EUROPLANET 2024 Research Infrastructure

# Tutorial Session :

# Setting-up a VESPA service « Starter pack »

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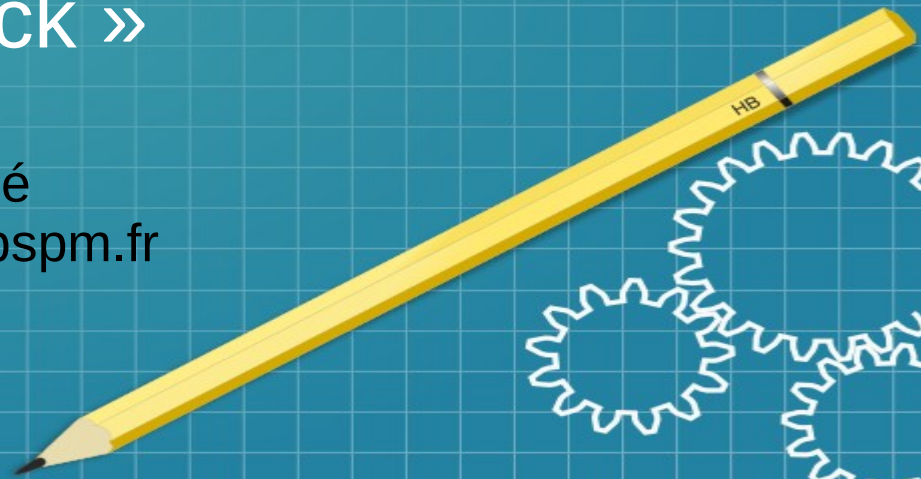
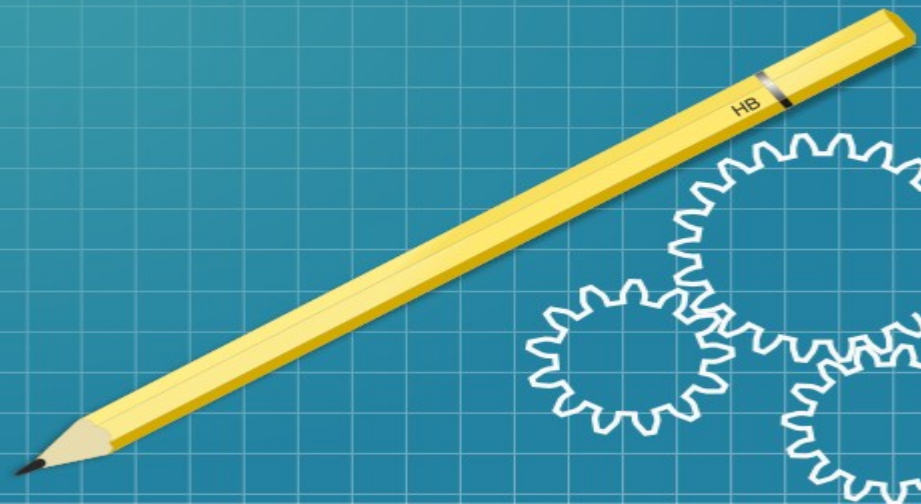



l'Observatoire de Paris

# Setting-up an EPN-TAP service

- VO server (mainly DaCHS)
  - Virtual Machine
  - Docker Container
- Import the service from a Resource Descriptor (RD) – xml-like
  - Map the source information to the epn_core schema
    - Mandatory / optionnal columns
    - Columns added manually
    - Post-treatment using python scripts
- Import the service
- Register the service



# VO Server

## Virtual Machine / Docker

- Debian
- Install DaCHS + postgres + Apache 2
- DaCHS Configuration (gavo.rc, userconfig.rd, defaultmeta.txt)

  (for production)

  https://voparis-wiki.obspm.fr/display/VES/EPN-TAP+Server+Installation+for+VESPA+Data+Provider+Tutorial

# Create the service

## Where is the information ?

- CSV : map and post-treated in the Resource Descriptor

```
column A, column B, column C
valueA1, valueB1 , valueB1
valueA2, valueB2 , valueB2
```

