IPDA 7th Steering Committee Meeting
MOX, ISTRAC, ISRO
Bangalore, India
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Name	Country Affiliation	Email
Navita Thakkar	India	navitat@sac.isro.gov.in
Maira Teresa Capria	Italy	Mariateresa.capria@iasf-roma.inaf.it
Baptiste Cecconi	France	Baptiste.cecconi@obspm.fr
Dan Crichton	USA	Dan.crichton@jpl.nasa.gov
Director, ISTRAC, ISRO	India	director@istrac.org
Michel Gangloff	France	michel.gangloff@cesr.fr
Dave Heather	ESA	dheather@rssd.edu.int
Naru Hirata	Japan	naru@u-aizu.ac.jp
Steve Hughes	USA	Steve.hughes@jpl.nasa.gov
B. Gopala Krishna	India	bgk@sac.isro.gov.in
Manthira Moorthi	India	smmoorthi@sac.isro.gov.in
Ajay Prashar	India	Ajay-prashu@sac.isro.gov.in
Amit Purohit	India	Amit.purohir@sac.isro.gov.in
JD Rao	India	jdrao@istrac.org
Alain Sarkissian	France	Alain.sarkissian@latmos.lpsl.fr
Sreenath	India	sreenath@istrac.org
R. Srinivasan	India	rsvasan@istrac.org
Tom Stein	USA	tstein@wustl.edu
Yukio Yamamoto	Japan	yukio@planeta.sci.isas.jaxa.jp

Executive Summary

The IPDA Steering Committee met for 3 full days of discussion covering IPDA progress, agency efforts in archiving planetary science data, coordination on the development of PDS4, construction of shared protocols for data discovery, registration and cross-agency search of planetary archives, plans for evolving geometry services, and updates to the administration of the IPDA. The Director of ISTRAC opened the IPDA meeting welcoming everyone to ISRO. He expressed his support of the IPDA. The IPDA thanked him, Mr. R. Srinivasan and B. Gopala Krishna for coordinating and hosting the meeting.

Overall, significant progress has been made in the IPDA and agencies are working well together. A critical aspect of this has been aligning IPDA projects with agency funding which increases their chances of a successful outcome. In particular, using future missions as drivers for developing IPDA standards and promoting interoperability has helped move the IPDA forward with PDS4, PDAP, Registration and Cross Agency Search. Many of the projects have gone through phases of requirements assessment, development, testing/evaluation, and then adoption/implementation. Over this past year, significant collaboration has occurred around testing and evaluating PDS4 and the IPDA Steering Committee moved to endorse the adoption of PDS4 by member agencies. The Bepi Columbo mission is currently scheduled to be the first project outside NASA to begin implementation of PDS4.

In addition to discussion of agency's activities and IPDA projects, the IPDA was given a very generous presentation by Dr. Shri M. Annadurai who described the activities of the India Space Research Organization. Dr. Annadurai is a distinguished leader at ISRO who directs the remote sensing satellite program. He stressed the importance of a "win-win" situation though international collaboration. In addition to Dr. Annadurai's lecture, the ISRO hosts provided a tour of their tracking facility and its capabilities. Besides invited talks by ISRO, Maria Teresa Capria provided an update on the EuroPlanet activities.

On Friday afternoon, the IPDA met to finalize the projects and structure for 2012-2013. Several projects were identified, leveraging on the excellent activities of the IPDA in the previous year. These included a PDS4 implementation project, multiple PDS4 registry development and implementation projects to support cross agency search of data, tools and services. There was also discussion on a coordination project between PDAP and PDS4 and delivery of a core PDAP specification, and extension of the geometry project to development a PDS4 geometry model. The IPDA Steering Committee felt that regular teleconferences will be critical and potentially a mid-year IPDA SC telecom to assess progress. After identifying the projects, the IPDA discussed plans for the next Steering Committee. Alain Sarkissian offered the possibility of CNES hosting the meeting. This was chosen as the candidate location with Alain checking on the feasibility. Finally, the meeting ended with members expressing their heartfelt thanks to the ISRO colleagues for their support and hospitality in hosting the meeting this year.

7th IPDA Meeting Participations at ISRO, Bangalore, India

IPDA 7th Steering Committee Meeting 11 July 2012 (Day 1)

IPDA Update

Dan Crichton

Agenda and Logistics

State of the IPDA

Mission of IPDA (extracted from IPDA charter)

- How to facilitate global access to and exchange of scientific data
- Support construction of compatible archives
- Support sharing of tools and software services
- Define data standards

It is important for to create a concerted system that does not duplicate work but rather is interoperable.

History

- NASA Standard : PDS (1980s)
- ESA Standard : PSA (2000s) based on PDS 3 standards.
- Last (6th Steering Committee) Meeting in Sept 2012 at Caltech.

Administration

- Quarterly teleconferences
- Publish IPSA yearly report in Space Research (Planned Outcome) – thanks to Maria Teresa for starting this
- Updates to the website for reorganization
- Outreach at key meetings

Current steering committee listed

Technical Experts Group listed

Projects for 2011-2012 (to be reported on Thursday)

- PDS4 Prototype Project – Santa Martinez
- PDAP Development and Coordination – Jesus Segaldo
- OPDA Query Language – Steve Hughes
- Registry Development and Coordination – Sean Hardman
- Website Development – Emily Law
- Geometry Requirements – Chuck Acton

IPDA Standards Progress (chart) – to serve as a roadmap for IPDA

Website

- Goal to simplify the website

- More discussion during this meeting
- By end of meeting, each person should have login access and should upload their presentation

Outreach / IPDA Networking

- EPSC/DPS 2011 in Nante –IPDA session
- PV 2011
- AGU 2011 – booth with posters and handouts on IPDA, PDS4, PSA; considerable traffic
- LPSC 2012
- VAO 2012
- 2012 Planetary Data Workshop
- COSPAR 2012 – 20 to 30 presentations and posters

Goals for this meeting

- Significant discussion/plan for PDS4 release, targeting upcoming missions that will use PDS4
- Significant discussion for PDAP release
- Registering and accessing data from other space agencies
- New/missing projects
- Outreach
- Administration plan for the coming year
- Next IPDA meeting

Action items from previous meeting

- Review TEG membership; let Pedro/Dan know if out of date
- Jesus and Pedro to produce a standard template for extensions to PDAP and pass to the fly-by-product project.
- Send out the PDAP extension for fly-by-product to the TEG mailing list
- Pedro will pre-book the TEG meeting every two months and to the TEG
- Align PDS4 model and software classes in PDAP – further discussion in this meeting
- What are the return types for PDAP? TEG to formulate a proposal for submission to the SC for review. Also consider including other items pertinent for the SV to review prior to submission of PDAP.
- Generate an OPDA data dictionary service
- Dan will add the new Russians to the IPDA TEG; send to Pedro
- Develop a project for validation rules for PDS4
- Vicki to help us find someone who could join TEG from CSA
- Review the mailing lists organization to make sure it is an effective tool
- Dan to distribute the voting procedure
- Dan to send out SC plans for 2012
- Put together a structure for PDAP with a set of goals (Jesus)

- Explore addition of new countries (Poland, e.g.) (Alain to help us)
- Tom Morgan will lead development of the IPDA/AGU planning; will meet in Nantes

ESA Agency report

Dave Heather (presenting), Christophe Arviset

PSA – Planetary Science Archive (began in 2004)

- Active development
- Datasets received from PI teams are peer-reviewed and validated before ingestion
- ~17 TB of data
- Advanced search interface
- Map based interface from MEX
- FTP (non searchable) interface
- Machine interface for batch downloads

PSA structure

- Small group – 5 people in PSA
- Data standards
- Data preparation and validation with PI teams
- Helpdesk support for community
- Data workshops
- Coordination and chair for peer reviews
- Data set administration
- Requirements definition for user interfaces
- Design, production, and deliver of auxiliary data
- Spice conversion (Germany)
- ESOC data long-term archive preparations

