
XNAT Python Client Documentation

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A new XNAT client that exposes XNAT objects/functions as python objects/functions.

The XNAT Python client is open-source (licensed under the Apache 2.0 license) and hosted on bitbucket at https://bitbucket.org/bigr_erasmusmc/xnatpy

The official documentation can be found at xnat.readthedocs.org

To install from pypi simply use:

```
pip install xnat
```

There is also a conda package available:

```
conda install -c conda-forge xnat
```

Alternatively, you can get yourself a copy of the source code:

```
hg clone https://<yourusername>@bitbucket.org/bigr_erasmusmc/xnatpy
```

or if you have a ssh key pair:

```
hg clone ssh://hg@bitbucket.org/bigr_erasmusmc/xnatpy
```

Note: The source will be moved from mercurial to git at the end of 2019!

Note: This is NOT pyxnat, but a new module which is not as mature but uses a different philosophy for the user interface. Pyxnat is located at: <https://pythonhosted.org/pyxnat/>

1.1 Introduction

A new XNAT client that exposes XNAT objects/functions as python objects/functions.

1.1.1 Getting started

To install just use pip:

```
pip install xnat
```

If desired, instead of pip conda can be used. There is also a conda package available:

```
conda install -c conda-forge xnat
```

To get started, create a connection and start querying:

```
>>> import xnat
>>> session = xnat.connect('https://central.xnat.org', user="", password="")
>>> session.projects['Sample_DICOM'].subjects
>>> session.disconnect()
```

To see all options for creating connections see the `xnat.connect()`.

The `XNAT session` is the main class for interacting with XNAT. It contains the main communication functions.

When using IPython most functionality can be figured out by looking at the available attributes/methods of the returned objects.

1.1.2 Credentials

To store credentials this module uses the `.netrc` file. This file contains login information and should be accessible ONLY by the user (if not, the module will throw an error to let you know the file is unsafe).

1.1.3 Status

Currently we have basic support for almost all data on XNAT servers. Also it is possible to import data via the import service (upload a zip file). There is also some support for working with the prearchive (reading, moving, deleting and archiving).

Any function not exposed by the object-oriented API of `xnatpy`, but exposed in the XNAT REST API can be called via the generic `get/put/post` methods in the session object.

There is at the moment still a lack of proper tests in the code base and the documentation is somewhat sparse, this is a known limitation and can hopefully be addressed in the future. You can contact the author for any feature request and they will be considered. Also pull requests, documentation updates and other help are always appreciated.

1.2 XNATpy Tutorial

1.2.1 XNAT REST API

The XNAT REST API allows users to work with `xnat` via scripts. The REST API is an interface that is language independent and is build on top of HTTP. Operations are carried out by HTTP requests with one of the verbs `GET`, `PUT`, `POST` or `DELETE`. The `GET` request is generally used for retrieving data, whereas the `PUT`, `POST`, and `DELETE` are used for modifying data.

A simple `GET` request can be send by simply putting the target url in a web browser and looking at the result. For a sending more complex HTTP requests, you can for example use `curl` (a command-line tool for linux), `postman` (an extension for the chrome browser), or the `requests` package for Python (on top of which this package as well as `pyxnat` is build)

To get an idea of how the XNAT REST API works it is helpful to visit the following URLs in your browser:

- <https://central.xnat.org/data/archive/projects>
- <https://central.xnat.org/data/archive/projects?format=xml>
- <https://central.xnat.org/data/archive/projects?format=json>

The first URL give you a table with an overview of all projects you can access on XNAT central. The second and third URL give the same information, but in different machine readable formats (XML and JSON respectively). This is extremely useful when creating scripts to automatically retrieve or store data from XNAT.

1.2.2 Installation

The easiest way to install `xnat` is via to python package index via `pip`:

```
pip install xnat
```

However, if you do not have `pip` or want to install from source just use the `setup.py` normally:

```
python setup.py install
```

1.2.3 Connecting to a server

To get started, create a connection:


```
>>> import xnat
>>> session = xnat.connect('https://central.xnat.org')
```

To see all options for creating connections see the `xnat.connect()`. The connection holds your login information, the server information and a session. It will also send a heartbeat every 14 minutes to keep the connection alive.

When working with a session it is always important to disconnect when done:

```
>>> session.disconnect()
```

Credentials

It is possible to pass your credentials for the session when connecting. This would look like:

```
>>> session = xnat.connect('http://my.xnat.server', user='admin', password='secret')
```

This would work and log in fine, but your password might be visible in your source code, command history or just on your screen. If you only give a user, but not a password xnatpy will prompt you for your password. This is fine for interactive use, but for automated scripts this is useless.

To store credentials this xnatpy uses the `.netrc` file. On linux the file is located in `~/.netrc`. This file contains login information and should be accessible ONLY by the user (if not, the module will throw an error to let you know the file is unsafe). For example:

```
echo "machine images.xnat.org
> login admin
> password admin" > ~/.netrc
chmod 600 ~/.netrc
```

This will create the `netrc` file with the correct contents and set the permission correct.

Self-closing sessions

When in a script where there is a possibility for unforeseen errors it is safest to use a context operator in Python. This can be achieved by using the following:

```
>>> with xnat.connect('http://my.xnat.server') as session:
...     print session.projects
```

As soon as the scope of the `with` exists (even if because of an exception thrown!) the session will be disconnected automatically.

1.2.4 Exploring your xnat server

When a session is established, it is fairly easy to explore the data on the XNAT server. The data structure of XNAT is mimicked as Python objects. The connection gives access to a listing of all projects, subjects, and experiments on the server.

```
>>> import xnat
>>> session = xnat.connect('http://images.xnat.org', user='admin', password='admin')
>>> session.projects
<XNATListing (sandbox, sandbox project): <ProjectData sandbox project (sandbox)>>
```

The XNATListing is a special type of mapping in which you can access elements by a primary key (usually the *ID* or *Accession #*) and a secondary key (e.g. the label for a subject or experiment). Selection can be performed the same as a Python dict:

```
>>> sandbox_project = session.projects["sandbox"]
>>> sandbox_project.subjects
<XNATListing (XNAT_S00001, test001): <SubjectData test001 (XNAT_S00001)>>
```

You can browse the following levels on the XNAT server: projects, subjects, experiments, scans, resources, files. Also under experiments you have assessors which again can contain resources and files. This all following the same structure as XNAT.

Warning: Loading all subjects/experiments on a server can take very long if there is a lot of data. Going down through the project level is more efficient.

1.2.5 Looping over data

There are situations in which you want to perform an action for each subject or experiment. To do this, you can think of an XNATListing as a Python dict and most things will work naturally. For example:

```
>>> sandbox_project.subjects.keys()
[u'XNAT_S00001']
>>> sandbox_project.subjects.values()
[<SubjectData test001 (XNAT_S00001)>]
>>> len(sandbox_project.subjects)
1
>>> for subject in sandbox_project.subjects.values():
...     print(subject.label)
test001
```

1.2.6 Downloading data

If you have the following in your XNAT:

```
>>> experiment.scans['T1']
<MrScanData T1 (1001-MR3)>
```

In some cases you might want to download an individual scan to inspect/process locally. This is using:

```
>>> experiment.scans['T1'].download('/home/hachterberg/temp/T1.zip')
Downloading http://127.0.0.1/xnat/data/experiments/demo_E00091/scans/1001-MR3/files?
↪format=zip:
13035 kb
Saved as /home/hachterberg/temp/T1.zip...
```

As you can see, the scan is downloaded as a zip archive that contains all the DICOM files.

If you are interested in downloading all data of an entire subject, it is possible to use a helper function that downloads the data and extracts it in the target directory. This will create a data structure similar to that of XNAT on your local disk:

```
>>> subject = experiment.subject

>>> subject.download_dir('/home/hachterberg/temp/')
Downloading http://120.0.0.1/xnat/data/experiments/demo_E00091/scans/ALL/files?
↳format=zip:
23736 kb
Downloaded image session to /home/hachterberg/temp/ANONYMIZ3
Downloaded subject to /home/hachterberg/temp/ANONYMIZ3
```

To see what is downloaded, we can use the linux command find from ipython:

```
$ find /home/hachterberg/temp/ANONYMIZ3
/home/hachterberg/temp/ANONYMIZ3
/home/hachterberg/temp/ANONYMIZ3/ANONYMIZ3
/home/hachterberg/temp/ANONYMIZ3/ANONYMIZ3/scans
/home/hachterberg/temp/ANONYMIZ3/ANONYMIZ3/scans/1001-MR2-FLAIR
/home/hachterberg/temp/ANONYMIZ3/ANONYMIZ3/scans/1001-MR2-FLAIR/resources
/home/hachterberg/temp/ANONYMIZ3/ANONYMIZ3/scans/1001-MR2-FLAIR/resources/DICOM
/home/hachterberg/temp/ANONYMIZ3/ANONYMIZ3/scans/1001-MR2-FLAIR/resources/DICOM/files
/home/hachterberg/temp/ANONYMIZ3/ANONYMIZ3/scans/1001-MR2-FLAIR/resources/DICOM/files/
↳IM2.dcm
/home/hachterberg/temp/ANONYMIZ3/ANONYMIZ3/scans/1001-MR2-FLAIR/resources/DICOM/files/
↳IM32.dcm
/home/hachterberg/temp/ANONYMIZ3/ANONYMIZ3/scans/1001-MR2-FLAIR/resources/DICOM/files/
↳IM11.dcm
...
```

The REST API allows for downloading of data from XNAT. The xnatpy package includes helper functions to make the downloading of data easier. For example, to download all experiments belonging to a subject:

```
>>> subject = sandbox_project.subjects['test001']
>>> subject.download_dir('./Downloads/test001')
```

This will download all the relevant experiments and unpack them in the target folder. This is available for projects, subjects, experiments, scans, and resources.

Experiments, scans and resources can also be downloaded in a zip bundle using the download method for experiments, scans, and resources.

1.2.7 Custom variables

The custom variables are exposed as a dict-like object in xnatpy. They are located in the field attribute under the objects that can have custom variables:

```
In [18]: experiment = project.subjects['ANONYMIZ'].experiments['ANONYMIZ']

In [19]: experiment.fields
Out[19]: <VariableMap {u'brain_volume': u'0'}>

In [20]: experiment.fields['brain_volume']
Out[20]: u'0'

In [21]: experiment.fields['brain_volume'] = 42.0

In [22]: experiment.fields
Out[22]: <VariableMap {u'brain_volume': u'42.0'}>
```

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```
In [27]: experiment.fields['brain_volume']
Out[27]: u'42.0'
```

1.2.8 Getting external urls of an object

Sometimes you want to know the full external URL of a resource in XNAT, for this all XNAT objects have a function to retrieve this:

```
>>> experiment_01.external_uri()
'https://xnat.server.com/data/archive/projects/project/subjects/XNAT_S09618/
↳ experiments/XNAT_E36346'
```

You can change the query string or scheme used with extra arguments:

```
>>> experiment_01.external_uri(scheme='test', query={'hello': 'world'})
'test://xnat.server.com/data/archive/projects/project/subjects/XNAT_S09618/
↳ experiments/XNAT_E36346?hello=world'
```

1.2.9 Importing data into XNAT

To add new data into XNAT it is possible to use the REST import service. It allows you to upload a zip file containing an experiment and XNAT will automatically try to store it in the correct place:

```
>>> session.services.import_('/path/to/archive.zip', project='sandbox', subject=
↳ 'test002')
```

Will upload the DICOM files in archive.zip and add them as scans under the subject *test002* in project *sandbox*. For more information on importing data see [import_](#)

As it is dangerous to add data straight into the archive due to lack of reviewing, it is possible to also upload the data to the prearchive first. This can be achieved by adding the `destination` argument as follows:

```
# Import via prearchive:
>>> prearchive_session = session.services.import_('/home/hachterberg/temp/ANONYMIZ.zip
↳ ', project='brainimages', destination='/prearchive')
>>> print(preactive_session)
<PreactiveSession brainimages/20161107_114859342/ANONYMIZ>
```

Once the data is uploaded (either via `xnatpy` or other means) it is possible to query the prearchive and process the scans in it. To get a list of sessions waiting for archiving use the following:

```
>>> session.preactive.sessions()
[<PreactiveSession brainimages/20161107_114859342/ANONYMIZ>]
```

Once the data in the prearchive is located it can be archived as follows:

```
>>> prearchive_session = session.preactive.sessions()[0]
>>> experiment = prearchive_session.archive(subject='ANONYMIZ3', experiment='ANONYMIZ3
↳ ')
>>> print(experiment)
<MrSessionData ANONYMIZ3 (demo_E00092)>
```

Note: It is worth noting that it is possible to inspect the scan before archiving: one can look at the status, move it between projects, list the scans and files contained in the scans.

1.2.10 Prearchive

When scans are sent to the XNAT they often end up in the prearchive pending review before adding them to the main archive. It is possible to view the prearchive via xnatpy:

```
>>> session.prearchive.sessions()
[]
```

This gives a list of `PrearchiveSessions` in the archive. It is possible to *archive*, *rebuild*, *move*, or *delete* the session using simple methods. For more information see [PrearchiveSession](#)

1.2.11 Object creation

It is possible to create object on the XNAT server (such as a new subject, experiment, etc). This is achieved by creating such an object in python and xnatpy will create a version of the server. For example you can create a subject:

```
>>> import xnat
>>> connection = xnat.connect('https://xnat.example.com')
>>> project = connection.projects['myproject']
>>> subject = connection.classes.SubjectData(parent=project, label='new_subject_label')
↪
>>> subject
<SubjectData new_subject_label>
```

Note: the parent need to be the correct parent for the type, so an `MRSessionData` would need a `SubjectData` to be the parent.

In the `connection.classes` are all classes known the XNAT, also `MRSessionData`, `CTSessionData`. To get a complete list you can do:

```
>>> dir(connection.classes)
```

Note: the valid parent for a project (`ProjectData`) would be the connection object itself

1.2.12 Accessing XNAT files as local files (partial read)

There is a helper added in xnatpy that allows you to open a remote file (`FileData` object) similarly as a local file. Note that it will read the file from the start and until it is done, seeking will download until the seek point.

For example:

```
>>> import xnat
>>> connection = xnat.connect('https://xnat.server.com')
>>> file_obj = connection.projects['project'].subjects['S'].experiments['EXP'].scans[
↪ 'T1'].resources['DICOM'].files[0]
```

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```
<FileData 1.3.6.1...-18s1eb2.dcm (1.3.6.1...-18s1eb2.dcm)>
>>> with file_obj.open() as fin:
    data = fin.read(3000)
>>> print(len(data))
3000
```

You can also use this to read the headers of a dicom file using pydicom:

```
>>> import pydicom
>>> with file_obj.open() as fin:
    data = pydicom.dcmread(fin, stop_before_pixels=True)
```

This should read the header and stop downloading once the entire header is read.

Note: The file is read in chunks so there might be a bit too much data downloaded

Note: If you open the file and not close it, the memory buffer might not be cleaned properly

1.2.13 Accessing DICOM headers of scan

Sometimes it is desired to read DICOM headers without downloading the entire scan. XNAT has a dicomdump service which can be used:

```
>>> connection.service.dicom_dump(scan_uri)
```

For more details see [import_](#). As a helper we added a `dicom_dump` method to `ScanData`:

```
>>> scan.dicom_dump()
```

See `ScanData.dicom_dump` for the details.

A limitation of the dicomdump of XNAT is that field values are truncated under 64 characters. If you want to access the entire dicom header, a convenience method is added that reads the header via `pydicom`:

```
>>> scan.read_dicom()
```

This reads only the header and not the pixel data and will only download part of the file. To read the pixel data use:

```
>>> scan.read_dicom(read_pixel_data=True)
```

For the details see `ScanData.dicom_dump`

Note: Only one file is loaded, so the pixel data will only contain a single slice unless it is a DICOM Enhanced file

1.2.14 Example scripts

There is a number of example scripts located in the `examples` folder in the source code. The following code is a small command-line tool that prints all files for a given scan in the XNAT archive:

```
#!/usr/bin/env python

import xnat
import argparse
import re

def get_files(connection, project, subject, session, scan):
    xnat_project = connection.projects[project]
    xnat_subject = xnat_project.subjects[subject]
    xnat_experiment = xnat_subject.experiments[session]
    xnat_scan = xnat_experiment.scans[scan]
    files = xnat_scan.files.values()
    return files

def filter_files(xnat_files, regex):
    filtered_files = []
    regex = re.compile(regex)
    for file in xnat_files:
        found = regex.match(file.name)
        if found:
            filtered_files.append(file)
    return filtered_files

def main():
    parser = argparse.ArgumentParser(description='Prints all files from a certain_
↪scan.')
    parser.add_argument('--xnathost', type=unicode, required=True, help='xnat host_
↪name')
    parser.add_argument('--project', type=unicode, required=True, help='Project id')
    parser.add_argument('--subject', type=unicode, required=True, help='subject')
    parser.add_argument('--session', type=unicode, required=True, help='session')
    parser.add_argument('--scan', type=unicode, required=True, help='scan')
    parser.add_argument('--filter', type=unicode, required=False, default='.*', help=
↪'regex filter for file names')
    args = parser.parse_args()

    with xnat.connect(args.xnathost) as connection:
        xnat_files = get_files(connection, args.project, args.subject, args.session,
↪args.scan)
        xnat_files = filter_files(xnat_files, args.filter)
        for file in xnat_files:
            print('{}'.format(file.name))

if __name__ == '__main__':
    main()
```

1.3 Changelog

All notable changes to this project will be documented in this file.