The easyest, create it with your favourite langage

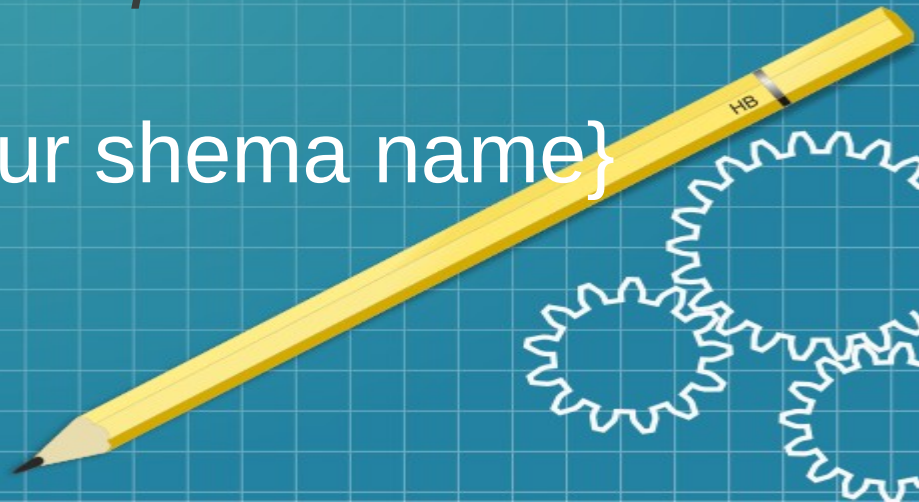
- From a SQL database :
  - Create your connection chain to access the database
  - Map an post-treat it in the Resource Descriptor
- From a Mongodb database
- Other : Fits, ...

# The Resource Descriptor

Generate a template with instructions with the command :

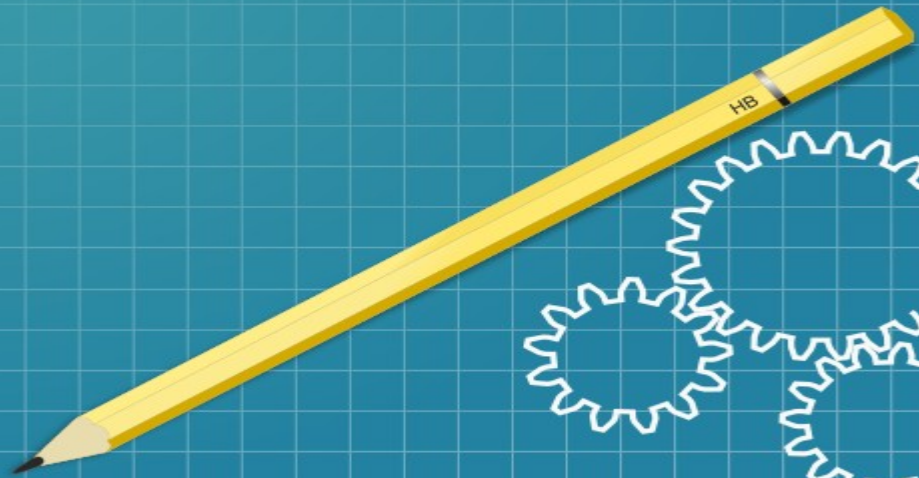
*‘dachs start epntap’*

From *var/*gavo/inputs/{Your shema name}



# Tutorial : CSV example « planets »

https://voparis-wiki.obspm.fr/display/VES/Setting-up+an+EPN-TAP+service%3A+Tutorial+for+Beginners