Technical support for the Science Archives Team (1.5 FTE)

- Manages technical aspects for ESA's astronomy and planetary archives
- Data base development / maintenance
- User interface development/ maintenance
- Validation tool maintenance and support
- Dictionary management
- Development and support of data set administration tools
- Development of interoperability protocol (PDAP)

Supporting missions

- Full delivery / in operation
  - GIOTTO
  - Mars Express
  - Venus Express
  - Huygens
  - Rosetta
  - SMART-1
  - Chandrayaan-1
- Planning
  - Bepi-Colombo – will use PDS4
  - ExoMars: archive plan under discussion
- Others
  - ATV, SPICE, Auxiliary

Mars Express

- More than 12 TB data available
- ASPERA IMA data 50% up to date with regular deliveries
- OMEGA third mission extension data in final preparation
- MARSIS AIS (ionosphere sounder) up to date
- Calibrated data from ASPERA, HRSC, and MARSIS AIS now coming in regularly
- Working group on Mars upper atmosphere
- Adding full-time Archive Scientist support for Mars Express later this year

Huygens

- New GCMS data ingested
- Iterating with NASA colleagues on DISR and other updates

Venus Express

- Deliveries now made regularly by all teams
- Expected all data sets to be up to date by end of year

Rosetta

- Lutetia flyby review being closed
- Data now available
- New review system developed for raising and tracking issues

SPICE

- Updated Rosetta, MEX, and VEX data sets

Chandrayaan-1

- Review this week
- Data pipelines set
- Plan to use interoperability between ESA and ISRO

Bepi-Colombo

- Discussions starting with PI teams and SGS on how to proceed with PDS4; working group meeting planned for November

ATV

- Details of data set preparation agreed with mission team

Data Validation

- PVV (PSA Volume Verification Tool) still in use
- Some incompatibility with PDS validation

PVS : qualitative validation tool now operational

PSA Workshop

Data / SPICE workshop

Substantial international support

PSA and PDS Interactions

ESA / NASA working relationship Mars Express

MEx – Geosciences/PPI; MOU between ESA / NASAA

Rosetta: SBN

VEX – Atmospheres Node via interoperability

Ancillary data with SPICE

Engineering Node of PDS for PDS4

Open Issues

Difficult to control dataset delivery schedule with PI led missions; using new mechanism (Archive Process Controller) to better track deliveries and schedules

- Maria Teresa Capria : “Difficult when working in missions which have multiple standards and requirements” e.g., NASA and ESA. Dave: problem is process as well as content when trying to pass reviews. PSD4 should help alleviate part of this problem.

Calibrated data are not made available by some experiment teams on the ongoing planetary missions; some agreements are in place for ESA to work on these data internally

Insufficient resources for archiving within some of the experimenter teams

Parallel activities in member states need better coordination

Standards evolution – involved in IPDA process

Peer reviews are a very heavy process – data are slow to be released through the formal procedure

- Rosetta Lutetia flyby data release as “in lien resolution”

Data set ingestion turnaround time – primarily a manual process

- Automated system being developed

Dan: we should work during the week to capture everyone’s open issues and see how IPDA can help support solutions.

Dave: PDS4 should be tremendously helpful and I am looking forward to using it.

ISRO Agency Report

B Gopala Krishna

Overview of missions

- Changrayaan-1 (current)
- Astrosat (future, launch in 2013)
- Mecha-Tropiques (current)

ISRO Science Data Archive – ISDA

Chandrayaan-1 Archive

- Launched 22 October 2008
- Data sets archived in PDS
- Processing levels for all payloads at ISSDC archive
    - Level - 0 raw payload data along with calibration and ancillary information
    - Level 1 processing

Astrosat

- India's first astronomical satellite
- Datasets to be archived in FITS format
- Processing levels are identified for all instruments for archive at ISSDC

Megha-Tropiques

- Launched Oct 2011
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- MADRAS radiometer
- SAPHIR sounder
- SCARAB radiometer
- Raw data only at ISSDC

Virtual Observatory

- Collection of interoperating data archives
- Astrosat to be VO compliant

Utilities and tools

-
- PDS Viewer
- Web Services for Astrosat
- Name resolver
- Cone search
- Simple image access
- Catalog metadata
- Open standards SOAP/WSDL
- Chandrayaan-1 DEM browser

Archive development status

- One full data set for TMC and HySI is prepared and peer reviewed
- SIR-2, SARA, and CIXS instrument data submitted
- Peer review for NSA instruments carried out by respective organizations
- Software development being carried out for Astrosat data processing and archival
- Participating in PDS4 assessment
    - Study of information model and XML schema
    - Tools downloaded: PDS3 to PDS4 converter, PDS4 validation tool
    - Discussion held with the IPDA PDS4 telecon

Dan: is ISRO planning public data release?

Gopala: With peer reviews complete, some data will be released in Sept to Dec time frame.

Baptiste: do you plan to have a PDAP interface?

Gopala: we would like to

Dave: it would be helpful for us

Dan: this might be a good project to collaborate on this year (ISRO data with PDAP interface).

JAXA Report

Yujio Yamamoto

Missions and Data Archives

Kaguya (SELENE) – project finished in 2009; Updated level 2 database in 2012; data freely available

Akatsuki (Venus Climate Orbiter – Venus orbit insertion failed in 2010; mission continued to try again in 2015 or 2016. Cruise phase data will be archived

SPRINT-A/EXCEED – Space Telescope in EUV – launch scheduled in 2013; first version of data archive instruction is prepared.

BepiColombo/MMO (Mercury Orbiter) – Launch scheduled for 2014. Discussion of data archives to start soon. Considering PDS4 format.

Hayabusa 1 – sample return mission from an asteroid – launch scheduled for 2014, possibly in 2015; discussion of data archives to start soon. PDS3 is candidate format.

New Data

Kaguya tracking data – raw tracking data of the main orbiter and two sub satellites is preleased. These data are available to check Kaguya's orbit and to reconstruct the gravity model of the Moon.

Laguya HDTV data – the movies and still images taken by Kaguya HDTV will be released soon to promote scientific and educational utilization.

JAXA's data is not in public domain. Currently exploring possibility of releasing more data publicly. Hopefully HDTV data will be available in a few months.

PDAP Systems

For Kaguya Level 2 database – based on version 0.4 specification; developed and registered for all L2 products.

PDAP System for Kaguya HDTV – Original extensions are implemented—locate, title, longitude/latitude (even though data are not natively registered), display_offset, display_limit; complex SQL query supported

Movie data formats

Free form discussion on how to archive movie data within PDS 4. JAXA faces challenges with georeferencing of footprints and supporting data searches.

CNES/IPSL Report

Alain Sarkissian and colleagues

Planetary data archives for France are organized by lab: CDPP, LESIA, IPSL

Sources – data from space missions

Objectives: consolidation and extension of existing data bases; still working to recover older data from French-Russian collaboration

Activities

- Solar System Data Portal of the IPSL http://bdap.ipsl.fr
- Mars Express, Venus Express, Cassini-Huygens
- ISIS, SOHO, PICARD, Rosetta
- Lab experiments, climate models, chemistry models
- Portals: IDIS atmospheres node, Europlanet/IPSK; Fondue (IVOA); VO-SCAT, Sun-Climate

Tools and services

- Science case oriented portals (Europlanet, VO-SCAT, polar caps, etc)
- Bibliography, experts, labs (Europlanet)
- Workflows (LATMOS, IPSL)
- Proposal to ESA related to a science case
- Contribution to Europlanet VO (registry, table, data access, etc.)