The format is based on [Keep a Changelog](#) and this project adheres to [Semantic Versioning](#)

1.3.1 0.3.19 - 2019-09-20

Added

- xnatpy changes the user-agent header to give detailed information about the xnatpy client running.
- option to have some progress logging/printing added to the `download_dir` methods for projects and subjects
- add method to find specific sessions in the prearchive

Improved

- Avoid use of `get_source` when generating xnatpy module code, which should help when compiling xnatpy to a binary (py2exe etc)

1.3.2 0.3.18 - 2019-06-06

Improved

- Added `force` flag to `ScanData.read_dicom`
- Added `open` to `PrearchiveFile` (same as for `FileData`)
- Added `read_dicom` to `PrearchiveScan` (same as for `ScanData`)
- Documentation improved, added code reference and changelog into docs

Fixed

- Flag `extension_types=False` now also working for 1.7 servers

1.3.3 0.3.17 - 2019-04-04

Added

- Can open `FileData` object with `file.open()` to get a file-like object that can be used similar to a local file.
- Added `read_dicom()` to `ScanData` to read the dicom header/file with `pydicom`
- `external_uri` method to get a full external uri of an XNAT object

1.3.4 0.3.16 - 2019-03-28

Fixed

- Support for changing subject and experiment labels
- Support creation of `ScanData` types with the id and type set on creation
- Fix a bug in scanning extension types where there are new-lines in the `xs:schema` tag

1.3.5 0.3.14 - 2019-02-22

Added

- Check which user is logged in and expose that in `connection.logged_in_user`
- Check the cookies to set the appropriate heartbeat interval for the server.
- Allow getting the session expiration information with `connection.session_expiration_time`

Changed

- Refactored some code in the model building, which is optional if you only want to use xnatpy for a convenience layer about requests. Giving `no_build_model=True` to the connect function will disable the scraping of the server xml structure and not create all classes, but will log in and keep alive a connection. Only the simple connection get, head, put, post, delete, download, upload methods are really safe to use in that case.
- XNAT objects (including subject and experiments) will use the listing to get their label and xsitype to avoid the need to get each experiment when creating a listing. This makes listings way more efficient.

Fixed

- Bug with auth when xnat was not running in the server root, but rather in a subdirectory

1.3.6 0.3.13 - 2019-01-07

Fixed

- Import problem in Python 2 which broke xnatpy

1.3.7 0.3.12 - 2019-01-03

Added

- Adds fields argument to the `dicom_dump` method to filter on dicom tags server side.
- Adds `dicom_dump` method to prearchive scan.
- Allow deleting variables by using `del object.variable`, this works in most cases but seem to fail server-side on restriction such as gender (it does not match any valid options)

Changed

- Better computation for the uri's of resources

Fixed

- Fixed xml deprecation warning due to the use of `.getchildren()`

1.3.8 0.3.11 - 2018-11-12

Fixed

- Functions with an `async` parameter had them renamed to `asynchronous` as `async` is a keyword as of Python 3.7
- Fix a bug in the XSD parsing when an XSD contains a schema-level `simpleType`
- Bug in `upload_dir` with `python3` when using a method based on a temporary file

Added

- Resource upload methods can now forward `kwargs` to the `connection.upload` method.
- Resource constructor also optionally takes a `data_dir` and `upload_method` arguments for uploading data immediately after creation.

1.3.9 0.3.10 - 2018-08-31

Added

- The `experiment.create_resource` and `scan.create_resource` now take two extra arguments: `data_dir` and `method`, which allow the uploading of the content of a directory as the content of the newly created resource. The method is the method for `resource.upload_dir` method
- Command line callable scripts that copies an entire project to another xnat. See `xnat_cp_project --help`

Changed

- Removed wrong default argument for `create_assessor` (invalid assessor type)
- The lower level `get/put/post/delete` methods now can process full uris as well as paths as long as the uri start matches the server uri (e.g. instead of using `/data/projects` you can also give <https://serveruri.com/data/projects>).

Fixed

- Fixed a small bug where an incorrect error message was giving when not giving a value for the secondary label during object creation.

1.3.10 0.3.9 - 2018-07-02

Fixed

- `xnatpy` had issues with shared subjects and sessions as the REST API would return the original object (with sharing information in it). Now `xnatpy` check the requested uri and makes sure the information of the correct project is used. Now shared objects can be used properly in `xnatpy`.

Added

- `resource.upload` now takes an `extract` parameter indicating data should be extracted into files after upload
- `resource.upload_dir` to upload an entire directory to a resource, the directory will be added into the resources so that e.g. `directory/a.txt` becomes `resource/a.txt`
- redirection detections, if the server has moved and is being redirected (e.g. using a 302 or 301 response), `xnatpy` will detect that and use the new url instead.

1.3.11 0.3.8 - 2018-06-04

Added

- Methods to retrieve the DICOM header dump using the `dcmdump` service. This can be used via `services.dicom_dump(uri)` or `experiment.dicom_dump` to get the dump of the specific experiment

Fixed

- Strict username checking after login disabled to avoid problems with OIDC
- Fix a bug where token result would contain extra data

1.3.12 0.3.7 - 2018-03-12

Fixed

- Fixed a bug where the prompt for the password on Windows would not work

Changed

- Hide certificate warnings if `verify=False`, just give a one time warning that things might not be safe, but no spam at every single request

1.3.13 0.3.6 - 2018-03-09

Added

- Support for issuing tokens in the service module

Fixed

- Allow user to login using a token (the username check will catch this and allow it)

Changed

- Improved the logging by reducing spam at the INFO/DEBUG levels. The `debug` parameter on connect can now be used to enable the logging of `xnatpy` internals.
- Give a specific error if the XNAT password is outdated and requires an update.

1.3.14 0.3.5 - 2018-01-02

Fixed

- There were bugs in the prearchive breaking the entire pre-archive functionality

1.3.15 0.3.4 - 2017-11-13

Fixed

- Files in assessors would have a path prefixed with a / in some cases (which should never happen)

1.3.16 0.3.3 - 2017-10-18

Changed

- Abstracted the progress bar for downloading to allow other progress hooks (e.g. GUI)

Fixed

- Set proper minimal versions for requirements (e.g. six can be too old)
- Bug in upload for Python3
- Bug with getting the file size when there are redirects (issue #8)
- Bug with getting files from a project/subject/experiment/scan directly instead of via resource (issue #5)

1.3.17 0.3.2 - 2017-10-15

Fixed

- Bug in the the create_object function in the selection of the non-history object
- Bug in the setting of project properties (due to the lack of a parent)

1.3.18 0.3.1 - 2017-09-04

Changed

- FileData now has an id and path, the id is the filename and the path is the path relative from the resource. This makes working with subdirectories in resources possible.

Fixed

- Bug where history of XNAT was misinterpreted and an old version of an object could be loaded
- Resources could lose track of their ID when the cache was cleared
- Resources did not invalidate cache after uploading files

1.3.19 0.3.0 - 2017-08-17

Added

- Better support for complex data structures, especially data types that include lists in their data.
- Support for extension types, xnatpy automatically searches for all extension xsd files and will create Python classes for those as well.
- Listings can be indexed with integers to get their n-th element, the order is the order given by XNAT.
- Allow overwriting of files on upload
- Support for listing users via /data/users REST endpoint in the session.users

Changed

- xsd schema parsing is completely rewritten, allows more support for complex data structures

Fixed

- Support for XNAT 1.7.3
- Fixed a bug where opening a second session would ruin the first one, it should now be possible to have multiple sessions open concurrently.

1.3.20 0.2.3 - 2017-04-03

Added

- xnatpy now uses the progressbar2 package to deliver fancy progress bars when downloading
- Attributes in the session that allow users to skip/alter the checking of responses

Changed

- Logging now using a logger. You can change the log levels or supply your own logger which xnatpy will use in favour of its own
- xnatpy now gets the version information from 1.7 xnat correctly

Fixed

- A bug in XNAT 1.7 caused the prearchive routes to be wrong, added a work around that fixes the prearchive with xnatpy

1.4 Code reference

1.4.1 xnat Package

This package contains the entire client. The connect function is the only function actually in the package. All following classes are created based on the <https://central.xnat.org/schema/xnat/xnat.xsd> schema and the xnatcore and xnatbase modules, using the convert_xsd.

```
xnat.connect(server, user=None, password=None, verify=True, netrc_file=None, debug=False,
             extension_types=True, loglevel=None, logger=None, detect_redirect=True,
             no_parse_model=False)
```

Connect to a server and generate the correct classed based on the servers xnat.xsd This function returns an object that can be used as a context operator. It will call disconnect automatically when the context is left. If it is used as a function, then the user should call `.disconnect()` to destroy the session and temporary code file.

Parameters

- **server** (*str*) – uri of the server to connect to (including <http://> or <https://>)
- **user** (*str*) – username to use, leave empty to use netrc entry or anonymous login.
- **password** (*str*) – password to use with the username, leave empty when using netrc. If a username is given and no password, there will be a prompt on the console requesting the password.
- **verify** (*bool*) – verify the https certificates, if this is false the connection will be encrypted with ssl, but the certificates are not checked. This is potentially dangerous, but required for self-signed certificates.
- **netrc_file** (*str*) – alternative location to use for the netrc file (path pointing to a file following the netrc syntax)
- **bool** (*debug*) – Set debug information printing on and print extra debug information. This is meant for xnatpy developers and not for normal users. If you want to debug your code using xnatpy, just set the loglevel to DEBUG which will show you all requests being made, but spare you the xnatpy internals.
- **loglevel** (*str*) – Set the level of the logger to desired level
- **logger** (*logging.Logger*) – A logger to reuse instead of creating an own logger
- **detect_redirect** (*bool*) – Try to detect a redirect (via a 302 response) and short-cut for subsequent requests
- **no_parse_model** (*bool*) – Create an XNAT connection without parsing the server data model, this create a connection for which the simple get/head/put/post/delete functions where, but anything requiring the data model will file (e.g. any wrapped classes)

Returns XNAT session object

Return type *XNATSession*

Preferred use:

```
>>> import xnat
>>> with xnat.connect('https://central.xnat.org') as session:
...     subjects = session.projects['Sample_DICOM'].subjects
...     print('Subjects in the SampleDICOM project: {}'.format(subjects))
Subjects in the SampleDICOM project: <XNATListing (CENTRAL_S01894, dcmtest1):
↪<SubjectData CENTRAL_S01894>, (CENTRAL_S00461, PACE_HF_SUPINE): <SubjectData_
↪CENTRAL_S00461>>
```

Alternative use:

```
>>> import xnat
>>> session = xnat.connect('https://central.xnat.org')
>>> subjects = session.projects['Sample_DICOM'].subjects
>>> print('Subjects in the SampleDICOM project: {}'.format(subjects))
Subjects in the SampleDICOM project: <XNATListing (CENTRAL_S01894, dcmtest1):
↳<SubjectData CENTRAL_S01894>, (CENTRAL_S00461, PACE_HF_SUPINE): <SubjectData_
↳CENTRAL_S00461>>
>>> session.disconnect()
```

1.4.2 session Module

class `xnat.session.XNATSession`(*server, logger, interface=None, user=None, password=None, keepalive=None, debug=False, original_uri=None, logged_in_user=None*)

Bases: `object`

The main XNATSession session class. It keeps a connection to XNATSession alive and manages the main communication to XNATSession. To keep the connection alive there is a background thread that sends a heart-beat to avoid a time-out.

The main starting points for working with the XNATSession server are:

- `XNATSession.projects`
- `XNATSession.subjects`
- `XNATSession.experiments`
- `XNATSession.prearchive`
- `XNATSession.services`
- `XNATSession.users`

Note: Some methods create listing that are using the `xnat.core.XNATListing` class. They allow for indexing with both XNATSession ID and a secondary key (often the label). Also they support basic filtering and tabulation.

There are also methods for more low level communication. The main methods are `XNATSession.get`, `XNATSession.post`, `XNATSession.put`, and `XNATSession.delete`. The methods do not query URIs but instead query XNATSession REST paths as described in the [XNATSession 1.6 REST API Directory](#).

For an even lower level interfaces, the `XNATSession.interface` gives access to the underlying `requests` interface. This interface has the user credentials and benefits from the keep alive of this class.

Note: `XNATSession` Objects have a client-side cache. This is for efficiency, but might cause problems if the server is being changed by a different client. It is possible to clear the current cache using `XNATSession.clearcache`. Turning off caching complete can be done by setting `XNATSession.caching`.

Warning: You should NOT try use this class directly, it should only be created by `xnat.connect`.

clearcache()

Clear the cache of the listings in the Session object

delete (*path*, *headers=None*, *accepted_status=None*, *query=None*, *timeout=None*)

Delete the content of a given REST directory.

Parameters

- **path** (*str*) – the path of the uri to retrieve (e.g. “/data/archive/projects”) the remained for the uri is constructed automatically
- **headers** (*dict*) – the HTTP headers to include
- **query** (*dict*) – the values to be added to the query string in the uri
- **accepted_status** (*list*) – a list of the valid values for the return code, default [200]
- **timeout** (*float or tuple*) – timeout in seconds, float or (connection timeout, read timeout)

Returns the requests reponse

Return type requests.Response

download (*uri*, *target*, *format=None*, *verbose=True*, *timeout=None*)

Download uri to a target file

download_stream (*uri*, *target_stream*, *format=None*, *verbose=False*, *chunk_size=524288*, *update_func=None*, *timeout=None*)

Download the given *uri* to the given *target_stream*.

Parameters

- **uri** (*str*) – Path of the uri to retrieve.
- **target_stream** (*file*) – A writable file-like object to save the stream to.
- **format** (*str*) – Request format
- **verbose** (*bool*) – If True, and an *update_func* is not specified, a progress bar is shown on stdout.
- **chunk_size** (*int*) – Download this many bytes at a time
- **update_func** (*func*) – If provided, will be called every *chunk_size* bytes. Must accept three parameters:
 - the number of bytes downloaded so far
 - the total number of bytes to be downloaded (might be None),
 - A boolean flag which is False during the download, and True when the download has completed (or failed)
- **timeout** (*float or tuple*) – timeout in seconds, float or (connection timeout, read timeout)

download_zip (*uri*, *target*, *verbose=True*, *timeout=None*)

Download uri to a target zip file

experiments

Listing of all experiments on the XNAT server

Returns an *XNATListing* with elements that are subclasses of *ExperimentData*

get (*path*, *format=None*, *query=None*, *accepted_status=None*, *timeout=None*, *headers=None*)

Retrieve the content of a given REST directory.

Parameters

- **path** (*str*) – the path of the uri to retrieve (e.g. “/data/archive/projects”) the remained for the uri is constructed automatically
- **format** (*str*) – the format of the request, this will add the format= to the query string
- **query** (*dict*) – the values to be added to the query string in the uri
- **accepted_status** (*list*) – a list of the valid values for the return code, default [200]
- **timeout** (*float or tuple*) – timeout in seconds, float or (connection timeout, read timeout)
- **headers** (*dict*) – the HTTP headers to include

Returns the requests reponse

Return type requests.Response

get_json (*uri, query=None, accepted_status=None*)

Helper function that perform a GET, but sets the format to JSON and parses the result as JSON

Parameters

- **uri** (*str*) – the path of the uri to retrieve (e.g. “/data/archive/projects”) the remained for the uri is constructed automatically
- **query** (*dict*) – the values to be added to the query string in the uri

head (*path, accepted_status=None, allow_redirects=False, timeout=None, headers=None*)

Retrieve the header for a http request of a given REST directory.

Parameters

- **path** (*str*) – the path of the uri to retrieve (e.g. “/data/archive/projects”) the remained for the uri is constructed automatically
- **accepted_status** (*list*) – a list of the valid values for the return code, default [200]
- **allow_redirects** (*bool*) – allow you request to be redirected
- **timeout** (*float or tuple*) – timeout in seconds, float or (connection timeout, read timeout)
- **headers** (*dict*) – the HTTP headers to include

Returns the requests reponse

Return type requests.Response

interface

The underlying `requests` interface used.

post (*path, data=None, json=None, format=None, query=None, accepted_status=None, timeout=None, headers=None*)

Post data to a given REST directory.

