

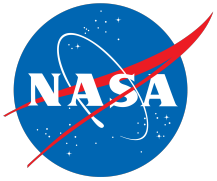


PDS4 Operational Readiness Review

System Architecture and Operations Concept

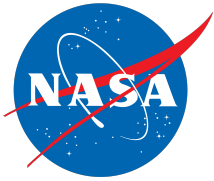
Sean Hardman
Engineering Node





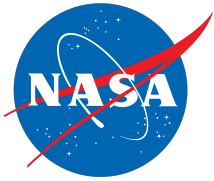
Topics

- Overview
- Core Concepts
- System Components
- Operations Concept
- Wrap Up



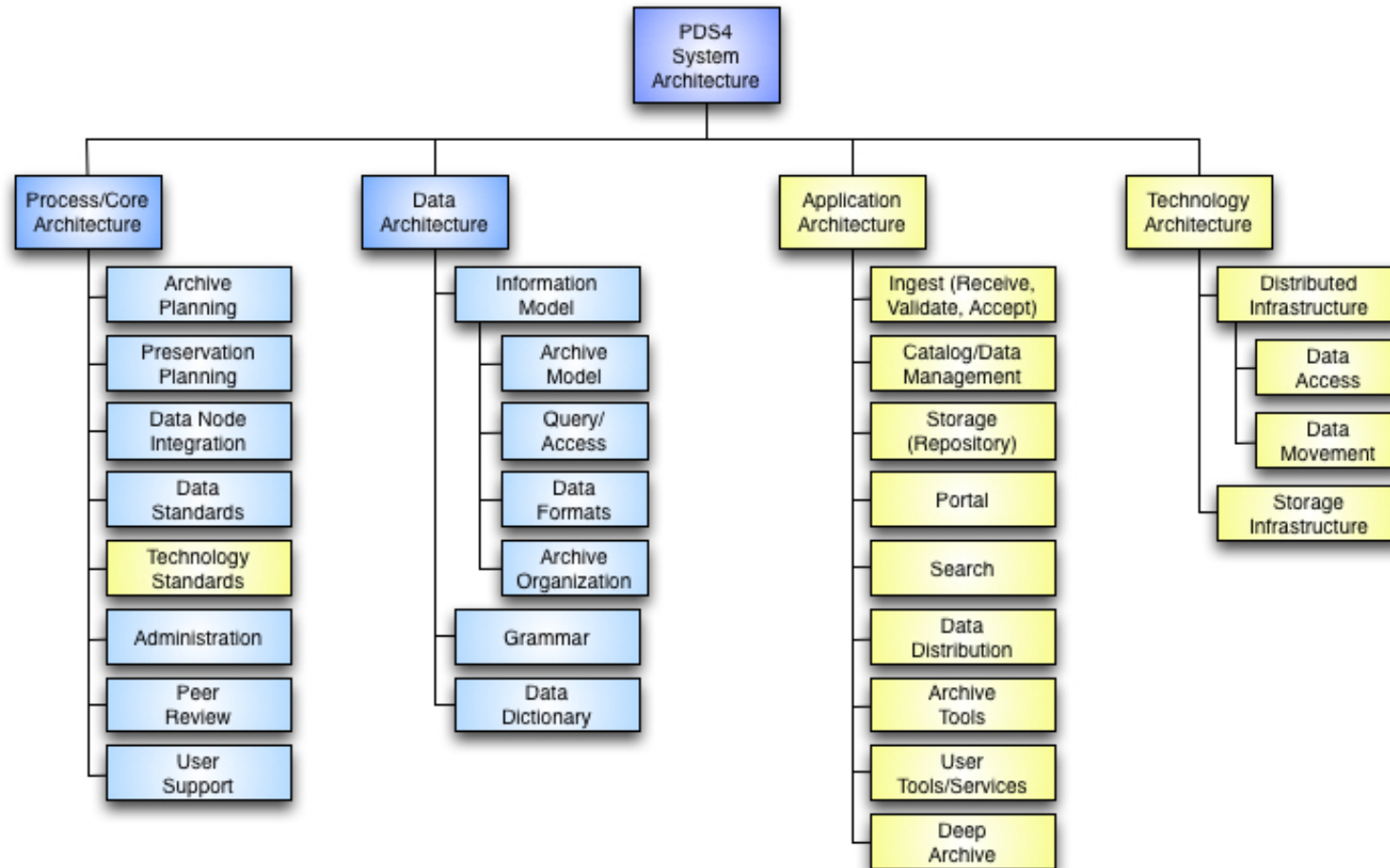
Overview

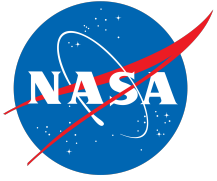
- The system architecture offers a balance between a distributed system and a centralized system.
- The system includes distributed services for product registration and search to be deployed at the Nodes along side their local data repositories.
- The system also includes centralized services for high-level search, tracking, reporting and monitoring to be deployed at the Engineering Node.



