
Pacifica Metadata Documentation

David Brown

May 11, 2020

Contents:

1	Installation	3
1.1	Installation in Virtual Environment	3
2	Configuration	5
2.1	CherryPy Configuration File	5
2.2	Service Configuration File	5
2.3	Starting the Service	6
3	Metadata Model	9
3.1	All The Objects	9
3.2	Note	21
4	Example Usage	23
4.1	The API	23
5	Metadata Python Module	27
5.1	Configuration Python Module	28
5.2	Globals Python Module	28
5.3	ORM Python Module	28
5.4	REST Python Module	28
5.5	WSGI Python Module	31
5.6	Client Python Module	31
5.7	Admin Command Python Module	31
6	Indices and tables	33

The Pacifica Metadata service provides metadata storage about the files stored in Pacifica.

The Pacifica software is available through PyPi so creating a virtual environment to install is what is shown below. Please keep in mind compatibility with the Pacifica Core services.

1.1 Installation in Virtual Environment

These installation instructions are intended to work on both Windows, Linux, and Mac platforms. Please keep that in mind when following the instructions.

Please install the appropriate tested version of Python for maximum chance of success.

1.1.1 Linux and Mac Installation

```
mkdir ~/.virtualenvs
python -m virtualenv ~/.virtualenvs/pacifica
. ~/.virtualenvs/pacifica/bin/activate
pip install pacifica-metadata
```

1.1.2 Windows Installation

This is done using PowerShell. Please do not use Batch Command.

```
mkdir "$Env:LOCALAPPDATA\virtualenvs"
python.exe -m virtualenv "$Env:LOCALAPPDATA\virtualenvs\pacifica"
& "$Env:LOCALAPPDATA\virtualenvs\pacifica\Scripts\activate.ps1"
pip install pacifica-metadata
```


The Pacifica Core services require two configuration files. The REST API utilizes `CherryPy` and review of their [configuration documentation](#) is recommended. The service configuration file is a INI formatted file containing configuration for database connections.

2.1 CherryPy Configuration File

An example of Metadata server CherryPy configuration:

```
[global]
log.screen: True
log.access_file: 'access.log'
log.error_file: 'error.log'
server.socket_host: '0.0.0.0'
server.socket_port: 8121

[/]
request.dispatch: cherrypy.dispatch.MethodDispatcher()
tools.response_headers.on: True
tools.response_headers.headers: [('Content-Type', 'application/json')]
```

2.2 Service Configuration File

The service configuration is an INI file and an example is as follows:

```
[database]
; This section contains database connection configuration

; peewee_url is defined as the URL PeeWee can consume.
; http://docs.peewee-orm.com/en/latest/peewee/database.html#connecting-using-a-
↪ database-url
```

(continues on next page)

(continued from previous page)

```
peewee_url = postgresql://pacifica:metadata@localhost:5432/pacifica_metadata

; connect_attempts are the number of times the service will attempt to
; connect to the database if unavailable.
connect_attempts = 10

; connect_wait are the number of seconds the service will wait between
; connection attempts until a successful connection to the database.
connect_wait = 20

; enable debug logging of database queries
debug_logging = False

[notifications]
; This section describes where the notifications server is.

; Disable eventing for the metadata service.
disabled = False

; URL to the receive endpoint on the notifications server.
url = http://127.0.0.1:8070/receive

[elasticsearch]
; This section describes configuration to contact elasticsearch

; URL to the elasticsearch server
url = http://127.0.0.1:9200
```

2.3 Starting the Service

Starting the Metadata service can be done by two methods. However, understanding the requirements and how they apply to REST services is important to address as well. Using the internal CherryPy server to start the service is recommended for Windows platforms. For Linux/Mac platforms it is recommended to deploy the service with [uWSGI](#).

2.3.1 Deployment Considerations

The Metadata service is the authoritative metadata store for all data in Pacifica. This means any queries needed by any other Pacifica services goes through a REST endpoint on this service. As different services require performance characteristics of each endpoint it is important to have a deployment mechanism that behaves consistently.

The CherryPy service works well enough for many of the queries. However, for performance and scalability using [uWSGI](#) is preferred. Also putting system memory consumption limits on the service is also recommended. As you get more data in the system some queries will grow to consume memory beyond a single system.

