

MAPPING BETWEEN PDS3 AND PDS4 PROPERTIES. A. Waldron¹, C. De Cesare¹, K. Grimes¹, and P. Ramirez¹, ¹Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Drive, Pasadena, CA, 91109-8099, USA (anna.waldron@jpl.caltech.edu).

Introduction: The Planetary Data System Imaging Node (PDSIMG) [1] stores hundreds of terabytes of images with their corresponding metadata labels. PDSIMG is currently in the process of transitioning the storage of new image metadata labels from the PDS3 standard [2] to the new PDS4 standard [3]. As new image data with metadata following the PDS4 standard is submitted to PDSIMG for archival, it will be necessary for tools such as the Image Atlas [4], a web-based tool for searching data based on properties of PDS metadata labels, to store and search across both PDS3 and PDS4 label metadata. This will require knowledge of which PDS3 keywords correspond to which PDS4 XML elements, so that a single search can provide results from metadata labels following either standard. The Label Mapping Tool (LMT) [5] has been developed by PDSIMG to solve this problem.

The Label Mapping Tool: The LMT consists of two services which are each run in their own Docker containers and must be able to connect to each other: a service for hosting the database which stores the PDS properties and their relationships, and a service for interacting with the database through a REST API.

The database service. The database service hosts a PostgreSQL database which contains tables for PDS3 properties, PDS4 properties, and “common names”, which are intermediary names used by the Image Atlas and other services to provide user-friendly synonyms for PDS3 and PDS4 properties. The tables contain relations to each other which keep track of the mappings between the PDS3 and PDS4 properties and their common names. The LMT considers these three property types – PDS3, PDS4, and their common names – to be the three currently available “standards” available for requesting and storing property mappings.

The http web service. The web service provides a REST API for interacting with the property map database through HTTP endpoints. Currently, the API provides the following endpoints:

- A GET endpoint for requesting the mappings from a single property of a standard to either all available standards or one standard of interest.
- A GET endpoint for requesting the mappings from all properties of a standard to either all available standards or one standard of interest.

- A POST endpoint for adding a common name and its relationships to PDS3 and PDS4 properties to the database.

The API will also provide endpoints for retrieving information on properties such as their data types.

Ingesting the mappings: Initially, the mappings between PDS3 keywords and PDS4 elements are created by manually editing the Imaging Ingest Local Data Dictionary (IILDD) [6] XML file, to add each PDS3 keyword into the <Property_Map> element of the PDS4 class or attribute it is a synonym of. This is typically done by PDSIMG personnel who understand the meaning of both the PDS3 keyword and the PDS4 attribute/class.

The LMT ingests the PDS3 and PDS4 properties and their mappings directly from the ILDD’s Property Map Dictionary. These properties and mappings are updated periodically from the publicly provided ILDD. The common names are added by users, such as the Image Atlas, on an as-needed basis.

Conclusions and Further Work: The Label Mapping Tool provides an important resource for translating between different PDS standards, a growing necessity as the PDSIMG archive becomes more diverse. In the future it may become the single source of truth for the relationships between PDS properties of different standards and negate the need for tracking these relationships in the Property Map Dictionary of the ILDD.

References: [1] IMG: <https://pds-imaging.jpl.nasa.gov/>. [2] PDS3 Data Standard: <https://pds.jpl.nasa.gov/datastandards/pds3/>. [3] PDS4 Data Standard: <https://pds.nasa.gov/datastandards/about/>. [4] Image Atlas: <https://pds-imaging.jpl.nasa.gov/search>. [5] <https://github.jpl.nasa.gov/PDSIMG/label-mapping-tool>. [6] Imaging LDD: <https://github.com/nasa-pds-data-dictionaries/ldd-img>.