Architectural Elements

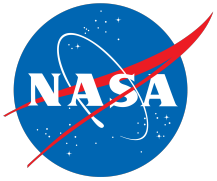
(Elements derived from Level 3 Requirements)





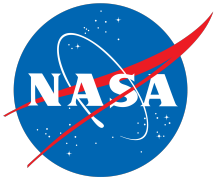
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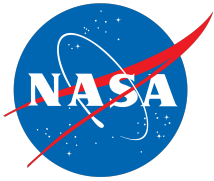
Core Concepts

- Service-Based Design
 - Support remote access to data and services to bring the federation together both for ingestion and distribution.
- System of Registries
 - Adopt a system of registries to support improved tracking and access.
- Common Search
 - A publicly available layer facilitating search across PDS.
- Enhanced Tool Suite
 - A tool-based approach is still appropriate for certain functions.



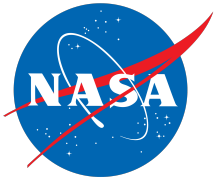
Service-Based Design

- Service-based functionality will focus on public interfaces for search, retrieval and value-added processing (science services) of data.
- Where web-based service interfaces are planned, a REST-based interface will be implemented.
- Other services that integrate COTS or open source solutions will utilize their provided interfaces (e.g., LDAP).



System of Registries

- Provides functionality for tracking, auditing, locating, and maintaining artifacts within the system.
 - Artifacts range from products consisting of data and label files, schemas, dictionary definitions for objects and elements, service definitions, etc.
- Design based on a Registry Reference Model effort that is based on the ebXML standard.
- Provides a common implementation for registry instances.

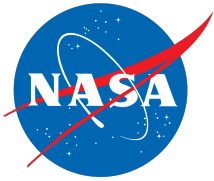


System of Registries

One Implementation, Multiple Uses

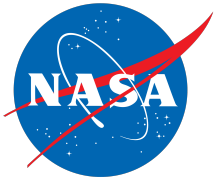


- Inventory
 - Captures catalog and product metadata in a number of distributed instances deployed at the Engineering and Discipline Nodes.
 - Tracks catalog and product artifacts from mission delivery to deep archive.
- Dictionary
 - Captures the data dictionary, which consists of object/element definitions and their associations.
- Service
 - Captures descriptions of PDS services and their associations with data collections.



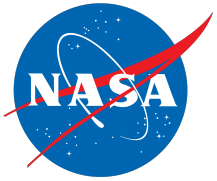
Common Search

- Serves as the publicly available interface for information contained in the registries.
- The metadata in the registries represents the contents of the PDS archives.
- This service allows product metadata to be annotated for the purposes of search.
 - For example, updates to geometry, feature identification, etc.
- Defines a common search query language that facilitates parameter passing and search integration.



Enhanced Tool Suite

- There are several functions related to product labels and data where a tool is an appropriate interface:
 - **Design** of product label schemas
 - **Validation** of products and collections of products
 - **Generation** of product labels in a pipeline
 - **Transformation** of product formats (labels and data)
 - **Visualization** of data
- Tool-based interfaces include standalone command-line and GUI applications executed on a user's desktop machine.

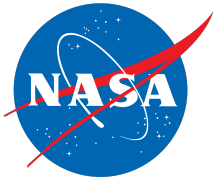


Enhanced Tool Suite



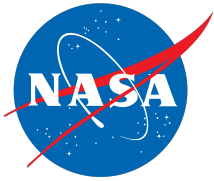
Approach

- Capabilities provided in the form of software libraries with command-line interfaces.
- Develop a common set of functions and make them available in Java and Python-based libraries.
- 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.