Parameters

- **path** (*str*) – the path of the uri to retrieve (e.g. “/data/archive/projects”) the remained for the uri is constructed automatically
- **data** – Dictionary, bytes, or file-like object to send in the body of the Request.
- **json** – json data to send in the body of the Request.
- **format** (*str*) – the format of the request, this will add the format= to the query string

- **query** (*dict*) – the values to be added to the query string in the uri
- **accepted_status** (*list*) – a list of the valid values for the return code, default [200, 201]
- **timeout** (*float or tuple*) – timeout in seconds, float or (connection timeout, read timeout)
- **headers** (*dict*) – the HTTP headers to include

Returns the requests reponse

Return type requests.Response

prearchive

Representation of the prearchive on the XNAT server, see [*xnat.prearchive*](#)

projects

Listing of all projects on the XNAT server

Returns an [*XNATListing*](#) with elements of [*ProjectData*](#)

put (*path, data=None, files=None, json=None, format=None, query=None, accepted_status=None, timeout=None, headers=None*)
Put the content of a given REST directory.

Parameters

- **path** (*str*) – the path of the uri to retrieve (e.g. “/data/archive/projects”) the remained for the uri is constructed automatically
- **data** – Dictionary, bytes, or file-like object to send in the body of the Request.
- **json** – json data to send in the body of the Request.
- **files** – Dictionary of 'name': file-like-objects (or {'name': file-tuple}) for multipart encoding upload. file-tuple can be a 2-tuple ('filename', fileobj), 3-tuple ('filename', fileobj, 'content_type') or a 4-tuple ('filename', fileobj, 'content_type', custom_headers), where 'content-type' is a string defining the content type of the given file and custom_headers a dict-like object containing additional headers to add for the file.
- **format** (*str*) – the format of the request, this will add the format= to the query string
- **query** (*dict*) – the values to be added to the query string in the uri
- **accepted_status** (*list*) – a list of the valid values for the return code, default [200, 201]
- **timeout** (*float or tuple*) – timeout in seconds, float or (connection timeout, read timeout)
- **headers** (*dict*) – the HTTP headers to include

Returns the requests reponse

Return type requests.Response

scan_types

A list of scan types associated with this XNATSession instance

scanners

A list of scanners referenced in XNATSession

services

Collection of services, see `xnat.services`

session_expiration_time

Get the session expiration time information from the cookies. This returns the timestamp (datetime format) when the session was created and an integer with the session timeout interval.

This can return None if the cookie is not found or cannot be parsed.

Returns datetime with last session refresh and integer with timeout in seconds

Return type tuple

subjects

Listing of all subjects on the XNAT server

Returns an `XNATListing` with elements of `SubjectData`

upload (*uri, file_, retries=1, query=None, content_type=None, method='put', overwrite=False, timeout=None*)

Upload data or a file to XNAT

Parameters

- **uri** (*str*) – uri to upload to
- **file** – the file handle, path to a file or a string of data (which should not be the path to an existing file!)
- **retries** (*int*) – amount of times xnatpy should retry in case of failure
- **query** (*dict*) – extra query string content
- **content_type** – the content type of the file, if not given it will default to application/octet-stream
- **method** (*str*) – either put (default) or post
- **overwrite** (*bool*) – indicate if previous data should be overwritten
- **timeout** (*float or tuple*) – timeout in seconds, float or (connection timeout, read timeout)

Returns

url_for (*obj, query=None, scheme=None*)

Return the (external) url for a given XNAT object :param XNATBaseObject obj: object to get url for :param query: extra query string parameters :param scheme: scheme to use (when not using original url scheme) :return: external url for the object

users

Representation of the users registered on the XNAT server

xnat_version

The version of the XNAT server

`xnat.session.default_update_func` (*total*)

Set up a default update function to be used by the `Session.download_stream` method. This function configures a `progressbar.ProgressBar` object which displays progress as a file is downloaded.

Parameters **total** (*int*) – Total number of bytes to be downloaded (might be None)

Returns A function to be used as the `update_func` by the `Session.download_stream` method.

1.4.3 core Module

```
class xnat.core.CustomVariableMap (parent, field)
    Bases: xnat.core.VariableMap

class xnat.core.VariableMap (parent, field)
    Bases: collections.abc.MutableMapping

    clearcache ()

    data

    field

    xnat

class xnat.core.XNATBaseListing (parent, field_name, secondary_lookup_field=None,
                                xsi_type=None, **kwargs)
    Bases: collections.abc.Mapping, collections.abc.Sequence

    clearcache ()

    data
        The data mapping using the primary key

    data_maps
        The generator function (should be cached) of all the data access properties. They are all generated from
        the same data, so their caching is shared.

    key_map
        The data mapping using the secondary key

    listing
        The listing view of the data

    non_unique_keys
        Set of non_unique keys

    sanitize_name (name)

    uri

    xnat_session

class xnat.core.XNATBaseObject (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: object

    SECONDARY_LOOKUP_FIELD = None

    caching

    clearcache ()

    data
        The data of the current object (data fields only)

    del_ (name)

    delete (remove_files=True)
        Remove the item from XNATSession

    external_uri (query=None, scheme=None)
        Return the external url for this object, not just a REST path

    Parameters
```

- **query** – extra query string parameters
- **scheme** – scheme to use (when not using original url scheme)

Returns external url for this object

fieldname

fulldata

The full data of the current object (incl children, meta etc)

fulluri

get (*name*, *type_=None*)

get_object (*fieldname*, *type_=None*)

id

logger

mset (*values=None*, *timeout=None*, ***kwargs*)

parent

set (*name*, *value*, *type_=None*, *timeout=None*)

Set a field in the current object

Parameters

- **name** (*str*) – name of the field
- **value** – value to set
- **type** – type of the field

uri

xnat_session

xpath

The xpath of the object as seen from the root of the data. Used for setting fields in the object.

class `xnat.core.XNATListing` (*uri*, *filter=None*, ***kwargs*)

Bases: `xnat.core.XNATBaseListing`

data_maps

The generator function (should be cached) of all the data access properties. They are all generated from the same data, so their caching is shared.

filter (*filters=None*, ***kwargs*)

Create a new filtered listing based on this listing. There are two way of defining the new filters. Either by passing a dict as the first argument, or by adding filters as keyword arguments.

For example::

```
>>> listing.filter({'ID': 'A*'})
>>> listing.filter(ID='A*')
```

are equivalent.

Parameters

- **filters** (*dict*) – a dictionary containing the filters
- **kwargs** (*str*) – keyword arguments containing the filters

Returns new filtered XNATListing

Return type *XNATListing*

static merge_filters (*old_filters*, *extra_filters*)

tabulate (*columns=None*, *filter=None*)

Create a table (tuple of namedtuples) from this listing. It is possible to choose the columns and add a filter to the tabulation.

Parameters

- **columns** (*tuple*) – names of the variables to use for columns
- **filter** (*dict*) – update filters to use (form of { 'variable': 'filter*' }), setting this option will try to merge the filters and throw an error if that is not possible.

Returns tabulated data

Return type *tuple*

Raises **ValueError** – if the new filters conflict with the object filters

used_filters

```
class xnat.core.XNATNestedObject (uri=None, xnat_session=None, id_=None, datafields=None,  
                                parent=None, fieldname=None, overwrites=None,  
                                **kwargs)
```

Bases: *xnat.core.XNATBaseObject*

clearcache ()

data

The data of the current object (data fields only)

fulldata

The full data of the current object (incl children, meta etc)

uri

xpath

The xpath of the object as seen from the root of the data. Used for setting fields in the object.

```
class xnat.core.XNATObject (uri=None, xnat_session=None, id_=None, datafields=None, par-  
                           ent=None, fieldname=None, overwrites=None, **kwargs)
```

Bases: *xnat.core.XNATBaseObject*

data

The data of the current object (data fields only)

fulldata

The full data of the current object (incl children, meta etc)

xpath

The xpath of the object as seen from the root of the data. Used for setting fields in the object.

```
class xnat.core.XNATSimpleListing (parent, field_name, secondary_lookup_field=None,  
                                 xsi_type=None, **kwargs)
```

Bases: *xnat.core.XNATBaseListing*, *collections.abc.MutableMapping*, *collections.abc.MutableSequence*

data_maps

The generator function (should be cached) of all the data access properties. They are all generated from the same data, so their caching is shared.

fulldata

insert (*index, value*)
 S.insert(index, value) – insert value before index

xnat_session

class `xnat.core.XNATSubListing` (*parent, field_name, secondary_lookup_field=None, xsi_type=None, **kwargs*)
 Bases: `xnat.core.XNATBaseListing`, `collections.abc.MutableMapping`, `collections.abc.MutableSequence`

data_maps
 The generator function (should be cached) of all the data access properties. They are all generated from the same data, so their caching is shared.

fulldata

fulluri

insert (*index, value*)
 S.insert(index, value) – insert value before index

uri

xnat_session

xpath

class `xnat.core.XNATSubObject` (*uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs*)
 Bases: `xnat.core.XNATBaseObject`

clearcache ()

data
 The data of the current object (data fields only)

fulldata
 The full data of the current object (incl children, meta etc)

uri

xpath
 The xpath of the object as seen from the root of the data. Used for setting fields in the object.

`xnat.core.caching` (*func*)
 This decorator caches the value in self._cache to avoid data to be retrieved multiple times. This works for properties or functions without arguments.

1.4.4 inspect Module

class `xnat.inspect.Inspect` (*xnat_session*)
 Bases: `object`

datafields (*datatype, pattern='*', prepend_type=True*)

datatypes (*pattern='*', fields_pattern=None*)

xnat_session

1.4.5 prearchive Module

class `xnat.prearchive.Prearchive` (*xnat_session*)

Bases: `object`

caching

find (*project=None, subject=None, session=None, status=None*)

Find specific session(s) given the project/subject/session/status

Parameters

- **project** (*str*) –
- **subject** (*str*) –
- **session** (*str*) –
- **status** (*str*) –

Returns list of matching sessions

Return type `list[PrearchiveSession]`

sessions (*project=None*)

Get the session in the prearchive, optionally filtered by project. This function is not cached and returns the results of a query at each call.

Parameters **project** (*str*) – the project to filter on

Returns list of prearchive session found

Return type `list`

xnat_session

class `xnat.prearchive.PrearchiveFile` (*uri, xnat_session, id_=None, datafields=None, parent=None, fieldname=None*)

Bases: `xnat.core.XNATBaseObject`

data

The data of the current object (data fields only)

download (*path*)

Download the file

Parameters **path** (*str*) – the path to download to

Returns the path of the downloaded file

Return type `str`

fulldata

The full data of the current object (incl children, meta etc)

name

The name of the file

open ()

size

The size of the file

xpath

The xpath of the object as seen from the root of the data. Used for setting fields in the object.

```
class xnat.prearchive.PrearchiveScan(uri, xnat_session, id_=None, datafields=None, parent=None, fieldname=None)
```

Bases: `xnat.core.XNATBaseObject`

data
The data of the current object (data fields only)

dicom_dump (*fields=None*)
Retrieve a dicom dump as a JSON data structure See the XAPI documentation for more detailed information: [DICOM Dump Service](#)

Parameters **fields** (*list*) – Fields to filter for DICOM tags. It can either a tag name or tag number in the format GGGGEEEE (G = Group number, E = Element number)

Returns JSON object (dict) representation of DICOM header

Return type `dict`

download (*path*)
Download the scan as a zip

Parameters **path** (*str*) – the path to download to

Returns the path of the downloaded file

Return type `str`

files
List of files contained in the scan

fulldata
The full data of the current object (incl children, meta etc)

read_dicom (*file=None, read_pixel_data=False, force=False*)

series_description
The series description of the scan

xpath
The xpath of the object as seen from the root of the data. Used for setting fields in the object.

```
class xnat.prearchive.PrearchiveSession(uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
```

Bases: `xnat.core.XNATBaseObject`

archive (*overwrite=None, quarantine=None, trigger_pipelines=None, project=None, subject=None, experiment=None*)
Method to archive this prearchive session to the main archive

Parameters

- **overwrite** (*str*) – how the handle existing data (none, append, delete)
- **quarantine** (*bool*) – flag to indicate session should be quarantined
- **trigger_pipelines** (*bool*) – indicate that archiving should trigger pipelines
- **project** (*str*) – the project in the archive to assign the session to
- **subject** (*str*) – the subject in the archive to assign the session to
- **experiment** (*str*) – the experiment in the archive to assign the session content to

Returns the newly created experiment

Return type `xnat.classes.ExperimentData`

autoarchive

data

The data of the current object (data fields only)

delete (*asynchronous=None*)

Delete the session from the prearchive

Parameters **asynchronous** (*bool*) – flag to delete asynchronously

Returns requests response

download (*path*)

Method to download the zip of the prearchive session

Parameters **path** (*str*) – path to download to

Returns path of the downloaded zip file

Return type *str*

folder_name

fulldata

The full data of the current object (incl children, meta etc)

id

A unique ID for the session in the prearchive :return:

label

lastmod

move (*new_project, asynchronous=None*)

Move the session to a different project in the prearchive

Parameters

- **new_project** (*str*) – the id of the project to move to
- **asynchronous** (*bool*) – flag to move asynchronously

Returns requests response

name

prevent_anon

prevent_auto_commit

project

rebuild (*asynchronous=None*)

Rebuilt the session in the prearchive

Parameters **asynchronous** (*bool*) – flag to rebuild asynchronously

Returns requests response

scan_date

scan_time

scans

List of scans in the prearchive session

status

subject

tag

timestamp

uploaded

Datetime when the session was uploaded

xpath

The xpath of the object as seen from the root of the data. Used for setting fields in the object.

1.4.6 services Module

class `xnat.services.Services` (*xnat_session*)

Bases: `object`

The class representing all service functions in XNAT found in the /data/services REST directory

dicom_dump (*src, fields=None*)

Retrieve a dicom dump as a JSON data structure See the XAPI documentation for more detailed information: [DICOM Dump Service](#)

Parameters

- **src** (*str*) – The url of the scan to generate the DICOM dump for
- **fields** (*list*) – Fields to filter for DICOM tags. It can either a tag name or tag number in the format GGGGEEEE (G = Group number, E = Element number)

Returns JSON object (dict) representation of DICOM header

Return type `dict`

import_ (*path, overwrite=None, quarantine=False, destination=None, trigger_pipelines=None, project=None, subject=None, experiment=None, content_type=None*)

Import a file into XNAT using the import service. See the [XNAT wiki](#) for a detailed explanation.

Parameters

- **path** (*str*) – local path of the file to upload and import
- **overwrite** (*str*) – how the handle existing data (none, append, delete)
- **quarantine** (*bool*) – flag to indicate session should be quarantined
- **trigger_pipelines** (*bool*) – indicate that archiving should trigger pipelines
- **destination** (*str*) – the destination to upload the scan to
- **project** (*str*) – the project in the archive to assign the session to
- **subject** (*str*) – the subject in the archive to assign the session to
- **experiment** (*str*) – the experiment in the archive to assign the session content to
- **content_type** (*str*) – overwrite the content_type (by the mimetype will be guessed)

Returns

issue_token (*user=None*)

Issue a login token, by default for the current logged in user. If username is given, for that user. To issue tokens for other users you must be an admin.

Parameters **user** (*str*) – User to issue token for, default is current user

Returns Token in a named tuple (alias, secret)

```
xnat_session  
class xnat.services.TokenResult (alias, secret)  
    Bases: tuple  
  
    alias  
        Alias for field number 0  
  
    secret  
        Alias for field number 1
```

1.4.7 users Module

```
class xnat.users.User (data)  
    Bases: object  
  
    Representation of a user on the connected XNAT system  
  
    data  
  
    email  
        The email of the user  
  
    first_name  
        The first name of the user  
  
    id  
        The id of the user  
  
    last_name  
        The last name of the user  
  
    login  
        The login name of the user  
  
class xnat.users.Users (xnat_session)  
    Bases: collections.abc.Mapping  
  
    Listing of the users on the connected XNAT installation  
  
    data  
  
    xnat_session
```

1.4.8 mixin Module

```
class xnat.mixin.AbstractResource (uri=None, xnat_session=None, id_=None,  
                                   datafields=None, parent=None, fieldname=None, over-  
                                   writes=None, data_dir=None, upload_method=None,  
                                   **kwargs)  
  
    Bases: xnat.core.XNATBaseObject  
  
    SECONDARY_LOOKUP_FIELD = 'label'  
  
    data  
        The data of the current object (data fields only)  
  
    download (path, verbose=True)  
  
    download_dir (target_dir, verbose=True)  
        Download the entire resource and unpack it in a given directory
```

Parameters

- **target_dir** (*str*) – directory to unpack to
- **verbose** (*bool*) – show progress

file_count**file_size****files****fulldata**

The full data of the current object (incl children, meta etc)

upload (*data, remotepath, overwrite=False, extract=False, **kwargs*)

upload_dir (*directory, overwrite=False, method='tgz_file', **kwargs*)

Upload a directory to an XNAT resource. This means that if you do `resource.upload_dir(directory)` that if there is a file `directory/a.txt` it will be uploaded to `resource/files/a.txt`

The method has 5 options, default is `tgz_file`:

1. `per_file`: Scans the directory and uploads file by file
2. `tar_memory`: Create a tar archive in memory and upload it in one go
3. `tgz_memory`: Create a gzipped tar file in memory and upload that
4. `tar_file`: Create a temporary tar file and upload that
5. `tgz_file`: Create a temporary gzipped tar file and upload that

The considerations are that sometimes you can fit things in memory so you can save disk IO by putting it in memory. The `per_file` does not create additional archives, but has one request per file so might be slow when uploading many files.

