

---

# **decisionengine**

***Release 1.6.99.post6.post9+g4ba38bcd***

**Fermilab**

**Aug 19, 2021**



## CONTENTS

<b>1</b>	<b>Release Notes</b>	<b>3</b>
<b>2</b>	<b>Developer Documentation</b>	<b>17</b>
<b>3</b>	<b>Jenkins CI pipeline</b>	<b>19</b>
<b>4</b>	<b>Source code</b>	<b>25</b>
<b>5</b>	<b>Indices and tables</b>	<b>87</b>
	<b>Python Module Index</b>	<b>89</b>
	<b>Index</b>	<b>93</b>



The Decision Engine is a critical component of the HEP Cloud Facility. It provides the functionality of resource scheduling for disparate resource providers, including those which may have a cost or a restricted allocation of cycles



## RELEASE NOTES

### 1.1 Release Notes

HEPCloud's Decision Engine release notes.

The latest release is the designated production release. Decision Engine will support also N-1. New feature development will happen in the development branch and go in the next (N+1) release.

#### 1.1.1 Release 1.6.2

Patch level (bug fix) release.

##### Issues fixed in this release

Bugs fixed

- [DEM 200](#) (part of it): Invoke correctly channels shutdown: ([75eaa90](#))
- no issue: Use regular expression to support fail\_on\_error feature ([1386d20](#))

Enhancements:

- Improved CI support (e.g. added pylint tests)
- [217](#): Add option to de-client `-print-product` to only print the column names in a data block and-or to print one or more records in key/value format. ([c4c7681](#))

##### Full list of commits since version 1.6.1

[c4c7681](#): Updated de-query-tool w/ cherry pick of fixes from latest version of PR#332

[f964d4b](#): Fixup use of `pytest_postgresql` for version 3.0.0

[635ffd1](#): Also run pylint for extra sanity checks

[11676ff](#): Fixed function w/ the same name

[b8278f6](#): Add de-query-tool

[75eaa90](#): Merge pull request #335 from shreyb/publisher\_shutdown\_from\_1.6

[77e3d79](#): Added `set_to_shutdown` method to TaskManager and accompanying test

[1386d20](#): Merge branch 'knoepfel-fix-fail-on-error' into 1.6

73a18b1: Merge branch 'fix-fail-on-error' of <https://github.com/knoepfel/decisionengine> into knoepfel-fix-fail-on-error

4f49fb7: Merge branch 'jcpunk-finish-setuptools' into 1.6

a5e5d39: Merge branch 'finish-setuptools' of <https://github.com/jcpunk/decisionengine> into jcpunk-finish-setuptools

a1ed252: Merge branch 'vitodb-pylint' into 1.6

c8eddda: Merge branch 'pylint' of <https://github.com/vitodb/decisionengine> into vitodb-pylint Meerging PR#317 to release branch 1.6

d7c43b9: Use regular expression to support fail\_on\_error feature.

ada6692: add support to run pylint tests

efb1e57: Finish migration to pure setuptools

e4dc35e: Merge pull request #314 from jcpunk/jsonnet\_syntax

87e32c2: Merge pull request #294 from jcpunk/move-reaper

dec85d5: Merge pull request #319 from jcpunk/task-loop

4108472: Merge pull request #320 from jcpunk/container-swig

920af1c: Merge pull request #321 from knoepfel/include-init-files

650dfa: Don't forget \_\_init\_\_.py files.

1b412e0: The latest m2crypto seems to need swig now

a6e3ab1: Merge pull request #313 from jcpunk/conf-test

1205636: Simplify run loop

de553a7: fix test\_client\_with\_no\_server\_verbose unit test for Jenkins CI (#315)

30e59dc: fix test\_client\_with\_no\_server\_verbose unit test for Jenkins CI (#315)

10384a8: Move reaper into its own place and reuse state logic

250c14b: The \_validate function doesn't permit missing 'PRODUCES'

5ae1ce9: Make sure syntax error in config names the problem

b899fa2: Add SourceProxy module test. (#307)

7b3df14: Increase coverage of utils (#304)

ddba2a3: Fix duplicate entry warning (#311)

915673f: Test modules minimally (#298)

bc0c21a: Some repos may error out, don't let them kill the build (#297)

924a704: doc: add 1.6.1 release notes

b1ab4d3: doc: fix typo

85e5d71: postgresql: do not print stack trace for low level library (#309)

255c641: Setuptools uses entry return value as an error msg (#303)

2fd8db4: Fix name to match expectations (#305)

9cddb70: updated release notes

7fe0358: Error in more clean methods (#300)

84aa506: Fix a bug in setup.py parsing of requirements. (#301)



a58b61b: fix typo in release notes

33660bf: fixed a typo[locuser@fermicloud462 decisionengine]

## 1.1.2 Release 1.6.1

Patch level (bug fix) release.

### Issues fixed in this release

- 306 : /etc/decisionengine/decision\_engine.conf as shipped in RPM is wrong format (de0aef3)
- 275 : Running de-client --stop-channel <channel> results in KeyError (59fb44e)

### Full list of commits since version 1.6.0

d7ccd8a : doc: fix typo

ac48e50 : updated release notes

de0aef3 : Fix name to match expectations (#305)

59fb44e : postgresql: do not print stack trace for low level library (#309) (#310)

2162bbe : Setuptools uses entry return value as an error msg (#308)

b0fd9fb : 1.6.0 package backports (#302)

## 1.1.3 Release 1.6.0

In this release:

- The logic engine has been rewritten in pure python. This removes the last C++ dependency the decision engine had. The build system has been updated accordingly.
- Migrated to setuptools package development library. This build system is the standard vanilla python build system provided with the python distribution. Build configurations have been updated and rpm packaging remains the primary distribution method.
- Completed logging implementation.
- Improvements in error handling and code coverage.
- Improvements in Jenkins and GitHub actions CI/CD pipelines.

### Issues fixed in this release

- 44 : Logic Engine doesn't handle missing values gracefully (743effc)
- 253 : Decision engine can sometimes start up at boot time before network name resolution is working (ae04db5)

## **Full list of commits since version 1.5.0**

2551e07 : More coverage for de-client (#296)  
dde3945 : Make sure actions either complete in time or die (#295)  
381861c : Update Jenkins pipeline configuration (#292)  
eb771f4 : Try to cleanup Dockerfile PATH issue (#291)  
780cb56 : fix unittest doc  
8680942 : update unittest documentation  
8154b24 : Fixup sphinx doc (#290)  
5f7e13a : enhancements in logging and error handling in dataspace dir (#283)  
3d92725 : Add missing runtime requirement (#286)  
743effc : Allow conversion from errors to false values in logic-engine expressions. (#284)  
124dcab : Inherit version from setuptools\_scm if possible (#287)  
3669803 : added missing "" as line continuation  
761f1d9 : Drop invalid **init.py**  
dc0e71b : migrate to setuptools (#264)  
3b6f1bf : Make reaper reset state when starting from stopped proc (#280)  
b2f9061 : added ISO-8601 format to time in logging. changed name of function for better clarity. (#279)  
0a74fe1 : Improved DE client usage (#281)  
ebf53e3 : Added shutdown method to Publisher class (#278)  
f95ab6d : Address some flake8/black reports (#274)  
1c383b7 : Automatically pull in our settings from about.py (#273)  
e71f186 : logging and error handling enhancements to taskmanager directory (#277)  
7de9ab9 : Increase Reaper log verbosity (#267)  
019d245 : Update actions to follow new best practices (#272)  
b84e847 : Avoid possible sync issues in reaper startup (#271)  
891975f : Remove vestigial C++ files. (#270)  
42e5e1f : enhancements in logging and exception handling in newly added logicengine files (#265)  
38effe6 : Ensure the scheduler has started the thread before returning (#269)  
db54fa1 : Start testing on PyPy with psycpg2cffi (#223)  
cc44058 : Squashed commit of the following: (#263)  
d6548e9 : Enhanced logging in the logicengine directory files (#261)  
c341bf7 : Better match our workflow with codecov (#260)  
1fbe44d : Use 'new' syntax for forward compat (#259)  
2294b0b : Do a limited pin on version requirements (#256)  
bcda470 : Python implementation of logic engine (#246)  
c6721b4 : address comment on RB

ae04db5 : Add Wants and After (network-online.target) dependency

1a96b14 : Fix action repodata

a70cee8 : Move to CodeCov.io

7b16b4e : Add Wants and Requires dependencies (#258)

76c3670 : Move to CodeCov.io (#254)

e7ba013 : Fix action repodata (#255)

d7e72f2 : revert 3.9 test

b04154b : added 1.5.0 release notes

a03da29 : remove 3.9 to see if documentatoin gets generated

## 1.1.4 Release 1.5.0

In this release:

- Introduce data product query interface
- Cleanup of Lagic Engine code
- Improvements in error handling
- Improvements in testing and CI

### Issues fixed in this release

- 217 , 218 : Add option to de-client --print-product to only print the column names in a data block and-or to print one or more records in key/value format (fe7abcf)
- 240 : Logic Engine call leads to immediate taskmanager segfault exit (d855aa0)
- 239 : implement data product browsing interface (fe9faa9)

### Full list of commits since version 1.4.1

d66c54b : Add PEP-0396 metadata (#243)

bfc91a6 : More compat between psycopg2/psycopg2cffi (#248)

f5d31a6 : Cleanup Fixture FIXME (#249)

0dfaf3c : Adding docker documentation (#251)

4b166a2 : Since we are python3 only now, drop python-six compat layer (#252)

fe7abcf : Add format support to de-client (#217) (#241)

df5a3d7 : Add wheel support for easier testing (#247)

7de970d : Add place to inject env if need be (#242)

84e2930 : Fix race in test case (#250)

d855aa0 : Fix fact-lookup to support duplicate names in separate rules. (#245)

51370fb : Resolve fixture 'quickstart' issue (#238)

3ea9129 : Move from TravisCI to raw actions (#235)

fe9faa9 : implement data product browsing interface (#239)  
cf0f3c0 : Add support to use custom base docker container to run tests (#234)  
d91722f : Compat with psycpg2cffi (#233)  
7d15a8c : Test failing source proxy. (#232)  
b9a4bbb : Add debug logs for which threads are created #176 (#231)  
6e6f4c9 : Updated Jenkins configuration documentation (#229)  
2d9fd7b : Log if config passed validation #117 (#230)  
60c46d3 : Self-test needs a real namespace to 'import numpy' in new python eval (#228)  
a120077 : Test that the doc actually builds during CI (#227)  
4b6240a : Extend timeout for coverage combine (#226)  
b059696 : Update workflow per changes at github (#225)  
7a71cac : Use newer compilers/runtimes (#224)  
15ffd93 : Add header for strict includes (#222)  
71b141a : Add special PyPy only requirement (#221)  
9dbb932 : Move Python C extension to versioned .so file (#220)  
ea7ade5 : Migrate from boost-python to pybind11 (#215)  
e6b2eae : Add python 3.9 to testing matrix (#219)  
04c8f9c : Add the option to print columns types on de-client (#216)  
8815dc6 : Logic-engine cleanups (#211)  
086d0d5 : fix missing back tick  
54cc084 : modified release notes  
24744cf : Synchronize access to the task managers (#214)  
87a7fda : replde dash with underscore  
743d0fd : try sphinx\_rtd\_theme  
18c7909 : added 1.4.0 release notes  
ff3d491 : force docker pull when building the docker container to make sure to use an updated base layer (#210)

## **1.1.5 Release 1.4.1**

In this release:

- Bug fixes to 1.4.0 release

## Issues fixed in this release

- [213](#) : de-client hangs under certain circumstances in version 1.4 and greater (race condition) ([84ecfe2](#))

## Full list of commits since version 1.4.0

[9799b9a](#) : update release version to 1.4.1

[84ecfe2](#) : Synchronize access to the task managers (#214)

[751b6b8](#) : Address data races; remove need to sleep in unit tests (#205)

## 1.1.6 Release 1.4.0

In this release:

- Improvements in error handling and client/server interactions
- Added log rotation by time
- Improvements in code coverage

## Issues fixed in this release

- [153](#) : Have de-client --print-product return different error message if product does not exist ([18a950c](#))
- [171](#) : yum update on decision engine rpm from python2 to python3 doesn't undo the symlinks ([eb85c97](#))
- [188](#) : Channel debug info now leaks into startup.log ([99d20a5](#))
- [208](#) : Error when trying to run reaper in version 1.4.0 ([84eccf3](#))

## Full list of commits since version 1.3

[84eccf3](#) : Fix typo in reaper script. (#209)

[d836abf](#) : next RC

[926944a](#) : Fix coveralls reporting (#198)

[b95c323](#) : Updating base Dockerfile (#199)

[d302e31](#) : Help jsonnet, which doesn't understand PosixPath objects. (#204)

[2d791a7](#) : Test configuration policies. (#197)

[236e27a](#) : Ensure items are returned in a stable order (#202)

[e974f5f](#) : add pylintr and pycodestyle (#203)

[fbe7616](#) : Test task manager (#196)

[686ca80](#) : require more recent version of pytest-postgresql (#195)

[99d20a5](#) : Fix double-logging problem. (#192)

[4ce3d17](#) : A set of fixtures to simplify unit tests (#183)

[65f8052](#) : Fix typo (#190)

[f3a4be8](#) : Protect against None workers (#187)

ec310fb : remove py3 from package name  
7006489 : bump version to 1.4.0rc  
158d835 : decisionengine/framework/modules: Fix SourceProxy retries (#184)  
1356bf1 : Add support to test any branch in Jenkins (#182)  
692fa8e : Add timeout support for unit test on Jenkins (#181)  
e3d6e6a : Updated Jenkins documentation to take into account unit tests timeout parametr (#180)  
2586a3e : Configuration redesign (#168)  
fac984d : Fix error with DBUtils import. Looks like names of modules changed (#175)  
7d661ee : Move postgres-specific implementation to postgres source. (#174)  
eb85c97 : Rpm (#173)  
10fe843 : Adding log rotation by time (#170)  
a8d239b : Various improvements. (#167)  
d9b92ee : Ignore vim's \*.swp files (#166)  
d9f72ef : Fix call to shutdown\_timeout (and add sample entry to config) (#165)  
3161795 : Add drops for items using tables being dropped (#164)  
77d186d : Show output of test runtimes in travis (#163)  
81820a4 : Allow server to start with no channels. (#161)  
49879a6 : DE server and client usability improvements (#160)  
de91c4f : Add tests to default and override config (#158)  
14df1f6 : Use python fallback for options (#159)  
ac64a92 : Drop python 2.7 integration tests since we are python3 only (#157)  
d963301 : Update Jenkins pipeline to properly test closing PR (#156)  
64248cb : Merge 'runtime' tests into running channel tests (#150)  
065ad77 : Adding Jenkins pipeline documentation (#155)  
18a950c : fix print-product to report non-existing product as such (#154)  
6493735 : Fix invalid attribute name (#152)  
d953c6a : Remove unnecessary set\_start\_method call (#149)  
c8c9b65 : guarantee that process is killed so test never hang (#147)  
f1542b6 : Channel test (#146)  
7f349a8 : Fix faulty TaskManager state type (#145)  
d50f1c4 : fix logging regression introduced in f5e299969e0611e3480e9fa2782052df... (#142)  
becfa26 : Pass the correct type. (#144)  
1a60daf : DecisionEngine: fix typo (#143)  
9e7b867 : Updating Jenkins pipeline configuration (#140)  
e3a6703 : fix regression introduced in f5e299969e0611e3480e9fa2782052df86d7c4ed (#141)  
4900bc6 : Restore runtime test. (#139)

0823f3d : Consolidate DE server/client tests into one file. (#138)

4f84435 : A few more access fixes.

160cfd1 : Fix task manager state access.

c00d819 : A few more cleanups.

ec087e2 : Various cleanups

a309ffe : Improvements to DE client CLI.

## 1.1.7 Release 1.3.0

In this release:

- Introduced Jsonnet based configuration system
- Improved logging
- Improved coverage of datasource

### Full list of commits since version 1.2

239e82c : postgresql: improve SQL query (#133)

668eb1f : Update to make the code compatible with both python and JSON based config files (#129)

afd8837 : Configuration-manager fixes (#128)

571e2be : Remove pip installed system python packages

407d9ed : Update Dockerfile

1fefc69 : Implement unit tests for datablock.py (#122)

43c8d7a : Adjust global configuration to include program-option values. (#126)

2840813 : Switch to Jsonnet configuration system (#125)

5c4ae0e : logging changes: added config file and command line interface (#124)

6697f22 : Further config-manager testing and factorizations. (#123)

fa89fd0 : Insulate multiprocessing test from parent environment. (#120)

139a537 : Allow empty base directory for log file. (#119)

f14d40c : Factorize configuration-loading steps. (#118)

e00afee : Enhance testing and error reporting of ConfigManager (#117)

c3d1be3 : Python 3 upgrades. (#116)

e7399af : Header fix (#114)

0456abf : Adding editor config file, see <https://editorconfig.org/> (#115)

82112d1 : Dockerfile: fetch osg 3.5 repo rpm (#113)

97c21b1 : osg version 3.5 (#112)

33f28a8 : Introduce jsonnet dependency (#110)

3f8b55e : improve server error handling (#108)

f15588e : added 1.2.0 release notes

b433325 : Remove unnecessary 'main' functionality. (#107)

## **1.1.8 Release 1.2.0**

In this release:

- Switched to python3
- Improved coverage
- Database data retention : added reaper to remove data older than configurable number of days
- Improved logging

### **decisionengine**

3dfe167 : Jenkins pipeline improvements (#106)

22a7073 : pull request for review request 137 (#105)

cafff2 : Make it possible to run code directly (for tests), and (#100)

802e98b : replace psycog2 with psycog2-binary (#101)

573ce8f : Jenkins pipeline improvements (#99)

9d08835 : Run coveralls even under failed state (#97)

bc1df4b : Add tests for PostgreSQL datasource (#71)

c1ac391 : Fix missing py-modules.html (#96)

8dbfdee : Setup gh-pages doc workflow (#94)

cd4a01a : Doc (#93)

673080d : set version to 1.2.0 (for now). Supply conf file that corresponds to (#91)

f912225 : Db (#92)

dc8b68a : Add reaper to the RPC (#83) (#90)

29ade91 : adding .Jenkinsfile with Jenkins pipeline configuration (#86)

c1dfe5c : Don't exclude E1004 from pylint, do exclude line breaks (#89)

440f949 : Fix varname (#88)

313d135 : Compress (#87)

6b8dc4b : Revert "Add reaper to the RPC (#83)"

dbea8e5 : Update utils.sh so pytest will complete.

e848316 : Update to postgresql11

7f4b805 : Add reaper to the RPC (#83)

0ba2c51 : remove astpp module and dependencies it pulls in (#81)

6b8eab9 : don't track test coverage of tests (#80)

0da18ec : made reaper.py executable

aca24a3 : make reaper.py executable, make symbolic link to it from /usr/bin (#72)

0202acf : Implementation of data reaper (#70)



16b6be1 : Simple changes for Python 3 deployment (#69)  
 fd2418c : Fix warnings caught by PEP-8 Speaks.  
 d16359b : Python 3 (and other) simplifications.  
 3c7b6b7 : Only run Github Actions for python3.6 (#68)  
 453cbba : Update README.md  
 b27ed53 : remove unnecessary (and atually harmful) python shebang (#66)

## decisionengine\_modules

30d928b : clone version 1.2.0 of decisionengine  
 ae7c5a6 : Jenkins pipeline improvements (#236)  
 310befd : T198 (#235)  
 a65886d : Fix import as reported in : <https://github.com/HEPCloud/decisionengin...> (#232)  
 93711cc : Run coveralls even if tests fail (#229)  
 03d763a : Jenkins pipeline improvements (#230)  
 f48d30f : Fix/223 (#228)  
 c8aa262 : github ticket 199 (#222)  
 0323bda : Address : [https://github.com/HEPCloud/decisionengine\\_modules/issues/224](https://github.com/HEPCloud/decisionengine_modules/issues/224) (#226)  
 62e4df6 : Add support to run CI on Jenkins (#221)  
 5ab1541 : bump master version to 1.2.0 (for now) (#219)  
 bc19c65 : decisionengine\_modules/NERSC: Added retry loop for NERSC API Calls (#220)  
 41a50de : Sync up pep8speaks and run\_pylint.sh with decisionengine settings (#218)  
 db4634f : silence pylint error (#217)  
 1b95141 : Fix whitespace around operator error  
 746ea38 : ignore W503  
 8a8b5f4 : remove unused variable  
 a6668bf : fix PEP8 warnings  
 13773ee : address pep8 warnings  
 6bea4ca : silence pylint error  
 f589895 : Pass sort=True parameter to fix future warning (#215)  
 a1d0507 : fixing pep8 warning  
 a10bd17 : debugging one import error  
 ec501ad : make coveralls.io links work  
 deab1a7 : T201 (#204)  
 69f2645 : Add coveragerc  
 6d8a5f5 : decisionengine\_modules/NERSC: Make Nersc API call backward-compatible with old config (#196)  
 a7e0af9 : Only run Github Actions for python3.6 (#24)

## 1.1.9 Release 1.1.0

In this release:

- Fixed. [https://github.com/HEPCloud/decisionengine\\_modules/issues/108](https://github.com/HEPCloud/decisionengine_modules/issues/108) “Supply Postgres script to delete fields in main database before a certain date”
- significant code cleanup and pep8 compliance
- unit test work
- CI (GitHub actions and Travis) is introduced

commits

f894b1d : Skip unittest (#77)

632e64b : Add ipython

f681a79 : Make python 2.7 tests run on 1.1 branch

d6a32c0 : implementation of data reaper (#75)

2ad8614 : Use sparse checkout for first checkout to get .github/actions (#65)

812f032 : Cat output of pytest log Exit pylint entrypoint with the line count of pep8 and pylint logs Deal with (detach from ...) Only tar up (S)RPMS dirs for rpm build.

6b05ec7 : Fix errors reported by run\_pylint (#62)

d9f5b66 : Setup pep8speaks

c3b8ac2 : Run github actions as non-root uid. Install packages in virtualenv and remove system rpms.

ae01f9e : Support Python 3 for Boost Python

579761c : Support Python 3 for Boost Python

044b979 : Remove unnecessary using declarations.

00f6d00 : Add extra header dependency due to Boost Python ommission.

24e0795 : Apply clang-format

17c17f9 : Remove JSON dependency.

faa0b22 : Massive cleanup.

07b555f : Updates to Github Actions to allow building with python3.6

fef6c11 : Fix errors when running pylint.sh multiple times

da6f077 : Autopep8 -i fixes

39fe5b3 : TaskManager: fix calling log\_exception with correct number of arguments and minor format changes to reduce PEP8 warnings

17396da : logiceengine: get rid of compuler warnings

01dc3d1 : Only track what we need

b609d73 : Configure coveralls (and some minor cleanup)

bd9ed5e : Many C++ cleanups

2a61876 : Add Badges

c864f27 : Do not call pytest fixtures directly.

307db5f : white space fix

882b58f : fix unit tests

1da687c : Replace Boost facilities with C++ STL ones.

5a6e6b1 : Run tests on push

8404245 : Add missing Boost regex library dependency.

ceb5fe7 : Apply clang-format to files that were missed earlier.

3de9940 : Apply clang-format to C++ code.

8a8f560 : Cache venv directory instead

ad017ce : Build private boost for testing

928c64a : Test pip cache

358939a : Adjust CMakeLists.txt files to use correct Python versions

9f0ddb3 : Add pylint github action.

5e6ce4a : Remove more unused C++ files.

63717fe : Setup travis to use new cmake var

74fab2a : Use cmake argument -DPYVER=3.6 to build python3 library <https://fermicloud140.fnal.gov/reviews/r/31/>

843f30c : Minor cleanups per travis-lint

a538cac : Remove unused C++ files.

4c9d125 : Update repo where action is taken from

87fb2d9 : Update rpms installed in docker image. Update entrypoint.sh to use cmake3.

199ee87 : Find python3 libraries using cmake3 from epel rpm Also need to install python3-devel

4c79d2c : Remove unused GNUmakefiles.

94342ee : Add unit test as a Github Action

1a0e102 : more advanced travis.yml

0be413f : Add helper file for pip

7794327 : Make recursive import happy

7005c78 : Add simple target

de8b0fa : python3 compliance: replace string.join() where appropriate, handle UserDict

2662e6c : note required packages

3b87119 : Add missing header includes.

3e79b84 : Remove defunct code and its tests

b1dbe1a : Ensure attribs are defined at **init**

c4ad78a : Correct logger arguments do avoid duplicate string parse

a8dcc67 : Remove unused imports (per pylint)

d3502b5 : Remove obsolete CVS directories.

d744111 : add six module to the list of required modules

0a9b1e8 : Fix class declaration

b83157e : Handle metaclasses

549f33b : Add config for Travis CI

ee71044 : Drop trailing white space

3f82af6 : Python3 forward compatible syntax

28bf291 : Add safe (for python 2.7) python3 compatible syntax

1d1d76f : prepare for python3

## DEVELOPER DOCUMENTATION



## JENKINS CI PIPELINE

### 3.1 Decisionengine CI with Jenkins pipeline

Jenkins dashboard with Decisionengine framework CI results is available [here](#).

A CI build is triggered any time a PR is created/closed or a commit is made to an existing PR. There are also *nightly CI builds* to test a list of predefined branches.

The Jenkins pipeline runs *pylint* and *unit\_tests* test suites alongside the *rpmbuild* stage.

The Jenkins dashboard looks like this:

Jenkins > CI > decisionengine\_pipeline

[Back to Dashboard](#)  
[Status](#)  
[Changes](#)  
[Build with Parameters](#)  
[Delete Pipeline](#)  
[Configure](#)  
[Full Stage View](#)  
[GitHub](#)  
[Job Config History](#)  
[Rename](#)  
[GitHub PR](#)  
[Pipeline Syntax](#)  
[GitHub PR Polling Log](#)  
[Set Next Build Number](#)

## Pipeline decisionengine\_pipeline

DE pipeline

**Last Successful Artifacts**

mail.results	2.04 KB	<a href="#">view</a>
pep8.merge150.log	0 B	<a href="#">view</a>
pylint.merge150.log	0 B	<a href="#">view</a>
pytest.log	7.89 KB	<a href="#">view</a>
results.merge150.log	5.16 KB	<a href="#">view</a>
rpmbuild.tar	1.37 MB	<a href="#">view</a>

**Recent Changes**

### Stage View

Average stage times:  
(Average full run time: ~27min 25s)

	Declarative: Checkout SCM	DE tests	pylint	unit_tests	rpmbuild
319#PR#150 Sep 02 17:00 No Changes	1s	51ms	15min 17s	13min 24s	9min 44s
318#PR#150 Sep 02 16:36 No Changes	602ms	49ms	12min 45s	13min 49s failed	6min 20s
317#PR#150 Sep 02 16:25 No Changes	617ms	49ms	27min 5s	23min 43s	19min 15s
316#PR#150 Sep 02 16:23 No Changes	1s	54ms	21min 14s	20min 1s	15min 5s
315#PR#150 Sep 02 16:16 No Changes	1s	54ms	21min 4s	18min 41s	14min 36s
314#PR#150 Sep 02 16:10 No Changes	2s	57ms	22min 32s	19min 24s	14min 31s
313#PR#150 Sep 02 16:08 4 commits	921ms	55ms	16min 43s	14min 16s	7min 23s
312#PR#149 Sep 02 16:08 4 commits	789ms	42ms	16min 56s	14min 11s	8min 17s

**Build History** [trend](#)

find

- 319#PR#150 Sep 2, 2020 5:00 PM [#150](#)
- 318#PR#150 Sep 2, 2020 4:36 PM [#150](#)
- 317#PR#150 Sep 2, 2020 4:25 PM [#150](#)
- 316#PR#150 Sep 2, 2020 4:23 PM [#150](#)
- 315#PR#150 Sep 2, 2020 4:16 PM [#150](#)
- 314#PR#150 Sep 2, 2020 4:10 PM [#150](#)
- 313#PR#150 Sep 2, 2020 4:08 PM [#150](#)
- 312#PR#149 Sep 2, 2020 3:38 PM [#149](#)
- 311#PR#149 Sep 2, 2020 3:31 PM [#149](#)
- 310#PR#149 Sep 2, 2020 3:23 PM [#149](#)
- 309#PR#147 Sep 2, 2020 12:42 PM [#147](#)

On the bottom left side there is the list of recent CI builds that are named after the PR or the branch tested.