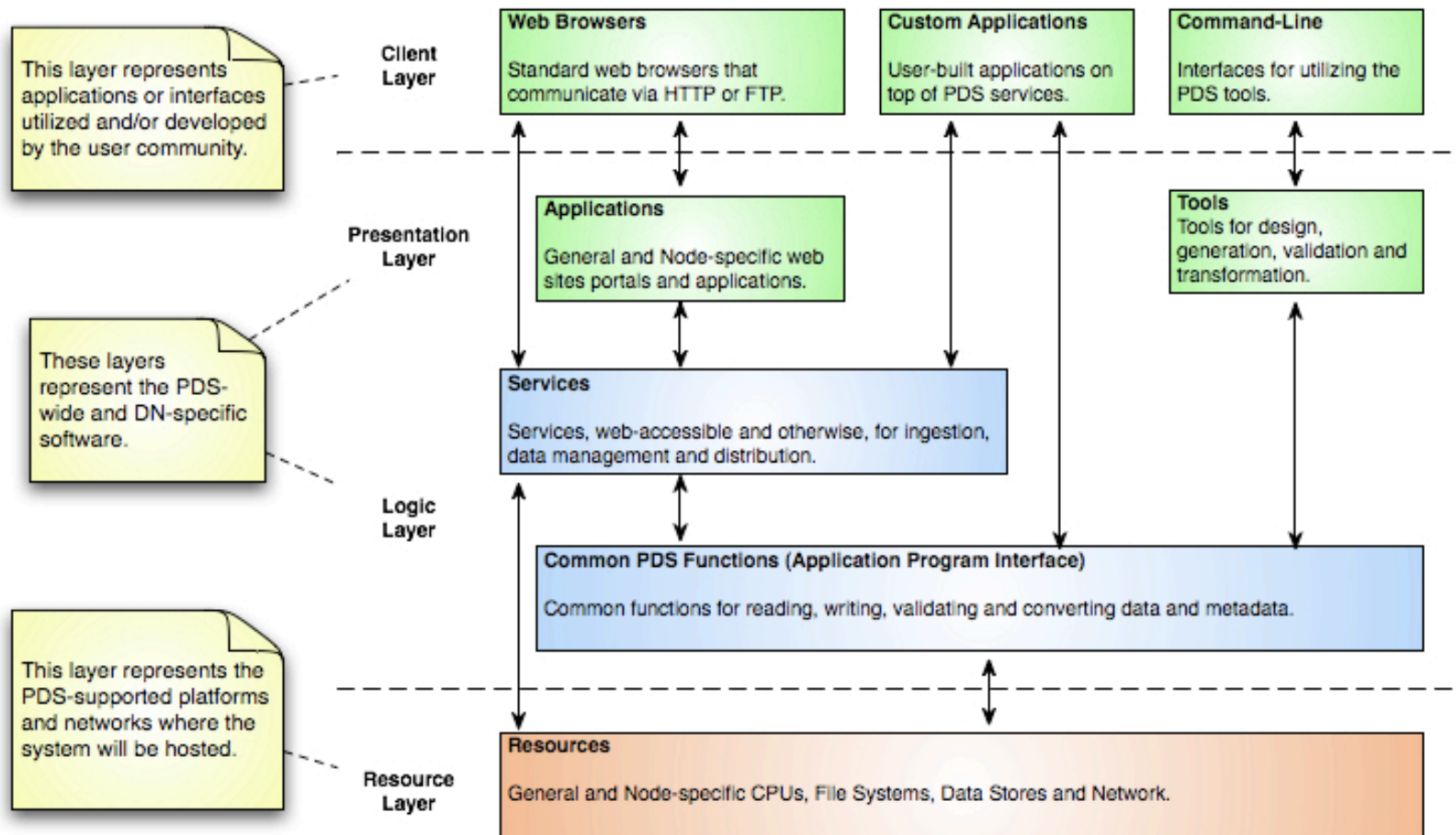


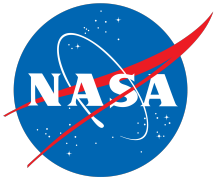