Parameters

- **directory** (*str*) – The directory to upload
- **overwrite** (*bool*) – Flag to force overwriting of files
- **method** (*str*) – The method to use

class `xnat.mixin.DerivedData` (*uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs*)

Bases: `xnat.core.XNATBaseObject`

create_resource (*label, format=None, data_dir=None, method=None*)

download (*path, verbose=True*)

files**fulluri****resources**

class `xnat.mixin.ExperimentData` (*uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs*)

Bases: `xnat.core.XNATBaseObject`

SECONDARY_LOOKUP_FIELD = 'label'

label

```
class xnat.mixin.ImageScanData(uri=None, xnat_session=None, id_=None, datafields=None,
                               parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.core.XNATBaseObject
    SECONDARY_LOOKUP_FIELD = 'type'
    create_resource(label, format=None, data_dir=None, method='tgz_file')
    dicom_dump(fields=None)
        Retrieve a dicom dump as a JSON data structure See the XAPI documentation for more detailed information: DICOM Dump Service
        Parameters fields (list) – Fields to filter for DICOM tags. It can either a tag name or tag number in the format GGGGEEEE (G = Group number, E = Element number)
        Returns JSON object (dict) representation of DICOM header
        Return type dict
    download(path, verbose=True)
    download_dir(target_dir, verbose=True)
    files
    read_dicom(file=None, read_pixel_data=False, force=False)
    resources
```

```
class xnat.mixin.ImageSessionData(uri=None, xnat_session=None, id_=None,
                                   datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.core.XNATBaseObject
    create_assessor(label, type_)
    download(path, verbose=True)
    download_dir(target_dir, verbose=True)
        Download the entire experiment and unpack it in a given directory. Note that this method will create a directory structure following $target_dir/{experiment.label} and unzip the experiment zips as given by XNAT into that. If the $target_dir/{experiment.label} does not exist, it will be created.
        Parameters
            • target_dir (str) – directory to create experiment directory in
            • verbose (bool) – show progress
    files
    share(project, label=None)
```

```
class xnat.mixin.ProjectData(uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.core.XNATBaseObject
    SECONDARY_LOOKUP_FIELD = 'name'
    download_dir(target_dir, verbose=True, progress_callback=None)
        Download the entire project and unpack it in a given directory. Note that this method will create a directory structure following $target_dir/{project.name}/{subject.label}/{experiment.label} and unzip the experiment zips as given by XNAT into that. If the $target_dir/{project.name} does not exist, it will be created.
        Parameters
```

- **target_dir** (*str*) – directory to create project directory in
- **verbose** (*bool*) – show progress
- **progress_callback** – function to call with progress string should be a function with one argument

experiments

files

fulluri

resources

subjects

```
class xnat.mixin.SubjectAssessorData (uri=None, xnat_session=None, id_=None,
                                       datafields=None, parent=None, fieldname=None,
                                       overwrites=None, **kwargs)
```

Bases: *xnat.core.XNATBaseObject*

fulluri

subject

```
class xnat.mixin.SubjectData (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
```

Bases: *xnat.core.XNATBaseObject*

SECONDARY_LOOKUP_FIELD = 'label'

download_dir (*target_dir*, *verbose=True*, *progress_callback=None*)

Download the entire subject and unpack it in a given directory. Note that this method will create a directory structure following \$target_dir/{subject.label}/{experiment.label} and unzip the experiment zips as given by XNAT into that. If the \$target_dir/{subject.label} does not exist, it will be created.

Parameters

- **target_dir** (*str*) – directory to create subject directory in
- **verbose** (*bool*) – show progress
- **progress_callback** – function to call with progress string should be a function with one argument

files

fulluri

label

share (*project*, *label=None*)

1.5 Generated XSD classes

1.5.1 XSD Classes Documentation

This is an overview of all generated classes based on the XSD files of central.xnat.org, without any extension types (only the default XSD files that come with XNAT 1.7)

```
class xnat.classes.AbstractDemographicData (uri=None, xnat_session=None, id_=None,
                                             datafields=None, parent=None, field-
                                             name=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATNestedObjectMixin

class xnat.classes.AbstractProtocol (uri=None, xnat_session=None, id_=None,
                                       datafields=None, parent=None, fieldname=None,
                                       overwrites=None, **kwargs)
    Bases: xnat.classes.XNATNestedObjectMixin

    data_type
        Property of type: str

    description
        Property of type: str

    id
        Property of type: str

    name
        Property of type: str

class xnat.classes.AbstractResource (uri=None, xnat_session=None, id_=None,
                                       datafields=None, parent=None, fieldname=None, over-
                                       writes=None, data_dir=None, upload_method=None,
                                       **kwargs)
    Bases: xnat.classes.XNATObjectMixin, xnat.mixin.AbstractResource

    label
        Property of type: str

    note
        Property of type: str

    tags
        listing of xnat.classes.AbstractResourceTags

class xnat.classes.AbstractResourceTags (uri=None, xnat_session=None, id_=None,
                                           datafields=None, parent=None, fieldname=None,
                                           overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin

    name
        Property of type: str

class xnat.classes.AbstractStatistics (uri=None, xnat_session=None, id_=None,
                                       datafields=None, parent=None, fieldname=None,
                                       overwrites=None, **kwargs)
    Bases: xnat.classes.XNATNestedObjectMixin

class xnat.classes.AbstractSubjectMetadata (uri=None, xnat_session=None, id_=None,
                                              datafields=None, parent=None, field-
                                              name=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATNestedObjectMixin

class xnat.classes.AddField (uri=None, xnat_session=None, id_=None, datafields=None, par-
                             ent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.LONGVARCHAR

    name
        Property of type: str
```



```

class xnat.classes.AddFieldString(uri=None,          xnat_session=None,          id_=None,
                                datafields=None, parent=None, fieldname=None, over-
                                writes=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin
    add_field
        Property of type: str

class xnat.classes.AddIDString(uri=None, xnat_session=None, id_=None, datafields=None,
                              parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin
    add_id
        Property of type: str

class xnat.classes.AdditionalStatisticsDouble(uri=None,          xnat_session=None,
                                              id_=None,          datafields=None,          par-
                                              ent=None,          fieldname=None,          over-
                                              writes=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin
    additional_statistics
        Property of type: float

class xnat.classes.Algorithm(uri=None, xnat_session=None, id_=None, datafields=None, par-
                             ent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATNestedObjectMixin
    family
        Property of type: listing of xnat.classes.DicomCodedValue
    name
        Property of type: str
    name_code
        Property of type: listing of xnat.classes.DicomCodedValue
    parameters
        Property of type: str
    source
        Property of type: str
    version
        Property of type: str

class xnat.classes.AliasString(uri=None, xnat_session=None, id_=None, datafields=None,
                               parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin
    alias
        Property of type: str

class xnat.classes.ComputationData(uri=None,          xnat_session=None,          id_=None,
                                   datafields=None, parent=None, fieldname=None, over-
                                   writes=None, **kwargs)
    Bases: xnat.classes.XNATNestedObjectMixin
    name
        Property of type: str
    source
        Property of type: str

```

units
Property of type: `str`

value
Property of type: `str`

class `xnat.classes.ContrastBolus` (`uri=None`, `xnat_session=None`, `id_=None`, `datafields=None`,
`parent=None`, `fieldname=None`, `overwrites=None`,
`**kwargs`)
Bases: `xnat.classes.XNATNestedObjectMixin`

active_ingredient
Property of type: `str`

agent
Property of type: `str`

concentration
Concentration of active ingredient in diluted agent, in mg/ml
Property of type: `float`

flow_duration
In s
Property of type: `float`

flow_rate
In ml/s
Property of type: `float`

route
Administration route
Property of type: `str`

total_dose
Total amount of undiluted agent (in ml)
Property of type: `float`

volume
Total amount of diluted agent (in ml)
Property of type: `float`

class `xnat.classes.CrScanData` (`uri=None`, `xnat_session=None`, `id_=None`, `datafields=None`, `parent=None`, `type=None`, `**kwargs`)
Bases: `xnat.classes.ImageScanData`

class `xnat.classes.CrSessionData` (`uri=None`, `xnat_session=None`, `id_=None`, `datafields=None`,
`parent=None`, `fieldname=None`, `overwrites=None`,
`**kwargs`)
Bases: `xnat.classes.ImageSessionData`

class `xnat.classes.CtScanData` (`uri=None`, `xnat_session=None`, `id_=None`, `datafields=None`, `parent=None`, `type=None`, `**kwargs`)
Bases: `xnat.classes.ImageScanData`

dcm_validation
Property of type: `listing of xnat.classes.CtScanDataDcmvalidation`

parameters
Property of type: `listing of xnat.classes.CtScanDataParameters`

```
class xnat.classes.CtScanDataDcmvalidation(uri=None, xnat_session=None, id_=None,
                                           datafields=None, parent=None, field-
                                           name=None, overwrites=None, **kwargs)
```

Bases: *xnat.classes.XNATSubObjectMixin*

status

Property of type: *bool*

```
class xnat.classes.CtScanDataParameters(uri=None, xnat_session=None, id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)
```

Bases: *xnat.classes.XNATSubObjectMixin*

acquisition_number

Number identifying the single continuous gathering of data over a period of time resulting in this image

Property of type: *int*

collection_diameter

Diameter of the region from which data were used to reconstruct this image, in mm

Property of type: *float*

collimation_width

Property of type: *listing* of *xnat.classes.CtScanDataParametersCollimationwidth*

contrast_bolus

Property of type: *listing* of *xnat.classes.ContrastBolus*

convolution_kernel

Label describing convolution kernel or algorithm used for reconstruction

Property of type: *str*

ct_divol

Computed Tomography Dose Index (CTDI_vol), according to IEC 60601-2-44, Ed. 2.1 (Clause 29.1.103.4); describes average dose for this image, in mGy

Property of type: *float*

derivation

Text description of how this image was derived

Property of type: *listing* of *xnat.classes.CtScanDataParametersDerivation*

distance_source_to_detector

Distance from source to detector center, in mm

Property of type: *float*

distance_source_to_patient

Distance from source to isocenter, in mm

Property of type: *float*

estimated_dose_saving

Percent value of dose saving due to modulation; negative value indicates increased exposure

Property of type: *listing* of *xnat.classes.CtScanDataParametersEstimateddosesaving*

exposure

in mA

Property of type: *float*

exposure_time

in ms

Property of type: `float`

filter

Label for the type of filter inserted into the x-ray beam

Property of type: `str`

focal_spots

Size of focal spot, in mm; if multiple values, small dimensions before large

listing of float

fov

Property of type: *listing of `xnat.classes.CtScanDataParametersFov`*

gantry_tilt

Nominal scanning gantry tilt angle, in degrees

Property of type: `float`

generator_power

Power to the x-ray generator, in kW

Property of type: `float`

image_type

Property of type: `str`

kvp

Peak output of X-ray generator, in kV

Property of type: `float`

options

Property of type: `str`

orientation

Property of type: `str`

pitch_factor

Ratio of table feed per rotation to total collimation width

Property of type: `float`

rescale

Relationship between stored values (SV) and Hounsfield (HU): $HU=m*SV+b$

Property of type: *listing of `xnat.classes.CtScanDataParametersRescale`*

rotation_direction

CW=clockwise; CC=counterclockwise

Property of type: `str`

subject_position

Property of type: `str`

table_feed_per_rotation

Motion of table during a complete revolution of the source around the gantry orbit, in mm

Property of type: `float`

table_height

Distance from top of patient table to center of rotation (below table > 0), in mm

Property of type: `float`

table_speed

in mm/s

Property of type: `float`

voxel_res

Property of type: *listing of `xnat.classes.CtScanDataParametersVoxelres`*

xray_tube_current

in mA

Property of type: `float`

```
class xnat.classes.CtScanDataParametersCollimationwidth (uri=None,
                                                         xnat_session=None,
                                                         id_=None,
                                                         datafields=None,
                                                         parent=None,      field-
                                                         name=None,      over-
                                                         writes=None, **kwargs)
```

Bases: *`xnat.classes.XNATSubObjectMixin`*

single

Width of a single row of acquired data, in mm

Property of type: `float`

total

Width of total collimation over the area of active x-ray detection, in mm

Property of type: `float`

```
class xnat.classes.CtScanDataParametersDerivation (uri=None,      xnat_session=None,
                                                    id_=None,      datafields=None,
                                                    parent=None,      fieldname=None,
                                                    overwrites=None, **kwargs)
```

Bases: *`xnat.classes.XNATSubObjectMixin`*

```
class xnat.classes.CtScanDataParametersEstimateddosesaving (uri=None,
                                                             xnat_session=None,
                                                             id_=None,
                                                             datafields=None,
                                                             parent=None,
                                                             fieldname=None,
                                                             overwrites=None,
                                                             **kwargs)
```

Bases: *`xnat.classes.XNATSubObjectMixin`*

modulation

Label describing type of exposure modulation used to limit dose

Property of type: `Unknown`

```
class xnat.classes.CtScanDataParametersFov (uri=None, xnat_session=None, id_=None,
                                             datafields=None, parent=None, field-
                                             name=None, overwrites=None, **kwargs)
```

Bases: *`xnat.classes.XNATSubObjectMixin`*

x
Property of type: `int`

y
Property of type: `int`

```
class xnat.classes.CtScanDataParametersRescale (uri=None,          xnat_session=None,
                                              id_=None,    datafields=None,    par-
                                              ent=None,    fieldname=None,    over-
                                              writes=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

intercept
b
Property of type: Unknown

slope
m
Property of type: Unknown

```
class xnat.classes.CtScanDataParametersVoxelres (uri=None,          xnat_session=None,
                                              id_=None,    datafields=None,    par-
                                              ent=None,    fieldname=None,    over-
                                              writes=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

units
Property of type: `str`

x
Property of type: `float`

y
Property of type: `float`

z
Property of type: `float`

```
class xnat.classes.CtSessionData (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, fieldname=None, overwrites=None,
                                **kwargs)
```

Bases: `xnat.classes.ImageSessionData`

```
class xnat.classes.DatatypeProtocol (uri=None,          xnat_session=None,          id_=None,
                                datafields=None,    parent=None,    fieldname=None,
                                overwrites=None, **kwargs)
```

Bases: `xnat.classes.AbstractProtocol`

definitions
`listing of xnat.classes.FieldDefinitionGroup`

```
class xnat.classes.DcmValidationString (uri=None,          xnat_session=None,          id_=None,
                                datafields=None,    parent=None,    fieldname=None,
                                overwrites=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

dcm_validation
Property of type: `str`

```
class xnat.classes.DelayInteger (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, fieldname=None, overwrites=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

delay
Property of type: `int`

class `xnat.classes.DemographicData` (`uri=None`, `xnat_session=None`, `id_=None`,
`datafields=None`, `parent=None`, `fieldname=None`, `over-`
`writes=None`, `**kwargs`)