IPSL contribution to IPDA 2012

- PDS4
- TEG

- Comments to PDAP spectral extension
- Posters at several international and national meetings

Teaching activities

- Interoperability in workflows and data bases

Objectives IPDA in 2013+

- PDS4, TEG, trainings
- New tutorials
- Other?

3DView IMPEx

Michel Gangloff

3DView IMPEx is a 3D orbit and attitude visualization tool developed in collaboration with CNES

- Science data analysis and interpretation
    - Spacecraft localization
    - Correlations between complementary missions
    - Special events
    - Science operations planning
    - Outreach

http://3dview.cesr.fr

Supports many missions

Main features – 3D visualization; automatic and manual; zoom, rotate, translate; lighting; frame time and coordinate system; instrument FOV; etc.

Adding new features in coming years

Goal: create interactive computational framework where data from planetary missions are interconnected with numerical models.

Improvements in modeling and data operation areas, as well as analytical models and simulations

PDS data (PPI node) in the CDPP/AMDA tool

Baptiste Cecconi

New planetary plasma datasets in AMDA

- MESSENGER, VEX, MGS, MEX, Galileo, Pioneer 10 & 11, Ulysses, Voyager 1 & 2, Cassini, Voyager 1 & 2

Q: Will PDS data be available via PDAP in the future?

Dan: Yes.

ASI Report

Maria Teresa Capria, Paolo Giommi

ASI involved with Rosetta, Cassini, BepiColombo, Mars Express, Venus Express, Juno, DAWN; pre- and post-launch funding assured to instrument teams working on data archiving.

ASI formally asking all ASI-funded data providers to build PDS-compliant datasets and deliver them as per Data Management Plans.

ASI Science Data Center (ASDC) to support space missions dedication to Observation of the Universe. Full integration with IVOA, close cooperation with industry and scientific personnel.

Projects dealing with data fusion have been funded.

Possible that the IDIS Small Bodies and Dust Node hosted by INAF/IAPS, will be transferred at ASSDC,

NASA Report

Dan Crichton, Reta Bebee, Tom Stein, Steve Hughes

Status of NASA missions and PDS 4

NASA Policy for implementing PDS4

Missions confirmed for flight after 1 Nov 2011 are required to archive using PDS4. Prior missions will continue to use PDS3. This can be a challenge to maintain the two systems for some years to come.

Current development schedule for PDS4

Data Design Working Group (chaired by Steve Hughes) and System Design Working Group (chaired by Sean Hardman) are working against demanding schedule of design builds. PDS4 build 2dc recently completed.

Discipline nodes have been actively testing the model and associated schemas using PDS3 test cases.

LADEE and MAVERN are PDS4 test cases.

Planetary missions

Slide showing current missions and lead node.

Impact of PDS4 on missions

Currently archiving in PDS3: Cassini Huygens, Mars Odyssey, Smart 1, LRO, MRO, Stardust NExT, LCROSS, Dawn, MER, Mrs Express, MESSENGER, New Horizons, etc.

Development, PDS3: Juno, GRAIL, MSL

PDS4: LADEE, MAVEN, OSIRIS-Rex

Transition from PDS3 to PDS4

Missions already archiving in PDS3 will continue to do so; up to nodes to convert data

PDS will help LADEE, MAVEN, and Osiris-Rex develop for PDS4.

PDS will migrate archived datasets based on usage and available staffing.

Funding

How does funding of planetary science work

Negotiation between NASA, White House, and Congress; fiscal year is October to September

White House, via Office of Management and Budget, proposes a budget. Congress reviews the budget and may make changes. Congress sends budget back to the White House which may sign it or require further negotiation.

With no agreement by October 1, federal government maintains continuing resolution operating on the previous year's budget.

NASA and congress rely heavily on the National Academy to set the science and mission priorities. It uses these to establish and justify what programs to fund.

What is the National Academy

The National Academy of Science chartered by congress under leadership of President Lincoln to provide scientific and technical advice to the government of the United States.

The Academy has been expanded to include National Academy of Engineering among others.

What is relationship among the Academy, NASA, and Congress

Congress accepts the Academy as a source of unbiased advice.

What is the decadal report

Slide detailing the Decadal Report

PDS was part of the Decadal Report.

"It is crucial that the capabilities of the Planetary Data System be maintained by NASA, both to provide a permanent archive of planetary data and to provide a means of distribution those data to the world at large."

"Announcements of Opportunity should mandate that instrument teams propose and be funded to generate derived products before missions have completed Phase E."

…it will be increasingly important for NASA to assure interoperability of the PDS with other international repositories of planetary data.

NASA response to upgrade of PDS

In effect, PDS4 is a move to upgrade in improving PDS work. Community feedback is sought.

FY13 in planetary science

Mars 16 and 18 cut; congress in reviewing budget and revising planetary science budget plans. NASA directed to continue to plan new Mars missions. NASA committed to ensuring that PDS is maintained to support robust data analysis program.

Report on the IPDA Geometry Project

Chuck Acton, Dan Crichton presenting

Objectives

Ascertain role of "geometry" within federation of national planetary data archive services

Determine requirements, recommendations, and best practices

Personnel - Chuck Acton (lead), Randy Kirk, Mitch Gordon, Jose Luis Vazquez-Garcia, Dave Heather, Dick Simpson, Ed Guinness

Draft report sent to team members, SC and TEG on 17 May 2012. Acton currently working on synthesizing comments.

Acton is concerned that bulk of input is NASA and ESA. What about ISRO, JAXA< and RSA?

Concern: there are as many "suggestions" as "requirements". Could lead to interoperability problems in search, data conversion, data analysis

SPICE use:

- All future NASA solar system missions will use SPICE
- ESA: BepiColombo and JUICE are set to use SPICE.
- Russia using SPICE on all future missions
-
- Some level of SPICE use within JAXA

Wide support of SPICE from NASA HQ, planetary data workshop

What is next step after white paper is released?

Some thoughts on what to do next regarding SPICE:

1. Tidy up white paper and terminate project.
2. Broaden participation through one year extension of project
3. Form ancillary data working group
    a. How would it operate?
    b. What agencies?
4. Adopt SPICE as the IPDA standard

Possible issues

- Inadequate funding and interest in some agencies
- How to get training
- NASA unlikely to back off from SPICE use
- NAIF will continue to develop SPICE

Perhaps need to split recommendation into two parts:

1. Adopt SPICE as IPDA standard, although a recommendation has already been made.
2. work to develop recommendations of what parts of SPICE should be archived

Dan: What does it mean to adopt SPICE as an IPDA standard? Discussion of this followed. Do we endorse SPICE, or do we require the use of it? Dan will work with Chuck tonight to define the implication of adoption of SPICE as an IPDA standard.

IDIS – European Planetary VO

Maria Teresa Capria and the IDIS team

Europlanet research infrastructure project, 27 participants, 2009 through 2012. Integrated and Distributed Information Service (IDIS) as a data acquisition and analysis service.

IDIS has five thematic nodes and a technical node

Research coordinator Gerard Chanteur, Deputy coordinator Maria Teresa Capria

Key objectives

- Produce data models
- Provide added value

Two protocols have been selected for data access: EPN TAP (based on IVOA table access protocol) and PDAP.

Future of IDIS? At the end of the project, some of the already involved institutions will continue to work on the Planetary Virtual Observatory. New institutions will probably join. MOU is being prepared to bridge between old and new members.

Baptiste gave demonstration of the planetary VO interfaces.

IPDA 7th Steering Committee Meeting 12 July 2012 (Day 2)

PDS4 Data Standards Status Report

Steve Hughes

Overview

Unlike many US systems, PDS data model is based on real needs for the PDS system.

Development of the model and its application *not* done in isolation. Representatives from every unit of PDS have participated in development of PDS4, as well as international partners.

Products have a wider definition than in PDS3. Tools, help pages are products and can be given appropriate priorities to help the novice enter the system.