On the bottom right side the dashboard shows for each CI build detailed status for each test suite.

Hovering the mouse over the *status box* for each CI build stage, a tool-tip with a button to access log details shows up.

Next to the build number the symbol  gives access to a menu with the list of artifacts stored for that build. Those artifacts include logs and the tarball with RPMs.

From the panel on the left side it is possible to access the PR on GitHub by clicking on the PR icon that looks like this  [#142](#).

On occasion it could be useful to trigger a manual CI build to test a branch on the official DE GitHub repository or on the user fork. For this purpose, on the top left panel the user can click on the  **Build with Parameters** button, and this panel shows up



# Pipeline decisionengine\_pipeline

This build requires parameters:

DOCKER_IMAGE	<input type="text" value="vitodb/decision-engine-ci:jenkins"/>
	Docker image name to use. Default is: vitodb/decision-engine-ci:jenkins
DE_REPO	<input type="text" value="https://github.com/HEPCloud/decisionengine/"/>
	Decisionengine repo. Default is: https://github.com/HEPCloud/decisionengine/
BRANCH	<input type="text" value="master"/>
	Branch to test. Default is: master
PYTEST_TIMEOUT	<input type="text" value="300"/>
	Timeout in seconds for unit_tests (it applies to individual unit test) Default is: 300

Build

the user can modify these parameters to customize what code to test with the CI build.

The *DE\_REPO* parameter can point to the user fork or to the main repository.

The *BRANCH* parameter can point to the desired branch to test.

The *PYTEST\_TIMEOUT* parameter is the timeout in seconds for *unit\_tests*.

When ready, by clicking on the *Build* button, the CI build will start.

The [pipeline configuration](#) is part of the decisionengine repo.

### 3.1.1 Nightly CI build configuration

The nightly CI build for Decisionengine framework uses this [Jenkins project](#) that triggers a CI build using the Jenkins pipeline described above to test a list of predefined branches.

**Jenkins** ▸ CI ▸ decisionengine\_ci ▸

Back to Dashboard

Status

Changes

Workspace

Build Now

Configure

Delete Multi-configuration project

Rebuild Last

Job Config History

Rename

Set Next Build Number

## Project decisionengine\_ci

Decision Engine CI running inside dedicated docker container

## Configurations

BRANCH=master BRANCH=1.4

## Subprojects

### Static

- decisionengine\_modules\_pipeline(non-blocking)
- decisionengine\_pipeline(non-blocking)

## Permalinks

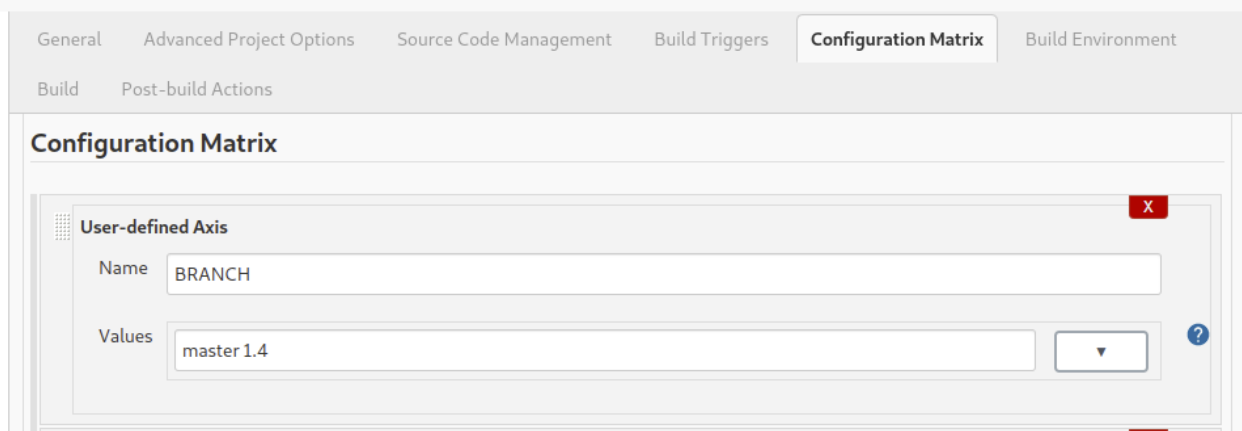
- Last build (#295), 7 hr 6 min ago
- Last stable build (#295), 7 hr 6 min ago
- Last successful build (#295), 7 hr 6 min ago
- Last completed build (#295), 7 hr 6 min ago

Build History trend ^

find

#295	<a href="#">Nov 19, 2020 2:23 AM</a>
#294	<a href="#">Nov 18, 2020 2:23 AM</a>
#293	<a href="#">Nov 17, 2020 2:23 AM</a>

Branches to test are defined using the project matrix as shown in the picture below. Each branch in the list (here *master* and *1.4*) spawns an independent CI build.

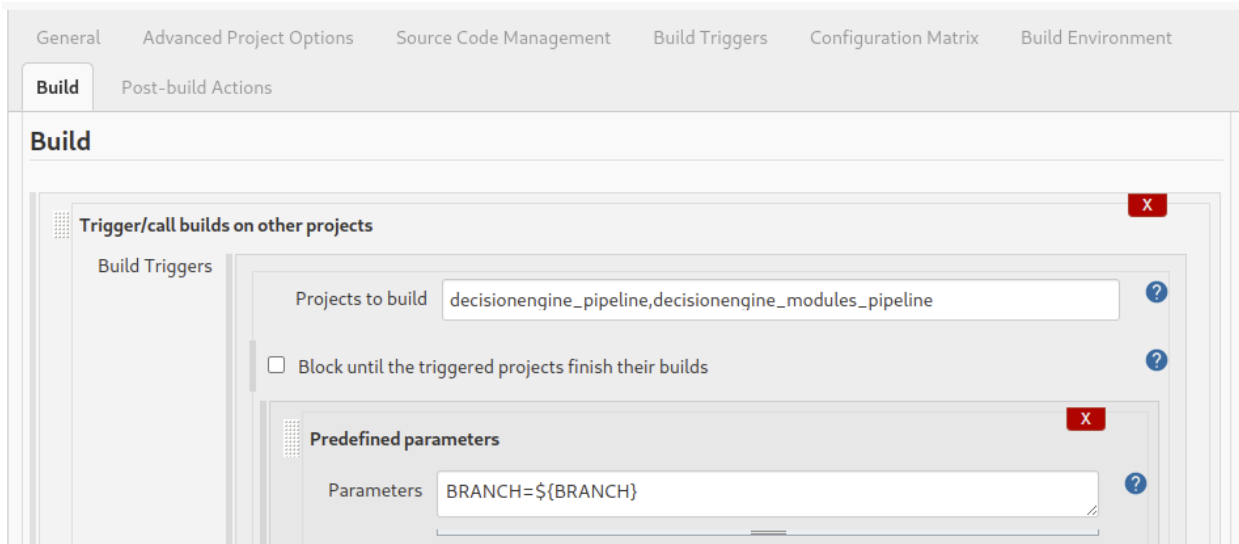


The screenshot shows the Jenkins Configuration Matrix configuration page. The 'Configuration Matrix' tab is selected. Under the 'User-defined Axis' section, the 'Name' field is set to 'BRANCH' and the 'Values' field is set to 'master 1.4'. There is a red 'X' icon in the top right corner of the axis configuration area and a blue question mark icon next to the values field.

In the *Build* section of the configuration it is set the list of Jenkins subprojects to be triggered, in this case we have *decisionengine\_pipeline* and *decisionengine\_modules\_pipeline*.

The *Parameters* text box is used to override parameters of each Jenkins subproject with a custom value.

In total this Jenkins project triggers 4 CI builds, i.e. 2 branches X 2 Jenkins subprojects.



The screenshot shows the Jenkins Build configuration page. The 'Build' tab is selected. Under the 'Trigger/call builds on other projects' section, the 'Projects to build' field is set to 'decisionengine\_pipeline,decisionengine\_modules\_pipeline'. The 'Block until the triggered projects finish their builds' checkbox is unchecked. Under the 'Predefined parameters' section, the 'Parameters' field is set to 'BRANCH=\${BRANCH}'. There are red 'X' icons in the top right corner of the 'Trigger/call builds on other projects' and 'Predefined parameters' sections, and blue question mark icons next to the 'Projects to build' and 'Parameters' fields.

Finally the *Build Triggers* section is used to setup the schedule for the periodic build, in this case it is scheduled to run at about 2 AM.

Jenkins will choose the actual time depending on the actual load on the system.

General

Advanced Project Options

Source Code Management

Build Triggers

Configuration Matrix

Build Environment

Build

Post-build Actions

### Build Triggers

☐ Trigger builds remotely (e.g., from scripts)

☐ Build after other projects are built

☒ Build periodically

Schedule

H 2 \* \* \*

Would last have run at Wednesday, November 4, 2020 2:23:53 AM CST;  
would next run at Thursday, November 5, 2020 2:23:53 AM CST.

## SOURCE CODE

### 4.1 Welcome to decisionengine's documentation!

#### 4.1.1 decisionengine package

##### Subpackages

decisionengine.framework package

##### Subpackages

decisionengine.framework.config package

##### Subpackages

decisionengine.framework.config.tests package

##### Submodules

decisionengine.framework.config.tests.test\_config module

```
decisionengine.framework.config.tests.test_config._channel_config_dir(relative_dir)
decisionengine.framework.config.tests.test_config._global_config_file(relative_filename)
decisionengine.framework.config.tests.test_config.load()
decisionengine.framework.config.tests.test_config.test_channel_empty_config(load, capsys,
                                                                              caplog)
decisionengine.framework.config.tests.test_config.test_channel_empty_dictionary(load,
                                                                                  caplog)
decisionengine.framework.config.tests.test_config.test_channel_invalid_modules_list(load,
                                                                                      caplog)
decisionengine.framework.config.tests.test_config.test_channel_invalid_modules_no_keys(load,
                                                                                       caplog)
decisionengine.framework.config.tests.test_config.test_channel_invalid_modules_string(load,
                                                                                       caplog)
```

```
decisionengine.framework.config.tests.test_config.test_channel_loading(caplog)
decisionengine.framework.config.tests.test_config.test_channel_module_missing_all(load,
                                                                                    caplog)
decisionengine.framework.config.tests.test_config.test_channel_module_missing_module(load,
                                                                                    caplog)
decisionengine.framework.config.tests.test_config.test_channel_module_missing_parameters(load,
                                                                                    caplog)
decisionengine.framework.config.tests.test_config.test_channel_names(load)
decisionengine.framework.config.tests.test_config.test_channel_no_config_files(load)
decisionengine.framework.config.tests.test_config.test_channel_no_modules(load)
decisionengine.framework.config.tests.test_config.test_empty_config(load)
decisionengine.framework.config.tests.test_config.test_empty_dict(load)
decisionengine.framework.config.tests.test_config.test_empty_dict_with_leading_comment(load)
decisionengine.framework.config.tests.test_config.test_minimal_jsonnet_right_extension(load,
                                                                                    cap-
                                                                                    sys)
decisionengine.framework.config.tests.test_config.test_minimal_jsonnet_wrong_extension(load,
                                                                                    cap-
                                                                                    sys)

decisionengine.framework.config.tests.test_config.test_minimal_python(load, capsys)
decisionengine.framework.config.tests.test_config.test_syntax_error_in_config_names_bad_file(load)
decisionengine.framework.config.tests.test_config.test_wrong_type(load)
```

#### **decisionengine.framework.config.tests.test\_policies module**

```
decisionengine.framework.config.tests.test_policies.test_channel_config_dir(tmp_path,
                                                                            monkeypatch)
decisionengine.framework.config.tests.test_policies.test_global_config_dir(tmp_path,
                                                                            monkeypatch)
decisionengine.framework.config.tests.test_policies.test_global_config_file(tmp_path,
                                                                            monkeypatch)
decisionengine.framework.config.tests.test_policies.test_valid_dir(tmp_path)
```

#### **decisionengine.framework.config.tests.test\_validconfig module**

```
decisionengine.framework.config.tests.test_validconfig._global_config_file(relative_filename)
decisionengine.framework.config.tests.test_validconfig.test_empty_config()
decisionengine.framework.config.tests.test_validconfig.test_invalid_config()
decisionengine.framework.config.tests.test_validconfig.test_no_such_file()
decisionengine.framework.config.tests.test_validconfig.test_wrong_type_config()
```

## Module contents

### Submodules

#### decisionengine.framework.config.ChannelConfigHandler module

Manager of channel configurations.

The ChannelConfigHandler manages only channel configurations and not the global decision-engine configuration. It is responsible for loading channel configuration files and validating that the channels have the correct configuration artifacts and inter-module product dependencies.

```
class decisionengine.framework.config.ChannelConfigHandler.ChannelConfigHandler(global_config,  
                                                                           chan-  
                                                                           nel_config_dir)
```

Bases: object

```
_load_channel(channel_name, path)
```

```
get_channels()
```

```
load_all_channels()
```

Load all channel configurations inside the stored channel-configuration directory.

Any cached configurations will be dropped prior to reloading.

```
load_channel(channel_name)
```

Load a single configuration for a channel with the supplied name.

The behavior is to read a configuration file whose path is:

<cached channel config. dir>/{channel\_name}.jsonnet

where the cached channel-configuration directory was stored whenever the ChannelConfigHandler object was created, and {channel\_name} is the value of the supplied method argument.

```
print_channel_config(channel)
```

```
decisionengine.framework.config.ChannelConfigHandler._check_keys(channel_conf_dict)
```

check that channel config has mandatory keys :type data: dict

```
decisionengine.framework.config.ChannelConfigHandler._make_de_logger(global_config)
```

#### decisionengine.framework.config.ValidConfig module

ValidConfig represents a valid JSON document.

The decision engine requires each of its configuration files to be valid JSON. This is achieved by either supplying a valid Jsonnet or JSON document upfront, or by providing a Python dictionary that can be trivially converted to a JSON document.

Vetting of a file for JSON validity happens upon construction of a 'ValidConfig' object. A fully constructed 'ValidConfig' object thus corresponds to a valid JSON document.

```
class decisionengine.framework.config.ValidConfig.ValidConfig(filename)
```

Bases: collections.UserDict

ValidConfig represents a valid JSON configuration in the form of a dictionary.

In addition to the normal dictionary operations, users may call 'dump()' to print out in a string form the JSON configuration.

```
_abc_impl = <_abc._abc_data object>
```

```
dump()
```

Print dictionary data to a valid JSON string.

```
decisionengine.framework.config.ValidConfig._config_from_file(config_file)
```

```
decisionengine.framework.config.ValidConfig._convert_to_json(config_file)
```

Attempt to convert JSON non-compliant configuration into a compliant one.

This is a temporary facility to aid the migration of Python-based configurations to Jsonnet-based ones. Python dictionaries that are similar in structure to JSON documents are generally trivially convertible.

## decisionengine.framework.config.policies module

Decision-engine default configuration policies.

For the decision-engine process, the configuration policies are:

- The global configuration file must be named ‘decision\_engine.jsonnet’ and it must reside in (a) a directory that can be accessed through the ‘CONFIG\_PATH’ environment variable, or (b) the /etc/decisionengine directory.
- All channel configurations must reside in (a) a directory accessible through the ‘CHANNEL\_CONFIG\_PATH’ environment variable, or (b) a ‘config.d’ subdirectory of the /etc/decisionengine directory.

The utilities provided in this module provide simple means of accessing the configuration artifacts according to the policies listed above. Please consult the documentation for each function below for more detailed information.

```
decisionengine.framework.config.policies.channel_config_dir(parent_dir=None)
```

Retrieve the channel configuration directory as a pathlib.Path object.

This function returns a path object according to the following precedence rules:

1. If the ‘parent\_dir’ argument is provided, the returned path object will correspond to ‘{parent\_dir}/config.d’.
2. If the ‘CHANNEL\_CONFIG\_PATH’ environment variable has been set, the returned path object will correspond to \${CHANNEL\_CONFIG\_PATH}.
3. If neither 1 or 2 apply, the returned path object corresponds to ‘{global\_config\_dir()}/config.d’ (see documentation for ‘global\_config\_dir()’).

Regardless of the precedence rule used, the returned path object must be a valid directory or an exception will be raised—i.e. if the ‘parent\_dir’ argument is supplied, and the resulting path object is not a valid directory, the function will exit with an exception and not attempt rule 2 or 3.

```
decisionengine.framework.config.policies.global_config_dir()
```

Retrieve global configuration dir as pathlib.Path object.

This is the directory that houses the ‘decision\_engine.jsonnet’ global configuration file.

This function checks that the ‘CONFIG\_PATH’ variable has been set or will use /etc/decisionengine otherwise. If the path exists as a directory, then the directory path is returned as a string; otherwise an exception is raised.

```
decisionengine.framework.config.policies.global_config_file(parent_dir=None)
```

Return the pathlib.Path object corresponding to the global configuration.

If supplied, the ‘parent\_dir’ is assumed to be the full path corresponding to a directory containing the ‘decision\_engine.jsonnet’ file. If not provided, the global configuration directory is determined based on the behavior of the ‘global\_config\_dir()’ function.

An exception is raised if no ‘decision\_engine.jsonnet’ file is found.



`decisionengine.framework.config.policies.valid_dir(path, scope)`

Throws if the supplied path object is not a directory, otherwise returns the path object.

## Module contents

### decisionengine.framework.dataspace package

#### Subpackages

### decisionengine.framework.dataspace.datasources package

#### Subpackages

### decisionengine.framework.dataspace.datasources.sqlalchemy\_ds package

#### Submodules

### decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.datasource\_api module

The datasource layer for our abstraction

**class** `decisionengine.framework.dataspace.datasources.sqlalchemy_ds.datasource_api.SQLAlchemyDS(config_dict)`

Bases: `decisionengine.framework.dataspace.datasource.DataSource`

A DecisionEngine data source via the SQL Alchemy ORM

```
{
    "dataspace": {
        "datasource": { "module": "decisionengine.framework.dataspace.datasources.sqlalchemy_ds",
                        "name": "SQLAlchemyDS", "params": {
                            "pool_size": 5, "max_overflow": 10, "timeout": 30,
                            # url is mandatory, but any engine keyword is accepted here.
                            "url": "dialect[+driver]://user:password@host/dbname"
                        }
                    }
    }
}
```

Exceptions should be caught and logged by the caller.

**\_abc\_impl** = `<_abc._abc_data object>`

**close()**

Close all connections to the database

**Returns** None

**connect()**

Create a pool of database connections

**Returns** None

**create\_tables()**

Create database tables

**Returns** None

**delete\_data\_older\_than(days)**

Delete data older than interval

**Parameters** **days** (*int*) – remove data older than this many days

**Returns** None

**duplicate\_datablock(taskmanager\_id, generation\_id, new\_generation\_id)**

For the given taskmanager\_id, make a copy of the datablock with given generation\_id, set the generation\_id for the datablock copy

**Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **generation\_id** (*int*) – generation id to clone
- **new\_generation\_id** (*int*) – generation id to create

**Returns** None

**get\_datablock(taskmanager\_id, generation\_id)**

Return the entire datablock from the dataproduct table for the given taskmanager\_id, generation\_id

**Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **generation\_id** (*int*) – generation id to locate

**Returns** with all set keys and their associated values

**Return type** dict

**get\_dataproduct(taskmanager\_id, generation\_id, key)**

Return the data from the dataproduct table for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **generation\_id** (*int*) – generation id to locate
- **key** (*str*) – key for the value

**Returns** The possibly binary value stored earlier

**Return type** obj

**get\_dataproducts(taskmanager\_id, key=None)**

Return list of all data products associated with taskmanager\_id

**Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **key** (*str*) – key for the value

**Returns** each element is the matching row as a dict()

**Return type** tuple

**get\_header(taskmanager\_id, generation\_id, key)**

Return the header from the header table for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **generation\_id** (*int*) – generation id to locate
- **key** (*str*) – key for the value

**Returns**

**fields in order are:** taskmanager.taskmanager\_id, header.taskmanager\_id,  
header.generation\_id, header.key, header.create\_time, header.expiration\_time,  
header.scheduled\_create\_time, header.creator, header.schema\_id

**Return type** tuple

**get\_last\_generation\_id**(*taskmanager\_name, taskmanager\_id=None*)

Return last generation id for current task manager or taskmanager w/ task\_manager\_id.

**Parameters**

- **taskmanager\_name** (*str*) – name of taskmanager to retrieve
- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve

**Returns** the largest generation stored within the database

**Return type** int

**get\_metadata**(*taskmanager\_id, generation\_id, key*)

Return the metadata from the metadata table for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **generation\_id** (*int*) – generation id to locate
- **key** (*str*) – key for the value

**Returns**

**fields in order are:** taskmanager.taskmanager\_id, metadata.taskmanager\_id, meta-  
data.generation\_id, metadata.key, metadata.state, metadata.generation\_time, meta-  
data.missed\_update\_count

**Return type** tuple

**get\_schema**(*table=None*)

Given the table name return it's schema

**get\_taskmanager**(*taskmanager\_name, taskmanager\_id=None*)

Find the task manager by name/uuid in the database get back the primary key.

If multiples match, find highest primary key.

**Parameters**

- **taskmanager\_name** (*str*) – name of taskmanager to retrieve
- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve

**Returns** the matching row, column names as keys

**Return type** dict

**get\_taskmanagers**(*taskmanager\_name=None, start\_time=None, end\_time=None*)

Find taskmanagers that meet our search

**Parameters**

- **taskmanager\_name** (*str*) – name of taskmanager to retrieve
- **start\_time** (*datetime*) – Datetime to confine against
- **end\_time** (*datetime*) – Datetime to confine against

**Returns** each element is a dict() matching row, column names as keys

**Return type** list

**insert**(*taskmanager\_id, generation\_id, key, value, header, metadata*)

Insert data into respective tables for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **generation\_id** (*int*) – generation id to create
- **key** (*str*) – key for the value
- **value** (*obj*) – Value can be an object or dict or a binary
- **header** (*datablock.Header*) – Header for the value
- **metadata** (*datablock.Metadata*) – Metadata for the value

**Returns** None

**reset\_connections**()

Reset the connection to the database. So long as self.engine isn't undef, the engine can still make new connections if new db actions happen. It just won't have any open at this time.

**Returns** None

**store\_taskmanager**(*name, taskmanager\_id, timestamp=None*)

Store TaskManager in database

**Parameters**

- **name** (*str*) – name of taskmanager to retrieve
- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **timestamp** (*datetime*) – datetime of created object, defaults to 'now'

**Returns** the primary key of the row in the database

**Return type** int

**update**(*taskmanager\_id, generation\_id, key, value, header, metadata*)

Update the data in respective tables for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **generation\_id** (*int*) – generation id to update
- **key** (*str*) – key for the value
- **value** (*obj*) – Value can be an object or dict or a binary
- **header** (*datablock.Header*) – Header for the value
- **metadata** (*datablock.Metadata*) – Metadata for the value

**Returns** None

**decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema module**

The table layout and utilities for our SQLAlchemy ORM

```
class decisionengine.framework.dataspace.datasources.sqlalchemy_ds.db_schema.Base(**kwargs)
    Bases: object
```

The base class of the class hierarchy.

When called, it accepts no arguments and returns a new featureless instance that has no instance attributes and cannot be given any.

```
_sa_registry = <sqlalchemy.orm.decl_api.registry object>
```

```
metadata = MetaData()
```

```
registry = <sqlalchemy.orm.decl_api.registry object>
```

```
class decisionengine.framework.dataspace.datasources.sqlalchemy_ds.db_schema.Dataproduct(**kwargs)
    Bases: sqlalchemy.orm.decl\_api.Base
```

The PRIMARY KEY on this table isn't used...

Existing code appears to depend on column order.

```
_sa_class_manager = {'generation_id':
    <sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'id':
    <sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'key':
    <sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'taskmanager':
    <sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'taskmanager_id':
    <sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'value':
    <sqlalchemy.orm.attributes.InstrumentedAttribute object>}
```

```
generation_id
```

```
id
```

```
key
```

```
taskmanager
```

```
taskmanager_id
```

```
value
```

```
class decisionengine.framework.dataspace.datasources.sqlalchemy_ds.db_schema.Header(**kwargs)
    Bases: sqlalchemy.orm.decl\_api.Base
```

The PRIMARY KEY on this table isn't used...

The existing code has a hard expectation on the time columns being BIGINT rather than datetime objects burried within the classes.

**Looks like there was an initial goal of a relationship** with the Schema table, but it may not be in use

Existing code appears to depend on column order.

```
_sa_class_manager = {'create_time':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'creator':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'expiration_time':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'generation_id':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'id':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'key':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'scheduled_create_time':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'schema_id':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'taskmanager':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'taskmanager_id':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>}
```

create\_time

creator

expiration\_time

generation\_id

id

key

scheduled\_create\_time

schema\_id

taskmanager

taskmanager\_id

```
class decisionengine.framework.dataspace.datasources.sqlalchemy_ds.db_schema.Metadata(**kwargs)  
    Bases: sqlalchemy.orm.decl\_api.Base
```

The PRIMARY KEY on this table isn't used....

The existing code has a hard expectation on the state field as a 'text' element.

The existing code has a hard expectation on the time columns being BIGINT rather than datetime objects burried within the classes.

