PDS4: Harnessing the Power of Generate and Apache Velocity. J. Padams[1], M. Cayanan[1], S. Hardman[1], [1]Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA. (Jordan.H.Padams@jpl.nasa.gov)

Introduction: The PDS4 Generate Tool [1] is a Java-based command-line tool developed by the Cartography and Imaging Sciences Nodes (PDSIMG) [2] for generating PDS4 XML labels, from Apache Velocity templates and input metadata.

PDS4 is the new standard for Planetary Data System data archiving based in Extensible Markup Language (XML). This standard is used as the standard syntax and structure for capturing metadata for archived data products [3].

The metadata that data providers want to include in these metadata labels can come from many sources in many different formats: Object Description Language (ODL) detached labels, ODL attached labels, comma-separated value (CSV) files, and MySQL databases, among others.

In the past, data providers were expected to develop their own tools to parse this metadata and output these metadata labels, often duplicating effort for software that does very similar things.

The PDS4 Generate Tool provides a single package for generating PDS4 XML labels from disparate metadata sources and file formats, including ODL, CSV, and MySQL databases. In short, the Generate Tool software provides readers for the various metadata formats, and harnesses the power Apache Velocity Templating Engine [4] to output the XML label.

Apache Velocity: Apache Velocity is an open source, Java-based template engine. It permits anyone to use a simple yet powerful template language to reference objects defined in Java code [4].

For example, to produce an PDS4 XML attribute from a PDS3 Keyword, a simple variable mapping in the Velocity template can be used in order to produce the expected XML output. See Figure 1 and Figure 2 for examples of how this would occur.

Beyond the simple variable mapping, Apache Velocity also provides a user with an entire library of capabilities through the Velocity Template Language [5].

Open Source: As an open-sourced, Java-based software tool (https://github.com/nasa-pds), the PDS4 Generate Tool can be easily extended with more readers for additional metadata file formats and sources.

Consistency: With past PDS standards, data providers were left to develop their own disparate tools to generate labels for the PDS archives. In many cases this was not only duplicating effort but duplicating problems that were solved by previous data providers. This problem also left data entering the archive be inconsistent across data volumes. By using one consistent tool for this label generation, it allows data providers to help one another by growing these pipelines an integrating with other tools and services, such as the PDS Label Assistance for Interactive Design (PLAID) [6] and the PDS Label Making Tool [7].

Conclusion: This talk will provide details on the power of the PDS4 Generate Tool and Apache Velocity and how the use of this tool can benefit future data providers.

References: [1] PDS: Planetary Data System. Generate Tool. https://pds.nasa.gov/pds4/software/generate/. [2] Cartography and Imaging Sciences Node. https://pds-imaging.jpl.nasa.gov/. [3] PDS: Planetary Data System. What is PDS4? https://pds.jpl.nasa.gov/pds4/about/what.shtml [4] The Apache Velocity Project. http://velocity.apache.org/ [5] The Apache Velocity Project: User Guide. http://velocity.apache.org/engine/2.0/user-guide.html. [6] PDS Label Assistant for Interactive Design (PLAID). https://plaid.jpl.nasa.gov/ [13] De Cesare, C. et al., 2018, this volume.