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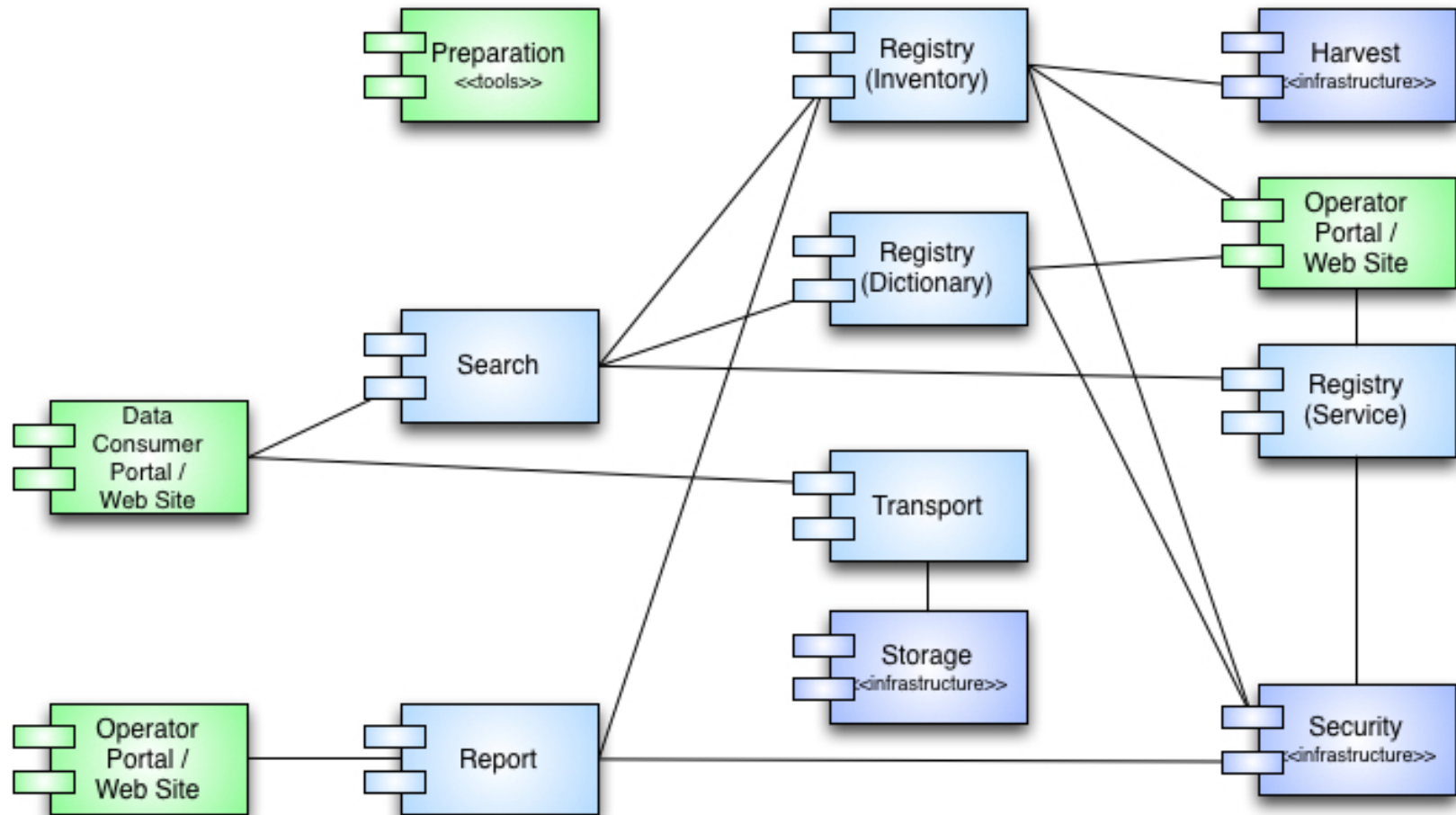
Component Layering