Existing code appears to depend on column order.

```
_sa_class_manager = {'generation_id':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'generation_time':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'id':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'key':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'missed_update_count':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'state':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'taskmanager':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'taskmanager_id':  
<sqlalchemy.orm.attributes.InstrumentedAttribute object>}
```

generation\_id

generation\_time

id

key

missed\_update\_count

state

**taskmanager**

**taskmanager\_id**

**class** decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema.**Schema**(\*\*kwargs)  
Bases: [sqlalchemy.orm.decl\\_api.Base](#)

This table may not be in use

**Has a one-to-many relationship with:** Header - may not be in use

**\_sa\_class\_manager** = {'schema': <sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'schema\_id': <sqlalchemy.orm.attributes.InstrumentedAttribute object>}

**schema**

**schema\_id**

**class** decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema.**Taskmanager**(\*\*kwargs)  
Bases: [sqlalchemy.orm.decl\\_api.Base](#)

**Has a one-to-many relationship with:** Header Metadata Dataproduct

**changes cascade on:** Header Metadata Dataproduct

Existing code appears to depend on column order.

**\_sa\_class\_manager** = {'datestamp': <sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'name': <sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'sequence\_id': <sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'task\_dataproduct': <sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'task\_header': <sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'task\_metadata': <sqlalchemy.orm.attributes.InstrumentedAttribute object>, 'taskmanager\_id': <sqlalchemy.orm.attributes.InstrumentedAttribute object>}

**datestamp**

**name**

**sequence\_id**

**task\_dataproduct**

**task\_header**

**task\_metadata**

**taskmanager\_id**

## decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.utils module

Code not written by us

decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.utils.**add\_engine\_pidguard**(engine)

Based on <https://stackoverflow.com/questions/62920507/using-sqlalchemy-connection-pooling-queues-with-python-multiprocessing>

decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.utils.**clone\_model**(model,  
\*\*kwargs)

Based on <https://stackoverflow.com/a/55991358>

decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.utils.**orm\_as\_dict**(obj)

Based on : <https://stackoverflow.com/a/37350445>

## Module contents

Top level import so we can rationally segment items of the ORM

**class** decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.**SQLAlchemyDS**(*config\_dict*)  
Bases: *decisionengine.framework.dataspace.datasource.DataSource*

A DecisionEngine data source via the SQL Alchemy ORM

```
{
    "dataspace": {
        "datasource": { "module": "decisionengine.framework.dataspace.datasources.sqlalchemy_ds",
                        "name": "SQLAlchemyDS", "params": {
                            "pool_size": 5, "max_overflow": 10, "timeout": 30,
                            # url is mandatory, but any engine keyword is accepted here.
                            "url": "dialect[+driver]://user:password@host/dbname"
                        }
                    }
    }
}
```

Exceptions should be caught and logged by the caller.

**\_abc\_impl** = <\_abc.\_abc\_data object>

**close()**

Close all connections to the database

**Returns** None

**connect()**

Create a pool of database connections

**Returns** None

**create\_tables()**

Create database tables

**Returns** None

**delete\_data\_older\_than(days)**

Delete data older than interval

**Parameters** **days** (*int*) – remove data older than this many days

**Returns** None

**duplicate\_datablock(taskmanager\_id, generation\_id, new\_generation\_id)**

For the given taskmanager\_id, make a copy of the datablock with given generation\_id, set the generation\_id for the datablock copy

**Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **generation\_id** (*int*) – generation id to clone
- **new\_generation\_id** (*int*) – generation id to create

**Returns** None



**get\_datablock**(*taskmanager\_id*, *generation\_id*)

Return the entire datablock from the dataproduct table for the given taskmanager\_id, generation\_id

**Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **generation\_id** (*int*) – generation id to locate

**Returns** with all set keys and their associated values

**Return type** dict

**get\_dataproduct**(*taskmanager\_id*, *generation\_id*, *key*)

Return the data from the dataproduct table for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **generation\_id** (*int*) – generation id to locate
- **key** (*str*) – key for the value

**Returns** The possibly binary value stored earlier

**Return type** obj

**get\_dataproducts**(*taskmanager\_id*, *key=None*)

Return list of all data products associated with with taskmanager\_id

**Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **key** (*str*) – key for the value

**Returns** each element is the matching row as a dict()

**Return type** tuple

**get\_header**(*taskmanager\_id*, *generation\_id*, *key*)

Return the header from the header table for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **generation\_id** (*int*) – generation id to locate
- **key** (*str*) – key for the value

**Returns**

**fields in order are:** taskmanager.taskmanager\_id, header.taskmanager\_id,  
header.generation\_id, header.key, header.create\_time, header.expiration\_time,  
header.scheduled\_create\_time, header.creator, header.schema\_id

**Return type** tuple

**get\_last\_generation\_id**(*taskmanager\_name*, *taskmanager\_id=None*)

Return last generation id for current task manager or taskmanager w/ task\_manager\_id.

**Parameters**

- **taskmanager\_name** (*str*) – name of taskmanager to retrieve
- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve

**Returns** the largest generation stored within the database

**Return type** int

**get\_metadata**(*taskmanager\_id*, *generation\_id*, *key*)

Return the metadata from the metadata table for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **generation\_id** (*int*) – generation id to locate
- **key** (*str*) – key for the value

**Returns**

**fields in order are:** taskmanager.taskmanager\_id, metadata.taskmanager\_id, metadata.generation\_id, metadata.key, metadata.state, metadata.generation\_time, metadata.missed\_update\_count

**Return type** tuple

**get\_schema**(*table=None*)

Given the table name return it's schema

**get\_taskmanager**(*taskmanager\_name*, *taskmanager\_id=None*)

Find the task manager by name/uuid in the database get back the primary key.

If multiples match, find highest primary key.

**Parameters**

- **taskmanager\_name** (*str*) – name of taskmanager to retrieve
- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve

**Returns** the matching row, column names as keys

**Return type** dict

**get\_taskmanagers**(*taskmanager\_name=None*, *start\_time=None*, *end\_time=None*)

Find taskmanagers that meet our search

**Parameters**

- **taskmanager\_name** (*str*) – name of taskmanager to retrieve
- **start\_time** (*datetime*) – Datetime to confine against
- **end\_time** (*datetime*) – Datetime to confine against

**Returns** each element is a dict() matching row, column names as keys

**Return type** list

**insert**(*taskmanager\_id*, *generation\_id*, *key*, *value*, *header*, *metadata*)

Insert data into respective tables for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **generation\_id** (*int*) – generation id to create
- **key** (*str*) – key for the value
- **value** (*obj*) – Value can be an object or dict or a binary

- **header** (`datablock.Header`) – Header for the value
- **metadata** (`datablock.Metadata`) – Metadata for the value

**Returns** None

#### **reset\_connections()**

Reset the connection to the database. So long as self.engine isn't undef, the engine can still make new connections if new db actions happen. It just won't have any open at this time.

**Returns** None

#### **store\_taskmanager**(*name, taskmanager\_id, datestamp=None*)

Store TaskManager in database

##### **Parameters**

- **name** (*str*) – name of taskmanager to retrieve
- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **datestamp** (*datetime*) – datetime of created object, defaults to 'now'

**Returns** the primary key of the row in the database

**Return type** int

#### **update**(*taskmanager\_id, generation\_id, key, value, header, metadata*)

Update the data in respective tables for the given taskmanager\_id, generation\_id, key

##### **Parameters**

- **taskmanager\_id** (*str/uuid*) – id of taskmanager to retrieve
- **generation\_id** (*int*) – generation id to update
- **key** (*str*) – key for the value
- **value** (*obj*) – Value can be an object or dict or a binary
- **header** (`datablock.Header`) – Header for the value
- **metadata** (`datablock.Metadata`) – Metadata for the value

**Returns** None

## **decisionengine.framework.dataspace.datasources.tests package**

### **Submodules**

#### **decisionengine.framework.dataspace.datasources.tests.fixtures module**

pytest fixtures/constants

decisionengine.framework.dataspace.datasources.tests.fixtures.PG\_DE\_DB\_WITHOUT\_SCHEMA(*request:*

*\_pytest.fixtures.FixtureRequest*)  
→  
*psycopg2.extensions.cursor*

Fixture factory for PostgreSQL.

**Parameters** **request** – fixture request object

**Returns** postgresql client

`decisionengine.framework.dataspace.datasources.tests.fixtures.PG_DE_DB_WITH_SCHEMA(PG_DE_DB_WITHOUT_SCHEMA)`  
 Load our PG schema into the database via this fixture so pytest knows the limitations on parallel usage of this database scope.

`decisionengine.framework.dataspace.datasources.tests.fixtures.PG_PROG(request: _pytest.fixtures.FixtureRequest, tmpdir_factory: _pytest.tmpdir.TempdirFactory) → Iterator[pytest_postgresql.executor.PostgreSQLExecutor]`

Process fixture for PostgreSQL.

**Parameters** `request` – fixture request object

**Returns** tcp executor

`decisionengine.framework.dataspace.datasources.tests.fixtures.SQLALCHEMY_PG_WITH_SCHEMA(PG_DE_DB_WITHOUT_SCHEMA)`  
 Get a blank database from `pytest_postgresql`. Then setup the SQLAlchemy style URL with that DB. The SQLAlchemyDS will create the schema as needed.

`decisionengine.framework.dataspace.datasources.tests.fixtures.SQLALCHEMY_TEMPFILE_SQLITE(tmp_path)`  
 Setup an SQLite database with the `pytest tmp_path` fixture. Then setup the SQLAlchemy style URL with that DB. The SQLAlchemyDS will create the schema as needed.

`decisionengine.framework.dataspace.datasources.tests.fixtures.datasources(request)`  
 This parameterized fixture will setup up various datasources.

Add datasource objects to `DATASOURCES_TO_TEST` once they've got our basic schema loaded. And adjust our *if* statements here until we are SQLAlchemy only.

Pytest should take it from there and automatically run it through all the tests using this fixture.

`decisionengine.framework.dataspace.datasources.tests.fixtures.mock_data_block()`  
 This fixture replaces the standard datablock implementation.

The current DataBlock implementation does not own any data products but forwards them immediately to a backend datasource. The only implemented datasource requires Postgres, which is overkill when needing to test simple data-product communication between modules.

This mock datablock class directly owns the data products, thus avoiding the need for a datasource backend. It is anticipated that a future design of the DataBlock will own the data products, thus making this mock class unnecessary.

## decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api module

This test plan covers a generic dataspace object via pytest parameters.

`decisionengine.framework.dataspace.datasources.tests.test_datasource_api.test_create_tables(datasource)`  
`create_tables()` should be safe to call multiple times

`decisionengine.framework.dataspace.datasources.tests.test_datasource_api.test_delete_data_older_than_age(datasource)`  
 Can we delete old entries

`decisionengine.framework.dataspace.datasources.tests.test_datasource_api.test_duplicate_datablock(datasource)`  
 Can we duplicate taskmanager1 and all its entries

`decisionengine.framework.dataspace.datasources.tests.test_datasource_api.test_get_datablock(datasource)`

`decisionengine.framework.dataspace.datasources.tests.test_datasource_api.test_get_dataproduct(datasource)`  
 Can we get the dataproduct by uuid with key

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_get\_dataproduct\_not\_exist  
Does it error out if we ask for bogus information?

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_get\_dataproducts(datasource)  
Can we get the dataproducts by uuid and uuid with key

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_get\_dataproducts\_not\_exist  
Does it error out if we ask for bogus information?

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_get\_header(datasource)  
Can we fetch a header?

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_get\_header\_not\_exist(datasource)  
Does it error out if we ask for a bogus header?

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_get\_last\_generation\_id(datasource)  
Can we get the last generation id by name or name and uuid

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_get\_last\_generation\_id\_not\_exist  
Does it error out if we ask for a bogus taskmanager?

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_get\_metadata(datasource)  
Can we fetch a metadata element?

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_get\_metadata\_not\_exist(datasource)  
Does it error out if we ask for a bogus metadata element?

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_get\_taskmanager\_exists(datasource)  
Can I get a taskmanager by name or name and uuid

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_get\_taskmanager\_not\_exist  
This should error out

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_get\_taskmanagers(datasource)  
Can I get multiple task managers

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_get\_taskmanagers\_not\_exist  
Do I error out when asking for garbage

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_has\_config(datasource)  
This should have a *config* dict we can pass to jsonnet

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_insert(datasource)  
Can we insert new elements

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_reset\_connections(datasource)  
reset\_connections() should be safe to call any time

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_store\_taskmanager(datasource)  
Can we make new entries

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_update(datasource)  
Do updates work as expected

decisionengine.framework.dataspace.datasources.tests.test\_datasource\_api.test\_update\_bad(datasource)  
Do updates fail to work on bogus taskmanager as expected

## decisionengine.framework.dataspace.datasources.tests.test\_postgresql module

decisionengine.framework.dataspace.datasources.tests.test\_postgresql.test\_generate\_insert\_query()

## Module contents

### Submodules

## decisionengine.framework.dataspace.datasources.null module

**class** decisionengine.framework.dataspace.datasources.null.NullDataSource(*config\_dict*)

Bases: *decisionengine.framework.dataspace.datasource.DataSource*

Implementation of data source ABC that does nothing

**\_abc\_impl** = <\_abc.\_abc\_data object>

**close()**

Close all connections to the database

**connect()**

Create a pool of database connections

**create\_tables()**

Create database tables

**delete\_data\_older\_than(days)**

Delete data older than interval :type days: long :arg days: remove data older than interval

**duplicate\_datablock(taskmanager\_id, generation\_id, new\_generation\_id)**

For the given taskmanager\_id, make a copy of the datablock with given generation\_id, set the generation\_id for the datablock copy

### Parameters

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data
- **new\_generation\_id** (int) – generation\_id of the new datablock created

**get\_datablock(taskmanager\_id, generation\_id)**

Return the entire datablock from the dataproduct table for the given taskmanager\_id, generation\_id

### Parameters

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data

**get\_dataproduct(taskmanager\_id, generation\_id, key)**

Return the data from the dataproduct table for the given taskmanager\_id, generation\_id, key

### Parameters

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data
- **key** (string) – key for the value

**get\_dataproducts**(*taskmanager\_id*, *key=None*)

Return list of all data products associated with with *taskmanager\_id*

**Parameters** **key** (string) – data product key

**get\_header**(*taskmanager\_id*, *generation\_id*, *key*)

Return the header from the header table for the given *taskmanager\_id*, *generation\_id*, *key*

**Parameters**

- **taskmanager\_id** (string) – *taskmanager\_id* for generation to be retrieved
- **generation\_id** (int) – *generation\_id* of the data
- **key** (string) – key for the value

**get\_last\_generation\_id**(*taskmanager\_name*, *taskmanager\_id=None*)

Return last generation id for current task manager or taskmanager w/ *task\_manager\_id*.

**Parameters**

- **taskmanager\_name** (string) – task manager name
- **taskmanager\_id** (string) – task manager id

**get\_metadata**(*taskmanager\_id*, *generation\_id*, *key*)

Return the metadata from the metadata table for the given *taskmanager\_id*, *generation\_id*, *key*

**Parameters**

- **taskmanager\_id** (string) – *taskmanager\_id* for generation to be retrieved
- **generation\_id** (int) – *generation\_id* of the data
- **key** (string) – key for the value

**get\_schema**(*table=None*)

Given the table name return it's schema

**Parameters** **table** (string) – Name of the table

**get\_taskmanager**(*taskmanager\_name*, *taskmanager\_id=None*)

Retrieve TaskManager :type *taskmanager\_name*: string :arg *taskmanager\_name*: name of taskmanager to retrieve :type *taskmanager\_id*: string :arg *taskmanager\_id*: id of taskmanager to retrieve

**get\_taskmanagers**(*taskmanager\_name=None*, *start\_time=None*, *end\_time=None*)

Retrieve TaskManagers :type *taskmanager\_name*: string :arg *taskmanager\_name*: name of taskmanager to retrieve :type *taskmanager\_id*: string :arg *taskmanager\_id*: id of taskmanager to retrieve

**insert**(*taskmanager\_id*, *generation\_id*, *key*, *value*, *header*, *metadata*)

Insert data into respective tables for the given *taskmanager\_id*, *generation\_id*, *key*

**Parameters**

- **taskmanager\_id** (string) – *taskmanager\_id* for generation to be retrieved
- **generation\_id** (int) – *generation\_id* of the data
- **key** (string) – key for the value
- **value** (object) – Value can be an object or dict
- **header** (Header) – Header for the value
- **header** – Metadata for the value

**reset\_connections**()

Drop any cached connections and reconnect to the database

**store\_taskmanager**(*name, taskmanager\_id, datestamp=None*)

Store TaskManager :type taskmanager\_name: **string** :arg taskmanager\_name: name of taskmanager to retrieve :type taskmanager\_id: **string** :arg taskmanager\_id: id of taskmanager to retrieve :type datestamp: **datetime** :arg datestamp: datetime of created object, defaults to 'now'

**update**(*taskmanager\_id, generation\_id, key, value, header, metadata*)

Update the data in respective tables for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (**string**) – taskmanager\_id for generation to be retrieved
- **generation\_id** (**int**) – generation\_id of the data
- **key** (**string**) – key for the value
- **value** (**object**) – Value can be an object or dict
- **header** (**Header**) – Header for the value
- **header** – Metadata for the value

## decisionengine.framework.dataspace.datasources.postgresql module

**class** decisionengine.framework.dataspace.datasources.postgresql.**Postgresql**(*config\_dict*)

Bases: [decisionengine.framework.dataspace.datasource.DataSource](#)

Implementation of postgresql data source

**\_\_query**(*query\_string, values=None, cursor\_factory=None*)

**\_abc\_impl** = <\_abc.\_abc\_data object>

**\_delete**(*sql\_query, values=None*)

**\_insert**(*table\_name\_or\_sql\_query, record=None*)

**\_insert\_returning\_result**(*table\_name\_or\_sql\_query, record=None*)

**\_remove**(*sql\_query, values=None*)

**\_select**(*query\_string, values=None, cursor\_factory=None*)

**\_select\_dictresult**(*sql\_query, values=None*)

**\_select\_getresult**(*sql\_query, values=None*)

**\_select\_tuple**(*sql\_query, values*)

**\_update**(*query\_string, values=None*)

**\_update\_returning\_result**(*query\_string, values=None*)

**close**()

Close all connections to the database

**connect**()

Create a pool of database connections

**create\_tables**()

Create database tables

**delete\_data\_older\_than**(*days*)

Delete data older than days interval :type days: **int** :arg days: remove data older than days interval



**duplicate\_datablock**(*taskmanager\_id, generation\_id, new\_generation\_id*)

For the given taskmanager\_id, make a copy of the datablock with given generation\_id, set the generation\_id for the datablock copy

**Parameters**

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data
- **new\_generation\_id** (int) – generation\_id of the new datablock created

**get\_connection**()

**get\_datablock**(*taskmanager\_id, generation\_id*)

Return the entire datablock from the dataproduct table for the given taskmanager\_id, generation\_id

**Parameters**

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data

**get\_dataproduct**(*taskmanager\_id, generation\_id, key*)

Return the data from the dataproduct table for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data
- **key** (string) – key for the value

**get\_dataproducts**(*taskmanager\_id, key=None*)

Return list of all data products associated with with taskmanager\_id

**Parameters** **key** (string) – data product key

**get\_header**(*taskmanager\_id, generation\_id, key*)

Return the header from the header table for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data
- **key** (string) – key for the value

**get\_last\_generation\_id**(*taskmanager\_name, taskmanager\_id=None*)

Return last generation id for current task manager or taskmanager w/ task\_manager\_id.

**Parameters**

- **taskmanager\_name** (string) – task manager name
- **taskmanager\_id** (string) – task manager id

**get\_metadata**(*taskmanager\_id, generation\_id, key*)

Return the metadata from the metadata table for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data
- **key** (string) – key for the value

**get\_schema**(*table=None*)

Given the table name return it's schema

**Parameters** **table** (string) – Name of the table

**get\_taskmanager**(*taskmanager\_name, taskmanager\_id=None*)

Retrieve TaskManager :type taskmanager\_name: string :arg taskmanager\_name: name of taskmanager to retrieve :type taskmanager\_id: string :arg taskmanager\_id: id of taskmanager to retrieve

**get\_taskmanagers**(*taskmanager\_name=None, start\_time=None, end\_time=None*)

Retrieve TaskManagers :type taskmanager\_name: string :arg taskmanager\_name: name of taskmanager to retrieve :type taskmanager\_id: string :arg taskmanager\_id: id of taskmanager to retrieve

**insert**(*taskmanager\_id, generation\_id, key, value, header, metadata*)

Insert data into respective tables for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data
- **key** (string) – key for the value
- **value** (object) – Value can be an object or dict
- **header** (Header) – Header for the value
- **header** – Metadata for the value

**reset\_connections**()

Drop any cached connections and reconnect to the database

**store\_taskmanager**(*name, taskmanager\_id, datestamp=None*)

Store TaskManager :type taskmanager\_name: string :arg taskmanager\_name: name of taskmanager to retrieve :type taskmanager\_id: string :arg taskmanager\_id: id of taskmanager to retrieve :type datestamp: datetime :arg datestamp: datetime of created object, defaults to 'now'

```
tables = {'dataproduuct': ['taskmanager_id TEXT', 'generation_id INT', 'key TEXT',  
'value BLOB'], 'header': ['taskmanager_id TEXT', 'generation_id INT', 'key TEXT',  
'create_time REAL', 'expiration_time REAL', 'scheduled_create_time REAL', 'creator  
TEXT', 'schema_id INT'], 'metadata': ['taskmanager_id TEXT', 'generation_id INT',  
'key TEXT', 'state TEXT', 'generation_time REAL', 'missed_update_count INT'],  
'schema': ['schema_id INT', 'schema BLOB']}
```

**update**(*taskmanager\_id, generation\_id, key, value, header, metadata*)

Update the data in respective tables for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data
- **key** (string) – key for the value
- **value** (object) – Value can be an object or dict
- **header** (Header) – Header for the value
- **header** – Metadata for the value

decisionengine.framework.dataspace.datasources.postgresql.**generate\_insert\_query**(*table\_name, keys*)

Generate insert query given table name and list of fields



`decisionengine.framework.dataspace.tests.fixtures.dataspace(request)`

This parameterized fixture will setup up various datasources. Add datasource objects to DATA-SOURCES\_TO\_TEST once they've got our basic schema loaded. And adjust our *if* statements here until we are SQLAlchemy only.

Pytest should take it from there and automatically run it through all the tests using this fixture.

`decisionengine.framework.dataspace.tests.fixtures.load_sample_data_into_datasource(schema_only_db)`

load our sample test data into a dataspace This is a function not a fixture so you can run it on any datasource providing the right API.

### **decisionengine.framework.dataspace.tests.test\_Reaper module**

`decisionengine.framework.dataspace.tests.test_Reaper.config()`

`decisionengine.framework.dataspace.tests.test_Reaper.reaper(request)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_fail_bad_config(reaper, config)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_fail_missing_config(reaper,  
config)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_fail_missing_config_key(reaper,  
config)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_fail_small_retain(reaper)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_fail_small_run_interval(reaper)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_fail_start_two_reapers(reaper)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_fail_wrong_config_key(reaper,  
config)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_just_stop_no_error(reaper)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_loop_of_start_stop_in_clumps(reaper)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_reap_default_state(reaper)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_reaper_can_reap(reaper)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_source_fail_can_be_fixed(reaper)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_start_delay(reaper)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_start_stop(reaper)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_start_stop_stop(reaper)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_state_can_be_active(reaper)`

`decisionengine.framework.dataspace.tests.test_Reaper.test_state_sets_timer_and_uses_it(reaper)`

### **decisionengine.framework.dataspace.tests.test\_datablock module**

`decisionengine.framework.dataspace.tests.test_datablock.test_DataBlock_constructor(dataspace)`

`decisionengine.framework.dataspace.tests.test_datablock.test_DataBlock_duplicate(dataspace)`

`decisionengine.framework.dataspace.tests.test_datablock.test_DataBlock_get_dataproducts(dataspace)`

`decisionengine.framework.dataspace.tests.test_datablock.test_DataBlock_get_header(dataspace)`

`decisionengine.framework.dataspace.tests.test_datablock.test_DataBlock_get_metadata(dataspace)`

`decisionengine.framework.dataspace.tests.test_datablock.test_DataBlock_get_taskmanager(dataspace)`

`decisionengine.framework.dataspace.tests.test_datablock.test_DataBlock_is_expired(dataspace)`

This test just validates the method/function exists. The stub within our default code should be replaced by a class inheriting from it. That class should have more rational return types.

`decisionengine.framework.dataspace.tests.test_datablock.test_DataBlock_is_expired_with_key(dataspace)`

This test just validates the method/function exists. The stub within our default code should be replaced by a class inheriting from it. That class should have more rational return types.

`decisionengine.framework.dataspace.tests.test_datablock.test_DataBlock_key_management(dataspace)`

`decisionengine.framework.dataspace.tests.test_datablock.test_DataBlock_key_management_change_name(dataspace)`

`decisionengine.framework.dataspace.tests.test_datablock.test_DataBlock_mark_expired(dataspace)`

`decisionengine.framework.dataspace.tests.test_datablock.test_DataBlock_no_key_by_name(dataspace)`

`decisionengine.framework.dataspace.tests.test_datablock.test_DataBlock_to_str(dataspace)`

`decisionengine.framework.dataspace.tests.test_datablock.test_Header_constructor(dataspace)`

`decisionengine.framework.dataspace.tests.test_datablock.test_Header_is_valid(dataspace)`

`decisionengine.framework.dataspace.tests.test_datablock.test_Metadata_constructor(dataspace)`

`decisionengine.framework.dataspace.tests.test_datablock.test_Metadata_set_state(dataspace)`

### **decisionengine.framework.dataspace.tests.test\_datablock\_zlib module**

`decisionengine.framework.dataspace.tests.test_datablock_zlib.test_compress()`

`decisionengine.framework.dataspace.tests.test_datablock_zlib.test_zdumps()`

`decisionengine.framework.dataspace.tests.test_datablock_zlib.test_zloads()`

### **decisionengine.framework.dataspace.tests.test\_datasource module**

`decisionengine.framework.dataspace.tests.test_datasource.test_has_methods_we_expect()`

## decisionengine.framework.dataspace.tests.test\_dataspace module

decisionengine.framework.dataspace.tests.test\_dataspace.test\_dataspace\_config\_finds\_bad()

decisionengine.framework.dataspace.tests.test\_dataspace.test\_duplicate\_datablock(dataspace)

Can we duplicate taskmanager1 and all its entries

decisionengine.framework.dataspace.tests.test\_dataspace.test\_get\_datablock(dataspace)

Can we get the datablock content

decisionengine.framework.dataspace.tests.test\_dataspace.test\_get\_dataproduct(dataspace)

Can we get the dataproduct by uuid with key

decisionengine.framework.dataspace.tests.test\_dataspace.test\_get\_dataproduct\_not\_exist(dataspace)

Does it error out if we ask for bogus information?

decisionengine.framework.dataspace.tests.test\_dataspace.test\_get\_dataproducts(dataspace)

Can we get the dataproducts by uuid and uuid with key

decisionengine.framework.dataspace.tests.test\_dataspace.test\_get\_dataproducts\_not\_exist(dataspace)

Does it error out if we ask for bogus information?

decisionengine.framework.dataspace.tests.test\_dataspace.test\_get\_header(dataspace)

Can we fetch a header?

decisionengine.framework.dataspace.tests.test\_dataspace.test\_get\_header\_not\_exist(dataspace)

Does it error out if we ask for a bogus header?

decisionengine.framework.dataspace.tests.test\_dataspace.test\_get\_last\_generation\_id(dataspace)

Can we get the last generation id by name or name and uuid

decisionengine.framework.dataspace.tests.test\_dataspace.test\_get\_last\_generation\_id\_not\_exist(dataspace)

Does it error out if we ask for a bogus taskmanager?

decisionengine.framework.dataspace.tests.test\_dataspace.test\_get\_metadata(dataspace)

Can we fetch a metadata element?

decisionengine.framework.dataspace.tests.test\_dataspace.test\_get\_metadata\_not\_exist(dataspace)

Does it error out if we ask for a bogus metadata element?

decisionengine.framework.dataspace.tests.test\_dataspace.test\_get\_taskmanager\_exists(dataspace)

Can I get a taskmanager by name or name and uuid

decisionengine.framework.dataspace.tests.test\_dataspace.test\_get\_taskmanager\_not\_exists(dataspace)

This should error out

decisionengine.framework.dataspace.tests.test\_dataspace.test\_get\_taskmanagers(dataspace)

Can I get multiple task managers

decisionengine.framework.dataspace.tests.test\_dataspace.test\_get\_taskmanagers\_not\_exist(dataspace)

Do I error out when asking for garbage

decisionengine.framework.dataspace.tests.test\_dataspace.test\_has\_config(dataspace)

verify our config entry exists

decisionengine.framework.dataspace.tests.test\_dataspace.test\_insert(dataspace)

Can we insert new elements

decisionengine.framework.dataspace.tests.test\_dataspace.test\_store\_taskmanager(dataspace)

Can we make new entries

decisionengine.framework.dataspace.tests.test\_dataspace.test\_update(dataspace)

Do updates work as expected

decisionengine.framework.dataspace.tests.test\_dataspace.test\_update\_bad(dataspace)  
Do updates fail to work on bogus taskmanager as expected

## Module contents

### Submodules

#### decisionengine.framework.dataspace.datablock module

**class** decisionengine.framework.dataspace.datablock.**DataBlock**(dataspace, name,  
taskmanager\_id=None,  
generation\_id=None,  
sequence\_id=None)

Bases: object

**\_\_insert**(key, value, header, metadata)  
Insert a new product into database with header and metadata

**\_\_update**(key, value, header, metadata)  
Update an existing product in the database with header and metadata

**\_setitem**(key, value, header, metadata=None)  
put a product in the database with header and metadata

**duplicate**()  
Duplicate the datablock and return this new DataBlock. The intent is that at the point the duplication occurs there is only information from the sources in the DataBlock. This also increments the generation\_id of this DataBlock.