As data volume in Pacifica and load on queries increase the Metadata service works better running in [uWSGI](#). The chance increases of a query consuming all the system memory on the server. As CherryPy is a threaded application Linux will kill the process to free up memory. This results in the service going down entirely and not servicing requests. [uWSGI](#) takes care of this by utilizing a forking model for handling requests. Using [uWSGI](#), a child process is killed and a 500 is returned to the client. [uWSGI](#) continues handling requests, cleans up the dead child and spawns new ones.

2.3.2 CherryPy Server

To make running the Metadata service using the CherryPy's builtin server easier we have a command line entry point.

```
$ pacifica-metadata --help
usage: pacifica-metadata [-h] [--cpconfig CPCONFIG] [-c CONFIG] [-p PORT]
                        [-a ADDRESS]

Run the metadata server.

optional arguments:
  -h, --help            show this help message and exit
  --cpconfig CPCONFIG  cherrypy config file
  -c CONFIG, --config CONFIG
                        database config file
  -p PORT, --port PORT  port to listen on
  -a ADDRESS, --address ADDRESS
                        address to listen on

$ pacifica-metadata-cmd dbsync
$ pacifica-metadata
[09/Jan/2019:09:17:26] ENGINE Listening for SIGTERM.
[09/Jan/2019:09:17:26] ENGINE Bus STARTING
[09/Jan/2019:09:17:26] ENGINE Set handler for console events.
[09/Jan/2019:09:17:26] ENGINE Started monitor thread 'Autoreloader'.
[09/Jan/2019:09:17:26] ENGINE Serving on http://0.0.0.0:8121
[09/Jan/2019:09:17:26] ENGINE Bus STARTED
```

2.3.3 uWSGI Server

To make running the UniqueID service using uWSGI easier we have a module to be included as part of the uWSGI configuration. uWSGI is very configurable and can use this module many different ways. Please consult the [uWSGI Configuration](#) documentation for more complicated deployments.

```
$ pip install uwsgi
$ uwsgi --http-socket :8121 --master --module pacifica.metadata.wsgi
```


This covers all the objects and their relationships to other objects in the model.

3.1 All The Objects

3.1.1 Journals

Column	Type	Reference	Attributes
id	AutoField		NOT NULL, PRIMARY KEY
name	CharField		NOT NULL
impact_factor	FloatField		NOT NULL
website_url	CharField		NOT NULL
encoding	CharField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.2 Users

Column	Type	Reference	Attributes
id	AutoField		NOT NULL, PRIMARY KEY
first_name	CharField		NOT NULL
middle_initial	CharField		NOT NULL
last_name	CharField		NOT NULL
network_id	CharField		NULL
email_address	CharField		NOT NULL
encoding	CharField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.3 Institutions

Column	Type	Reference	Attributes
id	AutoField		NOT NULL, PRIMARY KEY
name	TextField		NOT NULL
association_cd	CharField		NOT NULL
is_foreign	BooleanField		NOT NULL
encoding	CharField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.4 Projects

Column	Type	Reference	Attributes
id	CharField		NOT NULL, PRIMARY KEY
title	TextField		NOT NULL
short_name	CharField		NULL
abstract	TextField		NULL
science_theme	CharField		NULL
project_type	CharField		NULL
submitted_date	ExtendDateTimeField		NOT NULL
accepted_date	ExtendDateField		NULL
actual_start_date	ExtendDateField		NULL
actual_end_date	ExtendDateField		NULL
closed_date	ExtendDateField		NULL
suspense_date	ExtendDateField		NULL
encoding	CharField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.5 Instruments

Column	Type	Reference	Attributes
id	AutoField		NOT NULL, PRIMARY KEY
display_name	CharField		NOT NULL
name	CharField		NOT NULL
name_short	CharField		NOT NULL
active	BooleanField		NOT NULL
encoding	CharField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.6 Citations

Column	Type	Reference	Attributes
id	AutoField		NOT NULL, PRIMARY KEY
article_title	TextField		NOT NULL
journal	ForeignKeyField	Journals.id	NOT NULL
journal_volume	IntegerField		NOT NULL
journal_issue	IntegerField		NOT NULL
page_range	CharField		NOT NULL
abstract_text	TextField		NOT NULL
xml_text	TextField		NOT NULL
release_authorization_id	CharField		NOT NULL
doi_reference	CharField		NOT NULL
encoding	CharField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.7 Contributors

Column	Type	Reference	Attributes
id	AutoField		NOT NULL, PRIMARY KEY
user	ForeignKeyField	Users.id	NOT NULL
first_name	CharField		NOT NULL
middle_initial	CharField		NOT NULL
last_name	CharField		NOT NULL
dept_code	CharField		NOT NULL
institution	ForeignKeyField	Institutions.id	NOT NULL
encoding	CharField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.8 Datasets

