

PDS4: Developing the Next Generation Planetary Data System

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Abstract

The Planetary Data System (PDS) is in the midst of a major upgrade to its system. This upgrade is a critical modernization of the PDS as it prepares to support the future needs of both the mission and scientific community. It entails improvements to the software system and the data standards, capitalizing on newer, data system approaches. The upgrade is important not only for the purpose of capturing results from NASA planetary science missions, but also for improving standards and interoperability among international planetary science data archives. As the demands of the missions and science community increase, PDS is positioning itself to evolve and meet those demands.

1. Introduction

The Planetary Data System (PDS) serves as NASA's official archive for scientific data results captured from solar system missions and research. Over the past few years, the PDS has undertaken an ambitious project to transform the PDS, upgrading the software and data standards to incorporate modern data system approaches. This has included moving to an online, distributed, web-based infrastructure, as well as building a rigorous data model and corresponding set of data standards. In addition to improving the overall implementation of PDS, it is anticipated that this improvement will also allow increased worldwide access and international interoperability among planetary science archives as version 4.0 of the system and data standards are released to the community.

2. System Goals of PDS4

As part of preparing for the release of PDS4, the PDS has three fundamental system goals that include: (1) Providing more efficient client delivery of data by

data providers to the PDS; (2) Enabling a stable, long-term usable planetary science data archive; and (3) Enabling services for the data consumer to find, access and use the data they require in contemporary data formats. These goals are critical to preparing PDS, as a system, to support the next decade of planetary science missions along with the user community.

3. Data Standards and International Interoperability

At the core of PDS4 is version 4.0 of the PDS Data Standards. These standards are being developed to ensure rigorous capture of planetary science data, both for the U.S. and world-wide. Given the importance of sharing planetary science data, the PDS has not only embarked on improving the standards and infrastructure for its own system, but also working with the International Planetary Data Alliance (IPDA) to ensure that interoperability and standards are coordinated across the various space agencies. The PDS4 Standards provide a framework for capturing planetary science data results in international archives based on a homogeneous set of standards that can be extended for both various planetary science disciplines as well as for each space agency.

4. Progress

To date, the PDS has already been performing regular system builds for PDS4 and testing is now underway. Additional capabilities are currently being integrated as the system is being prepared for release. For the data standards, a series of assessments and prototyping have taken place both within PDS and with the IPDA to ensure that PDS4 will be ready and can be used for future missions.

4. Conclusion

Significant progress has been made over the past year on PDS4, and PDS is now planning for the operational release. PDS is now testing the software and planning for the transition. The transition covers migration to PDS4, changes in the software infrastructure, and planning for missions support. As part of this project, the PDS has gained significant experience in upgrading a major archive system that involves a number of stakeholders.

Acknowledgements

The authors would like to thank the PDS Management Council along with members of the PDS4 development team including both the system design and data design teams.

A portion of this research described was carried out at the Jet Propulsion Laboratory, California Institute of Technology under contract to the National Aeronautics and Space Administration.

References

- [1] Beebe, R., Crichton, D., Hughes, J. S., and Grayzeck, E.: Evolving the Technical Infrastructure of the Planetary Data System for the 21st Century, 42nd Division of Planetary Sciences, October 2010, Pasadena, CA, USA, 2010.
- [2] Crichton, D., Osuna, P., Capria, M.T., Beebe, R., Hughes, J. S., Yamamoto Y., Salgado, J., and Kasaba, Y.: Developing the International Planetary Data Alliance, Ensuring Long-term Preservation and Adding Value to Scientific and Technical Data, November 2009, Madrid, Spain, 2009.