TODO: Also update the header and the metadata information TODO: Make this threadsafe

**Return type** *DataBlock*

**get**(key, default=None)  
Return the value associated with the key in the database

**Return type** dict

**get\_dataproducts**(key=None)

**get\_header**(key)  
Return the Header associated with the key in the database

**Return type** *Header*

**get\_metadata**(key)  
Return the metadata associated with the key in the database

**Return type** *Metadata*

**get\_taskmanager**(taskmanager\_name, taskmanager\_id=None)  
Retrieve TaskManager :type taskmanager\_name: string :arg taskmanager\_name: name of taskmanager to retrieve :type taskmanager\_id: string :arg taskmanager\_id: id of taskmanager to retrieve :rtype: :obj: dict

The dictionary returned looks like : { 'datestamp': datetime.datetime(2017, 12, 20, 17, 37, 17, 503210, tzinfo=psycpg2.tz.FixedOffsetTimezone(offset=-360, name=None)),  
'sequence\_id': 135L, 'name': 'AWS\_Calculations', 'taskmanager\_id': '77B16EB5-C79E-45B0-B1B1-37E846692E1D' }

**is\_expired**(*key=None*)

Check if the dataproduct for a given key or any key is expired

**keys**()

**mark\_expired**(*expiration\_time*)

Set the expiration\_time for the current generation of the dataproduct and mark it as expired if expiration\_time <= current time

**put**(*key, value, header, metadata=None*)

Put data into the DataBlock

**store\_taskmanager**(*taskmanager\_name, taskmanager\_id*)

Persist TaskManager, returns sequence number :type taskmanager\_name: string :type taskmanager\_id: :obj: string :rtype: int

```
class decisionengine.framework.dataspace.datablock.Header(taskmanager_id, create_time=None,
                                                         expiration_time=None,
                                                         scheduled_create_time=None,
                                                         creator='module', schema_id=None)
```

Bases: collections.UserDict

**\_abc\_impl** = <\_abc.\_abc\_data object>

**default\_data\_lifetime** = 1800

**is\_valid**()

Check if the Header has minimum required information

**required\_keys** = {'create\_time', 'creator', 'expiration\_time',  
'scheduled\_create\_time', 'schema\_id', 'taskmanager\_id'}

**exception** decisionengine.framework.dataspace.datablock.InvalidMetadataError

Bases: Exception

Errors due to invalid Metadata

```
class decisionengine.framework.dataspace.datablock.Metadata(taskmanager_id, state='NEW',
                                                            generation_id=None,
                                                            generation_time=None,
                                                            missed_update_count=0)
```

Bases: collections.UserDict

**\_abc\_impl** = <\_abc.\_abc\_data object>

**required\_keys** = {'generation\_id', 'generation\_time', 'missed\_update\_count', 'state',  
'taskmanager\_id'}

**set\_state**(*state*)

Set the state for the Metadata

**valid\_states** = {'END\_CYCLE', 'METADATA\_UPDATE', 'NEW', 'START\_BACKUP'}



```
class decisionengine.framework.dataspace.datablock.ProductRetriever(product_name,
                                                                    product_type,
                                                                    product_source)
```

Bases: object

```
decisionengine.framework.dataspace.datablock.compress(obj)
```

Compress python object :param obj: python object :return: compressed object

```
decisionengine.framework.dataspace.datablock.decompress(zbytes)
```

Decompress zipped byte stream, convert to string. :param zbytes: byte stream :return: uncompressed string

```
decisionengine.framework.dataspace.datablock.zdumps(obj)
```

Pickle and compress :param obj: a python object :return: compressed string

```
decisionengine.framework.dataspace.datablock.zloads(zbytes)
```

Decompress and unpickle If input is not compressed attempts to just unpickle it

**Parameters** *zbytes* – compressed bytes

**Returns** returns python object

### decisionengine.framework.dataspace.datasources module

```
class decisionengine.framework.dataspace.datasources.DataSource(config)
```

Bases: object

```
_abc_impl = <_abc._abc_data object>
```

```
abstract close()
```

Close all connections to the database

```
abstract connect()
```

Create a pool of database connections

```
abstract create_tables()
```

Create database tables

```
dataprodukt_table = 'dataprodukt'
```

Name of the dataprodukt table

```
abstract delete_data_older_than(days)
```

Delete data older than interval :type days: long :arg days: remove data older than interval

```
abstract duplicate_datablock(taskmanager_id, generation_id, new_generation_id)
```

For the given taskmanager\_id, make a copy of the datablock with given generation\_id, set the generation\_id for the datablock copy

**Parameters**

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data
- **new\_generation\_id** (int) – generation\_id of the new datablock created

```
abstract get_datablock(taskmanager_id, generation_id)
```

Return the entire datablock from the dataprodukt table for the given taskmanager\_id, generation\_id

**Parameters**

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data

**abstract get\_dataproduct**(*taskmanager\_id, generation\_id, key*)

Return the data from the dataproduct table for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data
- **key** (string) – key for the value

**abstract get\_dataproducts**(*taskmanager\_id, key*)

Return list of all data products associated with with taskmanager\_id

**Parameters** **key** (string) – data product key

**abstract get\_header**(*taskmanager\_id, generation\_id, key*)

Return the header from the header table for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data
- **key** (string) – key for the value

**abstract get\_last\_generation\_id**(*taskmanager\_name, taskmanager\_id=None*)

Return last generation id for current task manager or taskmanager w/ task\_manager\_id.

**Parameters**

- **taskmanager\_name** (string) – task manager name
- **taskmanager\_id** (string) – task manager id

**abstract get\_metadata**(*taskmanager\_id, generation\_id, key*)

Return the metadata from the metadata table for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data
- **key** (string) – key for the value

**abstract get\_schema**(*table=None*)

Given the table name return it's schema

**Parameters** **table** (string) – Name of the table

**abstract get\_taskmanager**(*taskmanager\_name, taskmanager\_id*)

Retrieve TaskManager :type taskmanager\_name: **string** :arg taskmanager\_name: name of taskmanager to retrieve :type taskmanager\_id: **string** :arg taskmanager\_id: id of taskmanager to retrieve

**abstract get\_taskmanagers**(*taskmanager\_name=None, start\_time=None, end\_time=None*)

Retrieve TaskManagers :type taskmanager\_name: **string** :arg taskmanager\_name: name of taskmanager to retrieve :type taskmanager\_id: **string** :arg taskmanager\_id: id of taskmanager to retrieve

**header\_table = 'header'**

Name of the header table

**abstract insert**(*taskmanager\_id, generation\_id, key, value, header, metadata*)

Insert data into respective tables for the given taskmanager\_id, generation\_id, key

**Parameters**

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data
- **key** (string) – key for the value
- **value** (object) – Value can be an object or dict
- **header** (Header) – Header for the value
- **header** – Metadata for the value

**metadata\_table** = 'metadata'

Name of the metadata table

**abstract reset\_connections()**

Drop any cached connections and reconnect to the database

**abstract store\_taskmanager**(*taskmanager\_name, taskmanager\_id, datestamp=None*)

Store TaskManager :type taskmanager\_name: **string** :arg taskmanager\_name: name of taskmanager to retrieve :type taskmanager\_id: **string** :arg taskmanager\_id: id of taskmanager to retrieve :type datestamp: **datetime** :arg datestamp: datetime of created object, defaults to 'now'

**taskmanager\_table** = 'taskmanager'

Name of the taskmanager table

**abstract update**(*taskmanager\_id, generation\_id, key, value, header, metadata*)

Update the data in respective tables for the given taskmanager\_id, generation\_id, key

#### Parameters

- **taskmanager\_id** (string) – taskmanager\_id for generation to be retrieved
- **generation\_id** (int) – generation\_id of the data
- **key** (string) – key for the value
- **value** (object) – Value can be an object or dict
- **header** (Header) – Header for the value
- **header** – Metadata for the value

## decisionengine.framework.dataspace.dataspace module

**class** decisionengine.framework.dataspace.dataspace.**DataSpace**(*config*)

Bases: object

DataSpace class is collection of datablocks and provides interface to the database used to store the actual data

**close()**

**delete**(*taskmanager\_id, all\_generations=False*)

**duplicate\_datablock**(*taskmanager\_id, generation\_id, new\_generation\_id*)

**get\_datablock**(*taskmanager\_id, generation\_id*)

**get\_dataproduct**(*taskmanager\_id, generation\_id, key*)

**get\_dataproducts**(*taskmanager\_id, key=None*)

**get\_header**(*taskmanager\_id, generation\_id, key*)

**get\_last\_generation\_id**(*taskmanager\_name, taskmanager\_id=None*)

**get\_metadata**(*taskmanager\_id*, *generation\_id*, *key*)

**get\_taskmanager**(*taskmanager\_name*, *taskmanager\_id*=None)

**get\_taskmanagers**(*taskmanager\_name*=None, *start\_time*=None, *end\_time*=None)

**insert**(*taskmanager\_id*, *generation\_id*, *key*, *value*, *header*, *metadata*)

**mark\_demented**(*taskmanager\_id*, *keys*, *generation\_id*=None)

**mark\_expired**(*taskmanager\_id*, *generation\_id*, *key*, *expiry\_time*)

**store\_taskmanager**(*name*, *taskmanager\_id*, *timestamp*=None)

**update**(*taskmanager\_id*, *generation\_id*, *key*, *value*, *header*, *metadata*)

**exception** decisionengine.framework.dataspace.dataspace.DataSpaceConfigurationError

Bases: Exception

Errors related to database access

**exception** decisionengine.framework.dataspace.dataspace.DataSpaceConnectionError

Bases: Exception

Errors related to database access

**exception** decisionengine.framework.dataspace.dataspace.DataSpaceError

Bases: Exception

Errors related to database access

**exception** decisionengine.framework.dataspace.dataspace.DataSpaceExistsError

Bases: Exception

Errors related to database access

## decisionengine.framework.dataspace.maintain module

**class** decisionengine.framework.dataspace.maintain.Reaper(*config*)

Bases: object

Reaper provides functionality of periodic deletion of data older than *retention\_interval* in days

The class attributes indicate a rational set of defaults that shouldn't be altered by user configuration.

**MIN\_RETENTION\_INTERVAL\_DAYS** = 7

**MIN\_SECONDS\_BETWEEN\_RUNS** = 7080

**\_reaper\_loop**(*delay*)

The thread actually runs this.

**reap**()

Actually spawn the query to delete the old records. Lock the state as this task doesn't have a cancel option.

**property** *retention\_interval*

We have data constraints, so use a property to track

**property** *seconds\_between\_runs*

We have data constraints, so use a property to track

**start**(*delay*=0)

Start thread with an optional delay to start the thread in X seconds

**stop()**

Try to stop the reaper, will block if the reaper cannot be interrupted.

## Module contents

### decisionengine.framework.engine package

#### Subpackages

### decisionengine.framework.engine.tests package

#### Submodules

### decisionengine.framework.engine.tests.fixtures module

pytest defaults

decisionengine.framework.engine.tests.fixtures.**DEServer**(*conf\_path=None, conf\_override=None, channel\_conf\_path=None, channel\_conf\_override=None, host='127.0.0.1', port=None*)

A DE Server using a private database

decisionengine.framework.engine.tests.fixtures.**PG\_DE\_DB\_WITHOUT\_SCHEMA**(*request: \_pytest.fixtures.FixtureRequest*)  
→  
psycopg2.extensions.connection

Fixture factory for PostgreSQL.

**Parameters** **request** – fixture request object

**Returns** postgresql client

decisionengine.framework.engine.tests.fixtures.**PG\_DE\_DB\_WITH\_SCHEMA**(*PG\_DE\_DB\_WITHOUT\_SCHEMA*)  
Load our PG schema into the database via this fixture so pytest knows the limitations on parallel usage of this database scope.

decisionengine.framework.engine.tests.fixtures.**PG\_PROG**(*request: \_pytest.fixtures.FixtureRequest, tmpdir\_factory: \_pytest.tmpdir.TempdirFactory*) →  
Iterator[pytest\_postgresql.executor.PostgreSQLExecutor]

Process fixture for PostgreSQL.

**Parameters** **request** – fixture request object

**Returns** tcp executor

decisionengine.framework.engine.tests.fixtures.**SQLALCHEMY\_PG\_WITH\_SCHEMA**(*PG\_DE\_DB\_WITHOUT\_SCHEMA*)  
Get a blank database from pytest\_postgresql. Then setup the SQLAlchemy style URL with that DB. The SQLAlchemyDS will create the schema as needed.

decisionengine.framework.engine.tests.fixtures.**SQLALCHEMY\_TEMPFILE\_SQLITE**(*tmp\_path*)  
Setup an SQLite database with the pytest tmp\_path fixture. Then setup the SQLAlchemy style URL with that DB. The SQLAlchemyDS will create the schema as needed.

### decisionengine.framework.engine.tests.test\_client\_only module

```
decisionengine.framework.engine.tests.test_client_only.test_client_err_returned_as_rc()
    no de server is running, so -status should error
decisionengine.framework.engine.tests.test_client_only.test_client_err_returned_verbose_as_rc()
    no de server is running, so -status should error
decisionengine.framework.engine.tests.test_client_only.test_client_help(capfd)
decisionengine.framework.engine.tests.test_client_only.test_client_with_no_command_says_use_help()
decisionengine.framework.engine.tests.test_client_only.test_client_with_no_server()
decisionengine.framework.engine.tests.test_client_only.test_client_with_no_server_verbose()
decisionengine.framework.engine.tests.test_client_only.test_exclusive_options()
```

### decisionengine.framework.engine.tests.test\_query\_tool\_only module

```
decisionengine.framework.engine.tests.test_query_tool_only.test_client_err_returned_as_rc()
    no de server is running, so -status should error
decisionengine.framework.engine.tests.test_query_tool_only.test_client_err_returned_verbose_as_rc()
    no de server is running, so -status should error
decisionengine.framework.engine.tests.test_query_tool_only.test_query_tool_help()
decisionengine.framework.engine.tests.test_query_tool_only.test_query_tool_with_no_server()
decisionengine.framework.engine.tests.test_query_tool_only.test_query_tool_with_no_server_verbose()
```

### decisionengine.framework.engine.tests.test\_startup module

```
decisionengine.framework.engine.tests.test_startup._check_override(arguments)
decisionengine.framework.engine.tests.test_startup.test_change_port()
decisionengine.framework.engine.tests.test_startup.test_default_config()
```

## Module contents

### Submodules

### decisionengine.framework.engine.DecisionEngine module

Main loop for Decision Engine. The following environment variable points to decision engine configuration file: `DECISION_ENGINE_CONFIG_FILE` if this environment variable is not defined the `DE-Config.py` file from the `../tests/etc/` directory will be used.

```
class decisionengine.framework.engine.DecisionEngine.DecisionEngine(global_config,
                                                                    channel_config_loader,
                                                                    server_address)

    Bases: socketserver.ThreadingMixIn, xmlrpc.server.SimpleXMLRPCServer

    _dataframe_to_column_names(df)
```

**`_dataframe_to_csv(df)`**

**`_dataframe_to_json(df)`**

**`_dataframe_to_table(df)`**

**`_dataframe_to_vertical_tables(df)`**

**`_dispatch(method, params)`**

Dispatches the XML-RPC method.

XML-RPC calls are forwarded to a registered function that matches the called XML-RPC method name. If no such function exists then the call is forwarded to the registered instance, if available.

If the registered instance has a `_dispatch` method then that method will be called with the name of the XML-RPC method and its parameters as a tuple e.g. `instance._dispatch('add',(2,3))`

If the registered instance does not have a `_dispatch` method then the instance will be searched to find a matching method and, if found, will be called.

Methods beginning with an `'_'` are considered private and will not be called.

**`block_until(state, timeout=None)`**

**`block_while(state, timeout=None)`**

**`get_logger()`**

**`handle_sighup(signum, frame)`**

**`reaper_start(delay)`**

**`reaper_status()`**

**`reaper_stop()`**

**`rm_channel(channel, maybe_timeout)`**

**`rpc_block_while(state_str, timeout=None)`**

**`rpc_get_channel_log_level(channel)`**

**`rpc_get_log_level()`**

**`rpc_kill_channel(channel, timeout=None)`**

**`rpc_print_product(product, columns=None, query=None, types=False, format=None)`**

**`rpc_print_products()`**

**`rpc_query_tool(product, format=None, start_time=None)`**

**`rpc_reaper_start(delay=0)`**

Start the reaper process after 'delay' seconds. Default 0 seconds delay. :type delay: int

**`rpc_reaper_status()`**

**`rpc_reaper_stop()`**

**`rpc_rm_channel(channel, maybe_timeout)`**

**`rpc_set_channel_log_level(channel, log_level)`**

Assumes log\_level is a string corresponding to the supported logging-module levels.

**`rpc_show_config(channel)`**

Show the configuration for a channel.

```
rpc_show_de_config()
rpc_start_channel(channel_name)
rpc_start_channels()
rpc_status()
rpc_stop()
rpc_stop_channel(channel)
rpc_stop_channels()
start_channel(channel_name, channel_config)
start_channels()
stop_channels()
stop_worker(worker, timeout)

class decisionengine.framework.engine.DecisionEngine.RequestHandler(request, client_address,
                                                                    server)
    Bases: xmlrpc.server.SimpleXMLRPCRequestHandler
    rpc_paths = ('/RPC2',)

class decisionengine.framework.engine.DecisionEngine.StopState(value)
    Bases: enum.Enum
    An enumeration.
    Clean = 2
    NotFound = 1
    Terminated = 3

decisionengine.framework.engine.DecisionEngine._channel_preamble(name)
decisionengine.framework.engine.DecisionEngine._create_de_server(global_config,
                                                                    channel_config_loader)
    Create the DE server with the passed global configuration and config manager
decisionengine.framework.engine.DecisionEngine._get_de_conf_manager(global_config_dir,
                                                                    channel_config_dir,
                                                                    options)

decisionengine.framework.engine.DecisionEngine._get_global_config(config_file, options)
decisionengine.framework.engine.DecisionEngine._start_de_server(server)
    Start the DE server and listen forever

decisionengine.framework.engine.DecisionEngine.main(args=None)
    If args is None, sys.argv will be used instead If args is a list, it will be used instead of sys.argv (for unit testing)
decisionengine.framework.engine.DecisionEngine.parse_program_options(args=None)
    If args is a list, it will be used instead of sys.argv
```



## decisionengine.framework.engine.Workers module

**class** decisionengine.framework.engine.Workers.**Worker**(*task\_manager*, *logger\_config*)

Bases: multiprocessing.context.Process

Class that encapsulates a channel's task manager as a separate process.

This class' run function is called whenever the process is started. If the process is abruptly terminated—e.g. the run method is pre-empted by a signal or an os.\_exit(n) call—the Worker object will still exist even if the operating-system process no longer does.

To determine the exit code of this process, use the Worker.exitcode value, provided by the multiprocessing.Process base class.

**get\_consumes**()

**get\_produces**()

**get\_state\_name**()

**run**()

Method to be run in sub-process; can be overridden in sub-class

**wait\_until**(*state*, *timeout=None*)

**wait\_while**(*state*, *timeout=None*)

**class** decisionengine.framework.engine.Workers.**Workers**

Bases: object

This class manages and provides access to the task-manager workers.

The intention is that the decision engine never directly interacts with the workers but refers to them via a context manager:

```
with workers.access() as ws: # Access to ws now protected ws['new_channel'] = Worker(...)
```

In cases where the decision engine's block\_while or block\_until methods must be called (e.g. during tests), one should use the unguarded access:

```
with workers.unguarded_access() as ws: # Access to ws is unprotected
    ws['new_channel'].wait_until(...)
```

Calling a blocking method while using the protected context manager (i.e. workers.access()) will likely result in a deadlock.

**class** Access(*workers*, *lock*)

Bases: object

**\_update\_channel\_states**()

**access**()

**unguarded\_access**()

## decisionengine.framework.engine.de\_client module

`decisionengine.framework.engine.de_client.console_scripts_main(args_to_parse=None)`

This is the entry point for the setuptools auto generated scripts. Setuptools thinks a return from this function is an error message.

`decisionengine.framework.engine.de_client.create_parser()`

`decisionengine.framework.engine.de_client.execute_command_from_args(argsparsed, de_socket)`  
argsparsed should be from create\_parser in this file

`decisionengine.framework.engine.de_client.main(args_to_parse=None)`

If you pass a list of args, they will be used instead of sys.argv

## decisionengine.framework.engine.de\_query\_tool module

`decisionengine.framework.engine.de_query_tool.console_scripts_main(args_to_parse=None)`

This is the entry point for the setuptools auto generated scripts. Setuptools thinks a return from this function is an error message.

`decisionengine.framework.engine.de_query_tool.create_parser()`

`decisionengine.framework.engine.de_query_tool.execute_command_from_args(argsparsed, de_socket)`

Calls the proper function for the arguments passed to de\_query\_tool.

### Parameters

- **argsparsed** (*Namespace*) – Should be from create\_parser in this file.
- **de\_socket** (*ServerProxy*) – RPC Server Proxy.

**Returns** Output of the command.

**Return type** str

`decisionengine.framework.engine.de_query_tool.main(args_to_parse=None)`

Main function for de\_query\_tool

**Parameters** **args\_to\_parse** (*list, optional*) – If you pass a list of args, they will be used instead of sys.argv. Defaults to None.

**Returns** Query result

**Return type** str

## Module contents

**decisionengine.framework.logicengine package**

**Subpackages**

**decisionengine.framework.logicengine.tests package**

**Submodules**

### **decisionengine.framework.logicengine.tests.test\_cascaded\_rules module**

```
decisionengine.framework.logicengine.tests.test_cascaded_rules.myengine()  
decisionengine.framework.logicengine.tests.test_cascaded_rules.test_rule_that_does_not_fire(myengine)  
decisionengine.framework.logicengine.tests.test_cascaded_rules.test_rule_that_fires(myengine)
```

### **decisionengine.framework.logicengine.tests.test\_construction module**

```
decisionengine.framework.logicengine.tests.test_construction.test_configuration_with_fact_using_function()  
decisionengine.framework.logicengine.tests.test_construction.test_configuration_with_numpy_facts()  
decisionengine.framework.logicengine.tests.test_construction.test_default_construction()  
    LogicEngine is not default constructible.  
decisionengine.framework.logicengine.tests.test_construction.test_trivial_configuration()  
    Logic engine constructed with trivial rules and facts.  
decisionengine.framework.logicengine.tests.test_construction.test_wrong_configuration()  
    LogicEngine construction requires rules and facts; if we don't supply them it is an error.
```

### **decisionengine.framework.logicengine.tests.test\_duplicate\_fact\_names module**

```
decisionengine.framework.logicengine.tests.test_duplicate_fact_names.test_duplicate_fact_names()
```

### **decisionengine.framework.logicengine.tests.test\_facts module**

```
decisionengine.framework.logicengine.tests.test_facts.make_db(maximum)  
decisionengine.framework.logicengine.tests.test_facts.test_compound_fact_with_spaces()  
decisionengine.framework.logicengine.tests.test_facts.test_fact_using_numpy_array()  
decisionengine.framework.logicengine.tests.test_facts.test_fact_using_numpy_function()  
decisionengine.framework.logicengine.tests.test_facts.test_fact_with_fail_on_error()  
decisionengine.framework.logicengine.tests.test_facts.test_fact_with_nested_names()  
decisionengine.framework.logicengine.tests.test_facts.test_simple_fact()  
decisionengine.framework.logicengine.tests.test_facts.test_syntax_error(caplog)
```

### **decisionengine.framework.logicengine.tests.test\_fail\_on\_error module**

```
decisionengine.framework.logicengine.tests.test_fail_on_error.logic_engine_with_fact(fact)  
decisionengine.framework.logicengine.tests.test_fail_on_error.test_conditional_fact()  
decisionengine.framework.logicengine.tests.test_fail_on_error.test_fact_with_misspecified_attribute()  
decisionengine.framework.logicengine.tests.test_fail_on_error.test_fail_on_error(caplog)  
decisionengine.framework.logicengine.tests.test_fail_on_error.test_false_fact_with_spaces()  
decisionengine.framework.logicengine.tests.test_fail_on_error.test_false_literal_fact()
```

```
decisionengine.framework.logicengine.tests.test_fail_on_error.test_index_error()
decisionengine.framework.logicengine.tests.test_fail_on_error.test_misspecified_fact()
decisionengine.framework.logicengine.tests.test_fail_on_error.test_true_fact()
decisionengine.framework.logicengine.tests.test_fail_on_error.test_true_literal_fact()
```

#### decisionengine.framework.logicengine.tests.test\_pandas\_fact module

```
decisionengine.framework.logicengine.tests.test_pandas_fact.mydata(y)
    Return a 'datablock' surrogate carrying a Pandas DataFrame, and a parameter named 'y' with value y.
decisionengine.framework.logicengine.tests.test_pandas_fact.myengine()
decisionengine.framework.logicengine.tests.test_pandas_fact.test_rule_that_does_not_fire(myengine)
    Rules that do not fire do not create entries in the returned actions and newfacts.
decisionengine.framework.logicengine.tests.test_pandas_fact.test_rule_that_fires(myengine)
```

#### decisionengine.framework.logicengine.tests.test\_rule\_with\_negated\_fact module

```
decisionengine.framework.logicengine.tests.test_rule_with_negated_fact.myengine()
decisionengine.framework.logicengine.tests.test_rule_with_negated_fact.test_rule_that_does_not_fire(myengine)
    Rules that do not fire do not create entries in the returned actions and newfacts.
decisionengine.framework.logicengine.tests.test_rule_with_negated_fact.test_rule_that_fires(myengine)
```

#### decisionengine.framework.logicengine.tests.test\_simple\_configuration module

```
decisionengine.framework.logicengine.tests.test_simple_configuration.myengine()
decisionengine.framework.logicengine.tests.test_simple_configuration.test_rule_that_does_not_fire(myengine)
    Rules that do not fire do not create entries in the returned actions and newfacts.
decisionengine.framework.logicengine.tests.test_simple_configuration.test_rule_that_fires(myengine)
```

### Module contents

#### Submodules

#### decisionengine.framework.logicengine.BooleanExpression module

```
class decisionengine.framework.logicengine.BooleanExpression.BooleanExpression(expr)
    Bases: object
    evaluate(d)
        Return the evaluated Boolean value of this expression in the context of the given data 'd'.
exception decisionengine.framework.logicengine.BooleanExpression.LogicError
    Bases: TypeError
decisionengine.framework.logicengine.BooleanExpression.function_name_from_call(callnode)
decisionengine.framework.logicengine.BooleanExpression.maybe_fail_on_error(expr)
```

**decisionengine.framework.logicengine.FactLookup module**

**class** `decisionengine.framework.logicengine.FactLookup.FactLookup(fact_names, rules_cfg)`

Bases: `object`

Establishes a policy for looking up a fact based on the given name.