Capability of registry and local dictionaries allow user to access data at the product level.

Application to LADEE, MAVEN, early consideration for GRUNT, and proposed current application to BepColombo (PSA) are testing the data supplier aspect of the system now.

We need data into PDS4 before formal use testing can begin. For example, need data from different instrument types.

Data Standards Concepts

Diagram shown

Have an information model that is expressed as a data dictionary that is extracted to a label schema which are then used to create products. Products are tagged digital objects (commonly known in the international community as an information object) that use metadata to describe the bits.

PDS4 data standards adhere to explicit information architecture

- All PDS data is tied to a common information model
- Implemented in XML
- A hierarchy of dictionaries are designed to increase flexibility, enable complex searches, and make it easier to share data internationally.

Core Components

PDS Core Components are defined within a single shared information model.

Standard reference models have been incorporated

- ISO/IEC 11179 – provides schema for attribute definition (data dictionary)
- ISO 14721:2003 – Open Archive Information System (OAIS) provides basic unifying archive unit, the information object
- ebXML registry reference model – provides the necessary attributes to identify, version, and track products.

Consistency is ensured by using a model driven methodology. (Diagram shown)

Expert knowledge

Planetary science domain knowledge is captured using formal methodology.

Working group formed with at least one domain expert from each of the PDS nodes, both science and support.

Each thing of interest in the domain is defined and then related to other things of interest within the model.

Resulting information model is the principle defining source for the data standards.

Diagram of information model concept map.

Discussion of how to apply PDS4 to various formats, such as FITS files; attached labels (no longer supported); XML files as parseable byte streams.

Product_observational label

Parts of a product_observational label

- Identification area - The logical_identifier and version_id are unique for every product in PDS4.
- Observation area
- Reference list
- File area observational

Example Array_2d_Image label shown

Extending the Model

New classes can be defined as

- Object oriented class extensions and restrictions on existing PDS4 classes

- Completely new classes.

New classes can be defined at both the science discipline (node) and mission level (in concert with lead node). This goes into the mission_area within the observation_area of the product_observationl label. Similarly, there is a node_area.

New classes can be integrated into the PDS4 information model

- Classes will remain under local node or mission governance
- For example, the imaging node is working with other interested nodes to develop cartography classes.

Data Dictionary Model

A steward is the entity that maintains a particular data element.

Example shown of PDS4 imaging discipline level data dictionary.

Summary of progress to date

- System builds completed: 1a, 1b, 1c, 1d, 2a, 2b, 2c (latest: June 2012)
- Prototype PDS products defined using the PDS4 specification
    - LADEE team developing labels
    - Preparing for MAVEN's use of PDS4
- Initial transition to PDS4 in place at Engineering Node
    - Registry and Harvest infrastructure in place at EN
    - Central catalog migrated to registry; high level search has been migrated
    - Information model released for limited use
- International review of DPS4 underway
- AMMOS-PDS Pipeline Service (APPS) started
    - Advanced Multi-Mission Operations System/PDS Collaboration

Goals accomplished

PDS managed using planetary science ontology/information model

Address a major missing piece in PDS: identification of standard data structures/formats for archiving

Improved data dictionary and keyword management across missions, nodes, and international partners

Using XML

Dan: In PDS3, missions are handed a package of documents and processes and effectively told, “come back when the archive is ready”. In PDS4, though, seems as though we (PDS) are planning to write the schemas for the data providers. Will this become a standard process?

Steve: Standard templates will be provided so that there is not much tweaking required for a majority of the data types.

Tom: we do not give PDS3 as a package, though. PDS nodes always will be involved in helping out the data providers.

Dave: Importance of PDS4 is that there are more stringent requirements, and fewer “suggestions”.

Maria Teresa: too much work adapting data to PDS3 formats because reviewers preferred a different format, even though both formats were PDS3 compliant. Looking for PDS4 to help alleviate this problem?

Baptiste: Surprise that data reviewers would ask for data format changes.

MT: This is not really a problem of PDS—it is the opinion of the reviewer.

Baptiste: How do local data dictionaries make it back into the larger data dictionary?

Dan: LDD for missions are pretty straightforward, but it is a consideration for disciplines.

Online demo of PDS4 at http://pds.nasa.gov/pds4

Dan: PDS4 validation tool is online. There is a move to try to make these tools open source licensed so they can be available internationally.

IPDA PDS4 project summary report

Santa Martinez, Steve Hughes presenting

Project overview

Follow evolution and development of PDS4 standards with purpose of identifying concerns and potential areas of incompatibility

Exercise 1 – prototyping using PDS4

Exercise 2 - Evaluation of existing preparations tools

Exercise 3 - Validation requirements

Kick off telecon 21 March 2012

Progress telecon 16 May 2012

Summary

PDS making big effort to refit the information model

Versions 78-8 of the schemas address many of the key issues

Some of the issues identified last year have been postponed by PDS for later releases (LDD, documentation)

Since PDS4 is evolving, this is perfect time for this project

Key Issues

Leaning and Using PDS4 – due to number of documents and extensive information provided in PDS4 documentation, process of designing and generating PDS products is very slow and time consuming.

Suggestions:

- Provide minimum PDS4 labels for most common data products.
- Well documented guidelines with best practices and recommendation.
- PDS4 training to archiving authorities and data providers/users

PDS3 to PDS4 mapping – haven't been able to convert all keywords in PDS3 to PDS4.

Pointers to reference4 external fields in PDS3 labels; horizontal/vertical pixel scale

Suggestions:

- PDS3 to PDS4 mapping could be captured in the data dictionary terminological entry group

Documentation on how to convert PDS3 to PDS4 should be provided, including solutions to all known incompatibilities, differences, and problems.

Coordination on key permissible values for interoperability – most permissible values currently implemented are listed in the PDS schematron file but cannot be extended.

Suggestions:

- target > name and type
- Instrument > type
- Instrument_host > Type

- Etc.

Validation

Due to existing coordination between NASA and IPDA on PDS4, validation issues will be minimized. Potential incompatibilities identified within this project are expected to be addressed before the PDS4 standards are released.

Dan: what incompatibilities, and how do we ensure BepiColombo (e.g.) is using PDS4 release that minimizes these incompatibilities?

Suggestions:

- Increase validation requirements in XML schemas and schematron.
- It is assumed that the schematron will be further developed to implement relationship constraints and permissible vales. Clear requirements for PDS4 are needed to fully implement these constraints. PDS4 standard document and PDS4 data dictionary should be the primary inputs for the requirements.

Improving searching mechanisms

Suggestions:

- Define a minimum set of required geometry attributes (for small bodies targets, in this case)
- What about PDS3 concept of INDEX files? Designing standard formats and requirements for indices should be considered.

Yukio: What about incompatibility of PDS3 tools that users are already using? And what about information that will be lost when converting from PDS3 to PDS4?

Tom: information should not be lost during the conversion.

Dan: new tools for PDS4 from Engineering Node will be able to work with PDS3 products as well.

Steve: won't there be a tool to convert a PDS4 product back to PDS3?

Naru: what happens to PDS3 data after conversion to PDS4?

Steve: the PDS3 data will be kept.

Yukio: if a PDS3 product is missing information required for a PDS4 label, who creates the missing information?

Tom: the discipline node would work with the data provider to determine the correct values to use in the PDS4 label.

Question: will all PDS3 data be converted to PDS4?

Dan: it will be handled on a case by case basis. Example: there may be little use to migrate some radio science data because they are used so infrequently.

NASA and IPDA coordination on PDS4

What is the role IPDA wants to play in the continued development of the PDS4 standards?

