



Leibniz-Institut für
Astrophysik Potsdam

Behind the scenes of AIP IVOA data services

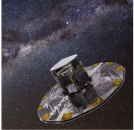
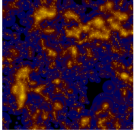
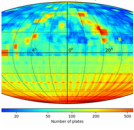

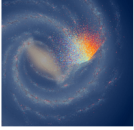
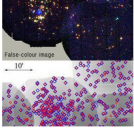
Providing DOI within the Datalink protocol and operations report - Django Daiquiri and dockerized DevOp environment

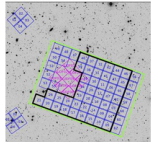
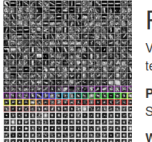



A. Galkin, K. Mekan / IVOA Interop, Sydney, Australia / May 2024

Outline - Behind the scenes of AIP IVOA data services

- IVOA compliant data archives at AIP
- Providing DOI within the Datalink protocol
- Operations report – Django Daiquiri and Dockerized DevOp environment

Data services at AIP – data.aip.de

 <p>Gaia Gaia Data from the Gaia satellite, observation of stars in the Milky Way Categories Astrometry, Photometry Projects Gaia, Daiquiri Website https://gaia.aip.de</p> <p>Query Metadata</p>	 <p>CosmoSim Cosmological simulations, database Categories Simulation data Projects CosmoSim, Daiquiri Website https://www.cosmosim.org</p> <p>Query Metadata</p>
 <p>APPLAUSE APPLAUSE Archive of digitized photographic plates Categories Astrometry, Spectroscopy, Light curves, Photometry Projects Applause, Daiquiri Website https://www.plate-archive.org</p> <p>Query Metadata</p>	 <p>CARS CARS Close AGN Reference Survey (CARS) data release Categories Spectroscopy Projects CARS, Daiquiri Website https://cars.aip.de/</p> <p>Query Gallery</p>
 <p>RAVE RAVE Results of the RAdial VELOCITY Survey (2003 - 2013) Categories Spectroscopy, Photometry Projects RAVE, Daiquiri Website https://www.rave-survey.org</p> <p>Query Metadata</p>	 <p>XMMSSC Data release of the XMM-Newton Survey Science Centre (SSC) Projects XMM-Newton SSC, Daiquiri Website https://xmmssc.aip.de</p> <p>Query Catalogues</p>

 <p>MUSE-Wide The MUSE-Wide project data release Projects MUSE, Daiquiri Website https://musewide.aip.de</p> <p>Query Metadata</p>	 <p>Publication data Various data collections for scientific papers or test data for pipelines. Projects various AIP publications, Gaia, StarHorse, PEPSI, MUSE, Daiquiri Website https://data.aip.de/projects</p>
 <p>AIP Cepheids database AIP Cepheids database Website https://cepheids.aip.de</p>	 <p>Historical Sky Discovering astronomical photographic plates Website https://public.aip.de/historical-sky/en/</p>
 <p>Verlust der Nacht Loss of the night How bright is the night? Website https://verlustdernacht.aip.de</p>	<h1>data.aip.de</h1>

Data services at AIP powered by Django Daiquiri framework

IVOA interfaces

- ADQL query interface
- TAP protocol
- IVOA Simple Cone Search
- VO endpoints for IVOA registry of registries
- Datalink protocol

Supports further interfaces:

- Metadata management backend incl. DOI and UCD
- OAI-PMH2 endpoint

As providers, we have to handle metadata for different protocols, each of the metadata schemas have diverse structures. Our goal is to re-use the information already given in the archive and to avoid duplicating it.

Providing DOI within the Datalink protocol

An example from the APPLAUSE archive (H. Enke et al. 2024)

- DOIs exist for schema and tables.
- Furthermore, DOIs exist for objects such as plates, previews, envelopes, logbooks.
- Instead of providing DOI via the science data base or an individual solution, we store the DOI information in the Datalink table.
- DOI was added as extension to the Datalink-core dictionary as DOI is not (yet?) part of the Datalink-core dictionary.

If a DOI is present, the Datalink tables are generated from already existing metadata either per script or on the fly (dynamic Datalink).

- Daiquiri framework automatically generates basic Datalink entries for schemas and tables which are present in each archive from the existing metadata.
- For other objects, our archives expect the DOI to be included directly in the Datalink tables.



Datalinks for applause_dr4.plate

Data Links

access_url	description	semantics	content_type	content_length
https://doi.org/10.17876/plate/dr.4	The applause_dr4.plate table is part of the linked resource.	#auxiliary	application/html	None
https://www.plate-archive.org/metadata/applause_dr4/plate/	Documentation for the applause_dr4.plate table	#documentation	application/html	None
https://doi.org/10.17876/plate/dr.4/6	Photographic plates as physical objects	#doi	application/html	None

https://www.plate-archive.org/datalink/applause_dr4.plate/

applause_dr4.plate table

https://www.plate-archive.org/datalink/plates/1_19928/

Datalinks for plates/1_19928

Data Links

access_url	description	semantics	content_type	content_length
https://www.plate-archive.org/files/DR3/scans/POT015/POT015_000001.hdr	Header for the scan of the plate 19928 in archive 1 from APPLAUSE DR3	#detached-header	text/plain	14.8 KB
https://doi.org/10.17876/plate/dr.3/plates/1_19928	Plate 19928 in archive 1 from APPLAUSE DR3	#doi	application/html	None
https://www.plate-archive.org/objects/dr.3/plates/1_19928	Object viewer for the plate 19928 in archive 1 from APPLAUSE DR3	#preview	application/html	None
https://www.plate-archive.org/files/DR4/scans/POT015/POT015_000001.fits	File for the scan of the plate 19928 in archive 1 from APPLAUSE DR3	#this	application/fits	677.9 MB

Plate 1_19928 object

<https://www.plate-archive.org/datalink/semantics#doi>

DOI Datalink dictionary extension

The extension to the Datalink-core dictionary

Term	Description
https://www.plate-archive.org/datalink/semantics#doi	The access_url points to the Digital Object Identifier (DOI) of the object.

