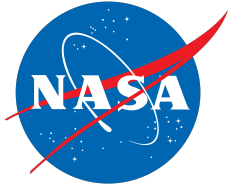
Design

- Functionality for designing PDS4 product labels using the XML Schema(s) and Schematron(s) as guidance.
- Early on in the project we promoted the use of Oxygen or Eclipse as generic design tools.
- We now have a number of tools to choose from which has created a bit of a quandary.



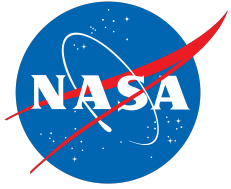
Design Tool Status

- LAbel Creation and Editing (LACE)
 - EN is in possession of this software, both as a service and a desktop tool.
 - Neither have been tested yet.
 - Not sure whether the latest model version is supported.
- APPS Label Design Tool (LDT)
 - A recent upgrade has streamlined the interface.
 - It has been requested that EN host and maintain this service.
- PDS4 XML Document Editor
 - Proposed by Todd King at the last F2F.
 - Not sure whether this should be explored as an option.



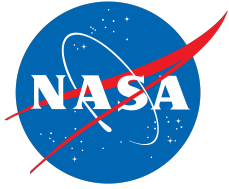
Design Tool Status (cont)

- Neither of the tools have a large enough community to justify their selection as a core tool.
- The plan is to test/evaluate LACE and LDT (possibly the other one) to determine the core tool that will be promoted and maintained.
 - We are currently waiting on a buildable/operable version of LACE.



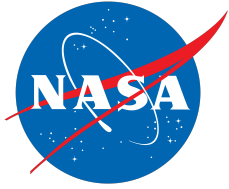
Generation

- Functionality for generating PDS4 product labels.
- Available tools offer a command-line interface with the intent to provide software that can be incorporated into a mission pipeline for producing labels.
- Requires the translation of the XML Schema(s) into a template.
 - These templates tend to be collection/product specific.



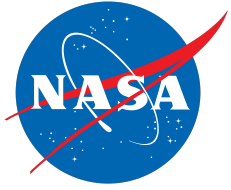
Generate Tool Status

- Both core tool solutions currently available utilize the Apache Velocity template engine.
 - Generate Tool
 - Supports transforming a PDS3 label to a PDS4 label.
 - Also supports metadata submitted in a DOM structure.
 - IGPP Docgen
 - Supports multiple metadata inputs: PDS3 label, text files containing keyword=value pairs, spreadsheets in CSV or TAB format and metadata in CDF files.
 - The output format can be text files, including well-formed PDS3 or XML.
 - Todd has a nice presentation on this in the afternoon.
- We have talked about merging these two tools into a single tool but it has been a low priority.



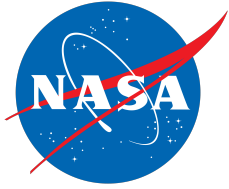
Validation

- Functionality for validating product labels and product data.
- The associated XML Schema(s) and Schematron(s) for the product label specify syntactic and semantic constraints.
- Additional constraints are levied by the PDS Standards Reference.
 - These constraints have been captured in the Validation Requirements document.



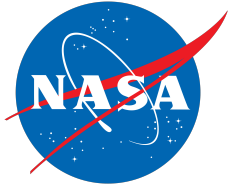
Validate Tool Status

- Current Functionality
 - Validate single products against XML Schema(s) and Schematron(s).
 - Validate aggregate products (bundle/collection) with referential integrity.
- Desired Functionality
 - Product content validation against label description.
 - Improved XML Catalog support.



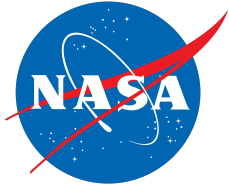
Validate Tool Status (cont)

- Waiting on final delivery of validation code from Ames.
 - This will include an initial implementation of content validation.
 - Also includes incorporation of PDS3 validation into a single tool as well as desktop version of Volume Validator.
- Once we can determine the functionality provided, the Validation Requirements will be reviewed to determine the remaining capabilities to prioritize and implement.



Transformation

- Functionality for transforming product labels and data to/from PDS4 formats.
- Focus has been on utilizing existing libraries, open source and otherwise, to provide transformations.
- Functionality available in library and command-line form currently.
- Next fiscal year we will be looking into a service-based interface.

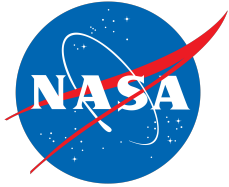


Transform Tool Status



Current Functionality

- Supports a number of PDS3/PDS4 image product transformations to common image formats.
 - When adding new transformations, we do need solid examples to work with.
- Supports PDS4 table product transformations to CSV.
- Supports transformation of multiple objects within a PDS4 product.



Transform Tool Status



Supported Transformations

PDS4 Labeled Data

Array_2D_Image, Array_3D_Image, Array_3D Spectrum, FITS Image	JPEG, GIF, JPEG 2000, PNG, PNM
Table_Binary, Table_Character, Table_Delimited	CSV

PDS4 Label

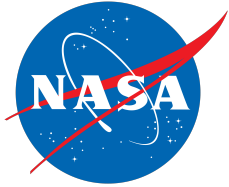
XML Label	PVL, HTML, HTML Structure
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PDS3 Labeled Data

8-Bit Image, 16-Bit Image	JPEG, GIF, JPEG 2000, PNG, PNM
VICAR Image (Prototype)	Array_2D_Image with PDS4 XML Label

PDS3 Label

ODL Label	PDS4 XML Label
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Next Steps

- Evaluate the design tools and determine the path forward.
- Determine whether merging the generate tools is the best approach.
- Evaluate the Validate Tool to determine requirements coverage and prioritize appropriately.
- Prioritize additional transformations for the Transform Tool and investigate service deployment.

Questions/Comments