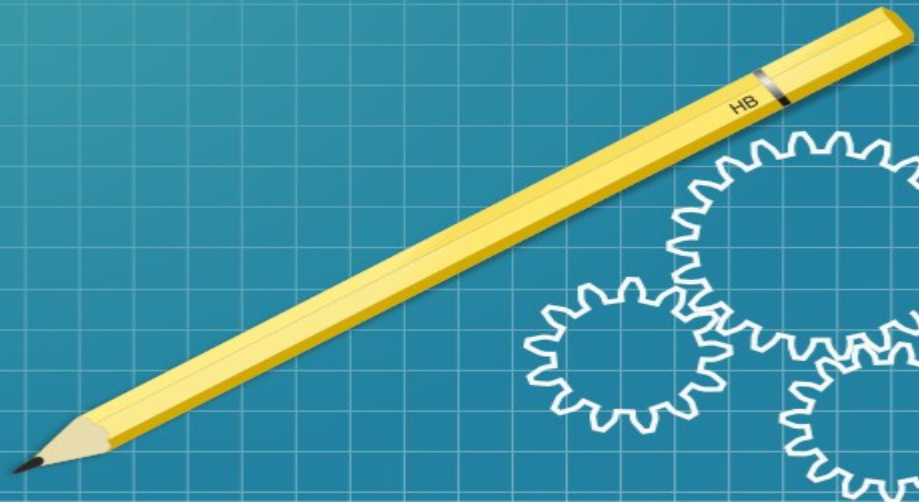


# Tutorial : CSV example « planets »

| name | mean radius (km) | mean radius uncertainty (km) | equatorial radius (km) | equatorial radius uncertainty (km) | polar radius (km) | polar radius uncertainty (km) | rms deviation (km) | elevation max (km) | elevation min (km) | mass (kg) | distance to primary (km) | sideral rotation period (h) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 2439.7 | 1.0 | 2439.7 | 1.0 | 2439.7 | 1.0 | 1 | 4.6 | 2.5 | 3.3014E23 | 57909227. | 1407.504 |
| Venus | 6051.8 | 1.0 | 6051.8 | 1.0 | 6051.8 | 1.0 | 1 | 11 | 2 | 4.86732E24 | 108209475. | -5832.432 |
| Earth | 6371.00 | 0.01 | 6378.14 | 0.01 | 6356.75 | 0.01 | 3.57 | 8.85 | 11.52 | 5.97219E24 | 149598262. | 23.93447232 |
| Mars | 3389.5 | 0.2 | 3396.19 | 0.1 | 3376. | 0.1 | 3.0 | 22.64 | 7.55 | 6.41693E23 | 227943824. | 24.624 |
| Jupiter | 69911. | 6 | 71492. | 4 | 66854. | 10 | 62.1 | 31 | 102 | 1.89813E27 | 778340821. | 9.92496 |
| Saturn | 58232. | 6 | 60268. | 4 | 54364. | 10 | 102.9 | 8 | 205 | 5.68319E26 | 1426666422. | 10.656 |
| Uranus | 25362. | 7 | 25559. | 4 | 24973. | 20 | 16.8 | 28 | 0 | 8.68103E25 | 2870658186. | -17.232 |
| Neptune | 24622. | 19 | 24764. | 15 | 24341. | 30 | 8 | 14 | 0 | 1.0241E26 | 4498396441. | 16.104 |

# Tutorial : CSV example « planets »

- VO server
- Define Granules – Epn-Core parameters
- CSV file
- Resource Descriptor



# Tutorial : CSV example « planets »

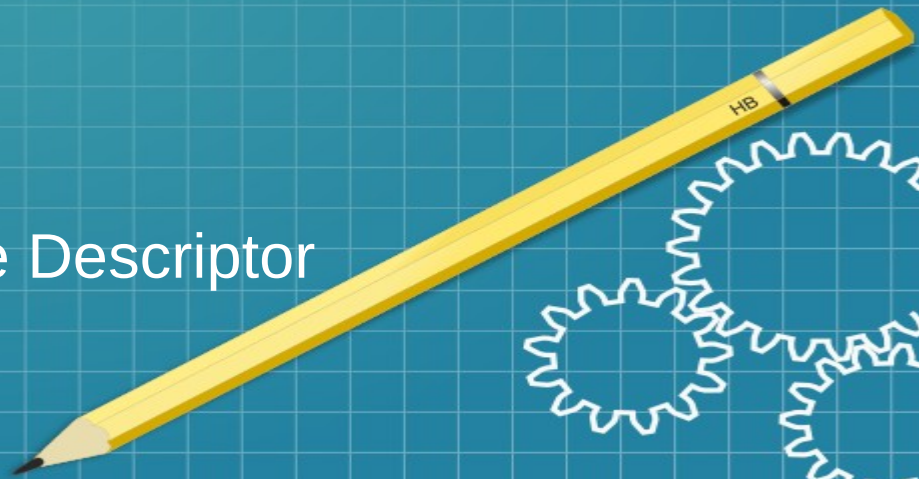
- *docker exec -ti dachs bash*
- *cd var/gavo/inputs*
- *git clone https://voparis-gitlab.obspm.fr/workshop-2021-material/planets_for_tuto.git*