Bases: `xnat.classes.AbstractDemographicData`

age
Property of type: `int`

birth_weight
Property of type: `float`

dob
Property of type: `datetime.date`

education
Property of type: `int`

education_desc
Property of type: `str`

employment
Employment status: 0: Employed 1: Unemployed 2: Retired 3: Unknown or N/A
Property of type: `int`

ethnicity
Property of type: `str`

gender
Property of type: `str`

gestational_age
Property of type: `float`

handedness
Property of type: `str`

height
Property of type: *listing of `xnat.classes.DemographicDataHeight`*

post_menstrual_age
Property of type: `float`

race
Property of type: `str`

race2
Property of type: `str`

race3
Property of type: `str`

race4
Property of type: `str`

race5
Property of type: `str`

race6
Property of type: `str`

```
ses
    Socioeconomic status
    Property of type: int

weight
    Property of type: listing of xnat.classes.DemographicDataWeight

yob
    Property of type: int

class xnat.classes.DemographicDataHeight (uri=None, xnat_session=None, id_=None,
                                           datafields=None, parent=None, fieldname=None,
                                           overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

units
    Property of type: str

class xnat.classes.DemographicDataWeight (uri=None, xnat_session=None, id_=None,
                                           datafields=None, parent=None, fieldname=None,
                                           overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

units
    Property of type: str

class xnat.classes.DerivationString (uri=None, xnat_session=None, id_=None,
                                     datafields=None, parent=None, fieldname=None,
                                     overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

derivation
    Property of type: str

class xnat.classes.DerivedData (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, fieldname=None, overwrites=None, **kwargs)

    Bases: xnat.classes.ExperimentData, xnat.mixin.DerivedData

provenance
    Property of type: listing of xnat.classes.Process

class xnat.classes.DicomCodedValue (uri=None, xnat_session=None, id_=None,
                                     datafields=None, parent=None, fieldname=None, over-
                                     writes=None, **kwargs)

    Bases: xnat.classes.XNATNestedObjectMixin

designator
    Property of type: str

meaning
    Property of type: str

value
    Property of type: str

version
    Property of type: str

class xnat.classes.DicomSeries (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, fieldname=None, overwrites=None,
                                data_dir=None, upload_method=None, **kwargs)

    Bases: xnat.classes.AbstractResource
```



```

cache_path
    Property of type: str

content
    Code indicating the contents of the image. E.g. GFC, T88
    Property of type: str

description
    Free-form comments about files
    Property of type: str

dimensions
    Property of type: listing of xnat.classes.DicomSeriesDimensions

format
    Format of file. E.g. DICOM, Analyze, 4dfp
    Property of type: str

image_set
    listing of xnat.classes.DicomSeriesImageset

orientation
    Property of type: str

uid
    Property of type: str

voxel_res
    Property of type: listing of xnat.classes.DicomSeriesVoxelres

class xnat.classes.DicomSeriesDimensions (uri=None, xnat_session=None, id=None,
                                             datafields=None, parent=None, fieldname=None,
                                             overwrites=None, **kwargs)

Bases: xnat.classes.XNATSubObjectMixin

volumes
    Property of type: int

x
    Property of type: int

y
    Property of type: int

z
    Property of type: int

class xnat.classes.DicomSeriesImageset (uri=None, xnat_session=None, id=None,
                                             datafields=None, parent=None, fieldname=None,
                                             overwrites=None, **kwargs)

Bases: xnat.classes.XNATSubObjectMixin

instance_number
    Property of type: int

sop_instance_uid
    Property of type: str

uri
    Property of type: str

```

```
class xnat.classes.DicomSeriesVoxelres (uri=None,      xnat_session=None,      id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin
    units
        Property of type: str
    x
        Property of type: float
    y
        Property of type: float
    z
        Property of type: float
class xnat.classes.DoseFloat (uri=None, xnat_session=None, id_=None, datafields=None, par-
                               ent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin
    dose
        Property of type: float
class xnat.classes.Dx3DCraniofacialScanData (uri=None, xnat_session=None, id_=None,
                                                datafields=None, parent=None, type=None,
                                                **kwargs)
    Bases: xnat.classes.ImageScanData
class xnat.classes.Dx3DCraniofacialSessionData (uri=None,      xnat_session=None,
                                                  id_=None,      datafields=None,      par-
                                                  ent=None,      fieldname=None,      over-
                                                  writes=None, **kwargs)
    Bases: xnat.classes.ImageSessionData
class xnat.classes.DxScanData (uri=None, xnat_session=None, id_=None, datafields=None, par-
                               ent=None, type=None, **kwargs)
    Bases: xnat.classes.ImageScanData
class xnat.classes.DxSessionData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None, fieldname=None, overwrites=None,
                                   **kwargs)
    Bases: xnat.classes.ImageSessionData
class xnat.classes.EcatValidationString (uri=None, xnat_session=None, id_=None,
                                           datafields=None, parent=None, fieldname=None,
                                           overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin
    ecat_validation
        Property of type: str
class xnat.classes.EcgScanData (uri=None, xnat_session=None, id_=None, datafields=None,
                                 parent=None, type=None, **kwargs)
    Bases: xnat.classes.ImageScanData
class xnat.classes.EcgSessionData (uri=None,      xnat_session=None,      id_=None,
                                    datafields=None, parent=None, fieldname=None, over-
                                    writes=None, **kwargs)
    Bases: xnat.classes.ImageSessionData
```

```

class xnat.classes.EegScanData (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, type=None, **kwargs)
    Bases: xnat.classes.ImageScanData

    channels
        listing of xnat.classes.EegScanDataChannels

    parameters
        Property of type: listing of xnat.classes.EegScanDataParameters

    software_filters_impedances
        Property of type: listing of xnat.classes.EegScanDataSoftwarefiltersimpedances

class xnat.classes.EegScanDataChannels (uri=None, xnat_session=None, id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin

    high_cut_off
        Property of type: str

    low_cut_off
        Property of type: str

    name
        Property of type: str

    notch
        Property of type: str

    resolution
        Property of type: float

class xnat.classes.EegScanDataParameters (uri=None, xnat_session=None, id_=None,
                                           datafields=None, parent=None, fieldname=None,
                                           overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin

    data_record
        Property of type: listing of xnat.classes.EegScanDataParametersDatarecord

    number_of_data_records
        Property of type: int

class xnat.classes.EegScanDataParametersDatarecord (uri=None, xnat_session=None,
                                                      id_=None, datafields=None,
                                                      parent=None, fieldname=None,
                                                      overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin

    duration
        Property of type: float

    units
        Property of type: str

class xnat.classes.EegScanDataSoftwarefiltersimpedances (uri=None,
                                                           xnat_session=None,
                                                           id_=None,
                                                           datafields=None,
                                                           parent=None, field-
                                                           name=None, over-
                                                           writes=None, **kwargs)

```

Bases: `xnat.classes.XNATSubObjectMixin`

impedance

listing of `xnat.classes.EegScanDataSoftwarefiltersimpedancesImpedance`

mean

Property of type: `float`

```
class xnat.classes.EegScanDataSoftwarefiltersimpedancesImpedance (uri=None,
                                                                    xnat_session=None,
                                                                    id_=None,
                                                                    datafields=None,
                                                                    parent=None,
                                                                    fieldname=None,
                                                                    overwrites=None,
                                                                    **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

name

Property of type: `str`

value

Property of type: `str`

```
class xnat.classes.EegSessionData (uri=None, xnat_session=None, id_=None,
                                     datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
```

Bases: `xnat.classes.ImageSessionData`

data_format_version

Property of type: `str`

number_of_channels

Property of type: `int`

sampling_interval

Property of type: *listing of `xnat.classes.EegSessionDataSamplinginterval`*

sampling_rate

Property of type: *listing of `xnat.classes.EegSessionDataSamplingrate`*

```
class xnat.classes.EegSessionDataSamplinginterval (uri=None, xnat_session=None,
                                                    id_=None, datafields=None,
                                                    parent=None, fieldname=None,
                                                    overwrites=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

units

Property of type: `str`

```
class xnat.classes.EegSessionDataSamplingrate (uri=None, xnat_session=None,
                                                id_=None, datafields=None,
                                                parent=None, fieldname=None,
                                                overwrites=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

units

Property of type: `str`

```

class xnat.classes.EpsScanData (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, type=None, **kwargs)
    Bases: xnat.classes.ImageScanData

class xnat.classes.EpsSessionData (uri=None, xnat_session=None, id_=None,
                                    datafields=None, parent=None, fieldname=None, over-
                                    writes=None, **kwargs)
    Bases: xnat.classes.ImageSessionData

class xnat.classes.EsScanData (uri=None, xnat_session=None, id_=None, datafields=None, par-
                                ent=None, type=None, **kwargs)
    Bases: xnat.classes.ImageScanData

class xnat.classes.EsSessionData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None, fieldname=None, overwrites=None,
                                   **kwargs)
    Bases: xnat.classes.ImageSessionData

class xnat.classes.EstimatedDoseSavingFloat (uri=None, xnat_session=None, id_=None,
                                              datafields=None, parent=None, field-
                                              name=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin

    estimated_dose_saving
        Property of type: float

class xnat.classes.EsvScanData (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, type=None, **kwargs)
    Bases: xnat.classes.ImageScanData

class xnat.classes.EsvSessionData (uri=None, xnat_session=None, id_=None,
                                    datafields=None, parent=None, fieldname=None, over-
                                    writes=None, **kwargs)
    Bases: xnat.classes.ImageSessionData

class xnat.classes.ExperimentData (uri=None, xnat_session=None, id_=None,
                                    datafields=None, parent=None, fieldname=None, over-
                                    writes=None, **kwargs)
    Bases: xnat.classes.XNATObjectMixin, xnat.mixin.ExperimentData

    acquisition_site
        Property of type: str

    date
        Date on which experiment was conducted
        Property of type: datetime.date

    delay
        Property of type: listing of xnat.classes.ExperimentDataDelay

    duration
        Duration of experiment
        Property of type: datetime.timedelta

    fields
        listing of xnat.classes.ExperimentDataFields

    investigator
        Property of type: listing of xnat.classes.InvestigatorData

    note
        Free form text for misc. information

```

```
    Property of type: str
original
    Property of type: str
project
    Property of type: str
protocol
    Property of type: str
resources
    listing of xnat.classes.AbstractResource
sharing
    listing of xnat.classes.ExperimentDataSharing
time
    Time experiment was conducted
    Property of type: datetime.time
validation
    Property of type: listing of xnat.classes.ValidationData
version
    Property of type: int
visit
    Property of type: str
visit_id
    Property of type: str
class xnat.classes.ExperimentDataDelay (uri=None, xnat_session=None, id=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin
ref_expt_id
    Property of type: str
class xnat.classes.ExperimentDataFields (uri=None, xnat_session=None, id=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin
name
    Property of type: str
class xnat.classes.ExperimentDataSharing (uri=None, xnat_session=None, id=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin
label
    Property of type: str
project
    Property of type: str
protocol
    Property of type: str
```

```
visit
    Property of type: str

class xnat.classes.FieldDefinitionGroup (uri=None, xnat_session=None, id=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)

Bases: xnat.classes.XNATNestedObjectMixin

data_type
    Property of type: str

description
    Property of type: str

fields
    listing of xnat.classes.FieldDefinitionGroupFields

id
    Property of type: str

project_specific
    Property of type: bool

shareable
    Property of type: bool

class xnat.classes.FieldDefinitionGroupFields (uri=None, xnat_session=None,
                                                id=None, datafields=None, par-
                                                ent=None, fieldname=None, over-
                                                writes=None, **kwargs)

Bases: xnat.classes.XNATSubObjectMixin

datatype
    Property of type: str

group
    Property of type: str

name
    Property of type: str

possible_values
    listing of xnat.classes.FieldDefinitionGroupFieldsFieldPossiblevalues

required
    Property of type: bool

sequence
    Property of type: int

type
    Property of type: str

xml_path
    Property of type: str
```

```
class xnat.classes.FieldDefinitionGroupFieldsFieldPossiblevalues (uri=None,
                                                                    xnat_session=None,
                                                                    id_=None,
                                                                    datafields=None,
                                                                    parent=None,
                                                                    fieldname=None,
                                                                    overwrites=None,
                                                                    **kwargs)

Bases: xnat.classes.XNATSubObjectMixin

display
    Property of type: str

class xnat.classes.FieldString (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, fieldname=None, overwrites=None, **kwargs)
Bases: xnat.classes.XNATSubObjectMixin

field
    Property of type: str

class xnat.classes.FileData (uri=None, xnat_session=None, id_=None, datafields=None, parent=None,
                              fieldname=None, overwrites=None, path=None)
Bases: xnat.classes.XNATObjectMixin

SECONDARY_LOOKUP_FIELD = 'path'

delete()
    Remove the item from XNATSession

download(*args, **kwargs)

download_stream(*args, **kwargs)

open()

path

size

class xnat.classes.GenericData (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, fieldname=None, overwrites=None, **kwargs)
Bases: xnat.classes.ExperimentData

class xnat.classes.GmScanData (uri=None, xnat_session=None, id_=None, datafields=None, parent=None,
                                type=None, **kwargs)
Bases: xnat.classes.ImageScanData

class xnat.classes.GmSessionData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None, fieldname=None, overwrites=None,
                                   **kwargs)
Bases: xnat.classes.ImageSessionData

class xnat.classes.GmvScanData (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, type=None, **kwargs)
Bases: xnat.classes.ImageScanData

class xnat.classes.GmvSessionData (uri=None, xnat_session=None, id_=None,
                                    datafields=None, parent=None, fieldname=None, overwrites=None,
                                    **kwargs)
Bases: xnat.classes.ImageSessionData
```



```

class xnat.classes.HdScanData (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, type=None, **kwargs)
    Bases: xnat.classes.ImageScanData

class xnat.classes.HdSessionData (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.ImageSessionData

class xnat.classes.HeightFloat (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin

    height
        Property of type: float

class xnat.classes.ImageAssessorData (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.DerivedData

    image_session_id
        Property of type: str

    in_
        listing of xnat.classes.AbstractResource

    out
        listing of xnat.classes.AbstractResource

    parameters
        listing of xnat.classes.AddField

class xnat.classes.ImageResource (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, data_dir=None, upload_method=None, **kwargs)
    Bases: xnat.classes.Resource

    dimensions
        Property of type: listing of xnat.classes.ImageResourceDimensions

    orientation
        Property of type: str

    voxel_res
        Property of type: listing of xnat.classes.ImageResourceVoxelres

class xnat.classes.ImageResourceDimensions (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin

    volumes
        Property of type: int

    x
        Property of type: int

    y
        Property of type: int

    z
        Property of type: int

```

```
class xnat.classes.ImageResourceSeries (uri=None,      xnat_session=None,      id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, data_dir=None,      up-
                                         load_method=None, **kwargs)
```

Bases: *xnat.classes.ResourceSeries*

dimensions

Property of type: *listing of xnat.classes.ImageResourceSeriesDimensions*

orientation

Property of type: *str*

voxel_res

Property of type: *listing of xnat.classes.ImageResourceSeriesVoxelres*

```
class xnat.classes.ImageResourceSeriesDimensions (uri=None,      xnat_session=None,
                                                    id_=None, datafields=None, par-
                                                    ent=None, fieldname=None, over-
                                                    writes=None, **kwargs)
```

Bases: *xnat.classes.XNATSubObjectMixin*

volumes

Property of type: *int*

x

Property of type: *int*

y

Property of type: *int*

z

Property of type: *int*

```
class xnat.classes.ImageResourceSeriesVoxelres (uri=None,      xnat_session=None,
                                                    id_=None, datafields=None, par-
                                                    ent=None, fieldname=None, over-
                                                    writes=None, **kwargs)
```

Bases: *xnat.classes.XNATSubObjectMixin*

units

Property of type: *str*

x

Property of type: *float*

y

Property of type: *float*

z

Property of type: *float*

```
class xnat.classes.ImageResourceVoxelres (uri=None,      xnat_session=None,      id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)
```

Bases: *xnat.classes.XNATSubObjectMixin*

units

Property of type: *str*

x

Property of type: *float*

y
Property of type: `float`

z
Property of type: `float`

class `xnat.classes.ImageScanData` (*uri=None, xnat_session=None, id_=None, datafields=None, parent=None, type=None, **kwargs*)
Bases: `xnat.classes.XNATObjectMixin`, `xnat.mixin.ImageScanData`

condition
Property of type: `str`

documentation
Property of type: `str`

file
listing of `xnat.classes.AbstractResource`

frames
Property of type: `int`

image_session_id
Property of type: `str`

modality
Property of type: `str`

note
Property of type: `str`

operator
Free form text to indicate individuals who operated scanner
Property of type: `str`

project
Property of type: `str`

quality
Property of type: `str`

scanner
Free form text to indicate name/ID of scanner
Property of type: *listing of `xnat.classes.ImageScanDataScanner`*

series_class
Property of type: `str`

series_description
Property of type: `str`

sharing
listing of `xnat.classes.ImageScanDataSharing`

start_date
Date the scan started
Property of type: `datetime.date`

start_time
Time the scan started
Property of type: `datetime.time`

```
type
    Property of type: str

uid
    DICOM Series Instance UID (0020,000E)
    Property of type: str

validation
    Property of type: listing of xnat.classes.ValidationData

class xnat.classes.ImageScanDataScanner (uri=None, xnat_session=None, id_=None,
                                           datafields=None, parent=None, fieldname=None,
                                           overwrites=None, **kwargs)