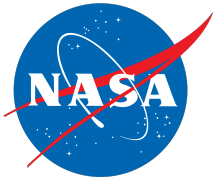




Component Identification

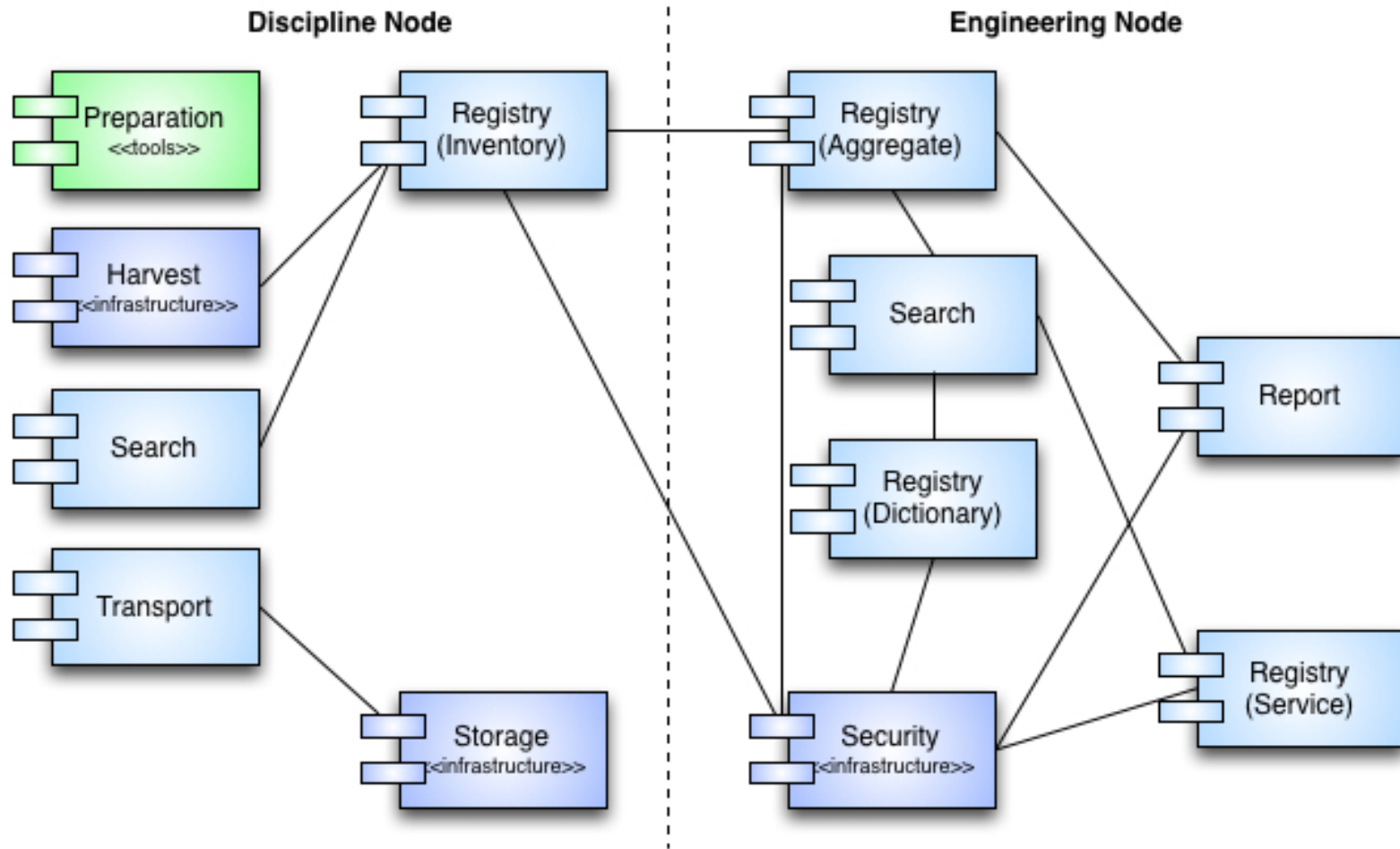
(Components derived from Architectural Elements)

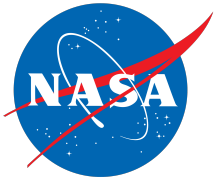




Component Provisioning

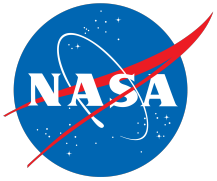
(Balanced between Centralized and Decentralized)