- IPDA: once PDS releases PDS4 data standards, does IPDA endorse, recommend, or adopt the standards?
  Maria Teresa: IPDA is the only way for international agencies to participate in the development of PDS4.
  Dan: PDS4 is already being released.
  Steve: maybe the question is how does IPDA participate in future releases?
  Yukio: I want to use PDS4, but some missions in Japan want to use stable version, whether PDS3 or PDS4. If IPDA recommends PDS4, then it must be a stable system.
  Gopala: yes, it must be stable.
  Dan: Suggestion - Point 1: IPDA recognizes move to PDS4; Point 2: Here is would IPDA needs in PDS4 to complete endorsement.
- Missions: because IPDA does not have a budget perhaps its job is to recommend PDS data standards to their respective missions.
- PDS: IPDA impacts the evolution of the PDS4 data standards by making recommendations for changes to the core of by extension at the discipline levels.

Dave: We need to define how this project gets extended. It would make sense to include BepiC as part of the project.

Dan: And perhaps some other instruments or missions.

Baptiste: So how do we get IPDA input into PDS4?

Dan: one way is for IPDA to submit an RFA against PDS4.

Dave and Maria Teresa: we will tie this into our BepiC work in order to have funding to work on it. This makes sense.

Dan: then perhaps the project for 2012-13 is application of PDS4 into this specific mission.

IPDA PDAP UML for Extensions

Jesus Segaldo (presenting via telephone)

During last IPDA meeting 4 different extensions were identifies

- Spectral
- Time support
- Flyby
- Geometrical

First step to identify possible data model extensions to plug into core PDAP UML model

Problems

1. Do we need new specifications for metadata?
2. How to solve multiple inheritance?
3. How to integrate all extensions into a single UML?
4. How to create a UML easily extendable?
5. Is this UML in line with PDS4?

Diagram of PDAP standard UML shown

Spectral UML metadata added

Spectral data looks a good candidate from product extension

No very present in planetary data compared to astrophysics. More 2D tables than spectral data

Appears in flyby products and map projected products in current UML

Spectral (energy) axis support could also be needed

Time support metadata added

After initial analysis, not too much metadata should be added

Time ranges support for queries and time axis support for products

Qualifier is needed to define the system of reference where these time values are applicable

Flyby metadata added

Flyby products are different from standard products due to spacecraft orbit position and orientation

This is defined within spice kernels

Suggestion to add a link to the spice kernel and some orientation angles and position

Diagram shown with proposal for addressing questions 2, 3, and 4

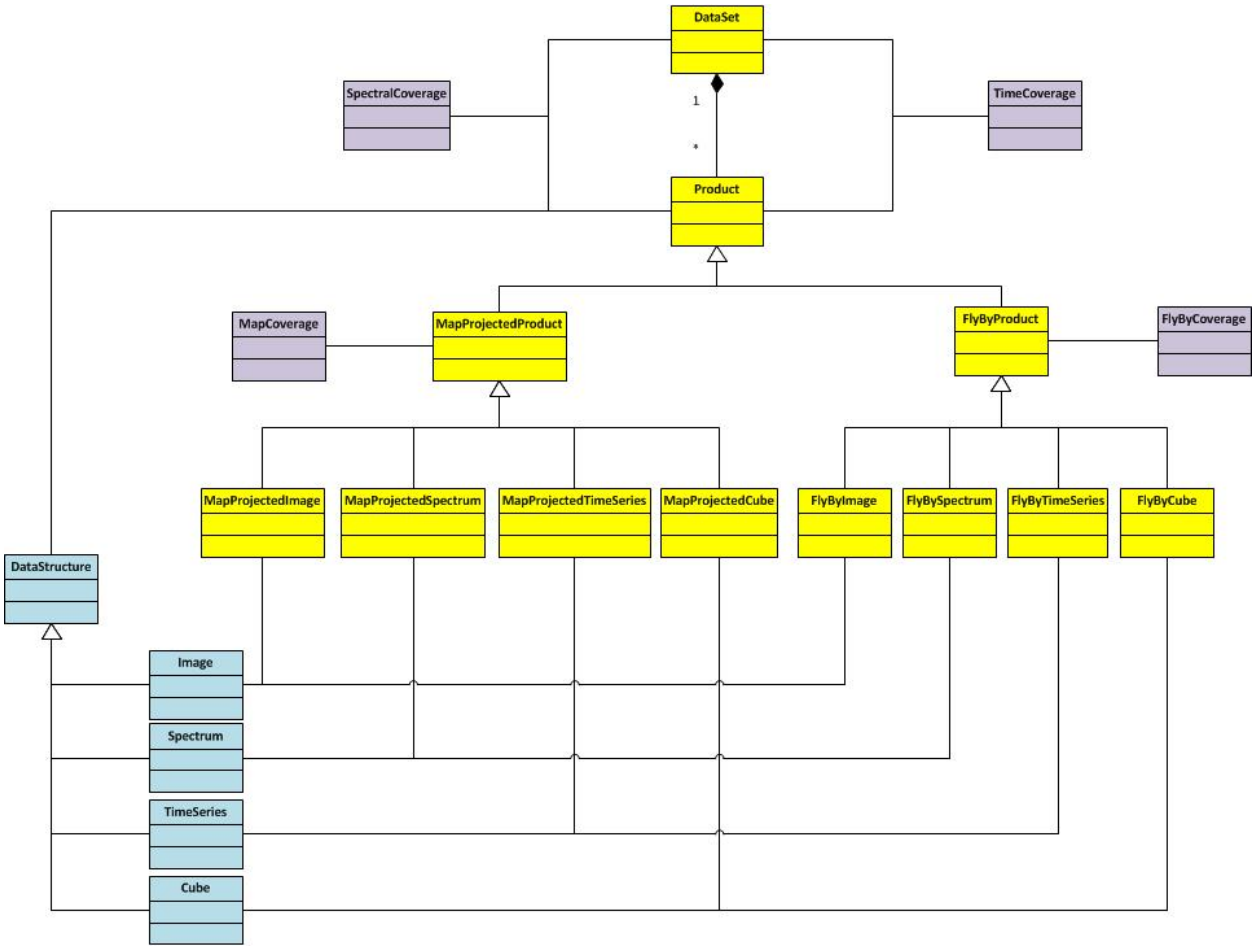


Figure of data structures mini-model shown

Figure of time support extension UML shown

Figure of spectral extension UML shown

Questions for discussion

- Is this approach a possible simplification or does it make the UML more complex?
  Yukio: relationship between UML and URL expression—URL is simple, UML is complex
- Do we need to explore different extensions?
- Do we need a single PDAP document, or a core doc with separate doc for extensions?
- How is this related to PDS4? Other planetary data models?

Discussion

Dan: PDAP should be as lightweight as possible to serve as a protocol for use with IPDA (?).

Steve: we will show a mechanism where a lightweight PDAP can be used to query PDS4. Also, the UML is useful for understanding the direction PDAP is going. The UML makes it easy to determine how PDAP relates to PDS4.

Dan: Write a thin, lightweight core document, with separate extensions. It may be that PDS4 becomes seen an extensions to PDAP.

Dan: How close is PDAP to being complete?

Jesus: <difficult to understand over phone line>

Alain: How many extensions must we have to apply PDAP to BepiC?

Jesus: with core PDAP, most of the functionality is there. Otherwise, it depends on what you are trying to do.

Dan: for PDS, most of what we're doing now is querying for data sets and products in a general way, so there is no need to perform deep searches through PDAP.

Baptiste: with new UML diagram, will this change PDAP specification that was proposed at the last IPDA meeting? We have implemented the IPDA specification that was proposed last year.

Jesus: there probably have been changes, including updates to address questions from that meeting.

Dan: how would you see next year's PDAP project working?

Jesus: work on the core and on the extensions.