To wit, the first fact with a given name is the one that is used in the evaluation of all subsequent facts.

As an example, consider the following configuration:

```
facts: { should_publish: "(True)",
}, rules: {
  publish_1: { expression: "should_publish", facts: ["should_publish"]
}, publish_2: {
  expression: "should_publish", actions: ["go_to_press"] facts: ["should_publish"]
} retract: {
  expression: "not should_publish", facts: ["should_retract"]
}
```

In the above, the first fact to be evaluated will always be the top-level facts (i.e. those not encapsulated by the 'rules' table). The rules labeled 'publish\_1' and 'publish\_2' both rely on the 'should\_publish' fact in their expressions, and they in turn create their own facts with the same name. FactLookup ensures that 'publish\_1' and 'publish\_2' will both use the evaluated fact from the top-level 'facts' table.

**rule\_for(*fact\_name*)**

Selects rule required to evaluate fact with the supplied name.

**Parameters** **fact\_name** (*str*) – Name of fact for which rule will be selected.

**Return type** `str`

**Returns** Rule name

**sorted\_rules(*rules\_cfg*)**

Rules sorted according to rule dependencies.

**Parameters** **rules\_cfg** (*dict*) – rules as specified in logic-engine configuration

**Return type** `list`

**Returns** Rules to be evaluated by the rule engine.

**decisionengine.framework.logicengine.LogicEngine module**

**class** `decisionengine.framework.logicengine.LogicEngine.LogicEngine(cfg, channel_name)`

Bases: `decisionengine.framework.modules.Module.Module`

**\_create\_facts\_dataframe(*newfacts*)**

Convert newfacts dict in format below to dataframe with columns ['rule\_name', 'fact\_name', 'fact\_value']

facts dict format: 'newfacts': {

    '**publish\_glidein\_requests**': { 'allow\_hpc\_new': True, 'allow\_foo': True

    }, 'dummy\_rule': {

        'dummy\_new\_fact': True

```
    }  
  }  
  
  consumes()  
    Return the names of all the items that must be in the DataBlock for the rules to be evaluated.  
  
  evaluate(db)  
    Evaluate our facts and rules, in the context of the given data. db can be any mappable, in particular a  
    DataBlock or dictionary.  
  
    Parameters db (DataBlock) – Products used to evaluate facts.  
  
  evaluate_facts(db)  
  
    Parameters db (DataBlock) – Products used to evaluate facts.  
  
    Return type dict  
  
    Returns Evaluated fact values (e.g. True or False) for each fact name.  
  
  produces()
```

### decisionengine.framework.logicengine.Rule module

```
class decisionengine.framework.logicengine.Rule.Rule(rule_name, rule_cfg)  
  Bases: object  
  
  In-memory representation of logic-engine rule, relying on parsing utilities in BooleanExpression.  
  
  evaluate(evaluated_facts)  
    Evaluates a compiled expression given the supplied facts.  
  
    Parameters evaluated_facts (dict) – Initial fact values (e.g. True or False) for each fact  
    name.  
  
    Return type bool
```

### decisionengine.framework.logicengine.RuleEngine module

```
class decisionengine.framework.logicengine.RuleEngine.RuleEngine(fact_names, rules_cfg)  
  Bases: object  
  
  Engine responsible for evaluating logic-engine rules.  
  
  This class is responsible for (a) forming a sorted set of rules that supports dependencies between them, and (b)  
  evaluating the rules according to a specified fact-lookup policy.  
  
  execute(evaluated_facts)  
    Evaluates all rules given the supplied facts.  
  
    Parameters evaluated_facts (dict) – Initial fact values (e.g. True or False) for each fact  
    name.  
  
    Return type tuple  
  
    Returns Actions to be taken based on rule evaluation; new facts produced during that evaluation.
```

## Module contents

### decisionengine.framework.modules package

#### Subpackages

### decisionengine.framework.modules.tests package

#### Submodules

#### decisionengine.framework.modules.tests.test\_LogicEngine module

`decisionengine.framework.modules.tests.test_LogicEngine.test_logicengine_structure()`  
The module.Module itself is a bit of a skeleton...

#### decisionengine.framework.modules.tests.test\_Module module

`decisionengine.framework.modules.tests.test_Module.test_module_structure()`  
The module.Module itself is a bit of a skeleton...

#### decisionengine.framework.modules.tests.test\_Publisher module

`decisionengine.framework.modules.tests.test_Publisher.test_publisher_structure()`  
The module.publisher itself is a bit of a skeleton...

#### decisionengine.framework.modules.tests.test\_Source module

`decisionengine.framework.modules.tests.test_Source.test_source_structure()`  
The module.Source itself is a bit of a skeleton...

#### decisionengine.framework.modules.tests.test\_Transform module

`decisionengine.framework.modules.tests.test_Transform.test_transform_structure()`  
The module.Transform itself is a bit of a skeleton...

#### decisionengine.framework.modules.tests.test\_de\_logger module

`decisionengine.framework.modules.tests.test_de_logger.log_setup()`  
`decisionengine.framework.modules.tests.test_de_logger.test_by_nonsense_is_err(log_setup)`  
`decisionengine.framework.modules.tests.test_de_logger.test_by_size(log_setup)`  
`decisionengine.framework.modules.tests.test_de_logger.test_by_time(log_setup)`

### decisionengine.framework.modules.tests.test\_module\_decorators module

```
decisionengine.framework.modules.tests.test_module_decorators.test_multiple_consumes_declarations()
decisionengine.framework.modules.tests.test_module_decorators.test_multiple_produces_declarations()
decisionengine.framework.modules.tests.test_module_decorators.test_supports_config()
decisionengine.framework.modules.tests.test_module_decorators.test_wrong_product_names()
decisionengine.framework.modules.tests.test_module_decorators.test_wrong_product_types()
```

### decisionengine.framework.modules.tests.test\_translate\_product\_name module

```
decisionengine.framework.modules.tests.test_translate_product_name.test_translate_all()
decisionengine.framework.modules.tests.test_translate_product_name.test_translate_illegal_characters()
decisionengine.framework.modules.tests.test_translate_product_name.test_translate_none()
decisionengine.framework.modules.tests.test_translate_product_name.test_translate_simple()
decisionengine.framework.modules.tests.test_translate_product_name.test_translate_with_underscores()
```

## Module contents

### Submodules

### decisionengine.framework.modules.LogicEngine module

```
class decisionengine.framework.modules.LogicEngine.LogicEngine(set_of_parameters)
    Bases: decisionengine.framework.modules.Module.Module
    evaluate(data_block)
```

### decisionengine.framework.modules.Module module

```
class decisionengine.framework.modules.Module.Module(set_of_parameters)
    Bases: object
    A skeleton of a module
    get_data_block()
    get_parameters()
    set_data_block(data_block)

decisionengine.framework.modules.Module.consumes(**kwargs)
decisionengine.framework.modules.Module.produces(**kwargs)
decisionengine.framework.modules.Module.verify_products(producer, data)
```



## decisionengine.framework.modules.Publisher module

```
class decisionengine.framework.modules.Publisher.Parameter(name, type=None, default=None,
                                                           comment=None)
```

Bases: object

```
class decisionengine.framework.modules.Publisher.Publisher(set_of_parameters)
```

Bases: [decisionengine.framework.modules.Module.Module](#)

```
_consumes = {}
```

```
publish(data_block=None)
```

```
shutdown()
```

```
decisionengine.framework.modules.Publisher.consumes(**kwargs)
```

```
decisionengine.framework.modules.Publisher.describe(cls, program_options=<class 'decisionengine.framework.modules.describe.ModuleProgramOptions'>)
```

```
decisionengine.framework.modules.Publisher.supports_config(*args)
```

## decisionengine.framework.modules.Source module

```
class decisionengine.framework.modules.Source.Parameter(name, type=None, default=None,
                                                         comment=None)
```

Bases: object

```
class decisionengine.framework.modules.Source.Source(set_of_parameters)
```

Bases: [decisionengine.framework.modules.Module.Module](#)

```
_produces = {}
```

```
acquire()
```

```
post_create(global_config)
```

```
decisionengine.framework.modules.Source.describe(cls, sample_config=None)
```

```
decisionengine.framework.modules.Source.produces(**kwargs)
```

```
decisionengine.framework.modules.Source.supports_config(*args)
```

## decisionengine.framework.modules.SourceProxy module

Fill in data from another channel data block

```
class decisionengine.framework.modules.SourceProxy.SourceProxy(config)
```

Bases: [decisionengine.framework.modules.Source.Source](#)

```
_get_data(data_block, key)
```

```
_supported_config = {'Dataproducts': (<class 'list'>, None, 'List of data products to retrieve.'), 'channel_name': (<class 'str'>, None, 'Channel from which to retrieve data products.'), 'retries': (<class 'int'>, 10, 'Number of attempts allowed to fetch products.'), 'retry_timeout': (<class 'int'>, 60, 'Number of seconds to wait between retries.')}
```

```
acquire()
```

Overrides Source class method

```
post_create(global_config)
```

### decisionengine.framework.modules.Transform module

```
class decisionengine.framework.modules.Transform.Parameter(name, type=None, default=None,
                                                           comment=None)
```

Bases: object

```
class decisionengine.framework.modules.Transform.Transform(set_of_parameters)
```

Bases: *decisionengine.framework.modules.Module.Module*

```
_consumes = {}
```

```
_produces = {}
```

```
transform()
```

```
decisionengine.framework.modules.Transform.consumes(**kwargs)
```

```
decisionengine.framework.modules.Transform.describe(cls, program_options=<class 'decision-
engine.framework.modules.describe.ModuleProgramOptions'>)
```

```
decisionengine.framework.modules.Transform.produces(**kwargs)
```

```
decisionengine.framework.modules.Transform.supports_config(*args)
```

### decisionengine.framework.modules.de\_logger module

Logger to use in all modules

```
decisionengine.framework.modules.de_logger.get_logger()
```

get default logger - "decisionengine" :rtype: logging.Logger - rotating file logger

```
decisionengine.framework.modules.de_logger.set_logging(log_level, file_rotate_by,
                                                         rotation_time_unit='D', rotation_interval=1,
                                                         max_backup_count=6,
                                                         max_file_size=200000000,
                                                         log_file_name='/tmp/decision_engine_logs/decisionengine.log')
```

#### Parameters

- **log\_level** (str) – log level
- **file\_rotate\_by** – files rotation by size or by time
- **rotation\_time\_unit** (str) – unit of time for file rotation
- **rotation\_interval** (int) – time in rotation\_time\_units between file rotations
- **log\_file\_name** (str) – log file name
- **max\_file\_size** (int) – maximal size of log file. If reached save and start new log.
- **max\_backup\_count** (int) – start rotaion after this number is reached

**Return type** None

### decisionengine.framework.modules.describe module

```
class decisionengine.framework.modules.describe.ModuleProgramOptions(module_spec, cls)
    Bases: object
```

```
    process_args()
```

```
class decisionengine.framework.modules.describe.Parameter(name, type=None, default=None,
                                                         comment=None)
    Bases: object
```

```
decisionengine.framework.modules.describe._par_default(par_type, default_value)
```

```
decisionengine.framework.modules.describe._par_type(par_type, default_value)
```

```
decisionengine.framework.modules.describe.main_wrapper(cls, program_options=<class 'decisionengine.framework.modules.describe.ModuleProgramOptions'>)
```

```
decisionengine.framework.modules.describe.supports_config(*args)
```

### decisionengine.framework.modules.logging\_configDict module

Global Logger config dictionary used by all loggers (in their own subkeys)

### decisionengine.framework.modules.print\_description module

```
decisionengine.framework.modules.print_description._print_comment(comment)
```

```
decisionengine.framework.modules.print_description._print_type(type_or_value)
```

```
decisionengine.framework.modules.print_description._print_value(v)
```

```
decisionengine.framework.modules.print_description._spec_from_file_name(filename)
```

```
decisionengine.framework.modules.print_description.print_consumes(cls)
```

```
decisionengine.framework.modules.print_description.print_produces(cls)
```

```
decisionengine.framework.modules.print_description.print_supported_config(module_spec, cls)
```

```
decisionengine.framework.modules.print_description.spec_if_main(cls)
```

### decisionengine.framework.modules.translate\_product\_name module

```
decisionengine.framework.modules.translate_product_name.translate(spec)
```

Break apart the string 'old -> new' into a tuple ('old', 'new')

```
decisionengine.framework.modules.translate_product_name.translate_all(specs)
```

## Module contents

### decisionengine.framework.taskmanager package

#### Submodules

#### decisionengine.framework.taskmanager.ProcessingState module

The ProcessingState class can represent any of the following task-manager states:

BOOT IDLE ACTIVE STEADY OFFLINE SHUTTINGDOWN SHUTDOWN ERROR

In addition, the class supports 'wait\_until(state)' and 'wait\_while(state)' methods, which, when called from a different process, block until the state has been entered or exited, respectively.

The 'RUNNING\_CONDITIONS' list is a list of states that a thread may have if it is started/starting. The 'STOPPING\_CONDITIONS' list is a list of states that a thread may have if it is stopped/stopping. The 'INACTIVE\_CONDITIONS' list is a list of states that a thread may have when it is not active

**class** decisionengine.framework.taskmanager.ProcessingState.**ProcessingState**(state=State.BOOT)

Bases: object

This object tracks the state of a process.

A number of convenience wrappers are provided.

Additionally you may use the .lock attribute for *with* block to lock the state during specific operations.

**get()**

This function is a minimally locking check to fetch the state.

**has\_value**(state)

**inactive()**

**property lock**

**probably\_running()**

**set**(state)

This function will lock (and possibly block) to ensure a consistent change to the state value.

This function can be blocked using the .lock to force state sync between threads if need be.

**should\_stop()**

**wait\_until**(state, timeout=None)

**wait\_while**(state, timeout=None)

**class** decisionengine.framework.taskmanager.ProcessingState.**State**(value)

Bases: enum.Enum

An enumeration.

**ACTIVE** = 2

**BOOT** = 0

**ERROR** = 7

**IDLE** = 1

**OFFLINE** = 6

SHUTDOWN = 5

SHUTTINGDOWN = 4

STEADY = 3

## decisionengine.framework.taskmanager.TaskManager module

Task Manager

**class** decisionengine.framework.taskmanager.TaskManager.**Channel**(*channel\_dict, channel\_name*)  
Bases: object

Decision Channel. Instantiates workers according to channel configuration

**class** decisionengine.framework.taskmanager.TaskManager.**TaskManager**(*name, generation\_id, channel\_dict, global\_config*)  
Bases: object

Task Manager

Task Manager

**data\_block\_put**(*data, header, data\_block*)

Put data into data block

### Parameters

- **data** (dict) – key, value pairs
- **header** (Header) – data header
- **data\_block** (DataBlock) – data block

**decision\_cycle**()

Decision cycle to be run periodically (by trigger)

**do\_backup**()

Duplicate current data block and return its copy

**Return type** DataBlock

**get\_consumes**()

**get\_loglevel**()

**get\_produces**()

**get\_state**()

**get\_state\_name**()

**get\_state\_value**()

**run**()

Task Manager main loop

**run\_logic\_engine**(*data\_block=None*)

Run Logic Engine.

**Parameters** **data\_block** (DataBlock) – data block

**run\_publishers**(*actions, facts, data\_block=None*)

Run Publishers in main process.

**Parameters** **data\_block** (DataBlock) – data block

**run\_source**(*src*)

Get the data from source and put it into the data block

**Parameters** *src* (*Worker*) – source Worker

**run\_transform**(*transform*, *data\_block*)

Run a transform

**Parameters**

- **transform** (*Worker*) – source Worker
- **data\_block** (DataBlock) – data block

**run\_transforms**(*data\_block=None*)

Run transforms. So far in main process.

**Parameters** *data\_block* (DataBlock) – data block

**set\_loglevel\_value**(*log\_level*)

Assumes log\_level is a string corresponding to the supported logging-module levels.

**set\_to\_shutdown**()

**start\_sources**(*data\_block=None*)

Start sources, each in a separate thread

**Parameters** *data\_block* (DataBlock) – data block

**take\_offline**(*current\_data\_block*)

offline and stop task manager

**wait\_for\_all**(*events\_done*)

Wait for all sources or transforms to finish

**Parameters** *events\_done* (list) – list of events to wait for

**wait\_for\_any**(*events\_done*)

Wait for any sources to finish

**Parameters** *events\_done* (list) – list of events to wait for

**class** decisionengine.framework.taskmanager.TaskManager.**Worker**(*conf\_dict*, *base\_class*,  
*channel\_name*)

Bases: object

Provides interface to loadable modules and events to synchronise execution

decisionengine.framework.taskmanager.TaskManager.**\_create\_module\_instance**(*config\_dict*,  
*base\_class*,  
*channel\_name*)

Create instance of dynamically loaded module

decisionengine.framework.taskmanager.TaskManager.**\_find\_only\_one\_subclass**(*module*, *base\_class*)

Search through module looking for only one subclass of the supplied base\_class

decisionengine.framework.taskmanager.TaskManager.**\_make\_workers\_for**(*configs*, *base\_class*,  
*channel\_name*)

## decisionengine.framework.taskmanager.module\_graph module

Ensure no circularities in produces and consumes.

```
decisionengine.framework.taskmanager.module_graph._consumed_products(*worker_lists)
```

```
decisionengine.framework.taskmanager.module_graph._produced_products(*worker_lists)
```

```
decisionengine.framework.taskmanager.module_graph.ensure_no_circularities(sources, transforms,  
                                                                           publishers)
```

Ensures no circularities among data products.

## Module contents

### decisionengine.framework.tests package

#### Submodules

#### decisionengine.framework.tests.ABTransform module

```
class decisionengine.framework.tests.ABTransform.ABTransform(module_parameters, *args,  
                                                             **kwargs)
```

Bases: *decisionengine.framework.modules.Transform.Transform*

```
_consumes = {'B': None}
```

```
_produces = {'A': None}
```

#### decisionengine.framework.tests.BATransform module

```
class decisionengine.framework.tests.BATransform.BATransform(module_parameters, *args,  
                                                             **kwargs)
```

Bases: *decisionengine.framework.modules.Transform.Transform*

```
_consumes = {'A': None}
```

```
_produces = {'B': None}
```

#### decisionengine.framework.tests.ErrorOnAcquire module

```
class decisionengine.framework.tests.ErrorOnAcquire.ErrorOnAcquire(config)
```

Bases: *decisionengine.framework.modules.Source.Source*

```
_produces = {'_placeholder': None}
```

```
acquire()
```

**decisionengine.framework.tests.FailingPublisher module**

```
class decisionengine.framework.tests.FailingPublisher.FailingPublisher(module_parameters,
                                                                    *args, **kwargs)
    Bases: decisionengine.framework.modules.Publisher.Publisher
    _consumes = {'bar': None}
    publish(data_block)
```

**decisionengine.framework.tests.FailingSourceNOP module**

```
class decisionengine.framework.tests.FailingSourceNOP.SourceWithMissingProduces(set_of_parameters)
    Bases: decisionengine.framework.modules.Source.Source
```

**decisionengine.framework.tests.FailingSourceProxy module**

```
class decisionengine.framework.tests.FailingSourceProxy.FailingSourceProxy(config)
    Bases: decisionengine.framework.modules.SourceProxy.SourceProxy
    acquire()
        Overrides Source class method
```

**decisionengine.framework.tests.ModuleProgramOptions module**

```
class decisionengine.framework.tests.ModuleProgramOptions.AcquireWithConfig(name)
    Bases: object
    test(byte_str, expected_stderr=")

class decisionengine.framework.tests.ModuleProgramOptions.AcquireWithSampleConfig(name)
    Bases: object
    test()

class decisionengine.framework.tests.ModuleProgramOptions.ConfigTemplate(name)
    Bases: object
    test(has_comments=False)

class decisionengine.framework.tests.ModuleProgramOptions.Describe(name)
    Bases: object
    test(consumes=None, produces=None)

class decisionengine.framework.tests.ModuleProgramOptions.DescribeAlias(alias, original)
    Bases: object
    test()

class decisionengine.framework.tests.ModuleProgramOptions.Help(name)
    Bases: object
    test(has_sample_config=False)

decisionengine.framework.tests.ModuleProgramOptions._expected_acquire_result(name, con-
                                                                              fig_file=None,
                                                                              multiplier=1)
```



```

decisionengine.framework.tests.ModuleProgramOptions._expected_config_template(name)
decisionengine.framework.tests.ModuleProgramOptions._expected_config_template_with_comments(name)
decisionengine.framework.tests.ModuleProgramOptions._expected_help(name)
decisionengine.framework.tests.ModuleProgramOptions._expected_source_help(name,
                                                                    has_sample_config=False)
decisionengine.framework.tests.ModuleProgramOptions._normalize(string)
decisionengine.framework.tests.ModuleProgramOptions._run_as_main(name, *program_options)

```

### decisionengine.framework.tests.PublisherNOP module

```

class decisionengine.framework.tests.PublisherNOP.PublisherNOP(module_parameters, *args,
                                                                **kwargs)
    Bases: decisionengine.framework.modules.Publisher.Publisher
    _consumes = {'bar': <class 'pandas.core.frame.DataFrame'>}
    publish(data_block)

```

### decisionengine.framework.tests.PublisherWithMissingConsumes module

```

class decisionengine.framework.tests.PublisherWithMissingConsumes.PublisherWithMissingConsumes(set_of_parameters)
    Bases: decisionengine.framework.modules.Publisher.Publisher

```

### decisionengine.framework.tests.SourceAlias module

### decisionengine.framework.tests.SourceNOP module

```

class decisionengine.framework.tests.SourceNOP.SourceNOP(config)
    Bases: decisionengine.framework.modules.Source.Source
    _produces = {'foo': <class 'pandas.core.frame.DataFrame'>}
    acquire()

```

### decisionengine.framework.tests.SourceWithSampleConfigNOP module

```

class decisionengine.framework.tests.SourceWithSampleConfigNOP.SourceWithSampleConfigNOP(config)
    Bases: decisionengine.framework.modules.Source.Source
    _produces = {'foo': <class 'pandas.core.frame.DataFrame'>}
    _supported_config = {'multiplier': (<class 'int'>, None, None)}
    acquire()

```

**decisionengine.framework.tests.SupportsConfigPublisher module**

```
class decisionengine.framework.tests.SupportsConfigPublisher.SupportsConfig(set_of_parameters)
    Bases: decisionengine.framework.modules.Publisher.Publisher
    _supported_config = {'comment': (<class 'str'>, None, 'Single-line comment'),
        'comment_with_nl': (<class 'str'>, None, 'Comment with newline\n'), 'convert_to':
        (<class 'int'>, 3, None), 'default_only': (<class 'float'>, 2.5, None), 'no_type':
        (None, None, None), 'only_type': (<class 'int'>, None, None)}
```

**decisionengine.framework.tests.TransformNOP module**

```
class decisionengine.framework.tests.TransformNOP.TransformNOP(module_parameters, *args,
                                                                **kwargs)
    Bases: decisionengine.framework.modules.Transform.Transform
    _consumes = {'foo': <class 'pandas.core.frame.DataFrame'>}
    _produces = {'bar': <class 'pandas.core.frame.DataFrame'>}
    transform(data_block)
```

**decisionengine.framework.tests.TransformWithMissingProducesConsumes module**

```
class decisionengine.framework.tests.TransformWithMissingProducesConsumes.TransformWithMissingProducesConsumesC
    Bases: decisionengine.framework.modules.Transform.Transform
    transform(data_block)
```

**decisionengine.framework.tests.WorkingSourceProxy module**

```
class decisionengine.framework.tests.WorkingSourceProxy.WorkingSourceProxy(config)
    Bases: decisionengine.framework.modules.SourceProxy.SourceProxy
    acquire()
        Overrides Source class method
```

**decisionengine.framework.tests.fixtures module**

defaults for pytest

```
decisionengine.framework.tests.fixtures.DEServer(conf_path=None, conf_override=None,
                                                  channel_conf_path=None,
                                                  channel_conf_override=None, host='127.0.0.1',
                                                  port=None)
```

A DE Server using a private database

```
decisionengine.framework.tests.fixtures.PG_DE_DB_WITHOUT_SCHEMA(request:
                                                                    _pytest.fixtures.FixtureRequest)
    →
    psycopg2.extensions.connection
```

Fixture factory for PostgreSQL.

**Parameters** **request** – fixture request object

**Returns** postgresql client

`decisionengine.framework.tests.fixtures.PG_DE_DB_WITH_SCHEMA(PG_DE_DB_WITHOUT_SCHEMA)`  
Load our PG schema into the database via this fixture so pytest knows the limitations on parallel usage of this database scope.

`decisionengine.framework.tests.fixtures.PG_PROG(request: _pytest.fixtures.FixtureRequest,  
tmpdir_factory: _pytest.tmpdir.TempdirFactory) →  
Iterator[pytest_postgresql.executor.PostgreSQLExecutor]`

Process fixture for PostgreSQL.