Use of Datalink tables in OAI PMH protocol

The Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) is a low-barrier mechanism for repository interoperability.

- DOI and the DOI landing page information come from the Datalink table
- Files for the object in OAI protocol also come from Datalink table
- OAI interface uses the „alternate identifier“ tag for an object to use with Datalink protocol

Plate 1_19928 object

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<alternateIdentifiers>
  <alternateIdentifier alternateIdentifierType="datalink">plates/1_19928</alternateIdentifier>
  <alternateIdentifier alternateIdentifierType="DOI Landing Page">https://www.plate-archive.org/objects/dr.3/plates/1_19928</alternateIdentifier>
</alternateIdentifiers>
```

https://www.plate-archive.org/oai/?verb=GetRecord&metadataPrefix=datacite&identifier=oai:www.plate-archive.org:plates/1_19928

Building a dockerized DevOp environment - from development to operation

Development
on local machine



Development
on a dev server:

- test data
- storage



Test on the
test instance:

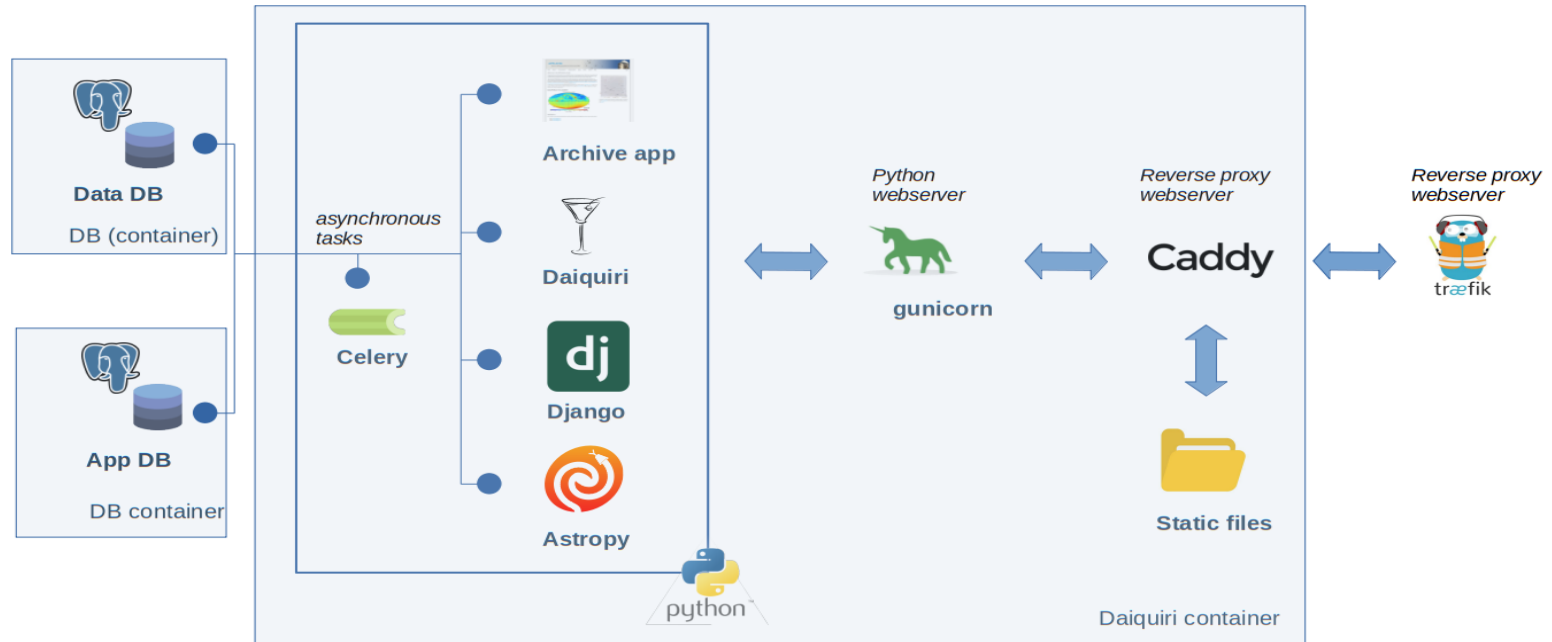
- identical to the prod instance plus the new feature
- test data
- storage



Deployment to the
productive instance

Ideally, a developer has the exact same environment as on the production instance.

Building a dockerized DevOp environment - an archive instance



The highs...

- The setup is reproducible. So are the bugs.
- Development, test and deployment setups are the same environment.
- Less downtime
- No more „changing configs“ on the productive instances.
- As many as dev or test instances as needed.
- Additional features for maintenance can be built into the setup – data volumes, custom installs for the app, cron jobs, etc.

Docker is a very fast developing technology – continuous updates are needed, more difficult to deploy on older OS. Same goes for web services.

With docker any updates or combinations of packages and features are possible and can be tested beforehand, as many dev or test instances as needed.

... and the lows ;)

Containerization does not mean simplicity. A lot of expertise is needed, but it is completely scripted / documented now.

Questions?

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github.com/django-daiquiri