Column	Type	Reference	Attributes
id	AutoField		NOT NULL, PRIMARY KEY
description	TextField		NULL
display_name	CharField		NOT NULL
suspense_date	ExtendDateField		NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.9 Relationships

Column	Type	Reference	Attributes
uuid	UUIDField		NOT NULL, PRIMARY KEY
name	CharField		NOT NULL
display_name	CharField		NOT NULL
description	TextField		NOT NULL
encoding	CharField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.10 DataSources

Column	Type	Reference	Attributes
uuid	UUIDField		NOT NULL, PRIMARY KEY
name	CharField		NOT NULL
uri	CharField		NOT NULL
display_name	CharField		NOT NULL
description	TextField		NOT NULL
encoding	CharField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.11 Keywords

Column	Type	Reference	Attributes
id	AutoField		NOT NULL, PRIMARY KEY
keyword	CharField		NOT NULL
encoding	CharField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.12 Groups

Column	Type	Reference	Attributes
id	AutoField		NOT NULL, PRIMARY KEY
name	CharField		NOT NULL
is_admin	BooleanField		NOT NULL
display_name	CharField		NOT NULL
description	TextField		NOT NULL
encoding	CharField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.13 AnalyticalTools

Column	Type	Reference	Attributes
id	AutoField		NOT NULL, PRIMARY KEY
name	CharField		NOT NULL
encoding	CharField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.14 InstrumentUser

Column	Type	Reference	Attributes
uuid	UUIDField		NOT NULL, PRIMARY KEY
instrument	ForeignKeyField	Instruments.id	NOT NULL
user	ForeignKeyField	Users.id	NOT NULL
relationship	ForeignKeyField	Relationships.uuid	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.15 InstitutionUser

Column	Type	Reference	Attributes
uuid	UUIDField		NOT NULL, PRIMARY KEY
user	ForeignKeyField	Users.id	NOT NULL
institution	ForeignKeyField	Institutions.id	NOT NULL
relationship	ForeignKeyField	Relationships.uuid	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.16 CitationContributor

Column	Type	Reference	Attributes
citation	ForeignKeyField	Citations.id	NOT NULL
author	ForeignKeyField	Contributors.id	NOT NULL
author_precedence	IntegerField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.17 CitationKeyword

Column	Type	Reference	Attributes
citation	ForeignKeyField	Citations.id	NOT NULL
keyword	ForeignKeyField	Keywords.id	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.18 ProjectInstrument

Column	Type	Reference	Attributes
uuid	UUIDField		NOT NULL, PRIMARY KEY
project	ForeignKeyField	Projects.id	NOT NULL
instrument	ForeignKeyField	Instruments.id	NOT NULL
relationship	ForeignKeyField	Relationships.uuid	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.19 ProjectUser

Column	Type	Reference	Attributes
uuid	UUIDField		NOT NULL, PRIMARY KEY
user	ForeignKeyField	Users.id	NOT NULL
project	ForeignKeyField	Projects.id	NOT NULL
relationship	ForeignKeyField	Relationships.uuid	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.20 ProjectGroup

Column	Type	Reference	Attributes
group	ForeignKeyField	Groups.id	NOT NULL
project	ForeignKeyField	Projects.id	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.21 CitationProject

Column	Type	Reference	Attributes
citation	ForeignKeyField	Citations.id	NOT NULL
project	ForeignKeyField	Projects.id	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.22 Transactions

Column	Type	Reference	Attributes
id	AutoField		NOT NULL, PRIMARY KEY
description	TextField		NULL
suspense_date	ExtendDateField		NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.23 TransSIP

Column	Type	Reference	Attributes
id	ForeignKeyField	Transactions.id	NOT NULL, PRIMARY KEY
submitter	ForeignKeyField	Users.id	NOT NULL
instrument	ForeignKeyField	Instruments.id	NOT NULL
project	ForeignKeyField	Projects.id	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.24 TransSAP

Column	Type	Reference	Attributes
id	ForeignKeyField	Transactions.id	NOT NULL, PRIMARY KEY
submitter	ForeignKeyField	Users.id	NOT NULL
analytical_tool	ForeignKeyField	AnalyticalTools.id	NOT NULL
project	ForeignKeyField	Projects.id	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.25 Files