**Parameters** **request** – fixture request object

**Returns** tcp executor

`decisionengine.framework.tests.fixtures.SQLALCHEMY_PG_WITH_SCHEMA(PG_DE_DB_WITHOUT_SCHEMA)`  
Get a blank database from `pytest_postgresql`. Then setup the SQLAlchemy style URL with that DB. The SQLAlchemyDS will create the schema as needed.

`decisionengine.framework.tests.fixtures.SQLALCHEMY_TEMPFILE_SQLITE(tmp_path)`  
Setup an SQLite database with the `pytest tmp_path` fixture. Then setup the SQLAlchemy style URL with that DB. The SQLAlchemyDS will create the schema as needed.

## decisionengine.framework.tests.test\_client\_errors module

Fixture based DE Server tests of the sample config

`decisionengine.framework.tests.test_client_errors.test_client_cannot_wait_on_bad_state(deserver)`  
Verify wait is for a valid state

## decisionengine.framework.tests.test\_client\_server module

Fixture based DE Server for the de-client tests

`decisionengine.framework.tests.test_client_server.test_client_print_product(deserver)`  
`decisionengine.framework.tests.test_client_server.test_client_print_product_columns(deserver)`  
`decisionengine.framework.tests.test_client_server.test_client_print_product_columns_query(deserver)`  
`decisionengine.framework.tests.test_client_server.test_client_print_product_json(deserver)`  
`decisionengine.framework.tests.test_client_server.test_client_print_product_not_real(deserver)`  
`decisionengine.framework.tests.test_client_server.test_client_print_product_query(deserver)`  
`decisionengine.framework.tests.test_client_server.test_client_print_product_types(deserver)`  
`decisionengine.framework.tests.test_client_server.test_client_print_product_vertical(deserver)`  
`decisionengine.framework.tests.test_client_server.test_client_status_msg_to_stdout(deserver)`  
Make sure the actual client console call goes to stdout

### decisionengine.framework.tests.test\_defaults module

Fixture based DE Server tests of the sample config

decisionengine.framework.tests.test\_defaults.test\_client\_can\_get\_de\_server\_show\_channel\_logger\_level(*deserver*)  
Verify unknown channel has NOTSET

decisionengine.framework.tests.test\_defaults.test\_client\_de\_config\_is\_json(*deserver*)  
Verify config can be fetched in json format

decisionengine.framework.tests.test\_defaults.test\_global\_channel\_log\_level\_in\_config(*deserver*)  
Verify global\_channel\_log\_level setting exists

### decisionengine.framework.tests.test\_error\_on\_acquire module

decisionengine.framework.tests.test\_error\_on\_acquire.test\_source\_only\_channel(*deserver*)

### decisionengine.framework.tests.test\_module\_program\_options module

decisionengine.framework.tests.test\_module\_program\_options.test\_acquire\_for\_sources()

decisionengine.framework.tests.test\_module\_program\_options.test\_config\_templates()

decisionengine.framework.tests.test\_module\_program\_options.test\_descriptions()

decisionengine.framework.tests.test\_module\_program\_options.test\_help()

decisionengine.framework.tests.test\_module\_program\_options.test\_module\_alias()

### decisionengine.framework.tests.test\_query\_tool\_server module

Fixture based DE Server for the de-query-tool tests

decisionengine.framework.tests.test\_query\_tool\_server.test\_query\_tool\_csv(*deserver*)

decisionengine.framework.tests.test\_query\_tool\_server.test\_query\_tool\_default(*deserver*)

decisionengine.framework.tests.test\_query\_tool\_server.test\_query\_tool\_invalid\_product(*deserver*)

decisionengine.framework.tests.test\_query\_tool\_server.test\_query\_tool\_json(*deserver*)

decisionengine.framework.tests.test\_query\_tool\_server.test\_query\_tool\_since(*deserver*)

### decisionengine.framework.tests.test\_reaper module

Fixture based DE Server for the reaper tests

decisionengine.framework.tests.test\_reaper.test\_client\_can\_get\_de\_server\_reaper\_start\_delay(*deserver*)  
Verify reaper can start with delay

decisionengine.framework.tests.test\_reaper.test\_client\_can\_get\_de\_server\_reaper\_status(*deserver*)  
Verify reaper status

decisionengine.framework.tests.test\_reaper.test\_client\_can\_get\_de\_server\_reaper\_stop(*deserver*)  
Verify reaper can stop

## decisionengine.framework.tests.test\_restart\_channel module

decisionengine.framework.tests.test\_restart\_channel.deserver\_mock\_data\_block(*mock\_data\_block*)

decisionengine.framework.tests.test\_restart\_channel.test\_restart\_channel(*deserver\_mock\_data\_block*)

## decisionengine.framework.tests.test\_sample\_config module

Fixture based DE Server tests of the defaults

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_double\_set\_de\_server\_channel\_log\_level(*deserver*)

Verify set log level to current level isn't an error

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_get\_de\_server\_channel\_config(*deserver*)

Verify config has expected items

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_get\_de\_server\_channel\_log\_level(*deserver*)

Verify can fetch log level for a channel

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_get\_de\_server\_show\_config(*deserver*)

Verify config has expected items

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_get\_de\_server\_show\_logger\_level(*deserver*)

Verify can fetch log level

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_get\_de\_server\_status(*deserver*)

Verify channel enters stable state

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_get\_products(*deserver*)

Verify client can get channel products

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_get\_products\_no\_channels(*deserver*)

Verify client can get channel products even when none are run

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_kill\_one\_channel(*deserver*)

Verify client can kill a single channel

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_kill\_one\_channel\_force(*deserver*)

Verify client can kill a single channel with force

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_kill\_one\_channel\_timeout(*deserver*)

Verify client can kill a single channel with timeout

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_set\_de\_server\_channel\_log\_level(*deserver*)

Verify set log level for a channel

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_start\_all\_channel(*deserver*)

Verify client can start all channel

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_start\_one\_channel(*deserver*)

Verify client can start a single channel

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_stop\_channels(*deserver*)

Verify client can stop channels

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_stop\_one\_channel(*deserver*)

Verify client can stop a single channel

decisionengine.framework.tests.test\_sample\_config.test\_client\_can\_stop\_server(*deserver*)

Verify de-client can run -stop

`decisionengine.framework.tests.test_sample_config.test_client_cannot_double_start(deserver)`  
Verify client cannot double start channels

`decisionengine.framework.tests.test_sample_config.test_client_get_channel_log_fails_cleanly(deserver)`  
Verify graceful fail on bogus channel

`decisionengine.framework.tests.test_sample_config.test_client_get_non_real_channel(deserver)`  
Verify config for missing channel does what it should

`decisionengine.framework.tests.test_sample_config.test_client_set_channel_log_fails_cleanly(deserver)`  
Verify graceful fail on bogus channel

`decisionengine.framework.tests.test_sample_config.test_client_start_non_real_channel(deserver)`  
Verify start for missing channel does what it should

`decisionengine.framework.tests.test_sample_config.test_client_stop_non_real_channel(deserver)`  
Verify stop for missing channel does what it should

`decisionengine.framework.tests.test_sample_config.test_client_wait_timeout_works(deserver)`  
Verify channel enters stable state and timeout works too

### **decisionengine.framework.tests.test\_source\_proxy module**

Fixture based tests of the SourceProxy module.

`decisionengine.framework.tests.test_source_proxy.test_stop_failing_source_proxy(deserver_fail)`  
`decisionengine.framework.tests.test_source_proxy.test_working_source_proxy(deserver)`

### **decisionengine.framework.tests.test\_start\_with\_bad\_channels module**

Fixture based DE Server tests of invalid channel configs

`decisionengine.framework.tests.test_start_with_bad_channels._consumes_not_subset(test_str)`  
`decisionengine.framework.tests.test_start_with_bad_channels._expected_circularity(test_str)`  
`decisionengine.framework.tests.test_start_with_bad_channels._missing_consumes(name)`  
`decisionengine.framework.tests.test_start_with_bad_channels._missing_produces(name)`  
`decisionengine.framework.tests.test_start_with_bad_channels.test_client_can_get_products_no_channels(deserver_mock_data_block)`  
Verify client can get channel products even when none are run

### **decisionengine.framework.tests.test\_start\_with\_no\_channels module**

Fixture based DE Server tests of the server without channels, then with them

`decisionengine.framework.tests.test_start_with_no_channels.deserver_mock_data_block(mock_data_block)`  
`decisionengine.framework.tests.test_start_with_no_channels.test_start_from_nothing(deserver_mock_data_block)`

## Module contents

### decisionengine.framework.util package

#### Submodules

#### decisionengine.framework.util.fs module

`decisionengine.framework.util.fs.files_with_extensions(dir_path, *extensions)`

Return all files in `dir_path` that match the provided extensions.

If no extensions are given, then all files in `dir_path` are returned.

Results are sorted by channel name to ensure stable output.

#### decisionengine.framework.util.metrics module

```
class decisionengine.framework.util.metrics.Counter(name, documentation, labelnames=(),
                                                    namespace="", subsystem="", unit="", registry=<prometheus_client.registry.CollectorRegistry
                                                    object>, _labelvalues=None)
```

Bases: `prometheus_client.metrics.Counter`

```
class decisionengine.framework.util.metrics.Gauge(*args, **kwargs)
```

Bases: `prometheus_client.metrics.Gauge`

Override prometheus client Gauge so that `multiprocess_mode` 'liveall' is the default as opposed to 'all'

```
_DEFAULT_MULTIPROC_MODE = 'liveall'
```

```
__determine_multiprocess_mode_existence(*args, **kwargs)
```

```
class decisionengine.framework.util.metrics.Histogram(name, documentation, labelnames=(),
                                                       namespace="", subsystem="", unit="", registry=<prometheus_client.registry.CollectorRegistry
                                                       object>, _labelvalues=None, buckets=(0.005,
                                                       0.01, 0.025, 0.05, 0.075, 0.1, 0.25, 0.5, 0.75,
                                                       1.0, 2.5, 5.0, 7.5, 10.0, inf))
```

Bases: `prometheus_client.metrics.Histogram`

```
class decisionengine.framework.util.metrics.Summary(name, documentation, labelnames=(),
                                                    namespace="", subsystem="", unit="", registry=<prometheus_client.registry.CollectorRegistry
                                                    object>, _labelvalues=None)
```

Bases: `prometheus_client.metrics.Summary`

### **decisionengine.framework.util.reaper module**

A stand-alone script purges data in database older than specified in configuration. Configuration file has to have this bit added:

```
{
    "dataspace" [{ "retention_interval_in_days"[365,]
        "datasource": { ... }
    }
}
```

Can be used in a cron job.

`decisionengine.framework.util.reaper.main()`

### **decisionengine.framework.util.singleton module**

**class** `decisionengine.framework.util.singleton.ScopedSingleton`

Bases: `decisionengine.framework.util.singleton.Singleton`

Singleton pattern using Metaclass with weak refs

`_instances = <WeakValueDictionary>`

**class** `decisionengine.framework.util.singleton.ScopedSingletonABC(name, bases, namespace, **kwargs)`

Bases: `abc.ABCMeta`, `decisionengine.framework.util.singleton.ScopedSingleton`

**class** `decisionengine.framework.util.singleton.Singleton`

Bases: `type`

Singleton pattern using Metaclass with strong refs

`_instances = {}`

**class** `decisionengine.framework.util.singleton.SingletonABC(name, bases, namespace, **kwargs)`

Bases: `abc.ABCMeta`, `decisionengine.framework.util.singleton.Singleton`

### **decisionengine.framework.util.sockets module**

`decisionengine.framework.util.sockets.get_random_port()`

### **decisionengine.framework.util.subclasses module**

`decisionengine.framework.util.subclasses._derived_class(cls, base_class)`

Only matches subclasses that are not equal to the base class.

`decisionengine.framework.util.subclasses.all_subclasses(module, base_class)`

Return all of a module's subclasses of the given base class.



## Module contents

### Submodules

#### decisionengine.framework.about module

PEP-0396 provides instructions for providing module versions While we are at it, add a few other useful bits

#### decisionengine.framework.version module

## Module contents

### decisionengine.tests package

### Submodules

#### decisionengine.tests.test\_framework\_package module

Make sure decisionengine.framework is a valid python package

`decisionengine.tests.test_framework_package.test_can_import()`

## Module contents

## Module contents

## 4.2 Indices and tables

- [genindex](#)
- [modindex](#)
- [search](#)



## INDICES AND TABLES

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



## PYTHON MODULE INDEX

### d

[decisionengine](#), 85  
[decisionengine.framework](#), 85  
[decisionengine.framework.about](#), 85  
[decisionengine.framework.config](#), 29  
[decisionengine.framework.config.ChannelConfigHandler](#), 27  
[decisionengine.framework.config.policies](#), 28  
[decisionengine.framework.config.tests](#), 27  
[decisionengine.framework.config.tests.test\\_config](#), 25  
[decisionengine.framework.config.tests.test\\_policies](#), 26  
[decisionengine.framework.config.tests.test\\_validconfig](#), 26  
[decisionengine.framework.config.ValidConfig](#), 27  
[decisionengine.framework.dataspace](#), 57  
[decisionengine.framework.dataspace.datablock](#), 51  
[decisionengine.framework.dataspace.datasource](#), 53  
[decisionengine.framework.dataspace.datasources](#), 47  
[decisionengine.framework.dataspace.datasources.null](#), 42  
[decisionengine.framework.dataspace.datasources.postgresql](#), 44  
[decisionengine.framework.dataspace.datasources.sqlalchemy\\_us](#), 36  
[decisionengine.framework.dataspace.datasources.sqlalchemy\\_us.datasource\\_api](#), 29  
[decisionengine.framework.dataspace.datasources.sqlalchemy\\_us.db\\_schema](#), 33  
[decisionengine.framework.dataspace.datasources.sqlalchemy\\_us.utils](#), 35  
[decisionengine.framework.dataspace.datasources.tests](#), 42  
[decisionengine.framework.dataspace.datasources.tests.fixtures](#), 39  
[decisionengine.framework.dataspace.datasources.tests.test\\_datasource\\_api](#), 40  
[decisionengine.framework.dataspace.datasources.tests.test\\_datasources](#), 42  
[decisionengine.framework.dataspace.dataspace](#), 55  
[decisionengine.framework.dataspace.maintain](#), 56  
[decisionengine.framework.dataspace.tests](#), 51  
[decisionengine.framework.dataspace.tests.fixtures](#), 47  
[decisionengine.framework.dataspace.tests.test\\_datablock](#), 49  
[decisionengine.framework.dataspace.tests.test\\_datablock\\_zl](#), 49  
[decisionengine.framework.dataspace.tests.test\\_datasource](#), 49  
[decisionengine.framework.dataspace.tests.test\\_dataspace](#), 50  
[decisionengine.framework.dataspace.tests.test\\_Reaper](#), 48  
[decisionengine.framework.engine](#), 62  
[decisionengine.framework.engine.de\\_client](#), 62  
[decisionengine.framework.engine.de\\_query\\_tool](#), 62  
[decisionengine.framework.engine.DecisionEngine](#), 58  
[decisionengine.framework.engine.tests](#), 58  
[decisionengine.framework.engine.tests.fixtures](#), 57  
[decisionengine.framework.engine.tests.test\\_client\\_only](#), 58  
[decisionengine.framework.engine.tests.test\\_query\\_tool\\_only](#), 58  
[decisionengine.framework.engine.tests.test\\_startup](#), 58  
[decisionengine.framework.engine.Workers](#), 61  
[decisionengine.framework.logicengine](#), 67  
[decisionengine.framework.logicengine.BooleanExpression](#), 64  
[decisionengine.framework.logicengine.FactLookup](#), 65  
[decisionengine.framework.logicengine.LogicEngine](#), 65

[decisionengine.framework.logicengine.Rule](#), 66  
[decisionengine.framework.logicengine.RuleEngine](#), 66  
[decisionengine.framework.logicengine.tests](#), 64  
[decisionengine.framework.logicengine.tests.test\\_cassandra\\_index](#), 63  
[decisionengine.framework.logicengine.tests.test\\_cassandra\\_index](#), 63  
[decisionengine.framework.logicengine.tests.test\\_dispatcher\\_interfaces](#), 63  
[decisionengine.framework.logicengine.tests.test\\_dispatcher\\_interfaces](#), 63  
[decisionengine.framework.logicengine.tests.test\\_fail\\_on\\_error](#), 63  
[decisionengine.framework.logicengine.tests.test\\_pandas\\_dataframe](#), 64  
[decisionengine.framework.logicengine.tests.test\\_rule\\_with\\_negated\\_fact](#), 64  
[decisionengine.framework.logicengine.tests.test\\_simple\\_configuration](#), 64  
[decisionengine.framework.modules](#), 72  
[decisionengine.framework.modules.de\\_logger](#), 70  
[decisionengine.framework.modules.describe](#), 71  
[decisionengine.framework.modules.logging\\_configuration](#), 71  
[decisionengine.framework.modules.LogicEngine](#), 68  
[decisionengine.framework.modules.Module](#), 68  
[decisionengine.framework.modules.print\\_description](#), 71  
[decisionengine.framework.modules.Publisher](#), 69  
[decisionengine.framework.modules.Source](#), 69  
[decisionengine.framework.modules.SourceProxy](#), 69  
[decisionengine.framework.modules.tests](#), 68  
[decisionengine.framework.modules.tests.test\\_dispatcher\\_interfaces](#), 67  
[decisionengine.framework.modules.tests.test\\_LogicEngine](#), 67  
[decisionengine.framework.modules.tests.test\\_Module](#), 67  
[decisionengine.framework.modules.tests.test\\_module\\_dispatcher](#), 68  
[decisionengine.framework.modules.tests.test\\_Publisher](#), 67  
[decisionengine.framework.modules.tests.test\\_Source](#), 67  
[decisionengine.framework.modules.tests.test\\_Transformer](#), 67  
[decisionengine.framework.modules.tests.test\\_transformer](#), 68  
[decisionengine.framework.modules.Transform](#), 70  
[decisionengine.framework.modules.translate\\_product\\_name](#), 71  
[decisionengine.framework.taskmanager](#), 75  
[decisionengine.framework.taskmanager.module\\_graph](#), 75  
[decisionengine.framework.taskmanager.ProcessingState](#), 72  
[decisionengine.framework.taskmanager.TaskManager](#), 73  
[decisionengine.framework.tests](#), 83  
[decisionengine.framework.tests.ABTransform](#), 76  
[decisionengine.framework.tests.BATransform](#), 76  
[decisionengine.framework.tests.ErrorOnAcquire](#), 75  
[decisionengine.framework.tests.FailingPublisher](#), 76  
[decisionengine.framework.tests.FailingSourceNOP](#), 76  
[decisionengine.framework.tests.FailingSourceProxy](#), 76  
[decisionengine.framework.tests.fixtures](#), 78  
[decisionengine.framework.tests.ModuleProgramOptions](#), 76  
[decisionengine.framework.tests.PublisherNOP](#), 77  
[decisionengine.framework.tests.PublisherWithMissingConsumer](#), 77  
[decisionengine.framework.tests.SourceAlias](#), 77  
[decisionengine.framework.tests.SourceNOP](#), 77  
[decisionengine.framework.tests.SourceWithSampleConfigNOP](#), 77  
[decisionengine.framework.tests.SupportsConfigPublisher](#), 78  
[decisionengine.framework.tests.test\\_client\\_errors](#), 79  
[decisionengine.framework.tests.test\\_client\\_server](#), 79  
[decisionengine.framework.tests.test\\_defaults](#), 80  
[decisionengine.framework.tests.test\\_error\\_on\\_acquire](#), 80  
[decisionengine.framework.tests.test\\_module\\_program\\_options](#), 80  
[decisionengine.framework.tests.test\\_query\\_tool\\_server](#), 80  
[decisionengine.framework.tests.test\\_reaper](#), 80  
[decisionengine.framework.tests.test\\_restart\\_channel](#), 81

- decisionengine.framework.tests.test\_sample\_config,  
81
- decisionengine.framework.tests.test\_source\_proxy,  
82
- decisionengine.framework.tests.test\_start\_with\_bad\_channels,  
82
- decisionengine.framework.tests.test\_start\_with\_no\_channels,  
82
- decisionengine.framework.tests.TransformNOP,  
78
- decisionengine.framework.tests.TransformWithMissingProducesConsumes,  
78
- decisionengine.framework.tests.WorkingSourceProxy,  
78
- decisionengine.framework.util, 85
- decisionengine.framework.util.fs, 83
- decisionengine.framework.util.metrics, 83
- decisionengine.framework.util.reaper, 84
- decisionengine.framework.util.singleton, 84
- decisionengine.framework.util.sockets, 84
- decisionengine.framework.util.subclasses, 84
- decisionengine.framework.version, 85
- decisionengine.tests, 85
- decisionengine.tests.test\_framework\_package,  
85





# INDEX

## Symbols

\_DEFAULT\_MULTIPROC\_MODE (decisionengine.framework.util.metrics.Gauge attribute), 83  
 \_\_determine\_multiprocess\_mode\_existence() (decisionengine.framework.util.metrics.Gauge method), 83  
 \_\_insert() (decisionengine.framework.dataspace.datablock.Datablock method), 51  
 \_\_query() (decisionengine.framework.dataspace.datasources.postgresql.Postgresql method), 44  
 \_\_update() (decisionengine.framework.dataspace.datablock.Datablock method), 51  
 \_abc\_impl (decisionengine.framework.config.ValidConfig.ValidConfig attribute), 27  
 \_abc\_impl (decisionengine.framework.dataspace.datablock.Datablock.Header attribute), 52  
 \_abc\_impl (decisionengine.framework.dataspace.datablock.Datablock.Metadata attribute), 52  
 \_abc\_impl (decisionengine.framework.dataspace.datasource.DataSource attribute), 53  
 \_abc\_impl (decisionengine.framework.dataspace.datasources.null.NullDataSource attribute), 42  
 \_abc\_impl (decisionengine.framework.dataspace.datasources.postgresql.Postgresql attribute), 44  
 \_abc\_impl (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.SQLAlchemyDS attribute), 36  
 \_abc\_impl (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.datasource\_api.SQLAlchemyDS attribute), 29  
 \_channel\_config\_dir() (in module decisionengine.framework.config.tests.test\_config), 25  
 \_channel\_preamble() (in module decisionengine.framework.engine.DecisionEngine), 60  
 \_check\_keys() (in module decisionengine.framework.config.ChannelConfigHandler), 27  
 \_check\_override() (in module decisionengine.framework.engine.tests.test\_startup), 58  
 \_config\_from\_file() (in module decisionengine.framework.config.ValidConfig), 28  
 \_consumed\_products() (in module decisionengine.framework.taskmanager.module\_graph), 75  
 \_consumes (decisionengine.framework.modules.Publisher.Publisher attribute), 69  
 \_consumes (decisionengine.framework.modules.Transform.Transform attribute), 70  
 \_consumes (decisionengine.framework.tests.ABTransform.ABTransform attribute), 75  
 \_consumes (decisionengine.framework.tests.BATransform.BATransform attribute), 75  
 \_consumes (decisionengine.framework.tests.FailingPublisher.FailingPublisher attribute), 76  
 \_consumes (decisionengine.framework.tests.PublisherNOP.PublisherNOP attribute), 77  
 \_consumes (decisionengine.framework.tests.TransformNOP.TransformNOP attribute), 78  
 \_consumes\_not\_subset() (in module decisionengine.framework.tests.test\_start\_with\_bad\_channels), 82  
 \_convert\_to\_json() (in module decisionengine.framework.config.ValidConfig), 28  
 \_create\_de\_server() (in module decisionengine.framework.engine.DecisionEngine), 60  
 \_create\_facts\_dataframe() (decisionengine.framework.logicengine.LogicEngine.LogicEngine method), 65  
 \_create\_module\_instance() (in module decisionengine.framework.taskmanager.TaskManager), 74  
 \_dataframe\_to\_column\_names() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 58  
 \_dataframe\_to\_csv() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 58  
 \_dataframe\_to\_json() (decisionengine.framework.engine.DecisionEngine.DecisionEngine

`method`), 59  
`_dataframe_to_table()` (decisionengine.framework.engine.DecisionEngine.DecisionEngine attribute), 59  
`_dataframe_to_vertical_tables()` (decisionengine.framework.engine.DecisionEngine attribute), 59  
`_delete()` (decisionengine.framework.dataspace.datasources.postgresql.Postgresql method), 44  
`_derived_class()` (in module decisionengine.framework.util.subclasses), 84  
`_dispatch()` (decisionengine.framework.engine.DecisionEngine attribute), 59  
`_expected_acquire_result()` (in module decisionengine.framework.tests.ModuleProgramOptions), 76  
`_expected_circularity()` (in module decisionengine.framework.tests.test\_start\_with\_bad\_channels), 82  
`_expected_config_template()` (in module decisionengine.framework.tests.ModuleProgramOptions), 76  
`_expected_config_template_with_comments()` (in module decisionengine.framework.tests.ModuleProgramOptions), 77  
`_expected_help()` (in module decisionengine.framework.tests.ModuleProgramOptions), 77  
`_expected_source_help()` (in module decisionengine.framework.tests.ModuleProgramOptions), 77  
`_find_only_one_subclass()` (in module decisionengine.framework.taskmanager.TaskManager), 74  
`_get_data()` (decisionengine.framework.modules.SourceProxy.SourceProxy method), 69  
`_get_de_conf_manager()` (in module decisionengine.framework.engine.DecisionEngine), 60  
`_get_global_config()` (in module decisionengine.framework.engine.DecisionEngine), 60  
`_global_config_file()` (in module decisionengine.framework.config.tests.test\_config), 25  
`_global_config_file()` (in module decisionengine.framework.config.tests.test\_validconfig), 26  
`_insert()` (decisionengine.framework.dataspace.datasources.postgresql.Postgresql method), 44  
`_insert_returning_result()` (decisionengine.framework.dataspace.datasources.postgresql.Postgresql method), 44  
`_instances` (decisionengine.framework.util.singleton.ScopedSingleton attribute), 84  
`_instances` (decisionengine.framework.util.singleton.Singleton attribute), 84  
`_load_channel()` (decisionengine.framework.config.ChannelConfigHandler.ChannelConfigHandler method), 27  
`_make_de_logger()` (in module decisionengine.framework.config.ChannelConfigHandler), 27  
`_make_workers_for()` (in module decisionengine.framework.taskmanager.TaskManager), 74  
`_missing_consumes()` (in module decisionengine.framework.tests.test\_start\_with\_bad\_channels), 82  
`_missing_produces()` (in module decisionengine.framework.tests.test\_start\_with\_bad\_channels), 82  
`_normalize()` (in module decisionengine.framework.tests.ModuleProgramOptions), 77  
`_par_default()` (in module decisionengine.framework.modules.describe), 71  
`_par_type()` (in module decisionengine.framework.modules.describe), 71  
`_print_comment()` (in module decisionengine.framework.modules.print\_description), 71  
`_print_type()` (in module decisionengine.framework.modules.print\_description), 71  
`_print_value()` (in module decisionengine.framework.modules.print\_description), 71  
`_produced_products()` (in module decisionengine.framework.taskmanager.module\_graph), 75  
`_produces` (decisionengine.framework.modules.Source.Source attribute), 69  
`_produces` (decisionengine.framework.modules.Transform.Transform attribute), 70  
`_produces` (decisionengine.framework.tests.ABTransform.ABTransform attribute), 75  
`_produces` (decisionengine.framework.tests.BATransform.BATransform attribute), 75  
`_produces` (decisionengine.framework.tests.ErrorOnAcquire.ErrorOnAcquire attribute), 75  
`_produces` (decisionengine.framework.tests.SourceNOP.SourceNOP attribute), 75  
`_produces` (decisionengine.framework.tests.SourceWithSampleConfigNOP.SourceWithSampleConfigNOP attribute), 77