Bases: xnat.classes.XNATSubObjectMixin

manufacturer
    Property of type: str

model
    Property of type: str

software_version
    Property of type: str

class xnat.classes.ImageScanDataSharing (uri=None, xnat_session=None, id_=None,
                                           datafields=None, parent=None, fieldname=None,
                                           overwrites=None, **kwargs)

Bases: xnat.classes.XNATSubObjectMixin

label
    Property of type: str

project
    Property of type: str

class xnat.classes.ImageSessionData (uri=None, xnat_session=None, id_=None,
                                       datafields=None, parent=None, fieldname=None,
                                       overwrites=None, **kwargs)

Bases: xnat.classes.SubjectAssessorData, xnat.mixin.ImageSessionData

assessors
    listing of xnat.classes.ImageAssessorData

dcm_accession_number
    DICOM Accession Number (0008,0050)
    Property of type: str

dcm_patient_birth_date
    DICOM Patient's Birth Date (0010,0030)
    Property of type: datetime.date

dcm_patient_id
    DICOM Patient ID (0010,0020)
    Property of type: str

dcm_patient_name
    DICOM Patient's Name (0010,0010)
    Property of type: str
```

dcm_patient_weight
 DICOM Patient's Weight (0010,1031)
 Property of type: `float`

modality
 Property of type: `str`

operator
 Free form text to indicate individuals who operated scanner
 Property of type: `str`

prearchive_path
 Property of type: `str`

reconstructions
listing of `xnat.classes.ReconstructedImageData`

regions
listing of `xnat.classes.RegionResource`

scanner
 Free form text to indicate name/ID of scanner
 Property of type: *listing of `xnat.classes.ImageSessionDataScanner`*

scans
listing of `xnat.classes.ImageScanData`

session_type
 Property of type: `str`

study_id
 Property of type: `str`

uid
 DICOM Study Instance UID (0020,000D)
 Property of type: `str`

class `xnat.classes.ImageSessionDataScanner` (`uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs`)

Bases: `xnat.classes.XNATSubObjectMixin`

manufacturer
 Property of type: `str`

model
 Property of type: `str`

class `xnat.classes.IntermediateFloat` (`uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs`)

Bases: `xnat.classes.XNATSubObjectMixin`

intermediate
 Property of type: `float`

class `xnat.classes.InvestigatorData` (`uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs`)

Bases: `xnat.classes.XNATNestedObjectMixin`

```
department
    Property of type: str

email
    Property of type: str

firstname
    Property of type: str

id
    Property of type: str

institution
    Property of type: str

lastname
    Property of type: str

phone
    Property of type: str

title
    Property of type: str

class xnat.classes.IoScanData (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, type=None, **kwargs)
    Bases: xnat.classes.ImageScanData

class xnat.classes.IoSessionData (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.ImageSessionData

class xnat.classes.IsotopeString (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin

isotope
    Property of type: str

class xnat.classes.LONGVARCHAR (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATNestedObjectMixin

value
    Property of type: str

class xnat.classes.LabelString (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin

label
    Property of type: str

class xnat.classes.MegScanData (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, type=None, **kwargs)
    Bases: xnat.classes.ImageScanData

class xnat.classes.MegSessionData (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.ImageSessionData
```

```
class xnat.classes.MgScanData (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, type=None, **kwargs)
```

Bases: `xnat.classes.ImageScanData`

```
class xnat.classes.MgSessionData (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
```

Bases: `xnat.classes.ImageSessionData`

```
class xnat.classes.MrAssessorData (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
```

Bases: `xnat.classes.ImageAssessorData`

```
class xnat.classes.MrQcScanData (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
```

Bases: `xnat.classes.QcScanData`

blurring

Blurring, Ghosting, or Ringing artifacts on the Scan

Property of type: `str`

flow

Property of type: `str`

image_contrast

Property of type: `str`

inhomogeneity

Property of type: `str`

interpac_motion

Property of type: `str`

susceptibility

Property of type: `str`

wrap

Property of type: `str`

```
class xnat.classes.MrScanData (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, type=None, **kwargs)
```

Bases: `xnat.classes.ImageScanData`

coil

Free form text to indicate the coil used in this scanning session

Property of type: `str`

dcm_validation

Property of type: `listing` of `xnat.classes.MrScanDataDcmvalidation`

field_strength

Free form text to indicate the field strength used in this scanning session

Property of type: `str`

file_name_uuid

Property of type: `str`

marker

Free form text to indicate method used to mark left-right (e.g. Vitamin E capsule)

Property of type: `str`

parameters

Property of type: *listing of `xnat.classes.MrScanDataParameters`*

stabilization

Free form text to indicate method used to stabilize head

Property of type: `str`

```
class xnat.classes.MrScanDataDcmvalidation(uri=None, xnat_session=None, id_=None,
                                         datafields=None, parent=None, field-
                                         name=None, overwrites=None, **kwargs)
```

Bases: *`xnat.classes.XNATSubObjectMixin`*

status

Property of type: `bool`

```
class xnat.classes.MrScanDataParameters(uri=None, xnat_session=None, id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)
```

Bases: *`xnat.classes.XNATSubObjectMixin`*

acq_time

Property of type: `str`

acq_type

Property of type: `str`

add_param

listing of `xnat.classes.AddField`

coil

Free form text to indicate the coil used in this scan

Property of type: `str`

coil_elements

Property of type: `str`

delta_te

Property of type: `float`

diffusion

Property of type: *listing of `xnat.classes.MrScanDataParametersDiffusion`*

dti_acq_count

Property of type: `int`

echo_spacing

in seconds; computed from Siemens private tags (0019,1028) Bandwidth Per Pixel Phase Encode and (0051,100b) AcquisitionMatrixText

Property of type: `float`

flip

Property of type: `int`

fov

Property of type: *listing of `xnat.classes.MrScanDataParametersFov`*

image_type

Property of type: `str`

in_plane_phase_encoding

Property of type: *listing of `xnat.classes.MrScanDataParametersInplanephaseencoding`*

matrix
Property of type: *listing of `xnat.classes.MrScanDataParametersMatrix`*

orientation
Property of type: `str`

origin
Property of type: `str`

partitions
Property of type: `int`

phase_encoding_direction
from Siemens image shadow data (0029,1010), subfield 20. 1 for A>>P, 0 for P>>A
Property of type: `str`

pixel_bandwidth
Reciprocal of the total sampling period, in Hz/pixel
Property of type: `float`

pmc
Property of type: `str`

readout_sample_spacing
Property of type: `str`

scan_options
Property of type: `str`

scan_sequence
Property of type: `str`

seq_variant
Property of type: `str`

sequence
Property of type: `str`

subject_position
Property of type: `str`

te
Property of type: `float`

ti
Property of type: `float`

tr
Property of type: `float`

voxel_res
Property of type: *listing of `xnat.classes.MrScanDataParametersVoxelres`*

class `xnat.classes.MrScanDataParametersDiffusion` (`uri=None`, `xnat_session=None`,
`id_=None`, `datafields=None`, `parent=None`, `fieldname=None`, `overrides=None`, `**kwargs`)

Bases: `xnat.classes.XNATSubObjectMixin`

anisotropy_type
Property of type: `str`

```
b_max
    Property of type: str

b_values
    Property of type: str

directionality
    Property of type: str

orientations
    Property of type: str

refocus_flip_angle
    Property of type: str

class xnat.classes.MrScanDataParametersFov (uri=None, xnat_session=None, id_=None,
                                             datafields=None, parent=None, field-
                                             name=None, overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

x
    Property of type: int

y
    Property of type: int

class xnat.classes.MrScanDataParametersInplanePhaseEncoding (uri=None,
                                                                xnat_session=None,
                                                                id_=None,
                                                                datafields=None,
                                                                parent=None,
                                                                fieldname=None,
                                                                overwrites=None,
                                                                **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

direction
    Property of type: str

direction_positive
    from Siemens image shadow data (0029,1010) PhaseEncodingDirectionPositive
    Property of type: str

polarity_swap
    Property of type: str

rotation
    Property of type: str

class xnat.classes.MrScanDataParametersMatrix (uri=None, xnat_session=None,
                                                  id_=None, datafields=None, par-
                                                  ent=None, fieldname=None, over-
                                                  writes=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

x
    Property of type: int

y
    Property of type: int
```

```
class xnat.classes.MrScanDataParametersVoxelres (uri=None, xnat_session=None,
                                                id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)
```

Bases: *xnat.classes.XNATSubObjectMixin*

units

Property of type: *str*

x

Property of type: *float*

y

Property of type: *float*

z

Property of type: *float*

```
class xnat.classes.MrSessionData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None, fieldname=None, overwrites=None,
                                   **kwargs)
```

Bases: *xnat.classes.ImageSessionData*

coil

Free form text to indicate the coil used in this scanning session

Property of type: *str*

field_strength

Free form text to indicate the field strength used in this scanning session

Property of type: *str*

marker

Free form text to indicate method used to mark left-right (e.g. Vitamin E capsule)

Property of type: *str*

stabilization

Free form text to indicate method used to stabilize head

Property of type: *str*

```
class xnat.classes.MrsScanData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None, type=None, **kwargs)
```

Bases: *xnat.classes.ImageScanData*

```
class xnat.classes.NmScanData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None, type=None, **kwargs)
```

Bases: *xnat.classes.ImageScanData*

```
class xnat.classes.NmSessionData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None, fieldname=None, overwrites=None,
                                   **kwargs)
```

Bases: *xnat.classes.ImageSessionData*

```
class xnat.classes.OpScanData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None, type=None, **kwargs)
```

Bases: *xnat.classes.ImageScanData*

```
class xnat.classes.OpSessionData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None, fieldname=None, overwrites=None,
                                   **kwargs)
```

Bases: *xnat.classes.ImageSessionData*

```

class xnat.classes.OptScanData (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, type=None, **kwargs)
    Bases: xnat.classes.ImageScanData

    dcm_validation
        Property of type: listing of xnat.classes.OptScanDataDcmvalidation

    parameters
        Property of type: listing of xnat.classes.OptScanDataParameters

class xnat.classes.OptScanDataDcmvalidation (uri=None, xnat_session=None, id_=None,
                                                datafields=None, parent=None, field-
                                                name=None, overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

    status
        Property of type: bool

class xnat.classes.OptScanDataParameters (uri=None, xnat_session=None, id_=None,
                                             datafields=None, parent=None, fieldname=None,
                                             overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

    fov
        Property of type: listing of xnat.classes.OptScanDataParametersFov

    illumination_power
        Power of the illuminator in microwatts at corneal plane

        Property of type: str

    illumination_wavelength
        Wavelength of the illuminator, in nm

        Property of type: str

    image_type
        Property of type: str

    laterality
        Laterality of (paired) body part examined: R (right) or L (left)

        Property of type: str

    voxel_res
        Property of type: listing of xnat.classes.OptScanDataParametersVoxelres

class xnat.classes.OptScanDataParametersFov (uri=None, xnat_session=None, id_=None,
                                                datafields=None, parent=None, field-
                                                name=None, overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

    x
        Property of type: int

    y
        Property of type: int

class xnat.classes.OptScanDataParametersVoxelres (uri=None, xnat_session=None,
                                                    id_=None, datafields=None, par-
                                                    ent=None, fieldname=None, over-
                                                    writes=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

```

```

units
    Property of type: str

x
    Property of type: float

y
    Property of type: float

z
    Property of type: float

class xnat.classes.OptSessionData (uri=None, xnat_session=None, id_=None,
                                     datafields=None, parent=None, fieldname=None, over-
                                     writes=None, **kwargs)
    Bases: xnat.classes.ImageSessionData

class xnat.classes.OtherDicomScanData (uri=None, xnat_session=None, id_=None,
                                          datafields=None, parent=None, type=None,
                                          **kwargs)
    Bases: xnat.classes.ImageScanData

class xnat.classes.OtherDicomSessionData (uri=None, xnat_session=None, id_=None,
                                             datafields=None, parent=None, fieldname=None,
                                             overwrites=None, **kwargs)
    Bases: xnat.classes.ImageSessionData

class xnat.classes.OtherQcScanData (uri=None, xnat_session=None, id_=None,
                                       datafields=None, parent=None, fieldname=None, over-
                                       writes=None, **kwargs)
    Bases: xnat.classes.QcScanData

other
    Property of type: str

class xnat.classes.PVisitData (uri=None, xnat_session=None, id_=None, datafields=None, par-
                                ent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.GenericData

closed
    Property of type: bool

end_date
    Property of type: datetime.datetime

notes
    Can be used to take visit notes, explain reason for status (e.g. missed visit), etc.
    Property of type: str

protocol_id
    Property of type: str

protocol_version
    Property of type: int

start_date
    Property of type: datetime.datetime

status
    Property of type: str

```

```
subject_id
    Property of type: str

terminal
    Property of type: bool

visit_name
    Property of type: str

visit_type
    Property of type: str

class xnat.classes.PetAssessorData (uri=None, xnat_session=None, id_=None,
                                     datafields=None, parent=None, fieldname=None, over-
                                     writes=None, **kwargs)
    Bases: xnat.classes.ImageAssessorData

class xnat.classes.PetQcScanData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None, fieldname=None, overwrites=None,
                                   **kwargs)
    Bases: xnat.classes.QcScanData

acceptable_voxel_size
    Property of type: str

acquisition
    Property of type: str

bottom_cutoff
    Property of type: str

correct_filters
    Property of type: str

correct_iterations_and_subsets
    Property of type: str

correct_reconstruction_algorithm
    Property of type: str

correct_slice_thickness
    Property of type: str

processing_errors
    listing of str

qc_outcome
    Property of type: str

qc_outcome_reason
    Property of type: str

reason_frames_unacceptable
    Property of type: str

reconstruction_algorithm_used
    Property of type: str

top_cutoff
    Property of type: str

unacceptable_frames
    Property of type: str
```

```

class xnat.classes.PetScanData (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, type=None, **kwargs)
    Bases: xnat.classes.ImageScanData

    ecat_validation
        Property of type: listing of xnat.classes.PetScanDataEcatvalidation

    parameters
        Property of type: listing of xnat.classes.PetScanDataParameters

class xnat.classes.PetScanDataEcatvalidation (uri=None, xnat_session=None, id_=None,
                                                datafields=None, parent=None, field-
                                                name=None, overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

    status
        Property of type: bool

class xnat.classes.PetScanDataParameters (uri=None, xnat_session=None, id_=None,
                                            datafields=None, parent=None, fieldname=None,
                                            overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

    acq_type
        Enumerated type (0=Undefined, 1=Blank, 2=Transmission, 3=Static emission, 4=Dynamic emission,
        5=Gated emission, 6=Transmission rectilinear, 7=Emission rectilinear)

        Property of type: int

    add_param
        listing of xnat.classes.AddField

    annotation
        Property of type: str

    bed_position
        Property of type: float

    bin_size
        Width of view sample (in cm)

        Property of type: float

    data_type
        Enumerated type (0=Unkonwn Matrix Data Type, 1=Byte Data, 2=VAX_Ix2, 3=VAX_Ix4, 4=VAX_Rx4,
        5=IEEE Float, 6=Sun short, 7=Sun long)

        Property of type: int

    dimensions
        Property of type: listing of xnat.classes.PetScanDataParametersDimensions

    ecat_calibration_factor
        Property of type: float

    facility
        Property of type: str

    file_type
        Enumerated type (00=unknown, 01=Sinogram, 02=Image-16, 03=Attenuation Correction, 04=Normal-
        ization, 05=Polar Map, 06=Volume 8, 07=Volume 16, 08=Projection 8, 09=Projection 16, 10=Image 8,
        11=3D Sinogram 16, 12=3D Sinogram 8, 13=3D Normalization, 14=3D Sinogram Fit)