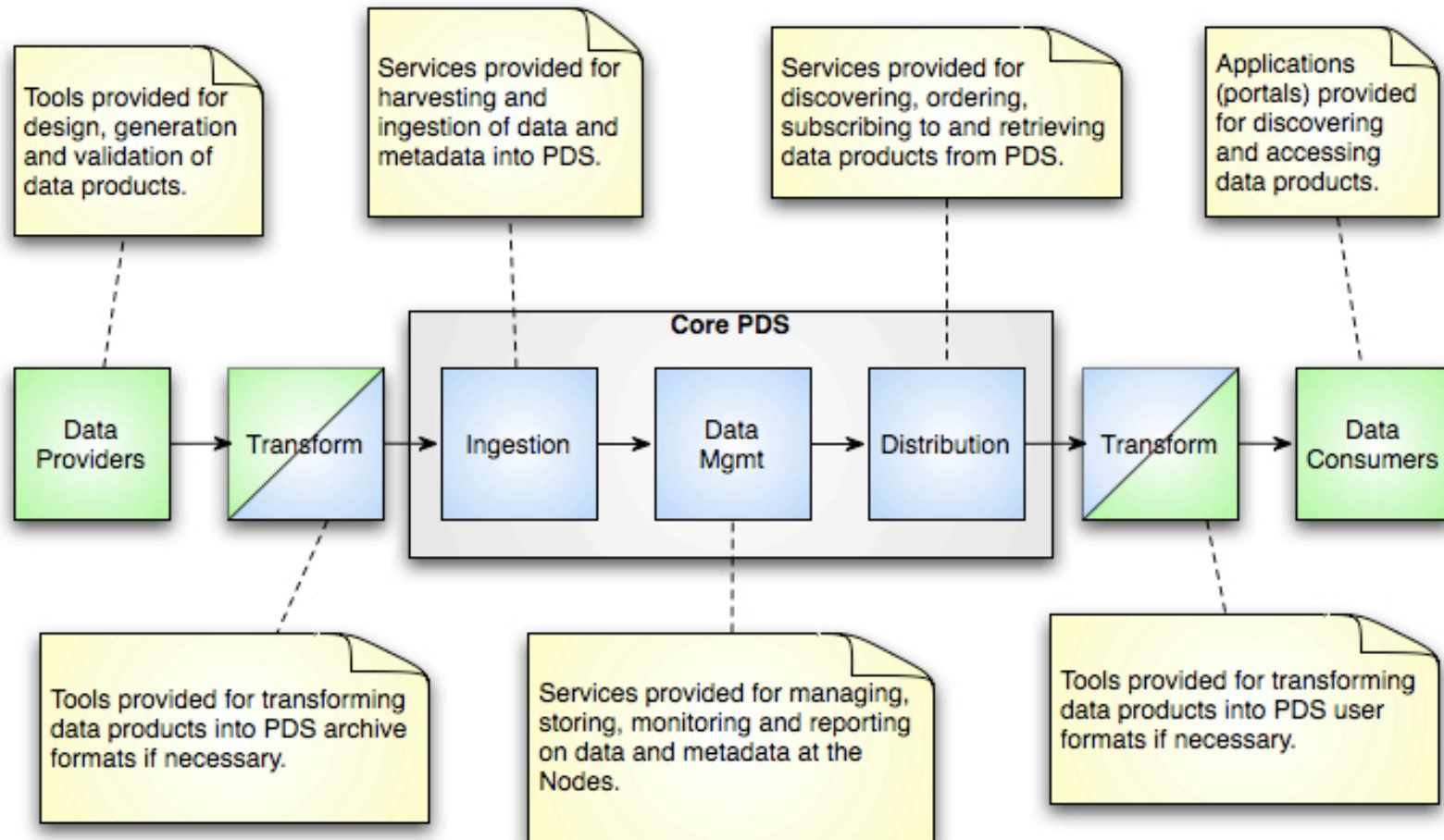


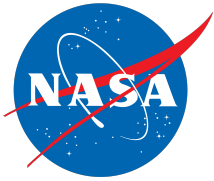
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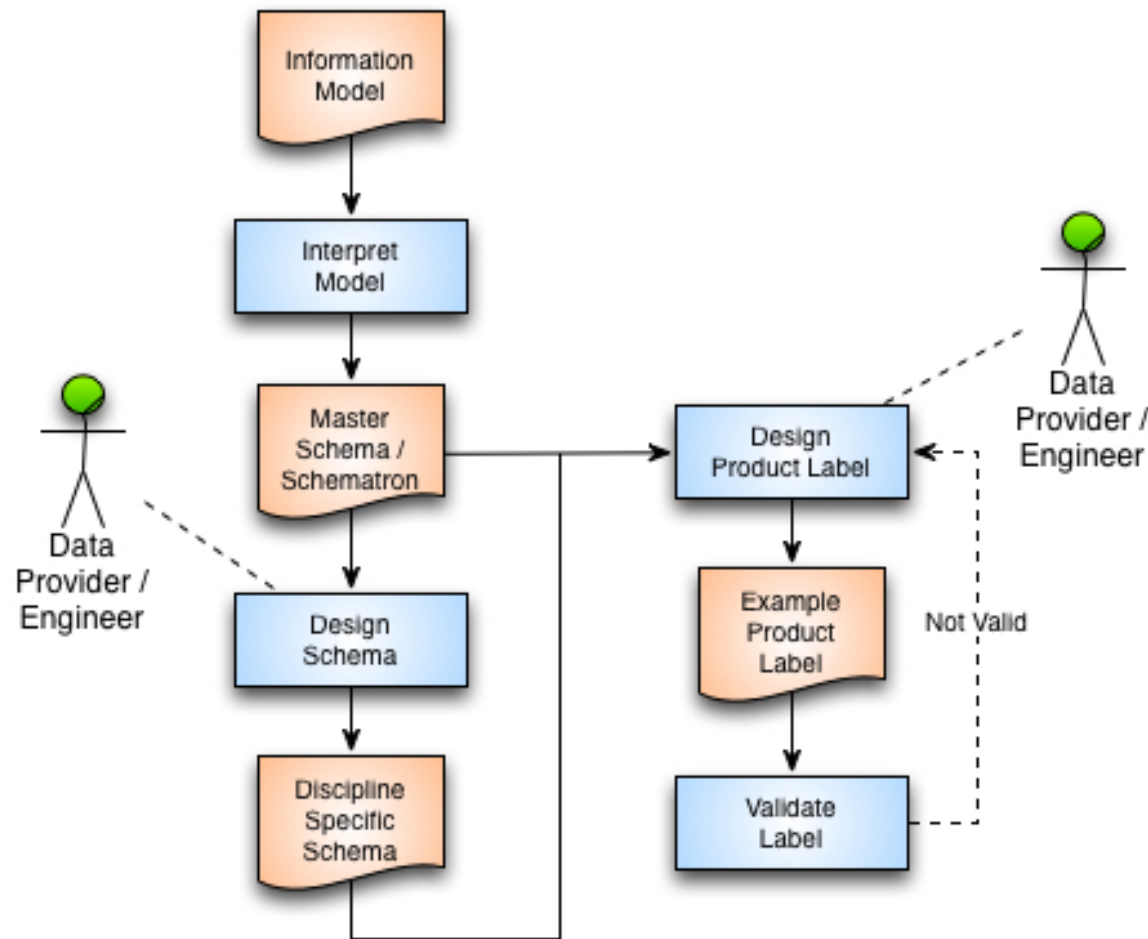
Operations Concept