\_produces (decisionengine.framework.tests.TransformNOP.TransformNOP, attribute), 78  
 \_reaper\_loop() (decisionengine.framework.dataspace.maintain.Reaper method), 56  
 \_remove() (decisionengine.framework.dataspace.datasources.postgresql.Postgresql method), 44  
 \_run\_as\_main() (in module decisionengine.framework.tests.ModuleProgramOptions), 77  
 \_sa\_class\_manager (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema.Dataproduct attribute), 33  
 \_sa\_class\_manager (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema.Header attribute), 33  
 \_sa\_class\_manager (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema.Metadata attribute), 34  
 \_sa\_class\_manager (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema.Schema attribute), 35  
 \_sa\_class\_manager (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema.Taskmanager attribute), 35  
 \_sa\_registry (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema.Base attribute), 33  
 \_select() (decisionengine.framework.dataspace.datasources.postgresql.Postgresql method), 44  
 \_select\_dictresult() (decisionengine.framework.dataspace.datasources.postgresql.Postgresql method), 44  
 \_select\_getresult() (decisionengine.framework.dataspace.datasources.postgresql.Postgresql method), 44  
 \_select\_tuple() (decisionengine.framework.dataspace.datasources.postgresql.Postgresql method), 44  
 \_setitem() (decisionengine.framework.dataspace.datablock.DataBlock method), 51  
 \_spec\_from\_file\_name() (in module decisionengine.framework.modules.print\_description), 71  
 \_start\_de\_server() (in module decisionengine.framework.engine.DecisionEngine), 60  
 \_supported\_config (decisionengine.framework.modules.SourceProxy.SourceProxy attribute), 69  
 \_supported\_config (decisionengine.framework.tests.SourceWithSampleConfigNOP.SourceWithSampleConfigNOP attribute), 77  
 \_supported\_config (decisionengine.framework.engine.DecisionEngine.DecisionEngine attribute), 78  
 \_update() (decisionengine.framework.dataspace.datasources.postgresql.Postgresql method), 44  
 \_update\_channel\_states() (decisionengine.framework.engine.Workers.Workers method), 61  
 \_update\_returning\_result() (decisionengine.framework.dataspace.datasources.postgresql.Postgresql method), 44  
 Any\_ds.db\_schema.Dataproduct (class in decisionengine.framework.tests.ABTransform), 75  
 access() (decisionengine.framework.engine.Workers.Workers method), 61  
 acquire() (decisionengine.framework.modules.Source.Source method), 61  
 acquire() (decisionengine.framework.modules.SourceProxy.SourceProxy method), 69  
 acquire() (decisionengine.framework.tests.ErrorOnAcquire.ErrorOnAcquire method), 75  
 acquire() (decisionengine.framework.tests.FailingSourceProxy.FailingSourceProxy method), 75  
 acquire() (decisionengine.framework.tests.SourceNOP.SourceNOP method), 77  
 acquire() (decisionengine.framework.tests.SourceWithSampleConfigNOP.SourceWithSampleConfigNOP method), 77  
 acquire() (decisionengine.framework.tests.WorkingSourceProxy.WorkingSourceProxy method), 78  
 AcquireWithConfig (class in decisionengine.framework.tests.ModuleProgramOptions), 76  
 AcquireWithSampleConfig (class in decisionengine.framework.tests.ModuleProgramOptions), 76  
 ACTIVE (decisionengine.framework.taskmanager.ProcessingState.State attribute), 72  
 add\_engine\_pidguard() (in module decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.utils), 35  
 all\_subclasses() (in module decisionengine.framework.util.subclasses), 84  
 B  
 Base (class in decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema), 33  
 BATransform (class in decisionengine.framework.tests.BATransform), 75  
 block\_until() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59



dataprodukt_table	(decisionengine.framework.dataspace.datasource.DataSource attribute), 53	decisionengine.framework.dataspace.datablock module, 51
DataSource	(class in decisionengine.framework.dataspace.datasource), 53	decisionengine.framework.dataspace.datasource module, 53
datasource()	(in module decisionengine.framework.dataspace.datasources.tests.fixture), 40	decisionengine.framework.dataspace.datasources module, 47
datasource()	(in module decisionengine.framework.dataspace.tests.fixtures), 47	decisionengine.framework.dataspace.datasources.null module, 42
DataSource	(class in decisionengine.framework.dataspace.dataspace), 55	decisionengine.framework.dataspace.datasources.postgresql module, 44
dataspace()	(in module decisionengine.framework.dataspace.tests.fixtures), 47	decisionengine.framework.dataspace.datasources.sqlalchemy module, 36
DataSourceConfigurationError, 56		decisionengine.framework.dataspace.datasources.sqlalchemy module, 29
DataSourceConnectionError, 56		decisionengine.framework.dataspace.datasources.sqlalchemy module, 33
DataSourceError, 56		decisionengine.framework.dataspace.datasources.sqlalchemy module, 35
DataSourceExistsError, 56		decisionengine.framework.dataspace.datasources.tests module, 42
datestamp (decisionengine.framework.dataspace.datasource attribute), 35		decisionengine.framework.dataspace.datasources.tests.fixture module, 39
decision_cycle()	(decisionengine.framework.taskmanager.TaskManager.TaskManager method), 73	decisionengine.framework.dataspace.datasources.tests.test module, 40
decisionengine	module, 85	decisionengine.framework.dataspace.dataspace module, 55
DecisionEngine	(class in decisionengine.framework.engine.DecisionEngine), 58	decisionengine.framework.dataspace.maintain module, 56
decisionengine.framework	module, 85	decisionengine.framework.dataspace.tests module, 51
decisionengine.framework.about	module, 85	decisionengine.framework.dataspace.tests.fixtures module, 47
decisionengine.framework.config	module, 29	decisionengine.framework.dataspace.tests.test_datablock module, 49
decisionengine.framework.config.ChannelConfigHandler	module, 27	decisionengine.framework.dataspace.tests.test_datablock_zl module, 49
decisionengine.framework.config.policies	module, 28	decisionengine.framework.dataspace.tests.test_datasource module, 49
decisionengine.framework.config.tests	module, 27	decisionengine.framework.dataspace.tests.test_dataspace module, 50
decisionengine.framework.config.tests.test_config	module, 25	decisionengine.framework.dataspace.tests.test_Reaper module, 48
decisionengine.framework.config.tests.test_policy	module, 26	decisionengine.framework.engine module, 62
decisionengine.framework.config.tests.test_validation	module, 26	decisionengine.framework.engine.de_client module, 62
decisionengine.framework.config.ValidConfig	module, 27	decisionengine.framework.engine.de_query_tool module, 62
decisionengine.framework.dataspace	module, 57	decisionengine.framework.engine.DecisionEngine module, 58
		decisionengine.framework.engine.tests module, 58



decisionengine.framework.engine.tests.fixtures	decisionengine.framework.modules.Publisher
module, 57	module, 69
decisionengine.framework.engine.tests.test_client_side_engine	decisionengine.framework.modules.Source
module, 58	module, 69
decisionengine.framework.engine.tests.test_query_side_engine	decisionengine.framework.modules.SourceProxy
module, 58	module, 69
decisionengine.framework.engine.tests.test_startup	decisionengine.framework.modules.tests
module, 58	module, 68
decisionengine.framework.engine.Workers	decisionengine.framework.modules.tests.test_de_logger
module, 61	module, 67
decisionengine.framework.logicengine	decisionengine.framework.modules.tests.test_LogicEngine
module, 67	module, 67
decisionengine.framework.logicengine.BooleanExpression	decisionengine.framework.modules.tests.test_Module
module, 64	module, 67
decisionengine.framework.logicengine.FactLookup	decisionengine.framework.modules.tests.test_module_decorator
module, 65	module, 68
decisionengine.framework.logicengine.LogicEngine	decisionengine.framework.modules.tests.test_Publisher
module, 65	module, 67
decisionengine.framework.logicengine.Rule	decisionengine.framework.modules.tests.test_Source
module, 66	module, 67
decisionengine.framework.logicengine.RuleEngine	decisionengine.framework.modules.tests.test_Transform
module, 66	module, 67
decisionengine.framework.logicengine.tests	decisionengine.framework.modules.tests.test_translate_product_name
module, 64	module, 68
decisionengine.framework.logicengine.tests.test_client_side_engine	decisionengine.framework.modules.Transform
module, 63	module, 70
decisionengine.framework.logicengine.tests.test_query_side_engine	decisionengine.framework.modules.translate_product_name
module, 63	module, 71
decisionengine.framework.logicengine.tests.test_dispatcher_interfaces	decisionengine.framework.taskmanager
module, 63	module, 75
decisionengine.framework.logicengine.tests.test_factio	decisionengine.framework.taskmanager.module_graph
module, 63	module, 75
decisionengine.framework.logicengine.tests.test_factioengine	decisionengine.framework.taskmanager.ProcessingState
module, 63	module, 72
decisionengine.framework.logicengine.tests.test_parallel_factio	decisionengine.framework.taskmanager.TaskManager
module, 64	module, 73
decisionengine.framework.logicengine.tests.test_dispatcher_interfaces	decisionengine.framework.tests
module, 64	module, 83
decisionengine.framework.logicengine.tests.test_dispatcher_interfaces	decisionengine.framework.tests.ABTransform
module, 64	module, 75
decisionengine.framework.modules	decisionengine.framework.tests.BATransform
module, 72	module, 75
decisionengine.framework.modules.de_logger	decisionengine.framework.tests.ErrorOnAcquire
module, 70	module, 75
decisionengine.framework.modules.describe	decisionengine.framework.tests.FailingPublisher
module, 71	module, 76
decisionengine.framework.modules.logging_config	decisionengine.framework.tests.FailingSourceNOP
module, 71	module, 76
decisionengine.framework.modules.LogicEngine	decisionengine.framework.tests.FailingSourceProxy
module, 68	module, 76
decisionengine.framework.modules.Module	decisionengine.framework.tests.fixtures
module, 68	module, 78
decisionengine.framework.modules.print_descriptions	decisionengine.framework.tests.ModuleProgramOptions
module, 71	module, 76

decisionengine.framework.tests.PublisherNOP module, 77	decisionengine.framework.util.subclasses module, 84
decisionengine.framework.tests.PublisherWithMissingConsumers module, 77	decisionengine.framework.version module, 85
decisionengine.framework.tests.SourceAlias module, 77	decisionengine.tests module, 85
decisionengine.framework.tests.SourceNOP module, 77	decisionengine.tests.test_framework_package module, 85
decisionengine.framework.tests.SourceWithSampleConfigNOP module, 77	delete_data_block() (in module decisionengine.framework.dataspace.datablock),
decisionengine.framework.tests.SupportsConfigPublisher module, 78	default_data_lifetime (decisionengine.framework.dataspace.datablock.Header attribute), 52
decisionengine.framework.tests.test_client_errors module, 79	delete() (decisionengine.framework.dataspace.dataspace.DataSpace method), 55
decisionengine.framework.tests.test_client_server module, 79	delete_data_older_than() (decisionengine.framework.dataspace.datasource.DataSource method), 53
decisionengine.framework.tests.test_defaults module, 80	delete_data_older_than() (decisionengine.framework.dataspace.datasources.null.NullDataSource method), 42
decisionengine.framework.tests.test_error_on_acquire module, 80	delete_data_older_than() (decisionengine.framework.dataspace.datasources.postgresql.Postgresql method), 44
decisionengine.framework.tests.test_module_program_options module, 80	delete_data_older_than() (decisionengine.framework.dataspace.datasources.sqlalchemy_ds.datasource method), 30
decisionengine.framework.tests.test_query_toolserver module, 80	delete_data_older_than() (decisionengine.framework.dataspace.datasources.sqlalchemy_ds.SQLAlchemy method), 36
decisionengine.framework.tests.test_reaper module, 80	Describe (class in decisionengine.framework.tests.ModuleProgramOptions), 76
decisionengine.framework.tests.test_restart_channel module, 81	DescribeFields (in module decisionengine.framework.modules.Publisher), 69
decisionengine.framework.tests.test_sample_config module, 81	describe() (in module decisionengine.framework.modules.Source), 69
decisionengine.framework.tests.test_source_proxy module, 82	describe() (in module decisionengine.framework.modules.Transform), 70
decisionengine.framework.tests.test_start_with_bad_channel module, 82	DescribeAlias (class in decisionengine.framework.tests.ModuleProgramOptions), 76
decisionengine.framework.tests.test_start_with_desc_channels module, 82	DEServer() (in module decisionengine.framework.engine.tests.fixtures), 57
decisionengine.framework.tests.TransformNOP module, 78	DEServer() (in module decisionengine.framework.tests.fixtures), 78
decisionengine.framework.tests.TransformWithMissingProducersConsumers module, 78	deserver_mock_data_block() (in module decisionengine.framework.tests.test_restart_channel), 81
decisionengine.framework.tests.WorkingSourceProxy module, 78	deserver_mock_data_block() (in module decisionengine.framework.util.subclasses module, 84)
decisionengine.framework.util module, 85	
decisionengine.framework.util.fs module, 83	
decisionengine.framework.util.metrics module, 83	
decisionengine.framework.util.reaper module, 84	
decisionengine.framework.util.singleton module, 84	
decisionengine.framework.util.sockets module, 84	

engine.framework.tests.test\_start\_with\_no\_channels() (in module decisionengine.framework.engine.de\_query\_tool), 62  
 do\_backup() (decisionengine.framework.taskmanager.TaskManager.TaskManagerEngine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema attribute), 73  
 dump() (decisionengine.framework.config.ValidConfig.ValidConfig method), 28  
**F**  
 duplicate() (decisionengine.framework.dataspace.datablock.DataBlock method), 51  
 duplicate\_datablock() (decisionengine.framework.dataspace.datasource.DataSource method), 53  
 duplicate\_datablock() (decisionengine.framework.dataspace.datasources.null.NullDataSource method), 42  
 duplicate\_datablock() (decisionengine.framework.dataspace.datasources.postgresql.PostgresqlEngine.framework.util.fs), 44  
 duplicate\_datablock() (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.datasource\_api.SQLAlchemyDS method), 30  
 duplicate\_datablock() (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.datasource\_api.SQLAlchemyDS method), 36  
 duplicate\_datablock() (decisionengine.framework.dataspace.dataspace.DataSpace method), 55  
**E**  
 ensure\_no\_circularities() (in module decisionengine.framework.taskmanager.module\_graph), 75  
 ERROR (decisionengine.framework.taskmanager.ProcessingState.State attribute), 72  
 ErrorOnAcquire (class in decisionengine.framework.tests.ErrorOnAcquire), 75  
 evaluate() (decisionengine.framework.logicengine.BooleanExpression.BooleanExpression method), 64  
 evaluate() (decisionengine.framework.logicengine.LogicEngine.LogicEngine method), 66  
 evaluate() (decisionengine.framework.logicengine.Rule.Rule method), 66  
 evaluate() (decisionengine.framework.modules.LogicEngine.LogicEngine method), 68  
 evaluate\_facts() (decisionengine.framework.logicengine.LogicEngine.LogicEngine method), 66  
 execute() (decisionengine.framework.logicengine.RuleEngine.RuleEngine method), 66  
 execute\_command\_from\_args() (in module decisionengine.framework.engine.de\_client), 62  
 execute\_command\_from\_args() (in module decisionengine.framework.engine.de\_query\_tool), 62  
 expiration\_time (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema attribute), 34  
 FactLookup (class in decisionengine.framework.logicengine.FactLookup), 65  
 FailingPublisher (class in decisionengine.framework.tests.FailingPublisher), 76  
 FailingSourceProxy (class in decisionengine.framework.tests.FailingSourceProxy), 76  
 files\_with\_extensions() (in module decisionengine.framework.util.fs), 83  
 function\_name\_from\_call() (in module decisionengine.framework.logicengine.BooleanExpression), 44  
**G**  
 Gauge (class in decisionengine.framework.util.metrics), 83  
 generate\_insert\_query() (in module decisionengine.framework.dataspace.datasources.postgresql), 46  
 generation\_id (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema attribute), 33  
 generation\_id (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema attribute), 34  
 generation\_id (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema attribute), 34  
 generation\_time (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema attribute), 34  
 get() (decisionengine.framework.dataspace.datablock.DataBlock method), 51  
 get() (decisionengine.framework.taskmanager.ProcessingState.ProcessingState method), 72  
 get\_channels() (decisionengine.framework.config.ChannelConfigHandler.ChannelConfigHandler method), 27  
 get\_connection() (decisionengine.framework.dataspace.datasources.postgresql.PostgresqlEngine method), 45  
 get\_consumes() (decisionengine.framework.engine.Workers.Worker method), 61



get_consumes()	(decisionengine.framework.taskmanager.TaskManager.TaskManager method), 73	get_dataproducts()	(decisionengine.framework.dataspace.datasources.sqlalchemy_ds.datasources method), 30
get_data_block()	(decisionengine.framework.modules.Module.Module method), 68	get_dataproducts()	(decisionengine.framework.dataspace.datasources.sqlalchemy_ds.SQLAlchemyDS method), 37
get_datablock()	(decisionengine.framework.dataspace.datasource.DataSource method), 53	get_dataproducts()	(decisionengine.framework.dataspace.dataspace.DataSpace method), 55
get_datablock()	(decisionengine.framework.dataspace.datasources.null.NullDataSource method), 42	get_header()	(decisionengine.framework.dataspace.datablock.DataBlock method), 51
get_datablock()	(decisionengine.framework.dataspace.datasources.postgresql.PostgreSQLDS method), 45	get_header()	(decisionengine.framework.dataspace.datasource.DataSource method), 54
get_datablock()	(decisionengine.framework.dataspace.datasources.sqlalchemy_ds.SQLAlchemyDS method), 30	get_header()	(decisionengine.framework.dataspace.datasources.null.NullDataSource method), 43
get_datablock()	(decisionengine.framework.dataspace.datasources.sqlalchemy_ds.SQLAlchemyDS method), 36	get_header()	(decisionengine.framework.dataspace.datasources.postgresql.PostgreSQLDS method), 45
get_datablock()	(decisionengine.framework.dataspace.dataspace.DataSpace method), 55	get_header()	(decisionengine.framework.dataspace.datasources.sqlalchemy_ds.datasources method), 30
get_dataproduct()	(decisionengine.framework.dataspace.datasource.DataSource method), 53	get_header()	(decisionengine.framework.dataspace.datasources.sqlalchemy_ds.SQLAlchemyDS method), 37
get_dataproduct()	(decisionengine.framework.dataspace.datasources.null.NullDataSource method), 42	get_header()	(decisionengine.framework.dataspace.dataspace.DataSpace method), 55
get_dataproduct()	(decisionengine.framework.dataspace.datasources.postgresql.PostgreSQLDS method), 45	get_last_generation_id()	(decisionengine.framework.dataspace.datasource.DataSource method), 54
get_dataproduct()	(decisionengine.framework.dataspace.datasources.sqlalchemy_ds.SQLAlchemyDS method), 30	get_last_generation_id()	(decisionengine.framework.dataspace.datasources.null.NullDataSource method), 43
get_dataproduct()	(decisionengine.framework.dataspace.datasources.sqlalchemy_ds.SQLAlchemyDS method), 37	get_last_generation_id()	(decisionengine.framework.dataspace.datasources.postgresql.PostgreSQLDS method), 45
get_dataproduct()	(decisionengine.framework.dataspace.dataspace.DataSpace method), 55	get_last_generation_id()	(decisionengine.framework.dataspace.datasources.sqlalchemy_ds.datasources method), 31
get_dataproducts()	(decisionengine.framework.dataspace.datablock.DataBlock method), 51	get_last_generation_id()	(decisionengine.framework.dataspace.datasources.sqlalchemy_ds.SQLAlchemyDS method), 37
get_dataproducts()	(decisionengine.framework.dataspace.datasource.DataSource method), 54	get_last_generation_id()	(decisionengine.framework.dataspace.dataspace.DataSpace method), 55
get_dataproducts()	(decisionengine.framework.dataspace.datasources.null.NullDataSource method), 42	get_logger()	(decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59
get_dataproducts()	(decisionengine.framework.dataspace.datasources.postgresql.PostgreSQLDS method), 45	get_logger()	(in module decisionengine.framework.modules.de_logger), 70

get\_loglevel() (decisionengine.framework.engine.Workers.Worker  
 nengine.framework.taskmanager.TaskManager.TaskManager  
 method), 61  
 get\_state\_name() (decision-  
 engine.framework.taskmanager.TaskManager.TaskManager  
 method), 73  
 get\_metadata() (decision-  
 engine.framework.dataspace.datablock.DataBlock  
 method), 73  
 get\_state\_value() (decision-  
 engine.framework.taskmanager.TaskManager.TaskManager  
 method), 73  
 get\_metadata() (decision-  
 engine.framework.dataspace.datasource.DataSource  
 method), 54  
 get\_taskmanager() (decision-  
 engine.framework.dataspace.datablock.DataBlock  
 method), 51  
 get\_metadata() (decision-  
 engine.framework.dataspace.datasources.null.NullDataSource  
 method), 43  
 get\_taskmanager() (decision-  
 engine.framework.dataspace.datasource.DataSource  
 method), 54  
 get\_metadata() (decision-  
 engine.framework.dataspace.datasources.postgresql.Postgresql  
 method), 45  
 get\_taskmanager() (decision-  
 engine.framework.dataspace.datasources.null.NullDataSource  
 method), 43  
 get\_metadata() (decision-  
 engine.framework.dataspace.datasources.sqlalchemy\_ds.DataSource  
 method), 31  
 get\_taskmanager() (decision-  
 engine.framework.dataspace.datasources.postgresql.Postgresql  
 method), 46  
 get\_metadata() (decision-  
 engine.framework.dataspace.datasources.sqlalchemy\_ds.DataSource  
 method), 38  
 get\_taskmanager() (decision-  
 engine.framework.dataspace.datasources.sqlalchemy\_ds.DataSource  
 method), 31  
 get\_parameters() (decision-  
 engine.framework.modules.Module.Module  
 method), 68  
 get\_taskmanager() (decision-  
 engine.framework.dataspace.datasources.sqlalchemy\_ds.DataSource  
 method), 38  
 get\_produces() (decision-  
 engine.framework.engine.Workers.Worker  
 method), 61  
 get\_taskmanager() (decision-  
 engine.framework.dataspace.dataspace.DataSpace  
 method), 56  
 get\_produces() (decision-  
 engine.framework.taskmanager.TaskManager.TaskManager  
 method), 54  
 get\_taskmanagers() (decision-  
 engine.framework.taskmanager.TaskManager.TaskManager  
 method), 73  
 get\_random\_port() (in module decision-  
 engine.framework.util.sockets), 84  
 get\_taskmanagers() (decision-  
 engine.framework.dataspace.datasources.null.NullDataSource  
 method), 43  
 get\_schema() (decision-  
 engine.framework.dataspace.datasource.DataSource  
 method), 54  
 get\_taskmanagers() (decision-  
 engine.framework.dataspace.datasources.postgresql.Postgresql  
 method), 46  
 get\_schema() (decision-  
 engine.framework.dataspace.datasources.null.NullDataSource  
 method), 43  
 get\_taskmanagers() (decision-  
 engine.framework.dataspace.datasources.sqlalchemy\_ds.DataSource  
 method), 31  
 get\_schema() (decision-  
 engine.framework.dataspace.datasources.postgresql.Postgresql  
 method), 45  
 get\_taskmanagers() (decision-  
 engine.framework.dataspace.datasources.sqlalchemy\_ds.DataSource  
 method), 38  
 get\_schema() (decision-  
 engine.framework.dataspace.datasources.sqlalchemy\_ds.DataSource  
 method), 31  
 get\_taskmanagers() (decision-  
 engine.framework.dataspace.datasources.postgresql.Postgresql  
 method), 46  
 get\_schema() (decision-  
 engine.framework.dataspace.datasources.sqlalchemy\_ds.DataSource  
 method), 31  
 global\_config\_dir() (in module decision-  
 engine.framework.config.policies), 28  
 get\_state() (decision-  
 engine.framework.taskmanager.TaskManager.TaskManager  
 method), 73  
 global\_config\_file() (in module decision-  
 engine.framework.config.policies), 28  
 get\_state\_name() (decision-  
 handle\_sighup() (decision-

engine.framework.engine.DecisionEngine.DecisionEngine (in module decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_source), 59  
 has\_value() (decisionengine.framework.taskmanager.ProcessingState.ProcessingState attribute), 34  
 Header (class in decisionengine.framework.dataspace.datablock), 52  
 Header (class in decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_source), 33  
 header\_table (decisionengine.framework.dataspace.datasource.DataSource attribute), 54  
 Help (class in decisionengine.framework.tests.ModuleProgramOptions), 76  
 Histogram (class in decisionengine.framework.util.metrics), 83  
 |  
 id (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_source attribute), 33  
 id (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_source attribute), 34  
 id (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_source attribute), 34  
 IDLE (decisionengine.framework.taskmanager.ProcessingState.State attribute), 72  
 inactive() (decisionengine.framework.taskmanager.ProcessingState attribute), 72  
 insert() (decisionengine.framework.dataspace.datasource.DataSource attribute), 54  
 insert() (decisionengine.framework.dataspace.datasources.null.NullDataSource attribute), 43  
 insert() (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_source attribute), 46  
 insert() (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_source attribute), 32  
 insert() (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_source attribute), 38  
 insert() (decisionengine.framework.dataspace.dataspace.DataSpace attribute), 56  
 InvalidMetadataError, 52  
 is\_expired() (decisionengine.framework.dataspace.datablock.DataBlock attribute), 52  
 is\_valid() (decisionengine.framework.dataspace.datablock.Header attribute), 52  
 K  
 key (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_source attribute), 33