Column	Type	Reference	Attributes
id	AutoField		NOT NULL, PRIMARY KEY
name	CharField		NOT NULL
subdir	CharField		NOT NULL
ctime	ExtendDateTimeField		NOT NULL
mtime	ExtendDateTimeField		NOT NULL
hashsum	CharField		NOT NULL
hashtype	CharField		NOT NULL
size	BigIntegerField		NOT NULL
transaction	ForeignKeyField	Transactions.id	NOT NULL
mimetype	CharField		NOT NULL
encoding	CharField		NOT NULL
suspense_date	ExtendDateField		NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.26 Keys

Column	Type	Reference	Attributes
id	AutoField		NOT NULL, PRIMARY KEY
key	CharField		NOT NULL
display_name	CharField		NOT NULL
description	TextField		NOT NULL
encoding	CharField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.27 Values

Column	Type	Reference	Attributes
id	AutoField		NOT NULL, PRIMARY KEY
value	CharField		NOT NULL
display_name	CharField		NOT NULL
description	TextField		NOT NULL
encoding	CharField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.28 FileKeyValue

Column	Type	Reference	Attributes
file	ForeignKeyField	Files.id	NOT NULL
key	ForeignKeyField	Keys.id	NOT NULL
value	ForeignKeyField	Values.id	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.29 TransactionKeyValue

Column	Type	Reference	Attributes
transaction	ForeignKeyField	Transactions.id	NOT NULL
key	ForeignKeyField	Keys.id	NOT NULL
value	ForeignKeyField	Values.id	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.30 UserGroup

Column	Type	Reference	Attributes
user	ForeignKeyField	Users.id	NOT NULL
group	ForeignKeyField	Groups.id	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.31 DatasetFile

Column	Type	Reference	Attributes
dataset	ForeignKeyField	Datasets.id	NOT NULL
file	ForeignKeyField	Files.id	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.32 DatasetProjectUser

Column	Type	Reference	Attributes
uuid	UUIDField		NOT NULL, PRIMARY KEY
dataset	ForeignKeyField	Datasets.id	NOT NULL
user	ForeignKeyField	Users.id	NOT NULL
project	ForeignKeyField	Projects.id	NOT NULL
relationship	ForeignKeyField	Relationships.uuid	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.33 InstrumentGroup

Column	Type	Reference	Attributes
instrument	ForeignKeyField	Instruments.id	NOT NULL
group	ForeignKeyField	Groups.id	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.34 AToolProject

Column	Type	Reference	Attributes
project	ForeignKeyField	Projects.id	NOT NULL
analytical_tool	ForeignKeyField	AnalyticalTools.id	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.35 AToolTransaction

Column	Type	Reference	Attributes
transaction	ForeignKeyField	Transactions.id	NOT NULL
analytical_tool	ForeignKeyField	AnalyticalTools.id	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.36 TransactionUser

Column	Type	Reference	Attributes
uuid	UUIDField		NOT NULL, PRIMARY KEY
user	ForeignKeyField	Users.id	NOT NULL
transaction	ForeignKeyField	Transactions.id	NOT NULL
relationship	ForeignKeyField	Relationships.uuid	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.37 DOIEntries

Column	Type	Reference	Attributes
doi	CharField		NOT NULL, PRIMARY KEY
status	CharField		NOT NULL
released	BooleanField		NOT NULL
site_url	CharField		NOT NULL
encoding	CharField		NOT NULL
creator	ForeignKeyField	Users.id	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.38 DOIAuthors

Column	Type	Reference	Attributes
id	AutoField		NOT NULL, PRIMARY KEY
last_name	CharField		NOT NULL
first_name	CharField		NOT NULL
email	CharField		NULL
affiliation	CharField		NULL
orcid	CharField		NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.39 DOITransaction

Column	Type	Reference	Attributes
doi	ForeignKeyField	DOIEntries.doi	NOT NULL, PRIMARY KEY
transaction	ForeignKeyField	TransactionUser.uuid	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.40 CitationTransaction

Column	Type	Reference	Attributes
citation	ForeignKeyField	Citations.id	NOT NULL
transaction	ForeignKeyField	TransactionUser.uuid	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.41 CitationDOI

Column	Type	Reference	Attributes
doi	ForeignKeyField	DOIEntries.doi	NOT NULL
citation	ForeignKeyField	Citations.id	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.42 DOIAuthorMapping

Column	Type	Reference	Attributes
author	ForeignKeyField	DOIAuthors.id	NOT NULL
doi	ForeignKeyField	DOIEntries.doi	NOT NULL
author_order	IntegerField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.43 DOIInfo