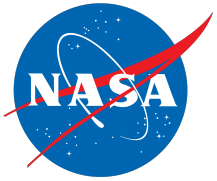




Operations Concept

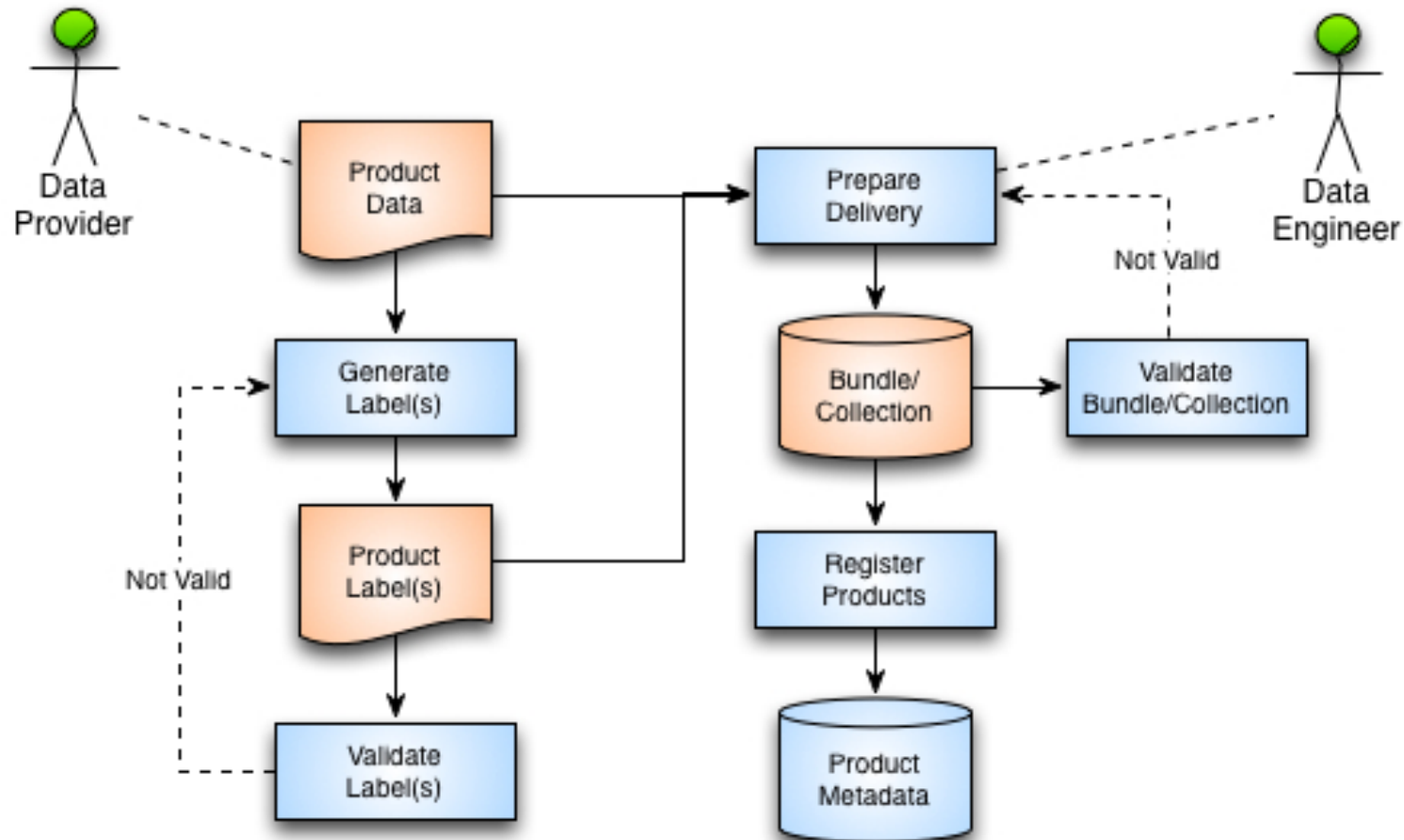
Product Lifecycle (Design)