Geometry support PDAP extensions

Naru Hirata

Not well defined at last IPDA meeting

Activities

- Clarify targets of the task
- Identify issues to work on

Target

- Add/expand for geolocation based search in PDAP
- Modify and update map_projected resource class in PDAP v1

- Must implement general PDAP input/output parameters. We will add ROI (regions of interest) parameters latitude range and longitude range

Issues to be considered

- Name of the task (geometry extension)
- Name of map_projected resource class
- Variations of expression on geographic coordinates
- Dictionary of coordinate names, map projection name and related parameters
- Implementation problem: handling on spatial relationships

Geometry extension?

Implying geometry between the target and the observer (spacecraft)

But: geolocation of a footprint of instrument

- Geographical coordinates of corners of camera FOV

Exclude cases that the limb of target appeared in FOV

Propose to rename geographical extension or geolocational extensions

Relationship to flyby class

- Map_projected and flyby classes are independent of each other currently
- Data in flyby product may have some geographic information
- Boundary between two classes should be carefully examined.
- User does not need to worry about this boundary

Category of products

- Non map projected data
  - Define outline of the footprint
  - Instrument based pixel coordinate
- Map-projected data (geocoded data)
  - Define outline of the map
  - Define map projection parameters
  - Map-based pixel coordinate

Map_projected class?

Data in map_projected class may not be map-projected (geocoded)

Current class/product name be reconsidered, such as geographical or geolocation

Issues to be considered but not discussed here

Variations of expression on geographic coordinates

Dictionary of coordinate names

Steve: what impact would there be on PDAP to make the changes Naru is advocating?

Jesus: there should not be any impact, but I would have to look at the changes one by one to confirm this.

Part of the problem is that the data in the map_projected field of some images is not really map projected.

FLYBY extension

Yukio Yamamoto

Current design of flyby product uses a generalized observing frame because instrument may not have a FOV.

Open issues

- The parameter distance_to_target and Target_phase_angel are useful for users even if the resource_class in not flyby_product.
    - Add new resource class
    - Enable multiple resource classes
    - Reserve keywords “distance’ and “phase_angle” for product.
- The transformation rule must be defined from instrument frame to observing frame.
- The name flyby is no longer appropriate. For instance, geometry_product may be a better name.
- The target size and the instrument FOV currently are ignored, which means the target appearance in the observation is also ignored. To correct:
    - Define the target position in an observing frame or other generic reference frame such as J2000
    - Make a good indicator to represent the situation

      We have to research use-cases for some missions such as Pioneer, VEX, Hayabusa, etc. and verify the specification.

- URL description is beautiful, but implementation looks like impossible or very slow to response
    - Resource_class-flyby_product&longitude=10&latitude=20

- Is PDAP designed for human readability or for application use?
    - For instance, quaternion is not suitable as a human interface, but good for the system interface

      PDAP must have consistency in its design policy.

      Baptiste: use VOTable format in PDAP query for machine usability.

IPDA Query Language Status Report

Steve Hughes

Introduction

- Project to define an IPDA query language that is compatible with the capabilities for the PDS and PSA data models.

Phase 1

Further test applicability of the query language syntax for a set of use cases

See if query syntax is compatible with PDS4

Phase 2

Write a specification document that formally defines and describes the query language syntax.

Define a conceptual syntax for working with PDS4, PSA, and PDS3 data

Related work

- Based on current PDAP core protocol
- PDS4 search service report on analysis of PDS4 search service query interface in comparison to PDAP.
    a. Simple query syntax supports HTTP parameters, similar to PDAP
        i. Simplifies interfaces and minimized encoding
    b. Advance query syntax is based on the Lucene/Solr query syntax and encapsulates query into a single parameter
        i. Supports wild carding, relational and logical operators, ranges, grouping and term search.

PDS4 query models

- PDS4 data standards are derived from the PDS4 information model
- Query models are also derived from the information model
- Query models specify to the registry the attributes that can be considered to be search parameters
    - These attributes must be understood by the search services

PDS4 query model example shown

Rationale for the query language

PDS data standards have been defined to describe a highly diverse set of product types.

Even within a single simple group such as mapped grayscale image, the available search parameters vary significantly across data sets.

Data processing levels also vary from raw data with minimal metadata to highly derive mapped data with map projections.

Example scenarios

List of example scenarios shown.

Discussion on making sure queries properly reflect real world, even if the label does not reflect clear values (example, for an image that crosses the pole, four corners of upper/lower lat/long does not necessarily apply).

Query syntax

Based on Apached Lucene query parser syntax and Slr parser plug-in framework.

PDS search protocol

The search protocol for the PDS4 provides a single interface for discover and access to data across PDS.

Protocol leverages heavily against Apache Lucene as well as certain characteristics from PDAP.

Search protocol implemented as a REST-based interface for the search service

Purpose

- Data discovery
    - Search protocol supports discovery of content
    - For PDS, content may be at the catalog or product level

- Data access
    - Supports retrieval of product data
    - Impacts on search protocol include additional parameters for specifying desired transformations and packaging
- Service linking
    - Passing search parameters from one service to another must be supported
    - Integrated search consists of a catalog level search interface

Common parameters

List of common parameters listed

A specific implementation should support additional search parameters beyond the common parameters

Conclusion

Continue testing and create a specification

Dan: how easy would it be to create a UML of this query model in order to compare it to PDAP. The goal is to merge this query model with PDAP.

IPDA 7th Steering Committee Meeting 13 July 2012 (Day 3)

PDS Geosciences Node Technology and Lessons Learned

Tom Stein

Presentation on what the PDS Geosciences Node does, how technology is implemented, and lessons learned from archiving process and interfaces developed. The GEO node is working many of the issues that other agencies face when working with data providers, applying standards, developing infrastructure, and supporting data distribution. Several agencies had a number of questions for Tom Stein. In particular, an extension discussion occurred regarding "peer review". This is partly due to the differences that the international community is encountering when working with different disciplines and performing peer review. Tom discussed how the GEO node organizes a peer review and how it works, in particular, with the Mars missions and community.

IPDA web project

Emily Law, Sean Hardman, Sean Kelly, Pedro Osuna, Dan Crichton (presenting)

Site address http://planetarydata.org/

Dan: Not looking for the project to continue for the next year. This should be a one and done.

Dan: project leaders should log into IPDA website and upload project artifacts into the 2011-2012 Projects area.

Alain: Please add agency logos to the front page.

Focus

- Enable IPDA project members to easily organize, post and make the project contents and artifacts up to date
- Make IPDA standards documentation and information easily accessible publicly
- Move the website host server from a temporary location to a permanent location at JPL

- Make a concerted effort to improve and build up the website for public outreach

Requirements

- Consistent organization (template) of project area must be created for each IPDA project
- Project content management procedure must be defined to aid in easily contributing, posting and accessing of project artifacts by project members and others
- Website server must be moved to JPL
- Public outreach page must be defined and created to post all IPDA presentations made at various conferences and meetings

Deliverables

- Project plan
- Website content management procedure
- Project specific web pages
- Public outreach web page
- Web server operational at JPL
- Project report

Status

- Formulated project and developed plan (Oct 11)
    - Project artifacts posted on:http://planetarydata.org/projects/active-projects-for-2011-2012/website-development
- Produced content management procedures (Jan 12)
- Held multiple project telecons
- Prototyped new web site (Jun 12)
- Hosted new prototype site at JPL (Jun 12)

Recommendations to SC

- Approve deployment of new website
- Close out Web Development Project
- Provide feedback to improve the new website
- Initiate a new IPDA logo contest

Registry Project Update

Sean Hardman, Dan Crichton presenting

Overview

- This project was initiated at the 6th IPDA Steering Committee meeting in September 2011.
- The intent was to build on the success of the previous year's Registry Implementation Project.
- That project stood up an IPDA Service and Tool Registry utilizing the PDS Registry Service and a custom web-based interface.
    - http://planetarydata.org/services/registry

Original Project Goals

- Maintain existing registry implementation including upgrades to support the latest version of the PDS Registry Service.
- Develop an interface for managing, searching and viewing data set registrations.
- Develop an automated mechanism for maintaining data set registrations.
- Populate the registry with Venus Express data set information.