Column	Type	Reference	Attributes
doi	ForeignKeyField	DOIEntries.doi	NOT NULL
key	CharField		NOT NULL
value	CharField		NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.44 InstrumentDataSource

Column	Type	Reference	Attributes
instrument	ForeignKeyField	Instruments.id	NOT NULL
data_source	ForeignKeyField	DataSources.uuid	NOT NULL
relationship	ForeignKeyField	Relationships.uuid	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.1.45 InstrumentKeyValue

Column	Type	Reference	Attributes
instrument	ForeignKeyField	Instruments.id	NOT NULL
key	ForeignKeyField	Keys.id	NOT NULL
value	ForeignKeyField	Values.id	NOT NULL
relationship	ForeignKeyField	Relationships.uuid	NOT NULL
created	ExtendDateTimeField		NOT NULL
updated	ExtendDateTimeField		NOT NULL
deleted	ExtendDateTimeField		NULL

3.2 Note

This document is generated by the `GenMetadataModelMD.py` script and needs to be regenerated whenever changes are made to the model.

4.1 The API

The Pacifica Metadata Services API covers the complete object life-cycle: create, read, update, and delete.

The examples in this section demonstrate the life-cycle of the `User` object using a Pacifica Metadata Services deployment at `http://localhost:8121/` (see “Installing the Service” section).

4.1.1 Creating an Object

To create a new `User` object, start by generating a new file `create.json` to store the JSON data:

```
{
  "_id": 127,
  "email_address": "john@doe.com",
  "first_name": "John",
  "last_name": "Doe",
  "middle_initial": "",
  "network_id": "guest"
}
```

Then, provide the contents of the new file as the body for a HTTP PUT request using the `curl` command:

```
curl -X PUT -T create.json 'http://localhost:8121/users'
```

4.1.2 Reading an Object

To retrieve the JSON data for the `User` object that was just created, send a HTTP GET request (with the `_id` attribute as a query parameter) using the `curl` command:

```
curl -X GET 'http://localhost:8121/users?_id=127'
```

The response body is a JSON array of JSON objects. Because the query uses the `_id` attribute, a primary key, the JSON array contains either zero (no match) or one (match) JSON objects:

```
[
  {
    "_id": 127,
    "email_address": "john@doe.com",
    "encoding": "UTF8",
    "first_name": "John",
    "last_name": "Doe",
    "middle_initial": "",
    "network_id": "guest",
    "created": 1459204793,
    "deleted": null,
    "updated": 1459204793
  }
]
```

Optionally, query on any other parts of an object by using its attributes as query parameters, e.g., to query on both the `first_name` and `last_name` attributes using the `curl` command:

```
curl -X GET 'http://localhost:8121/users?last_name=Doe&first_name=John'
```

Response bodies for queries on other parts may contain JSON data for more than one match:

```
[
  {
    "_id": 127,
    "email_address": "john@doe.com",
    "encoding": "UTF8",
    "first_name": "John",
    "last_name": "Doe",
    "middle_initial": "",
    "network_id": "guest",
    "created": 1459204793,
    "deleted": null,
    "updated": 1459204793
  },
  ...
]
```

Pagination

By default, Pacifica Metadata Services API endpoints respond with JSON data for all matching objects. Hence, the response size, and therefore, the response time is proportional to the number of matches.

To reduce the response time, but still enable access to all matching objects, all Pacifica Metadata Services API endpoints offer a “pagination” capability, where large responses are subdivided into “pages” with a fixed number of matching objects “per page”.

For example, 100 matching objects are divided into 4 pages of 25 matching objects per page:

- Page 1 = Matching objects 1 to 25
- Page 2 = Matching objects 26 to 50
- Page 3 = Matching objects 51 to 75
- Page 4 = Matching objects 76 to 100

- Page >4 = No matching objects

Use the `page_number` and `items_per_page` query parameters to specify the number of pages and the number of matching objects per page, respectively, e.g., to retrieve the 7th page of 10 Users per page using the `curl` command:

```
curl -X GET 'http://localhost:8121/users?items_per_page=10&page_number=7'
```

4.1.3 Updating an Object

To modify a preexisting object, use the query parameters to identify the object (or objects) and then send a HTTP POST request with the JSON data for the modified attributes as the request body, e.g., to modify the `network_id` attribute, start by generating a new file `update.json` to store the JSON data:

```
{
  "network_id": "example"
}
```