Masses2.csv

CSV file

q.rd

Resource Descriptor



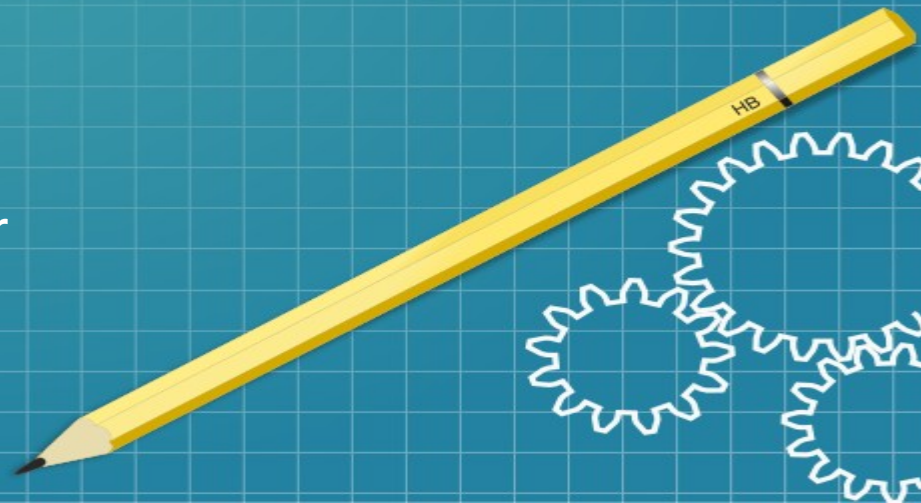
# Tutorial : CSV example « planets »

*Resource Descriptor*

```
<resource schema="...">
   <meta .../>
      ...
   <meta .../>

   <table ...>
      <mixin .../>

      <column .../>
         ...
      <column .../>
   </table>

   <data id="import">
      <sources .../>

      <csvGrammar> <rowfilter procDef="//products#define"> <bind name="table">"\schema.epn_core"</bind> </rowfilter> </csvGrammar>

      <make table="epn_core">
         <rowmaker idmaps="*">
            <var key="...">...</var>
               ...
            <var key="...">...</var>

            <apply procDef="//epntap2#populate-2_0" name="fillepn">
               <bind name="...">@...</bind>
                  ...
               <bind name="...">@...</bind>
            </apply>
         </rowmaker>
      </make>
   </data>
</resource>
```

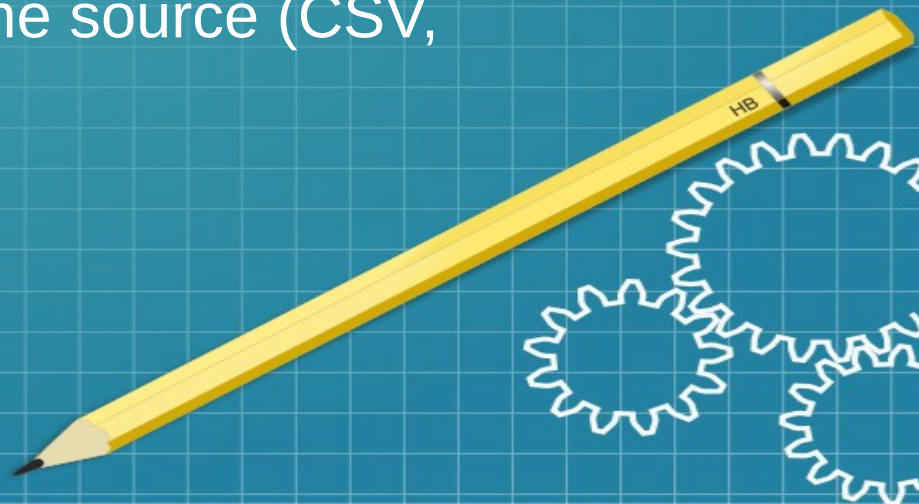
# Tutorial : CSV example « planets »