Approach

- Build the software system based on generic common software and common protocols for accessing that software.
    - PDS Registry Service with its REST-based API is the main component.
    - PDS Search Service based on Apache Solr provides support for high performance facet-based search.
- Utilize the PDS4 data model for data object definitions and to configure the software where appropriate.
    - The model defines the key context objects (i.e., Data Set, Instrument, etc.).

Architecture

- This project focused on deployment of the Registry Service and the harvesting of PSA data set metadata.
- Registry Service provides a common model for capturing metadata across multiple agencies.

Registry Service

- Provides functionality for tracking, auditing, locating, and maintaining artifacts within the system.
    - Artifacts include data products, data dictionary element definitions, service descriptions and project documents.
- Provides a common implementation for registry service instances based on the Registry Reference Model effort which in turn is based on ebXML.

Registry Architecture

- REST-based API over HTTP for registration and retrieval of metadata.
- Internals developed in Java with an API for manipulating registry objects.
- Metadata store interface allows for multiple database solutions.

Registry REST-Based API

- This interface delegates all functions involving a product:
  - http://ipda.jpl.nasa.gov/registry/extrinsics/
    - GET: Retrieves a paged list of products from the registry.
    - POST: Publishes a product to the registry.
- This interface acts on a specific product (lid stands for logical identifier):
  - http://ipda.jpl.nasa.gov/registry/extrinsics/logicals/{lid}/
    - GET: Retrieves the product from the registry.
    - POST: Updates the product in the registry.
    - DELETE: Removes the product from the registry.

Harvest Tool

- Crawler-based tool for capturing and registering product metadata.
- Provides a PDS-specific interface to the Registry Service for registering products.
- Allows for periodic or on-demand registration of products.
- Configurable to support registration of products residing in PDS3 and PDS4 archives.
- Provides the first line of metadata harvesting within the system in order to facilitate tracking of and access to products.

PDAP-Specific Harvest Tool

- Based on the PDS Harvest Tool.
- Currently accesses PSA via its PDAP interface.
- Can be extended to support other archives with PDAP interfaces.

Status - Original Project Goals

- Maintain existing implementation …
  - Supported updates for three PDS builds.
- Develop a data set interface …
  - Decided not to build a web-based interface at this point in time.
- Develop an automated mechanism …
  - The Harvest Tool can be configured to run periodically to pick up new data sets.
- Populate the registry …
  - Instead of limiting to just Venus Express, the Harvest Tool registers all available data sets from the PSA archive.

Status - Other Stuff

- Updated and improved the Python-based client library that the Tool Registry uses to access the Registry Service.
- Deployed the latest version of the Registry Service for IPDA.
    - http://ipda.jpl.nasa.gov/registry/
- Developed a Harvest Tool to extract data set metadata from PSA via the PDAP interface.
- Populated the IPDA registry with PSA metadata.
- Updated the Registry Service Design Specification document to correspond with the latest release of the PDS Registry Service.
- Authored the Registry Service Protocol and Harvest Tool Design Specification documents.

Future Work

- Work with other agencies to gain access to their data set metadata in order to populate the IPDA registry.
- Expand the support beyond data sets to encompass investigation, instrument, etc. information.
- Develop a procedure/process for keeping this extracted metadata up-to-date.
- Expand the IPDA web site interface to support management and search beyond tools and services.

Demonstration online

- This demonstration exercises the IPDA instance of the Registry Service and its REST-based API.
- The protocol for interfacing with the service is captured in the Registry Service Protocol document.
    - http://planetarydata.org/projects/active-projects-for-2011-2012/registry-development-and-coordination/registry-service-protocol

Wrap Up

- The IPDA instance of the Registry Service is hosted along side the prototype IPDA web site.
    - Once the DNS switch is made, both will be accessible via http://planetarydata.org.
- All endpoints are accessible to the outside world for GET requests.
- All other request types (e.g., POST, DELETE, etc.) are restricted to local machine access.
    - If external access is required in the future, we can configure it for authenticated access.

Tools Registry for the Planetary Science Community

Tom Stein

- Expand current IPDA tools catalog to a registry of publicly available data, tools, and web sites.

- Call from participants at Planetary Data Workshop in June 2012 for IPDA to offer and maintain such a registry.
- Natural fit with PDS4 registry.
- Project should determine
- Requirements for updating current IPDA tools catalog to Planetary Data Registry
- Guidelines for submission
- Updates to existing tools template
- Methods for submitting, reviewing, and maintaining entries
- Configuration control of the IPDA registry
- How such a registry fits into interoperability searches

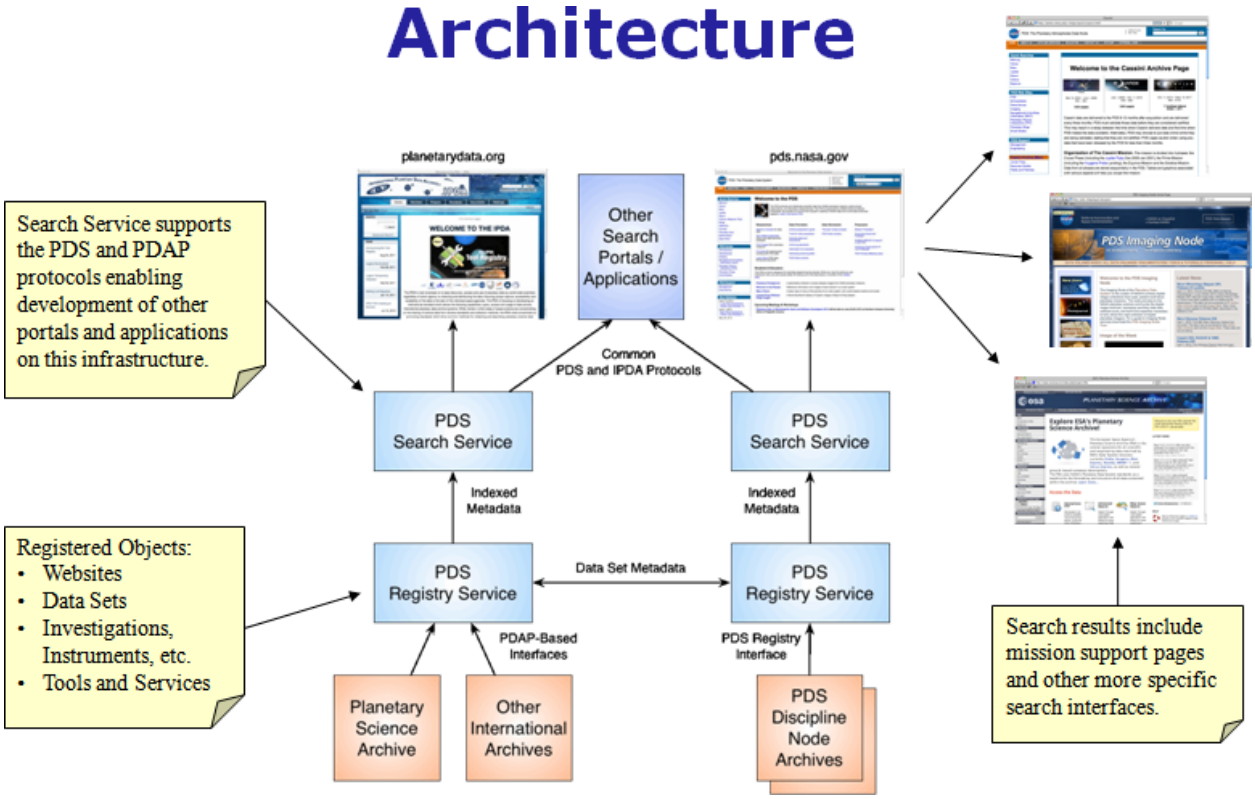
Cross-Agency Search and Access

Sean Hardman, Dan Crichton presenting

PDS4 Search Goals

- Improved integration across nodes and across agencies
  - Pass search parameters to the node search engines (e.g., two/n-tiered search)
  - International data sets showing up in PDS search results
- Better navigation and support for mission and other "virtual" views
  - PDS mission support pages registered in the PDS search infrastructure
  - Facet-based navigation to drive specific views
  - Revamp of PDS web space (Build 4 2013/2014)

Architecture diagram shown



Search Service

- This service is a deployable component that accepts queries for data and returns a set of matching results.
- Provides the public interface (REST-based API over HTTP) to the metadata contained in the federated instances of the Registry Service.
- Generation of search indices from registry metadata supports multiple query formats and is tailor-able for customized search interfaces.