Then, provide the contents of the new file as the body for a HTTP POST request using the `curl` command:

```
curl -X POST -T update.json 'http://localhost:8121/users?last_name=Doe&first_name=John'↵
```

Finally, verify the modifications by retrieving the most recent version of the object (see “Reading an Object” section), e.g., using the `curl` command:

```
curl -X GET 'http://localhost:8121/users?_id=127'
```

The updated attribute is automatically set to the current time when an object is modified:

```
[
  {
    "_id": 127,
    "email_address": "john@doe.com",
    "encoding": "UTF8",
    "first_name": "John",
    "last_name": "Doe",
    "middle_initial": "",
    "network_id": "example",
    "created": 1459204793,
    "deleted": null,
    "updated": 1459205143
  }
]
```

4.1.4 (Soft) Deleting an Object

To mark an object as deleted, i.e., to “soft delete” an object, send a HTTP DELETE request using the `curl` command:

```
curl -X DELETE 'http://localhost:8121/users?_id=127'
```

NOTE Don’t worry! The object isn’t really deleted.

Finally, verify the “soft delete” by retrieving the most recent version of the object (see “Reading an Object” section), e.g., using the `curl` command:

```
curl -X GET 'http://localhost:8121/users?_id=127'
```

The deleted attribute is automatically set to the current time when an object is “soft deleted”:

```
[
  {
    "_id": 127,
    "email_address": "john@doe.com",
    "encoding": "UTF8",
    "first_name": "John",
    "last_name": "Doe",
    "middle_initial": "",
    "network_id": "example",
    "created": 1459204793,
    "deleted": 1459205341,
    "updated": 1459205143
  }
]
```


5.1 Configuration Python Module

5.2 Globals Python Module

5.3 ORM Python Module

5.3.1 All Objects Python Module

5.3.2 Globals Python Module

5.3.3 Base Python Module

5.3.4 Sync Python Module

5.3.5 Analytical Tools Python Module

5.3.6 Analytical Tool Project Python Module

5.3.7 Analytical Tool Transaction Python Module

5.3.8 Citations Python Module

5.3.9 Citation Contributor Python Module

5.3.10 Citation Doi Python Module

5.3.11 Citation Keyword Python Module

5.3.12 Citation Project Python Module

5.3.13 Citation Transaction Python Module

5.3.14 Contributors Python Module

DOI Modified Time Update Python Module

DOI Registration Base Python Module

DOI Registration Entry Python Module

DOI Registration Update Python Module

5.4.2 File Info Python Module

Earliest Latest Python Module

Files With Tkv Python Module

File Details Python Module

5.4.3 Instrument Queries Python Module

Instrument Categories Python Module

Instrument Lookup Python Module

Instrument Term Search Python Module

Instrument User Search Python Module

Query Base Python Module

5.4.4 Migration Queries Python Module

Migrate Instruments Python Module

Migrate Projects Python Module

Migrate Users Python Module

5.4.5 Project Queries Python Module

Project Has Data Python Module

Project Lookup Python Module

Project Term Search Python Module

Project User Search Python Module

Query Base Python Module

5.4.6 Reporting Query Python Module

Detailed Transactions List Python Module

Query Base Python Module

Summarize By Date Python Module

5.4.7 Transaction Key Value Queries Python Module

Key Values For Transaction Python Module

Values For Key Python Module

5.4.8 Transaction Key Value Upload Queries Python Module

Upload Entries Python Module

5.4.9 Transaction Queries Python Module

File Lookup Python Module

Query Base Python Module

Transactions Multi Search Python Module

Transaction Last Python Module

Transaction Lookup Python Module

Transaction Release State Python Module

Transaction Search Python Module

5.4.10 User Queries Python Module

Query Base Python Module

User Lookup Python Module

User Search Python Module

5.4.11 DOI Upload Python Module

5.4.12 Fileinfo Python Module

5.4.13 Ingest Python Module

5.4.14 Instrumentinfo Python Module

5.4.15 Migrationinfo Python Module

5.4.16 Objectinfo Python Module

5.4.17 Orm Python Module

5.4.18 Projectinfo Python Module

5.4.19 Root Python Module

5.4.20 Summaryinfo Python Module

5.4.21 Transaction Key Value Info Python Module

5.4.22 Tkvupload Python Module

5.4.23 Transactioninfo Python Module

5.4.24 Userinfo Python Module

5.5 WSGI Python Module

5.6 Client Python Module

5.7 Admin Command Python Module

CHAPTER 6

Indices and tables

- `genindex`
- `modindex`
- `search`