        Property of type: int

```

filter

Property of type: *listing* of `xnat.classes.PetScanDataParametersFilter`

filter_code

Enumerated type (0=all pass, 1=ramp, 2=Butterworth, 3=Hanning, 4=Hamming,5=Parzen, 6=Shepp, 7=Butterworth-order 2, 8=Gaussian, 9=Median,10=Boxcar)

Property of type: `int`

frames

Property of type: *listing* of `xnat.classes.PetScanDataParametersFrames`

gate_duration

Gate duration (in msec)

Property of type: `int`

mt_1_1

Matrix transformation element (1,1).

Property of type: `float`

mt_1_2

Matrix transformation element (1,2).

Property of type: `float`

mt_1_3

Matrix transformation element (1,3).

Property of type: `float`

mt_1_4

Matrix transformation element (1,4).

Property of type: `float`

mt_2_1

Matrix transformation element (2,1).

Property of type: `float`

mt_2_2

Matrix transformation element (2,2).

Property of type: `float`

mt_2_3

Matrix transformation element (2,3).

Property of type: `float`

mt_2_4

Matrix transformation element (2,4).

Property of type: `float`

mt_3_1

Matrix transformation element (3,1).

Property of type: `float`

mt_3_2

Matrix transformation element (3,2).

Property of type: `float`

mt_3_3

Matrix transformation element (3,3).

Property of type: `float`

mt_3_4

Matrix transformation element (3,4).

Property of type: `float`

num_accepted_beats

Number of accepted beats for this gate

Property of type: `int`

num_angles

Number of angles from sinogram

Property of type: `float`

num_gates

Property of type: `int`

num_planes

Property of type: `int`

num_relements

Number R elements from sinogram

Property of type: `float`

offset

Property of type: *listing of `xnat.classes.PetScanDataParametersOffset`*

orientation

Property of type: `int`

original_file_name

Scan file creation name

Property of type: `str`

pixel_size

Property of type: *listing of `xnat.classes.PetScanDataParametersPixelsize`*

plane_separation

Physical distance between adjacent planes (in cm.)

Property of type: `float`

processing_code

Bit mask (0=Not Processed, 1=Normalized, 2=Measured Attenuation Correction, 4=Calculated Attenuation Correction, 8=X smoothing, 16=Y smoothing, 32=Z smoothing, 64=2D scatter correction, 128=3D scatter correction, 256=Arc correction, 512=Decay correction, 1024=Online compression)

Property of type: `int`

r_wave_offset

R wave offset (For phase sliced studies, average, in msec)

Property of type: `int`

recon_type

Enumerated type (0=Filtered backprojection, 1=Forward projection 3D (PROMIS), 2=Ramp 3D, 3=FA-VOR 3D, 4=SSRB, 5=Multi-slice rebinning, 6=FORE)

Property of type: `int`

recon_views

Number of views used to reconstruct the data

Property of type: `int`

recon_zoom

Reconstruction magnification factor (zoom)

Property of type: `float`

resolution

Property of type: *listing of `xnat.classes.PetScanDataParametersResolution`*

rfilter

Property of type: *listing of `xnat.classes.PetScanDataParametersRfilter`*

scatter_type

Enumerated type (0=None, 1=Deconvolution, 2=Simulated, 3=Dual Energy)

Property of type: `int`

system_type

Scanner model (i.e., 951, 951R, 953, 953B, 921, 922, 925, 961, 962, 966)

Property of type: `int`

transaxial_fov

Diameter (in cm.) of transaxial view

Property of type: `float`

zfilter

Property of type: *listing of `xnat.classes.PetScanDataParametersZfilter`*

zrotation_angle

Rotation in the xy plane (in degrees). Use righthand coordinate system for rotation angle sign.

Property of type: `float`

```
class xnat.classes.PetScanDataParametersDimensions (uri=None,    xnat_session=None,
                                                    id_=None,      datafields=None,
                                                    parent=None,   fieldname=None,
                                                    overwrites=None, **kwargs)
```

Bases: *`xnat.classes.XNATSubObjectMixin`*

num

Number of dimensions

Property of type: `int`

x

Dimension along x axis

Property of type: `int`

y

Dimension along y axis

Property of type: `int`

z

Dimension along z axis

Property of type: `int`

```

class xnat.classes.PetScanDataParametersFilter (uri=None,          xnat_session=None,
                                                id_=None,    datafields=None,    par-
                                                ent=None,    fieldname=None,    over-
                                                writes=None, **kwargs)

Bases: xnat.classes.XNATSubObjectMixin

cutoff
    Cutoff frequency
    Property of type: float

class xnat.classes.PetScanDataParametersFrames (uri=None,          xnat_session=None,
                                                id_=None,    datafields=None,    par-
                                                ent=None,    fieldname=None,    over-
                                                writes=None, **kwargs)

Bases: xnat.classes.XNATSubObjectMixin

frame
    listing of xnat.classes.PetScanDataParametersFramesFrame

num_frames
    Property of type: str

class xnat.classes.PetScanDataParametersFramesFrame (uri=None,  xnat_session=None,
                                                        id_=None,    datafields=None,
                                                        parent=None, fieldname=None,
                                                        overwrites=None, **kwargs)

Bases: xnat.classes.XNATSubObjectMixin

length
    Property of type: float

number
    Property of type: str

starttime
    Property of type: float

units
    Property of type: str

class xnat.classes.PetScanDataParametersOffset (uri=None,          xnat_session=None,
                                                id_=None,    datafields=None,    par-
                                                ent=None,    fieldname=None,    over-
                                                writes=None, **kwargs)

Bases: xnat.classes.XNATSubObjectMixin

x
    Offset in x axis for recon target (in cm)
    Property of type: float

y
    Offset in y axis for recon target (in cm)
    Property of type: float

z
    Offset in z axis for recon target (in cm)
    Property of type: float

```

```
class xnat.classes.PetScanDataParametersPixelsize (uri=None,      xnat_session=None,
                                                    id_=None,      datafields=None,
                                                    parent=None,   fieldname=None,
                                                    overwrites=None, **kwargs)
```

Bases: *xnat.classes.XNATSubObjectMixin*

x

X dimension pixel size (in cm)

Property of type: *float*

y

Y dimension pixel size (in cm)

Property of type: *float*

z

Z dimension pixel size (in cm)

Property of type: *float*

```
class xnat.classes.PetScanDataParametersResolution (uri=None,    xnat_session=None,
                                                    id_=None,    datafields=None,
                                                    parent=None,  fieldname=None,
                                                    overwrites=None, **kwargs)
```

Bases: *xnat.classes.XNATSubObjectMixin*

x

Resolution in the x dimension (in cm)

Property of type: *float*

y

Resolution in the y dimension (in cm)

Property of type: *float*

z

Resolution in the z dimension (in cm)

Property of type: *float*

```
class xnat.classes.PetScanDataParametersRfilter (uri=None,      xnat_session=None,
                                                    id_=None,    datafields=None,  par-
                                                    ent=None,   fieldname=None, over-
                                                    writes=None, **kwargs)
```

Bases: *xnat.classes.XNATSubObjectMixin*

code

Property of type: *int*

cutoff

Property of type: *float*

order

Property of type: *int*

resolution

Property of type: *float*

```
class xnat.classes.PetScanDataParametersZfilter (uri=None,      xnat_session=None,
                                                    id_=None,    datafields=None,  par-
                                                    ent=None,   fieldname=None, over-
                                                    writes=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

code
Property of type: `int`

cutoff
Property of type: `float`

order
Property of type: `int`

resolution
Property of type: `float`

```
class xnat.classes.PetSessionData (uri=None,          xnat_session=None,          id_=None,
                                   datafields=None, parent=None, fieldname=None, over-
                                   writes=None, **kwargs)
```

Bases: `xnat.classes.ImageSessionData`

blood_glucose
Property of type: `float`

blood_glucose_time
Property of type: `datetime.datetime`

blood_glucose_units
Property of type: `str`

patient_id
Patient identification descriptor
Property of type: `str`

patient_name
Patient name (free format ASCII)
Property of type: `str`

stabilization
Free form text to indicate method used to stabilize head
Property of type: `str`

start_time
Property of type: `datetime.datetime`

start_time_injection
Property of type: `datetime.datetime`

start_time_scan
Property of type: `datetime.datetime`

study_type
Study descriptor
Property of type: `str`

tracer
Radio-Pharmaceutical
Property of type: *listing of `xnat.classes.PetSessionDataTracer`*

```
class xnat.classes.PetSessionDataTracer(uri=None, xnat_session=None, id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

dose

Property of type: `listing` of `xnat.classes.PetSessionDataTracerDose`

intermediate

Property of type: `listing` of `xnat.classes.PetSessionDataTracerIntermediate`

isotope

Property of type: `listing` of `xnat.classes.PetSessionDataTracerIsotope`

name

Property of type: `str`

specific_activity

Property of type: `float`

start_time

Property of type: `datetime.datetime`

total_mass

Property of type: `listing` of `xnat.classes.PetSessionDataTracerTotalmass`

transmissions

Property of type: `int`

transmissions_starttime

Property of type: `datetime.datetime`

```
class xnat.classes.PetSessionDataTracerDose(uri=None, xnat_session=None, id_=None,
                                             datafields=None, parent=None, field-
                                             name=None, overwrites=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

units

Property of type: `str`

```
class xnat.classes.PetSessionDataTracerIntermediate(uri=None, xnat_session=None,
                                                    id_=None, datafields=None,
                                                    parent=None, fieldname=None,
                                                    overwrites=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

units

Property of type: `str`

```
class xnat.classes.PetSessionDataTracerIsotope(uri=None, xnat_session=None,
                                                id_=None, datafields=None, par-
                                                ent=None, fieldname=None, over-
                                                writes=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

half_life

half-life in seconds

Property of type: `float`

```
class xnat.classes.PetSessionDataTracerTotalmass (uri=None,      xnat_session=None,
                                                id_=None,  datafields=None,  par-
                                                ent=None,  fieldname=None,  over-
                                                writes=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

units

Property of type: `str`

```
class xnat.classes.PetmrSessionData (uri=None,      xnat_session=None,      id_=None,
                                      datafields=None,  parent=None,  fieldname=None,
                                      overwrites=None, **kwargs)
```

Bases: `xnat.classes.ImageSessionData`

blood_glucose

Property of type: `float`

blood_glucose_time

Property of type: `datetime.datetime`

blood_glucose_units

Property of type: `str`

coil

Free form text to indicate the coil used in this scanning session

Property of type: `str`

field_strength

Free form text to indicate the field strength used in this scanning session

Property of type: `str`

marker

Free form text to indicate method used to mark left-right (e.g. Vitamin E capsule)

Property of type: `str`

patient_id

Patient identification descriptor

Property of type: `str`

patient_name

Patient name (free format ASCII)

Property of type: `str`

stabilization

Free form text to indicate method used to stabilize head

Property of type: `str`

start_time

Property of type: `datetime.datetime`

start_time_injection

Property of type: `datetime.datetime`

start_time_scan

Property of type: `datetime.datetime`

study_type

Study descriptor

Property of type: `str`

tracer
Radio-Pharmaceutical

Property of type: *listing of `xnat.classes.PetmrSessionDataTracer`*

```
class xnat.classes.PetmrSessionDataTracer(uri=None, xnat_session=None, id_=None,
                                          datafields=None, parent=None, field-
                                          name=None, overwrites=None, **kwargs)
```

Bases: *`xnat.classes.XNATSubObjectMixin`*

dose
Property of type: *listing of `xnat.classes.PetmrSessionDataTracerDose`*

intermediate
Property of type: *listing of `xnat.classes.PetmrSessionDataTracerIntermediate`*

isotope
Property of type: *listing of `xnat.classes.PetmrSessionDataTracerIsotope`*

name
Property of type: `str`

specific_activity
Property of type: `float`

start_time
Property of type: `datetime.datetime`

total_mass
Property of type: *listing of `xnat.classes.PetmrSessionDataTracerTotalmass`*

transmissions
Property of type: `int`

transmissions_starttime
Property of type: `datetime.datetime`

```
class xnat.classes.PetmrSessionDataTracerDose(uri=None, xnat_session=None,
                                              id_=None, datafields=None, par-
                                              ent=None, fieldname=None, over-
                                              writes=None, **kwargs)
```

Bases: *`xnat.classes.XNATSubObjectMixin`*

units
Property of type: `str`

```
class xnat.classes.PetmrSessionDataTracerIntermediate(uri=None,
                                                      xnat_session=None,
                                                      id_=None, datafields=None,
                                                      parent=None, field-
                                                      name=None, over-
                                                      writes=None, **kwargs)
```

Bases: *`xnat.classes.XNATSubObjectMixin`*

units
Property of type: `str`

```
class xnat.classes.PetmrSessionDataTracerIsotope(uri=None, xnat_session=None,
                                                  id_=None, datafields=None, par-
                                                  ent=None, fieldname=None, over-
                                                  writes=None, **kwargs)
```


Bases: `xnat.classes.XNATSubObjectMixin`

half_life

half-life in seconds

Property of type: `float`

```
class xnat.classes.PetmrSessionDataTracerTotalmass (uri=None,    xnat_session=None,
                                                    id_=None,    datafields=None,
                                                    parent=None,   fieldname=None,
                                                    overwrites=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

units

Property of type: `str`

```
class xnat.classes.PossibleValueString (uri=None,    xnat_session=None,    id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

possible_value

Property of type: `str`

```
class xnat.classes.ProjectData (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, name=None, **kwargs)
```

Bases: `xnat.classes.XNATObjectMixin`, `xnat.mixin.ProjectData`

active

Property of type: `bool`

aliases

listing of `xnat.classes.ProjectDataAliases`

description

Property of type: `str`

fields

listing of `xnat.classes.ProjectDataFields`

investigators

listing of `xnat.classes.InvestigatorData`

keywords

Property of type: `str`

name

Property of type: `str`

pi

Property of type: *listing of `xnat.classes.InvestigatorData`*

publications

listing of `xnat.classes.PublicationResource`

secondary_id

Property of type: `str`

study_protocol

listing of `xnat.classes.AbstractProtocol`

type

Property of type: `str`

```
class xnat.classes.ProjectDataAliases (uri=None,      xnat_session=None,      id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin

    source
        Property of type: str

class xnat.classes.ProjectDataFields (uri=None,      xnat_session=None,      id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin

    name
        Property of type: str

class xnat.classes.ProjectParticipant (uri=None,      xnat_session=None,      id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)
    Bases: xnat.classes.XNATNestedObjectMixin

    group
        Property of type: str

    label
        Property of type: str

    project
        Property of type: str

    subject_id
        Property of type: str

class xnat.classes.PublicationResource (uri=None,      xnat_session=None,      id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, data_dir=None, up-
                                         load_method=None, **kwargs)
    Bases: xnat.classes.AbstractResource

    abstract
        Property of type: str

    citation
        Property of type: str

    commentary
        Property of type: str

    doi
        Property of type: str

    is_primary
        Property of type: bool

    medline
        Property of type: str

    other
        Property of type: str

    pubmed
        Property of type: str
```

```

title
    Property of type: str

type
    Property of type: str

class xnat.classes.QcAssessmentData (uri=None,      xnat_session=None,      id_=None,
                                     datafields=None, parent=None,  fieldname=None,
                                     overwrites=None, **kwargs)

    Bases: xnat.classes.MrAssessorData

scans
    listing of xnat.classes.QcAssessmentDataScans

type
    Property of type: str

class xnat.classes.QcAssessmentDataScans (uri=None,  xnat_session=None,  id_=None,
                                           datafields=None, parent=None, fieldname=None,
                                           overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

id
    Property of type: str

scan_statistics
    Property of type: listing of xnat.classes.AbstractStatistics

slice_qc
    listing of xnat.classes.QcAssessmentDataScansScanSliceqc

class xnat.classes.QcAssessmentDataScansScanSliceqc (uri=None,  xnat_session=None,
                                                         id_=None,    datafields=None,
                                                         parent=None,  fieldname=None,
                                                         overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

number
    Property of type: str

slice_statistics
    Property of type: listing of xnat.classes.AbstractStatistics

class xnat.classes.QcManualAssessorData (uri=None,  xnat_session=None,  id_=None,
                                           datafields=None, parent=None, fieldname=None,
                                           overwrites=None, **kwargs)

    Bases: xnat.classes.ImageAssessorData

comments
    Property of type: str

incidental_findings
    Possible clinical findings made during Quality Control. Not necessarily authorizative or clinical diagnoses.
    Further investigation required.

