Interoperability in the Planetary Science Archive (PSA)

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Planetary Science Archive (PSA) - Missions

PDS4 Missions (EM16 operational)
- exomars
- bepicolombo

PDS3 Missions
- rosetta
- smart-1
- mars express
- venus express
- cassini-huygens
- giotto
Planetary Science Archive (PSA) - Repository

- Repository of ESA’s missions for exploration of the Solar System (excluding the heliophysics missions)
- Contains science data sets and engineering data sets for spacecraft and instruments
- Archived data must follow the Planetary Data System formats, PDS3/PDS4
Planetary Science Archive (PSA) - Repository

- Approximately 45 TB of data from 70 instruments, 8 missions
- >27 TB (>0.8M products) from Mars Express
- >11 TB (>1.1M products) from Venus Express
- >2 TB (>7.5M products) from Rosetta
  - (over 100k images from OSIRIS + NAVCAM)
- >21GB (>50k products) from ExoMars2016
  - (mostly Spacecraft/Instrument Housekeeping)
Planetary Science Archive (PSA) - The New PSA

Released on 16th January 2017: http://psa.esa.int
Planetary Science Archive (PSA) - Interfaces to access data

➤ 4 main interfaces to access the data on the new PSA

➤ Graphical User Interface

➤ FTP server (all the public data is here!)

➤ Machine access interfaces (accessed either by command line, by custom scripts, on a web browser)

➤ PDAP

➤ EPN-TAP (beta)
Planetary Science Archive (PSA) - Interfaces to access data
Planetary Science Archive (PSA)
- Interfaces to access data

**Index of ftp://npsa01.n1data.lan/pub/mirror/**

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Planetary Science Archive (PSA) - Interfaces to access data

Available resources:

- tables - List the accessible tables and metadata for this service. (VOTable)
- sync - List of this user’s on-going synchronous query calls to this service.
- async - List of this user’s completed or on-going asynchronous query calls to this service.
- capabilities - List the capabilities of this service. (VOTable)
- availability - Display the availability of this service. (VOTable)
Current searchable parameters common to PDAP and EPN-TAP:

- Target
- Instrument
- Instrument Host
- Start / Stop time

* Some proprietary data (6-months default until public for PDS4 products and custom for PDS3)
PSA EPN-TAP (Beta)

http://psa.esa.int/epn-tap/tap

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- tables  - List the accessible tables and metadata for this service. (VOTable)
- sync    - List of this user's on-going synchronous query calls to this service.
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Planetary Science Archive (PSA)
- PSA PDAP

PSA PDAP
http://psa.esa.int/pdap/metadata
Planetary Science Archive (PSA) - PSA EPN-TAP

- Beta version since January 2017

- TAP server based on TAP+ (designed by ESDC)

- Doing progress on performance and speed access

- The service can be accessed and consumed by different ways
  - VESPA Query Interface (the best client to access)
  - TOPCAT
  - HTTP URL (web browser or by command line / script)
Planetary Science Archive (PSA)  
- PSA EPN-TAP Beta Service through VESPA

Custom Resource Form

Resource URL: http://psa.esa.int/epn-tap/tap
Schema Name: npsa
PDAP core v1.0 already in the new PSA 5.0 (16th January 2017)

Basic implementation of the PDAP protocol. 3 services: metadata (dataset/product), files (dataset) and download (dataset/product)

Analysis and assessment of PDS4 in PDAP

Evaluate needs for PDAP extensions within the IPDA forum
  - Time support on PSA PDAP
  - Geometrical support on PSA PDAP
  - Fly-by ext.
  - Spectral ext.
To get the bundles from ExoMars 2016:
http://psa.esa.int/pdap/metadata?RETURN_TYPE=VOTABLE&RESOURCE_CLASS=DATA_SET&MISSION_NAME='ExoMars 2016'

To get information on a specific dataset:
http://psa.esa.int/pdap/metadata?DATA_SET_ID=AIRUB-C-PHOTOCAM-2-EDR-HALLEY-1986-V1.0&RETURN_TYPE=VOTABLE

The Data Access Reference will allow to download the dataset:
http://psa.esa.int/pdap/download?RESOURCE_CLASS=DATASET&ID=AIRUB-C-PHOTOCAM-2-EDR-HALLEY-1986-V1.0

Search by Release Date feature in PSA v5.0 January 2017:
http://psa.esa.int/pdap/metadatadata?DATASET_RELEASE_DATE>='20170401'
Planetary Science Archive (PSA) - Conclusions

- Decisions on which implementation to follow PDAP vs EPN-TAP to be taken within the IPDA Steering Committee.

- Discussions on how useful PDAP is for PDS4 data and whether it is ready for its characteristics taking into account EPN-TAP.

- The PSA will keep both available to be accessed by any means.

- Developments ongoing on the EPN-TAP and PDAP will continue.
- Planetary Data Access Protocol (Core) v1.0 (April 2013)
  https://planetarydata.org/standards/IPDA_PDAP_v1.0.pdf
- NASA PDS (Planetary Data System) https://pds.nasa.gov
- Table Access Protocol http://www.ivoa.net/documents/TAP
- EuroPlanet – Table Access Protocol (EPN-TAP)
  https://voparis-confluence.obspm.fr/pages/viewpage.action?pageId=559861
- VESPA Query Interface (queries to different VO resources incl. PSA)
  http://vespa.obspm.fr/planetary/data/epn/query/all/