Search Architecture

- Search indexes built from multiple sources.
- Allows for annotation of archive metadata.
- Customizable for a discipline-specific search interface.

Search Engine

- Using Apache's Solr for the search engine portion of the Search Service.
- Developers at the EN have experience with the software package.
    - It is currently utilized on the backend of the current catalog-level search application.
- Recent releases contain some useful features:
    - Improved geospatial support
    - Range faceting on numeric fields

- Solr's robust query language is heavily leveraged in the PDS Search Protocol.

Index Generation

- The main source of metadata for the search index is the contents of the Registry Service.
- The index will make use of the associations in the registry to help users find related products, documents, etc.
- It will also make use of the classification schemes in the registry to help drive the faceted search capabilities.
- Indexes can be tailored for specific search applications.

Metadata Annotation

- The data model and the Search Service architecture facilitate metadata annotation.
    - Allows search to be based on the latest and most accurate metadata.
- A defined product with an associated table allows for updated or additional metadata to be specified for a set of products.
    - This product will be associated in the registry with a data set or subset of products.
- The Search Service will support a similar structure for supplying metadata separate from registered content.

Search REST-Based API - Three Aspects

- Data Discovery
    - Focuses on discovering content, whether at the catalog or product level.
    - Facilitated by support for search parameters and paged result sets.
- Data Access
    - Focuses on retrieval of product files.
- Service Linking
    - Focuses on passing search parameters from one service to another.
    - Deployment of the Search Service facilitates parameter passing and integration.

Search REST-Based API - Protocol

- Common PDS-based parameters
    - identifier, instrument, investigation, etc.
- Supports simple and advanced syntaxes
    - Simple syntax closely follows HTTP
    - Advanced syntax closely follows Apache Lucene/Solr
- Supports multiple result set formats
    - Default format available in XML and JSON
    - Currently adding support for VOTable
- All the above detailed in the PDS Search Protocol document.
- Plans to add support for PDAP in the near future.

Status

- PDS4 core infrastructure running at the PDS Engineering Node
    - Migration of central catalog mostly complete
    - Release of search infrastructure planned for late July
- Pilot activity with IPDA to register ESA data sets in search via PDAP protocol
    - Demonstration forthcoming
- Pilot activity with Cassini to register mission-specific website for Cassini data access
    - Demonstration planned for late July
- Use demonstration process to affirm the architecture and then expand

Demonstration

Wrap Up

- The PDS Search Protocol specification will be available in the very near future after review by the PDS System Design Working Group.
- The PDS development team plans on adding support for PDAP with VOTable result sets for the Build 3 delivery (September 2012).
- Additional enhancements to the Search Service are also planned for the Build 3 delivery.
    - This includes streamlining the search index to better make use of the PDS4 data model.

IPDA Projects

Dan Crichton

Endorsements

SPICE

No changes to current endorsement

> Recommended Standards for Ancillary Data
>
> The IPDA recommends the use of SPICE for capturing ancillary data and improving interoperability among planetary science archives
>
> Approved, IPDA Steering Committee, July 2010

PDS4 IPDA Statement Proposal

> The IPDA after conducting a series of reviews and prototypes using early releases of the PDS4 data standards during the 2011-2012 year endorses the use of the PDS4 data standards within the IPDA member agencies for future missions. It also recommends the incorporation of the

IPDA findings into the next release of the PDS4 data standards currently scheduled for September 2012. The IPDA recognizes that existing missions, designed under the PDS3 data standards, will continue to operate with the PDS3 data standards.

Proposal passes IPDA Steering Committee vote on 13.07.2012.

Administration

- How do we best move projects along?
  - Link projects to our funding
- Regular telecons?
  Dan: Bi-monthly project telecon; midterm steering committee telecon
  Yukio: use Skype or other online tool like EVO; time problem
  Naru: more use of e-mail
- Mid Term Check up?
  Dave: with report to steering committee
- Reports?

Projects

- PDS4 – Implementation projects
  - **Project 1:** BepiC and/or CNES/Atmosphere as single project to implement PDS4 (Dave, Alain)
- PDAP
  - **Project 2:** Deliver minimum Core PDAP spec to SC (Jesus)
    - Target delivery to SC for discussion at mid term
  - **Project: 3** PDAP and Planetary query language unification (Steve)
  - Goals
    - Deliver a skinny version of PDAP ASAP
    - Clearly delineate the skinny version of PDAP from the extensions
    - Promote a more comprehensive query language
    - Address some issues found from extension projects and implementation efforts (part of unification project
    - Extensions get put on hold for coming year
- Registries and Search
  - Goal: provide top level access to data, tools and services across agencies
  - **Project 4**: Propose a registry deployment project that focuses on registration of data, dictionary, tools and services from IPDA members; work data access (Sean); consider inclusion of EuroPlanet
  - **Project 5**: Collection of planetary tools; follow up from Planetary Data Workshop (Tom)
  - **Project 6**: Registry implementation project for ESA (Dave)
- Geometry

    - **Project 7:** Extend PDS4 to have an explicit geometry class (Chuck); include Lisa Gaddis, Navita, Jose, Yukio, Naru, as well as current team project members
    - Goal: define data that a data provider needs to include in PDS4 in order to understand the geometry of the data
- Web Site
  Dan: close project

Next meeting

CNES in Paris, hosted by Alain; July 2013

- Alain to check on dates and resources
- Try to coordinate with another Planetary Data workshop

Other items

- Peer reviews – how to address
    - Criteria differ by project and agency
    - Granularity of reviews, including re-reviews at data release
    - Heavy resource load on both the archive and instrument teams
- Develop a white paper/assessment of the situation of peer review (action item)
    - Reta, Dave, Maria Teresa, Faith Vilas

- Update from ISRO on interoperability plans at midterm or next steering committee meeting

Action Items from 2011-2012

- Review TEG membership (closed)
- PDAP extensions (closed due to new project)
- Send out PDAP extension for fly-by project (closed; will continue through new project)
- TEG telecon (closed)
- Align PDS4 model and software classes in PDAP (**open**; continuing through unification project)
- Identify return types for PDAP (**open**; addressed under new core spec project)
- Generate IPDA data dictionary (**open**; continuing through new project)
- Added Russians to TEG (closed)
- Develop PDS4 validation rules (closed)
- Identify Canadian TEG members (**open**)
- Review mailing list mechanism for IPDA
- Dan to distribute voting procedure (closed)
- SC plans for 2012 sent out (closed)
- Structure for PDAP (closed)

- Explore addition of new countries (Poland, Sweden, Brazil?) (**open**; Alain)
- Development of IPDA/AGU plan (closed)

Action Items from 2012-2013

- Investigate option of hosting the next IPDA SC meeting at CNES (Alain)
- Develop white paper assessing international peer review challenges (Maria Teresa, Reta, Dave)
- Develop minimal specification for PDAP (Jesus)
- Schedule teleconferences (Dan)
- Initiate new projects (Dan)