- Meta tags
  - subject
- Table definition
  - epn_core : collection of columns
    - Mandatory
    - Optional
  - Defined  by the data provider



# Tutorial : CSV example « planets »

- Data ingestion
  - Path to the Sources
  - Grammar
  - Mapping – associate columns previously_defined on the RD to columns from the source (CSV, database, etc)
  - Populate



# Tutorial : CSV example « planets »

Install tables

- *dachs val q.rd*
- *dachs imp q.rd*
- *dachs serve reload*

http://localhost:8080

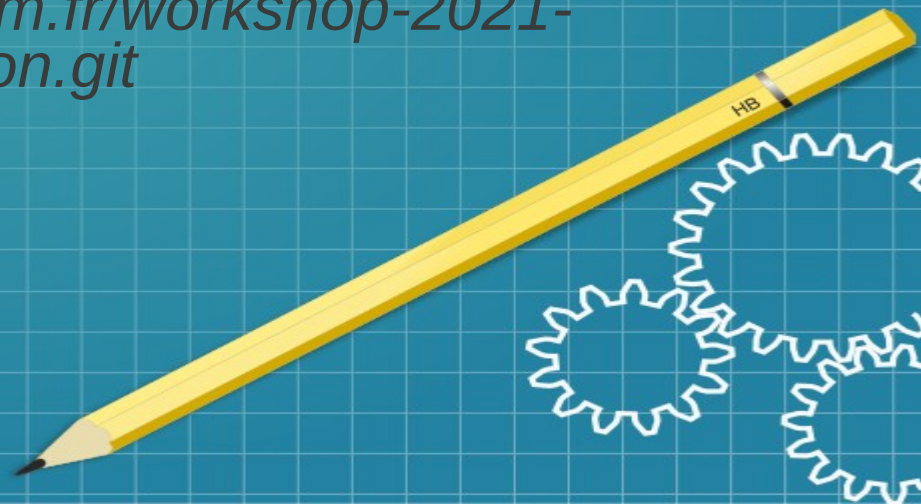
http://localhost:8080/__system__/dc_tables/list

SELECT * FROM planets.epn_core

# From a SQL database :

odbcGrammar

- python3-pyodbc must be installed on the server
  - *cd*
  - *git clone https://voparis-gitlab.obspm.fr/workshop-2021-material/pyodbc_installation.git*
  - *cd install_pyodbc*
  - *./install_pyodbc.sh*



# From a SQL database

- Using a Chaincode to access the database (instead of the CSV)

  ex : Helio services
  https://voparis-gitlab.obspm.fr/vespa/dachs/services/padc/voparis-tap-helio

  - MySQL (BASS2000): Driver={MySQL ODBC 8.0 Unicode Driver};Server=145.238.155.92;Database=bass2000prod;User=guest;Password=guest;Option=3;
  - PostgreSQL (HFC1AR): Driver={PostgreSQL Unicode};Server=bdd-lesia.obspm.fr;Port=5432;Database=hfcdb;Uid=guest;Pwd=guest;

# Resource descriptor from SQL

Contains the connection chain

```
<sources pattern="data/driver.txt">
<odbcGrammar  query="SELECT * FROM
hfc1.view_sp_hqi JOIN hfc1.sunspots ON
hfc1.view_sp_hqi.ID_SUNSPOT=hfc1.sunspots.ID_S
UNSPOT LIMIT 100">
```

Your SQL Query

# Resource Descriptors

- Other examples of features on RD (no matters the grammar) :
  - <data id="import" updating="True">
  - <rowfilter procDef="//products#define">

```
        <bind key="table">"\schema.epn_core"</bind>
        <code>  … post-treatment with python code … </code>
    </rowfilter>
```

  - Make functions, import modules, etc
- See hfc1ar service