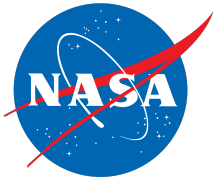




Operations Concept

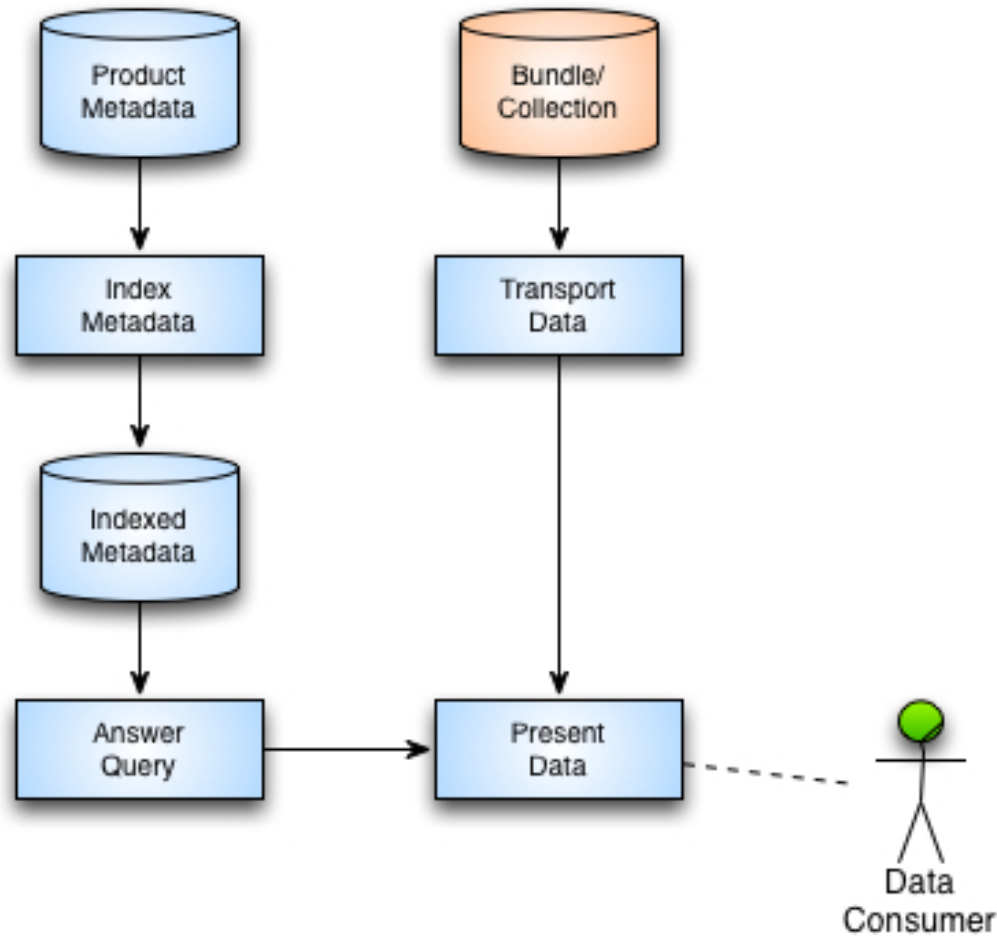
Product Lifecycle (Ingestion)

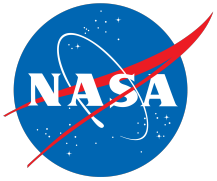




Operations Concept

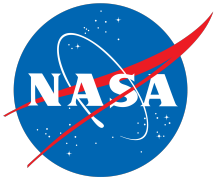
Product Lifecycle (Search/Distribution)





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Wrap Up

- The system architecture retains the spirit of the PDS as a loosely coupled federation.
- The operations concept works with existing PDS policies and procedures and strives to minimize the impact on the Nodes.

Questions/Comments