    Property of type: str

pass_
    Property of type: str

payable
    Property of type: str

```

rater
Property of type: `str`

rescan
Property of type: `str`

resolvable
Property of type: `str`

retrain
Property of type: `str`

scans
listing of `xnat.classes.QcScanData`

stereotactic_marker
Marker placed and located correctly.
Property of type: `str`

class `xnat.classes.QcScanData` (`uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs`)
Bases: `xnat.classes.XNATNestedObjectMixin`

comments
Property of type: `str`

coverage
Property of type: `str`

fields
listing of `xnat.classes.QcScanDataFields`

image_scan_id
Property of type: `str`

motion
Property of type: `str`

other_image_artifacts
Property of type: `str`

pass_
Property of type: `str`

rater
Property of type: `str`

rating
Property of type: *listing of `xnat.classes.QcScanDataRating`*

class `xnat.classes.QcScanDataFields` (`uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs`)
Bases: `xnat.classes.XNATSubObjectMixin`

name
Property of type: `str`

class `xnat.classes.QcScanDataRating` (`uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs`)
Bases: `xnat.classes.XNATSubObjectMixin`

```

scale
    Property of type: str
class xnat.classes.RatingString (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin
rating
    Property of type: str
class xnat.classes.ReconstructedImageData (uri=None, xnat_session=None, id_=None,
                                              datafields=None, parent=None, field-
                                              name=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATObjectMixin
base_scan_type
    Property of type: str
computations
    listing of xnat.classes.ComputationData
id
    Property of type: str
image_session_id
    Property of type: str
in_
    listing of xnat.classes.AbstractResource
in_scans
    listing of str
out
    listing of xnat.classes.AbstractResource
parameters
    listing of xnat.classes.AddField
provenance
    Property of type: listing of xnat.classes.Process
type
    Property of type: str
class xnat.classes.RegionResource (uri=None, xnat_session=None, id_=None,
                                      datafields=None, parent=None, fieldname=None, over-
                                      writes=None, **kwargs)
    Bases: xnat.classes.XNATNestedObjectMixin
baseimage
    the details of the file against which this region was created
    Property of type: listing of xnat.classes.AbstractResource
creator
    Property of type: listing of xnat.classes.RegionResourceCreator
file
    details of the region file
    Property of type: listing of xnat.classes.AbstractResource

```

hemisphereProperty of type: `str`**name**

Name of the region eg Brainstem

Property of type: `str`**session_id**Property of type: `str`**subregionlabels***listing* of `xnat.classes.RegionResourceSubregionlabels`

```
class xnat.classes.RegionResourceCreator(uri=None, xnat_session=None, id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`**firstname**Property of type: `str`**lastname**Property of type: `str`

```
class xnat.classes.RegionResourceSubregionlabels(uri=None, xnat_session=None,
                                                  id_=None, datafields=None, par-
                                                  ent=None, fieldname=None, over-
                                                  writes=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`**hemisphere**Property of type: `str`**id**Property of type: `str`

```
class xnat.classes.Resource(uri=None, xnat_session=None, id_=None, datafields=None, par-
                             ent=None, fieldname=None, overwrites=None, data_dir=None, up-
                             load_method=None, **kwargs)
```

Bases: `xnat.classes.AbstractResource`**cache_path**Property of type: `str`**content**

Code indicating the contents of the image. E.g. GFC, T88

Property of type: `str`**description**

Free-form comments about file

Property of type: `str`**format**

Format of file. E.g. DICOM, Analyze, 4dfp

Property of type: `str`**provenance**Property of type: *listing* of `xnat.classes.Process`

```
class xnat.classes.ResourceCatalog (uri=None,          xnat_session=None,          id_=None,
                                     datafields=None, parent=None, fieldname=None, over-
                                     writes=None, data_dir=None, upload_method=None,
                                     **kwargs)
```

Bases: *xnat.classes.Resource*

```
class xnat.classes.ResourceSeries (uri=None,          xnat_session=None,          id_=None,
                                    datafields=None, parent=None, fieldname=None, over-
                                    writes=None, data_dir=None, upload_method=None,
                                    **kwargs)
```

Bases: *xnat.classes.AbstractResource*

cache_path

Property of type: *str*

content

Code indicating the contents of the image. E.g. GFC, T88

Property of type: *str*

count

Property of type: *int*

description

Free-form comments about files

Property of type: *str*

format

Format of file. E.g. DICOM, Analyze, 4dfp

Property of type: *str*

name

Property of type: *str*

path

Property of type: *str*

pattern

Property of type: *str*

```
class xnat.classes.RfScanData (uri=None, xnat_session=None, id_=None, datafields=None, par-
                               ent=None, type=None, **kwargs)
```

Bases: *xnat.classes.ImageScanData*

```
class xnat.classes.RfSessionData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None, fieldname=None, overwrites=None,
                                   **kwargs)
```

Bases: *xnat.classes.ImageSessionData*

```
class xnat.classes.RtImageScanData (uri=None,          xnat_session=None,          id_=None,
                                     datafields=None, parent=None, type=None, **kwargs)
```

Bases: *xnat.classes.ImageScanData*

```
class xnat.classes.RtSessionData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None, fieldname=None, overwrites=None,
                                   **kwargs)
```

Bases: *xnat.classes.ImageSessionData*

```
class xnat.classes.SamplingIntervalFloat (uri=None, xnat_session=None, id_=None,
                                             datafields=None, parent=None, fieldname=None,
                                             overwrites=None, **kwargs)
```

Bases: *xnat.classes.XNATSubObjectMixin*

sampling_interval

Property of type: `float`

```
class xnat.classes.SamplingRateFloat (uri=None,      xnat_session=None,      id_=None,
                                     datafields=None, parent=None,  fieldname=None,
                                     overwrites=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

sampling_rate

Property of type: `float`

```
class xnat.classes.ScScanData (uri=None, xnat_session=None, id_=None, datafields=None, par-
                               ent=None, type=None, **kwargs)
```

Bases: `xnat.classes.ImageScanData`

```
class xnat.classes.ScannerString (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None,  fieldname=None,  overwrites=None,
                                   **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

scanner

Property of type: `str`

```
class xnat.classes.SegScanData (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, type=None, **kwargs)
```

Bases: `xnat.classes.ImageScanData`

```
class xnat.classes.ShareString (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, fieldname=None, overwrites=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

share

Property of type: `str`

```
class xnat.classes.SmScanData (uri=None, xnat_session=None, id_=None, datafields=None, par-
                               ent=None, type=None, **kwargs)
```

Bases: `xnat.classes.ImageScanData`

```
class xnat.classes.SmSessionData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None,  fieldname=None,  overwrites=None,
                                   **kwargs)
```

Bases: `xnat.classes.ImageSessionData`

```
class xnat.classes.SrScanData (uri=None, xnat_session=None, id_=None, datafields=None, par-
                               ent=None, type=None, **kwargs)
```

Bases: `xnat.classes.ImageScanData`

```
class xnat.classes.SrSessionData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None,  fieldname=None,  overwrites=None,
                                   **kwargs)
```

Bases: `xnat.classes.ImageSessionData`

```
class xnat.classes.StatisticsData (uri=None,      xnat_session=None,      id_=None,
                                   datafields=None, parent=None,  fieldname=None, over-
                                   writes=None, **kwargs)
```

Bases: `xnat.classes.AbstractStatistics`

add_field

listing of `xnat.classes.StatisticsDataAddfield`

additional_statistics

listing of `xnat.classes.StatisticsDataAdditionalstatistics`


```

max
    Property of type: float

mean
    Property of type: float

min
    Property of type: float

no_of_voxels
    Property of type: int

snr
    Property of type: float

stddev
    Property of type: float

class xnat.classes.StatisticsDataAddfield (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

    name
        Property of type: str

class xnat.classes.StatisticsDataAdditionalstatistics (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

    name
        Property of type: str

class xnat.classes.StudyProtocol (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)

    Bases: xnat.classes.AbstractProtocol

    acq_conditions
        listing of xnat.classes.StudyProtocolAcqconditions

    image_session_types
        listing of xnat.classes.StudyProtocolImagesessiontypes

    subject_groups
        listing of xnat.classes.StudyProtocolSubjectgroups

    subject_variables
        listing of xnat.classes.StudyProtocolSubjectvariables

class xnat.classes.StudyProtocolAcqconditions (uri=None, xnat_session=None, id_=None, datafields=None, parent=None, fieldname=None, overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

    description
        Property of type: str

```

```
    id
        Property of type: str

    name
        Property of type: str

class xnat.classes.StudyProtocolImagesessiontypes (uri=None,      xnat_session=None,
                                                    id_=None,      datafields=None,
                                                    parent=None,    fieldname=None,
                                                    overwrites=None, **kwargs)

Bases: xnat.classes.XNATSubObjectMixin

    description
        Property of type: str

    id
        Property of type: str

    name
        Property of type: str

class xnat.classes.StudyProtocolSubjectgroups (uri=None,      xnat_session=None,
                                                id_=None,      datafields=None,    par-
                                                ent=None,    fieldname=None,    over-
                                                writes=None, **kwargs)

Bases: xnat.classes.XNATSubObjectMixin

    description
        Property of type: str

    id
        Property of type: str

    name
        Property of type: str

class xnat.classes.StudyProtocolSubjectvariables (uri=None,      xnat_session=None,
                                                  id_=None,      datafields=None,    par-
                                                  ent=None,    fieldname=None,    over-
                                                  writes=None, **kwargs)

Bases: xnat.classes.XNATSubObjectMixin

    description
        Property of type: str

    id
        Property of type: str

    name
        Property of type: str

class xnat.classes.SubjectAssessorData (uri=None,      xnat_session=None,      id_=None,
                                         datafields=None,    parent=None,    fieldname=None,
                                         overwrites=None, **kwargs)

Bases: xnat.classes.ExperimentData, xnat.mixin.SubjectAssessorData

    age
        Property of type: float

    subject_id
        Property of type: str
```

```
class xnat.classes.SubjectData(uri=None, xnat_session=None, id_=None, datafields=None,
                               parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATObjectMixin, xnat.mixin.SubjectData
    add_id
        listing of xnat.classes.SubjectDataAddid
    demographics
        Property of type: listing of xnat.classes.AbstractDemographicData
    experiments
        listing of xnat.classes.SubjectAssessorData
    fields
        listing of xnat.classes.SubjectDataFields
    group
        Property of type: str
    initials
        Property of type: str
    investigator
        Property of type: listing of xnat.classes.InvestigatorData
    metadata
        Property of type: listing of xnat.classes.AbstractSubjectMetadata
    project
        Property of type: str
    resources
        listing of xnat.classes.AbstractResource
    sharing
        listing of xnat.classes.ProjectParticipant
    src
        Property of type: str
class xnat.classes.SubjectDataAddid(uri=None, xnat_session=None, id_=None,
                                     datafields=None, parent=None, fieldname=None,
                                     overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin
    name
        Property of type: str
class xnat.classes.SubjectDataFields(uri=None, xnat_session=None, id_=None,
                                       datafields=None, parent=None, fieldname=None,
                                       overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin
    name
        Property of type: str
class xnat.classes.SubjectMetadata(uri=None, xnat_session=None, id_=None,
                                    datafields=None, parent=None, fieldname=None, over-
                                    writes=None, **kwargs)
    Bases: xnat.classes.AbstractSubjectMetadata
    cohort
        Free form text to indicate recruitment/subject pool
```

Property of type: `str`

```
class xnat.classes.SubjectVariablesData(uri=None, xnat_session=None, id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)
```

Bases: `xnat.classes.SubjectAssessorData`

variables

listing of `xnat.classes.SubjectVariablesDataVariables`

```
class xnat.classes.SubjectVariablesDataVariables(uri=None, xnat_session=None,
                                                  id_=None, datafields=None, par-
                                                  ent=None, fieldname=None, over-
                                                  writes=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

name

Property of type: `str`

```
class xnat.classes.TagString(uri=None, xnat_session=None, id_=None, datafields=None, par-
                             ent=None, fieldname=None, overwrites=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

tag

Property of type: `str`

```
class xnat.classes.TotalMassFloat(uri=None, xnat_session=None, id_=None,
                                   datafields=None, parent=None, fieldname=None, over-
                                   writes=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`

total_mass

Property of type: `float`

```
class xnat.classes.UsScanData(uri=None, xnat_session=None, id_=None, datafields=None, par-
                              ent=None, type=None, **kwargs)
```

Bases: `xnat.classes.ImageScanData`

```
class xnat.classes.UsSessionData(uri=None, xnat_session=None, id_=None, datafields=None,
                                  parent=None, fieldname=None, overwrites=None,
                                  **kwargs)
```

Bases: `xnat.classes.ImageSessionData`

```
class xnat.classes.ValidationData(uri=None, xnat_session=None, id_=None,
                                   datafields=None, parent=None, fieldname=None, over-
                                   writes=None, **kwargs)
```

Bases: `xnat.classes.XNATNestedObjectMixin`

date

Property of type: `datetime.date`

method

Property of type: `str`

notes

Property of type: `str`

status

Property of type: `str`

validated_by

Property of type: `str`

```

class xnat.classes.VariableString(uri=None,          xnat_session=None,          id_=None,
                                datafields=None, parent=None, fieldname=None, over-
                                writes=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin

    variable
        Property of type: str

class xnat.classes.VoiceAudioScanData(uri=None,          xnat_session=None,          id_=None,
                                      datafields=None, parent=None, type=None,
                                      **kwargs)
    Bases: xnat.classes.ImageScanData

class xnat.classes.VolumetricRegion(uri=None,          xnat_session=None,          id_=None,
                                    datafields=None, parent=None, fieldname=None,
                                    overwrites=None, **kwargs)
    Bases: xnat.classes.XNATNestedObjectMixin

    hemisphere
        Property of type: str

    name
        Property of type: str

    subregions
        listing of xnat.classes.VolumetricRegionSubregions

    units
        Property of type: str

    voxels
        Property of type: int

class xnat.classes.VolumetricRegionSubregions(uri=None,          xnat_session=None,
                                                id_=None, datafields=None, par-
                                                ent=None, fieldname=None, over-
                                                writes=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin

    name
        Property of type: str

    voxels
        Property of type: float

class xnat.classes.WeightFloat(uri=None, xnat_session=None, id_=None, datafields=None,
                               parent=None, fieldname=None, overwrites=None, **kwargs)
    Bases: xnat.classes.XNATSubObjectMixin

    weight
        Property of type: float

class xnat.classes.XNATNestedObjectMixin(uri=None, xnat_session=None, id_=None,
                                           datafields=None, parent=None, fieldname=None,
                                           overwrites=None, **kwargs)
    Bases: xnat.core.XNATNestedObject

    xnat_session = None

class xnat.classes.XNATObjectMixin(uri=None,          xnat_session=None,          id_=None,
                                   datafields=None, parent=None, fieldname=None, over-
                                   writes=None, **kwargs)
    Bases: xnat.core.XNATObject

```

```

    classmethod query (*constraints)

    xnat_session = None

class xnat.classes.XNATSubObjectMixin (uri=None,      xnat_session=None,      id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)

    Bases: xnat.core.XNATSubObject

    xnat_session = None

class xnat.classes.Xa3DScanData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None, type=None, **kwargs)

    Bases: xnat.classes.ImageScanData

class xnat.classes.Xa3DSessionData (uri=None,      xnat_session=None,      id_=None,
                                      datafields=None, parent=None, fieldname=None, over-
                                      writes=None, **kwargs)

    Bases: xnat.classes.ImageSessionData

class xnat.classes.XaScanData (uri=None, xnat_session=None, id_=None, datafields=None, par-
                                ent=None, type=None, **kwargs)

    Bases: xnat.classes.ImageScanData

    parameters
        Property of type: listing of xnat.classes.XaScanDataParameters

class xnat.classes.XaScanDataParameters (uri=None,      xnat_session=None,      id_=None,
                                         datafields=None, parent=None, fieldname=None,
                                         overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

    contrast_bolus
        Property of type: listing of xnat.classes.ContrastBolus

    derivation
        Text description of how this image was derived

        Property of type: str

    fov
        Property of type: listing of xnat.classes.XaScanDataParametersFov

    image_type
        Property of type: str

    options
        Property of type: str

    orientation
        Orientation(s), separated by comma if multiple

        Property of type: str

    pixel_res
        Property of type: listing of xnat.classes.XaScanDataParametersPixelres

class xnat.classes.XaScanDataParametersFov (uri=None, xnat_session=None, id_=None,
                                              datafields=None, parent=None, field-
                                              name=None, overwrites=None, **kwargs)

    Bases: xnat.classes.XNATSubObjectMixin

    x
        Property of type: int

```

yProperty of type: `int`

```
class xnat.classes.XaScanDataParametersPixelres (uri=None,          xnat_session=None,
                                                id_=None,    datafields=None,  par-
                                                ent=None,    fieldname=None,  over-
                                                writes=None, **kwargs)
```

Bases: `xnat.classes.XNATSubObjectMixin`**units**Property of type: `str`**x**Property of type: `int`**y**Property of type: `int`

```
class xnat.classes.XaSessionData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None,    fieldname=None,    overwrites=None,
                                   **kwargs)
```

Bases: `xnat.classes.ImageSessionData`

```
class xnat.classes.XcScanData (uri=None, xnat_session=None, id_=None, datafields=None, par-
                                ent=None, type=None, **kwargs)
```

Bases: `xnat.classes.ImageScanData`

```
class xnat.classes.XcSessionData (uri=None, xnat_session=None, id_=None, datafields=None,
                                   parent=None,    fieldname=None,    overwrites=None,
                                   **kwargs)
```

Bases: `xnat.classes.ImageSessionData`

```
class xnat.classes.XcvScanData (uri=None, xnat_session=None, id_=None, datafields=None,
                                parent=None, type=None, **kwargs)
```

Bases: `xnat.classes.ImageScanData`

```
class xnat.classes.XcvSessionData (uri=None,          xnat_session=None,          id_=None,
                                   datafields=None, parent=None, fieldname=None, over-
                                   writes=None, **kwargs)
```

Bases: `xnat.classes.ImageSessionData`

```
xnat.classes.current_session()
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