mark_demented()	(decisionengine.framework.dataspace.dataspace.DataSpace method), 56	decisionengine.framework.dataspace.datablock, 51
mark_expired()	(decisionengine.framework.dataspace.datablock.DataBlock method), 52	decisionengine.framework.dataspace.datasource, 53
mark_expired()	(decisionengine.framework.dataspace.dataspace.DataSpace method), 56	decisionengine.framework.dataspace.datasources, 47
maybe_fail_on_error()	(in module decisionengine.framework.logicengine.BooleanExpression), 64	decisionengine.framework.dataspace.datasources.null, 42
Metadata	(class in decisionengine.framework.dataspace.datablock), 52	decisionengine.framework.dataspace.datasources.postgre, 44
Metadata	(class in decisionengine.framework.dataspace.datasources.sqlalchemydecisionengine), 34	decisionengine.framework.dataspace.datasources.sqlalch, 36
metadata	(decisionengine.framework.dataspace.datasources.sqlalchemydecisionengineframework), 33	decisionengine.framework.dataspace.datasources.sqlalch, 29
metadata_table	(decisionengine.framework.dataspace.datasource.DataSource attribute), 55	decisionengine.framework.dataspace.datasources.sqlalch, 33
MIN_RETENTION_INTERVAL_DAYS	(decisionengine.framework.dataspace.maintain.Reaper attribute), 56	decisionengine.framework.dataspace.datasources.sqlalch, 35
MIN_SECONDS_BETWEEN_RUNS	(decisionengine.framework.dataspace.maintain.Reaper attribute), 56	decisionengine.framework.dataspace.datasources.tests, 42
missed_update_count	(decisionengine.framework.dataspace.datasources.sqlalchemydecisionengineframework), 34	decisionengine.framework.dataspace.datasources.tests.f, 39
mock_data_block()	(in module decisionengine.framework.dataspace.datasources.tests.fixtures), 40	decisionengine.framework.dataspace.datasources.tests.t, 40
module		decisionengine.framework.dataspace.datasources.tests.t, 42
decisionengine,	85	decisionengine.framework.dataspace.dataspace, 55
decisionengine.framework,	85	decisionengine.framework.dataspace.maintain, 56
decisionengine.framework.about,	85	decisionengine.framework.dataspace.tests, 51
decisionengine.framework.config,	29	decisionengine.framework.dataspace.tests.fixtures, 47
decisionengine.framework.config.ChannelConfigHandler,	27	decisionengine.framework.dataspace.tests.test_databloc, 49
decisionengine.framework.config.policies,	28	decisionengine.framework.dataspace.tests.test_databloc, 49
decisionengine.framework.config.tests,	27	decisionengine.framework.dataspace.tests.test_datasour, 49
decisionengine.framework.config.tests.test_config,	25	decisionengine.framework.dataspace.tests.test_dataspac, 50
decisionengine.framework.config.tests.test_policy,	26	decisionengine.framework.dataspace.tests.test_Reaper, 48
decisionengine.framework.config.tests.test_validation,	26	decisionengine.framework.engine, 62
decisionengine.framework.config.ValidConfig,	27	decisionengine.framework.engine.de_client, 62
decisionengine.framework.dataspace,	57	decisionengine.framework.engine.de_query_tool, 62
		decisionengine.framework.engine.DecisionEngine, 58
		decisionengine.framework.engine.tests, 58
		decisionengine.framework.engine.tests.fixtures,

decisionengine.framework.engine.tests.test_cli_integration,	decisionengine.framework.modules.SourceProxy,
58	69
decisionengine.framework.engine.tests.test_query_execution,	decisionengine.framework.modules.tests,
58	68
decisionengine.framework.engine.tests.test_status,	decisionengine.framework.modules.tests.test_de_logger,
58	67
decisionengine.framework.engine.Workers,	decisionengine.framework.modules.tests.test_LogicEngine,
61	67
decisionengine.framework.logicengine,	decisionengine.framework.modules.tests.test_Module,
67	67
decisionengine.framework.logicengine.BooleanExpression,	decisionengine.framework.modules.tests.test_module_desc,
64	68
decisionengine.framework.logicengine.FactLookup,	decisionengine.framework.modules.tests.test_Publisher,
65	67
decisionengine.framework.logicengine.LogicEngine,	decisionengine.framework.modules.tests.test_Source,
65	67
decisionengine.framework.logicengine.Rule,	decisionengine.framework.modules.tests.test_Transform,
66	67
decisionengine.framework.logicengine.RuleEngine,	decisionengine.framework.modules.tests.test_translate,
66	68
decisionengine.framework.logicengine.tests,	decisionengine.framework.modules.Transform,
64	78
decisionengine.framework.logicengine.tests.test_cascaded_rules,	decisionengine.framework.modules.translate_product_name,
63	71
decisionengine.framework.logicengine.tests.test_construction,	decisionengine.framework.taskmanager,
63	75
decisionengine.framework.logicengine.tests.test_dispatcher_interfaces,	decisionengine.framework.taskmanager.module_graph,
63	75
decisionengine.framework.logicengine.tests.test_executor,	decisionengine.framework.taskmanager.ProcessingState,
63	72
decisionengine.framework.logicengine.tests.test_failure_modes,	decisionengine.framework.taskmanager.TaskManager,
63	73
decisionengine.framework.logicengine.tests.test_pipeline,	decisionengine.framework.tests,
64	83
decisionengine.framework.logicengine.tests.test_rule_with_negated_fact,	decisionengine.framework.tests.ABTransform,
64	76
decisionengine.framework.logicengine.tests.test_simple_configuration,	decisionengine.framework.tests.BATransform,
64	75
decisionengine.framework.modules,	decisionengine.framework.tests.ErrorOnAcquire,
72	76
decisionengine.framework.modules.de_logger,	decisionengine.framework.tests.FailingPublisher,
70	76
decisionengine.framework.modules.describe,	decisionengine.framework.tests.FailingSourceNOP,
71	76
decisionengine.framework.modules.logging_configuration,	decisionengine.framework.tests.FailingSourceProxy,
71	76
decisionengine.framework.modules.LogicEngine,	decisionengine.framework.tests.fixtures,
68	78
decisionengine.framework.modules.Module,	decisionengine.framework.tests.ModuleProgramOptions,
68	76
decisionengine.framework.modules.print_descriptions,	decisionengine.framework.tests.PublisherNOP,
71	77
decisionengine.framework.modules.Publisher,	decisionengine.framework.tests.PublisherWithMissingConnections,
69	77
decisionengine.framework.modules.Source,	decisionengine.framework.tests.SourceAlias,
69	77



decisionengine.framework.tests.SourceNOP, *nengine.framework.logicengine.tests.test\_pandas\_fact*),  
 77 64  
 decisionengine.framework.tests.SourceWithSampleConfigNOP, (in module *decisio-*  
 77 *nengine.framework.logicengine.tests.test\_cascaded\_rules*),  
 decisionengine.framework.tests.SupportsConfigPublisher,  
 78 *myengine()* (in module *decisio-*  
 decisionengine.framework.tests.test\_client\_errors, *nengine.framework.logicengine.tests.test\_pandas\_fact*),  
 79 64  
 decisionengine.framework.tests.test\_client\_myengine() (in module *decisio-*  
 79 *nengine.framework.logicengine.tests.test\_rule\_with\_negated\_fact*)  
 decisionengine.framework.tests.test\_defaults, 64  
 80 *myengine()* (in module *decisio-*  
 decisionengine.framework.tests.test\_error\_on\_acquire, *nengine.framework.logicengine.tests.test\_simple\_configuration*),  
 80 64  
 decisionengine.framework.tests.test\_module\_program\_options,  
 80 N  
 decisionengine.framework.tests.test\_query\_tool(*ServiceEngine.framework.dataspace.datasources.sqlalchemy\_ds.db-*  
 80 *attribute*), 35  
 decisionengine.framework.tests.test\_reaperNotFound(*decisionengine.framework.engine.DecisionEngine.StopState*  
 80 *attribute*), 60  
 decisionengine.framework.tests.test\_restart\_with\_data\_source (class in *decisio-*  
 81 *nengine.framework.dataspace.datasources.null*),  
 decisionengine.framework.tests.test\_sample\_config, 42  
 81  
 decisionengine.framework.tests.test\_source\_proxy,  
 82 OFFLINE(*decisionengine.framework.taskmanager.ProcessingState.State*  
 decisionengine.framework.tests.test\_start\_with\_bad\_channels, 12  
 82 *unhappy*), 12  
 decisionengine.framework.tests.test\_start\_with\_no\_channels, *orm\_as\_dict()* (in module *decisio-*  
 82 *nengine.framework.dataspace.datasources.sqlalchemy\_ds.utils*),  
 35  
 decisionengine.framework.tests.TransformNOP,  
 78 P  
 decisionengine.framework.tests.TransformWithMissingParameters, (in *decisio-*  
 78 *nengine.framework.modules.describe*), 71  
 decisionengine.framework.tests.WorkingSourceProxy (class in *decisio-*  
 78 *nengine.framework.modules.Publisher*),  
 decisionengine.framework.util, 85  
 69  
 decisionengine.framework.util.fs, 83  
 decisionengine.framework.util.metrics, 83  
 decisionengine.framework.util.reaper, 84  
 decisionengine.framework.util.singleton, *Parameter* (class in *decisio-*  
 84 *nengine.framework.modules.Source*), 69  
*Parameter* (class in *decisio-*  
*nengine.framework.modules.Transform*),  
 70  
 decisionengine.framework.util.sockets, 84  
 decisionengine.framework.util.subclasses, *parse\_program\_options()* (in module *decisio-*  
 84 *nengine.framework.engine.DecisionEngine*),  
 60  
 decisionengine.framework.version, 85  
 decisionengine.tests, 85  
 decisionengine.tests.test\_framework\_package, *PG\_DE\_DB\_WITH\_SCHEMA()* (in module *decisio-*  
 85 39  
*PG\_DE\_DB\_WITH\_SCHEMA()* (in module *decisio-*  
*nengine.framework.dataspace.tests.fixtures*),  
 47  
 Module (class in *decisio-*  
*nengine.framework.modules.Module*), 68  
 ModuleProgramOptions (class in *decisio-*  
*nengine.framework.modules.describe*), 71  
 mydata() (in module *decisio-*  
 57

PG\_DE\_DB\_WITH\_SCHEMA() (in module decisionengine.framework.tests.fixtures), 79

PG\_DE\_DB\_WITHOUT\_SCHEMA() (in module decisionengine.framework.dataspace.datasources.tests.fixtures), 39

PG\_DE\_DB\_WITHOUT\_SCHEMA() (in module decisionengine.framework.dataspace.tests.fixtures), 47

PG\_DE\_DB\_WITHOUT\_SCHEMA() (in module decisionengine.framework.engine.tests.fixtures), 57

PG\_DE\_DB\_WITHOUT\_SCHEMA() (in module decisionengine.framework.tests.fixtures), 78

PG\_PROG() (in module decisionengine.framework.dataspace.datasources.tests.fixtures), 40

PG\_PROG() (in module decisionengine.framework.dataspace.tests.fixtures), 47

PG\_PROG() (in module decisionengine.framework.engine.tests.fixtures), 57

PG\_PROG() (in module decisionengine.framework.tests.fixtures), 79

post\_create() (decisionengine.framework.modules.Source.Source method), 69

post\_create() (decisionengine.framework.modules.SourceProxy.SourceProxy method), 69

Postgresql (class in decisionengine.framework.dataspace.datasources.postgresql), 44

print\_channel\_config() (decisionengine.framework.config.ChannelConfigHandler.ChannelConfigHandler method), 27

print\_consumes() (in module decisionengine.framework.modules.print\_description), 71

print\_produces() (in module decisionengine.framework.modules.print\_description), 71

print\_supported\_config() (in module decisionengine.framework.modules.print\_description), 71

probably\_running() (decisionengine.framework.taskmanager.ProcessingState.ProcessingState method), 72

process\_args() (decisionengine.framework.modules.describe.ModuleProgramOptions.ModuleProgramOptions method), 71

ProcessingState (class in decisionengine.framework.taskmanager.ProcessingState), 72

produces() (decisionengine.framework.logicengine.LogicEngine.LogicEngine method), 66

produces() (in module decisionengine.framework.modules.Module), 68

produces() (in module decisionengine.framework.modules.Source), 69

produces() (in module decisionengine.framework.modules.Transform), 70

ProductRetriever (class in decisionengine.framework.dataspace.datablock), 52

publish() (decisionengine.framework.modules.Publisher.Publisher method), 69

publish() (decisionengine.framework.tests.FailingPublisher.FailingPublisher method), 76

publish() (decisionengine.framework.tests.PublisherNOP.PublisherNOP method), 77

Publisher (class in decisionengine.framework.modules.Publisher), 69

PublisherNOP (class in decisionengine.framework.tests.PublisherNOP), 77

PublisherWithMissingConsumes (class in decisionengine.framework.tests.PublisherWithMissingConsumes), 77

put() (decisionengine.framework.dataspace.datablock.DataBlock method), 52

## R

reap() (decisionengine.framework.dataspace.maintain.Reaper method), 56

Reaper (class in decisionengine.framework.dataspace.maintain), 56

reaper() (in module decisionengine.framework.dataspace.tests.test\_Reaper), 48

reaper\_start() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59

reaper\_status() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59

reaper\_stop() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59

registry (decisionengine.framework.dataspace.datasources.sqlalchemy\_dialect attribute), 33

RequestHandler (class in decisionengine.framework.engine.DecisionEngine), 60

required\_keys (decisionengine.framework.dataspace.datablock.Header attribute), 18

attribute), 52  
 required\_keys (decisionengine.framework.dataspace.datablock.Metadata attribute), 52  
 reset\_connections() (decisionengine.framework.dataspace.datasource.DataSource method), 55  
 reset\_connections() (decisionengine.framework.dataspace.sources.null.NullDataSource method), 43  
 reset\_connections() (decisionengine.framework.dataspace.sources.postgresql.PostgreSQL method), 46  
 reset\_connections() (decisionengine.framework.dataspace.sources.sqlalchemy\_ds.DataSourceApi SQLAlchemyDS method), 32  
 reset\_connections() (decisionengine.framework.dataspace.sources.sqlalchemy\_ds.DataSourceApi SQLAlchemyDS method), 39  
 retention\_interval (decisionengine.framework.dataspace.maintain.Reaper property), 56  
 rm\_channel() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_block\_while() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_get\_channel\_log\_level() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_get\_log\_level() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_kill\_channel() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_paths (decisionengine.framework.engine.DecisionEngine.RequestHandler attribute), 60  
 rpc\_print\_product() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_print\_products() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_query\_tool() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_reaper\_start() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_reaper\_status() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_reaper\_stop() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_rm\_channel() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_set\_channel\_log\_level() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_show\_config() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_show\_de\_config() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_start\_channel() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 59  
 rpc\_start\_channels() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 60  
 rpc\_status() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 60  
 rpc\_stop() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 60  
 rpc\_stop\_channel() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 60  
 rpc\_stop\_channels() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 60  
 RuleEngine (class in decisionengine.framework.logicengine.Rule), 66  
 rule\_for() (decisionengine.framework.logicengine.FactLookup.FactLookup method), 65  
 RuleEngine (class in decisionengine.framework.logicengine.RuleEngine), 66  
 run() (decisionengine.framework.engine.Workers.Worker method), 61  
 run() (decisionengine.framework.taskmanager.TaskManager.TaskManager method), 73  
 run\_logic\_engine() (decisionengine.framework.taskmanager.TaskManager.TaskManager method), 73  
 run\_publishers() (decisionengine.framework.taskmanager.TaskManager.TaskManager method), 73  
 run\_source() (decisionengine.framework.taskmanager.TaskManager.TaskManager method), 73  
 run\_transform() (decisionengine.framework.taskmanager.TaskManager.TaskManager method), 73



method), 74

run\_transforms() (decisionengine.framework.taskmanager.TaskManager.TaskManager method), 74

**S**

scheduled\_create\_time (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema.Header attribute), 34

Schema (class in decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema), 35

schema (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema.Schema attribute), 35

schema\_id (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema.Header attribute), 34

schema\_id (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema.Schema attribute), 35

ScopedSingleton (class in decisionengine.framework.util.singleton), 84

ScopedSingletonABC (class in decisionengine.framework.util.singleton), 84

seconds\_between\_runs (decisionengine.framework.dataspace.maintain.Reaper property), 56

sequence\_id (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_schema.Taskmanager attribute), 35

set() (decisionengine.framework.taskmanager.ProcessingState.ProcessingState method), 72

set\_data\_block() (decisionengine.framework.modules.Module.Module method), 68

set\_logging() (in module decisionengine.framework.modules.de\_logger), 70

set\_loglevel\_value() (decisionengine.framework.taskmanager.TaskManager.TaskManager method), 74

set\_state() (decisionengine.framework.dataspace.datablock.Metadata method), 52

set\_to\_shutdown() (decisionengine.framework.taskmanager.TaskManager.TaskManager method), 74

should\_stop() (decisionengine.framework.taskmanager.ProcessingState.ProcessingState method), 72

SHUTDOWN (decisionengine.framework.taskmanager.ProcessingState.ProcessingState attribute), 72

shutdown() (decisionengine.framework.modules.Publisher.Publisher method), 69

SHUTTINGDOWN (decisionengine.framework.taskmanager.ProcessingState.ProcessingState attribute), 72

Singleton (class in decisionengine.framework.util.singleton), 84

SingletonABC (class in decisionengine.framework.util.singleton), 84

sorted\_rules() (decisionengine.framework.logicengine.FactLookup.FactLookup method), 65

Source (class in decisionengine.framework.modules.Source), 69

SourceNOP (class in decisionengine.framework.tests.SourceNOP), 77

SourceProxy (class in decisionengine.framework.modules.SourceProxy), 69

SourceWithMissingProduces (class in decisionengine.framework.tests.FailingSourceNOP), 76

SourceWithSampleConfigNOP (class in decisionengine.framework.tests.SourceWithSampleConfigNOP), 77

spec\_if\_main() (in module decisionengine.framework.modules.print\_description), 71

SQLALCHEMY\_PG\_WITH\_SCHEMA() (in module decisionengine.framework.dataspace.datasources.tests.fixtures), 40

SQLALCHEMY\_PG\_WITH\_SCHEMA() (in module decisionengine.framework.dataspace.tests.fixtures), 47

SQLALCHEMY\_PG\_WITH\_SCHEMA() (in module decisionengine.framework.engine.tests.fixtures), 57

SQLALCHEMY\_PG\_WITH\_SCHEMA() (in module decisionengine.framework.tests.fixtures), 79

SQLALCHEMY\_TEMPFILE\_SQLITE() (in module decisionengine.framework.dataspace.datasources.tests.fixtures), 40

SQLALCHEMY\_TEMPFILE\_SQLITE() (in module decisionengine.framework.dataspace.tests.fixtures), 47

SQLALCHEMY\_TEMPFILE\_SQLITE() (in module decisionengine.framework.engine.tests.fixtures), 57

SQLALCHEMY\_TEMPFILE\_SQLITE() (in module decisionengine.framework.tests.fixtures), 79

SQLAlchemyDS (class in decisionengine.framework.dataspace.datasources.sqlalchemy\_ds), 36

SQLAlchemyDS (class in decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.datasource), 29

start() (decisionengine.framework.dataspace.maintain.Reaper method), 56

start\_channel() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 60

start\_channels() (decisionengine.framework.engine.DecisionEngine.DecisionEngine method), 60

nengine.framework.engine.DecisionEngine.DecisionEngine nengine.framework.modules.Transform),  
 method), 60 70  
 start\_sources() (decisionengine.framework.taskmanager.TaskManager.TaskManager nengine.framework.tests.SupportsConfigPublisher),  
 method), 74 78  
 State (class in decisionengine.framework.taskmanager.ProcessingState), 72  
 state (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.distribute) Metadata  
 attribute), 34 take\_offline() (decisionengine.framework.taskmanager.TaskManager.TaskManager  
 STEADY (decisionengine.framework.taskmanager.ProcessingState.State nengine.framework.taskmanager.TaskManager  
 attribute), 73 method), 74  
 stop() (decisionengine.framework.dataspace.maintain.ReapTask\_dataproduct (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_sch  
 method), 56  
 stop\_channels() (decisionengine.framework.engine.DecisionEngine.DecisionEngine nengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_sch  
 method), 60  
 stop\_worker() (decisionengine.framework.engine.DecisionEngine.DecisionEngine nengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_sch  
 method), 60  
 StopState (class in decisionengine.framework.engine.DecisionEngine), Taskmanager (class in decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_sch  
 60  
 store\_taskmanager() (decisionengine.framework.dataspace.datablock.DataBlock.TaskManager (class in decisionengine.framework.taskmanager.TaskManager),  
 method), 52  
 store\_taskmanager() (decisionengine.framework.dataspace.datasource.DataSource.taskmanager (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_sch  
 method), 55  
 store\_taskmanager() (decisionengine.framework.dataspace.datasources.null.NullTaskmanager (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_sch  
 method), 43  
 store\_taskmanager() (decisionengine.framework.dataspace.datasources.postgresql.PostgreSQLTaskmanager (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_sch  
 method), 46  
 store\_taskmanager() (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.api.SQLAlchemyDS taskmanager\_id (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_sch  
 method), 32  
 store\_taskmanager() (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.api.SQLAlchemyDS taskmanager\_id (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_sch  
 method), 39  
 store\_taskmanager() (decisionengine.framework.dataspace.dataspace.DataSpace.taskmanager\_id (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_sch  
 method), 56  
 Summary (class in decisionengine.framework.util.metrics), 83 taskmanager\_id (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_sch  
 supports\_config() (in module decisionengine.framework.modules.describe), 71 taskmanager\_id (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db\_sch  
 supports\_config() (in module decisionengine.framework.modules.Publisher), taskmanager\_table (decisionengine.framework.dataspace.datasource.DataSource  
 69 attribute), 55  
 supports\_config() (in module decisionengine.framework.modules.Source), 69 Terminated (decisionengine.framework.engine.DecisionEngine.StopState  
 supports\_config() (in module decisionengine.framework.tests.ModuleProgramOptions.AcquireW test() (decisionengine.framework.tests.ModuleProgramOptions.AcquireW

method), 76

test() (decisionengine.framework.tests.ModuleProgramOptions.ChannelInvalidModuleMissing\_module()  
method), 76

test() (decisionengine.framework.tests.ModuleProgramOptions.ConfigInvalid\_module\_missing\_parameters()  
method), 76

test() (decisionengine.framework.tests.ModuleProgramOptions.DescribeInvalid\_module\_names()  
method), 76

test() (decisionengine.framework.tests.ModuleProgramOptions.ChannelNames()  
method), 76

test\_acquire\_for\_sources() (in module decisionengine.framework.tests.test\_module\_program\_options), 80

test\_by\_nonsense\_is\_err() (in module decisionengine.framework.modules.tests.test\_de\_logger), 67

test\_by\_size() (in module decisionengine.framework.modules.tests.test\_de\_logger), 67

test\_by\_time() (in module decisionengine.framework.modules.tests.test\_de\_logger), 67

test\_can\_import() (in module decisionengine.tests.test\_framework\_package), 85

test\_change\_port() (in module decisionengine.framework.engine.tests.test\_startup), 58

test\_channel\_config\_dir() (in module decisionengine.framework.config.tests.test\_policies), 26

test\_channel\_empty\_config() (in module decisionengine.framework.config.tests.test\_config), 25

test\_channel\_empty\_dictionary() (in module decisionengine.framework.config.tests.test\_config), 25

test\_channel\_invalid\_modules\_list() (in module decisionengine.framework.config.tests.test\_config), 25

test\_channel\_invalid\_modules\_no\_keys() (in module decisionengine.framework.config.tests.test\_config), 25

test\_channel\_invalid\_modules\_string() (in module decisionengine.framework.config.tests.test\_config), 25

test\_channel\_loading() (in module decisionengine.framework.config.tests.test\_config), 25

test\_channel\_module\_missing\_all() (in module decisionengine.framework.config.tests.test\_config), 26

test\_channel\_no\_config\_files() (in module decisionengine.framework.config.tests.test\_config), 26

test\_channel\_no\_modules() (in module decisionengine.framework.config.tests.test\_config), 26

test\_client\_can\_double\_set\_de\_server\_channel\_log\_level() (in module decisionengine.framework.tests.test\_sample\_config), 81

test\_client\_can\_get\_de\_server\_channel\_config() (in module decisionengine.framework.tests.test\_sample\_config), 81

test\_client\_can\_get\_de\_server\_channel\_log\_level() (in module decisionengine.framework.tests.test\_sample\_config), 81

test\_client\_can\_get\_de\_server\_reaper\_start\_delay() (in module decisionengine.framework.tests.test\_reaper), 80

test\_client\_can\_get\_de\_server\_reaper\_status() (in module decisionengine.framework.tests.test\_reaper), 80

test\_client\_can\_get\_de\_server\_reaper\_stop() (in module decisionengine.framework.tests.test\_reaper), 80

test\_client\_can\_get\_de\_server\_show\_channel\_logger\_level() (in module decisionengine.framework.tests.test\_defaults), 80

test\_client\_can\_get\_de\_server\_show\_config() (in module decisionengine.framework.tests.test\_sample\_config), 81

test\_client\_can\_get\_de\_server\_show\_logger\_level() (in module decisionengine.framework.tests.test\_sample\_config), 81

test\_client\_can\_get\_de\_server\_status() (in module decisionengine.framework.tests.test\_sample\_config), 81

test_client_can_get_products() (in module decisionengine.framework.tests.test_sample_config), 81	79	test_client_de_config_is_json() (in module decisionengine.framework.tests.test_defaults), 80
test_client_can_get_products_no_channels() (in module decisionengine.framework.tests.test_sample_config), 81		test_client_err_returned_as_rc() (in module decisionengine.framework.engine.tests.test_client_only), 58
test_client_can_get_products_no_channels() (in module decisionengine.framework.tests.test_start_with_bad_channels), 82		test_client_err_returned_as_rc() (in module decisionengine.framework.engine.tests.test_query_tool_only), 58
test_client_can_kill_one_channel() (in module decisionengine.framework.tests.test_sample_config), 81		test_client_err_returned_verbose_as_rc() (in module decisionengine.framework.engine.tests.test_client_only), 58
test_client_can_kill_one_channel_force() (in module decisionengine.framework.tests.test_sample_config), 81		test_client_err_returned_verbose_as_rc() (in module decisionengine.framework.engine.tests.test_query_tool_only), 58
test_client_can_kill_one_channel_timeout() (in module decisionengine.framework.tests.test_sample_config), 81		test_client_get_channel_log_fails_cleanly() (in module decisionengine.framework.tests.test_sample_config), 82
test_client_can_set_de_server_channel_log_level() (in module decisionengine.framework.tests.test_sample_config), 81		test_client_get_non_real_channel() (in module decisionengine.framework.tests.test_sample_config), 82
test_client_can_start_all_channel() (in module decisionengine.framework.tests.test_sample_config), 81		test_client_help() (in module decisionengine.framework.engine.tests.test_client_only), 58
test_client_can_start_one_channel() (in module decisionengine.framework.tests.test_sample_config), 81		test_client_print_product() (in module decisionengine.framework.tests.test_client_server), 79
test_client_can_stop_channels() (in module decisionengine.framework.tests.test_sample_config), 81		test_client_print_product_columns() (in module decisionengine.framework.tests.test_client_server), 79
test_client_can_stop_one_channel() (in module decisionengine.framework.tests.test_sample_config), 81		test_client_print_product_columns_query() (in module decisionengine.framework.tests.test_client_server), 79
test_client_can_stop_server() (in module decisionengine.framework.tests.test_sample_config), 81		test_client_print_product_json() (in module decisionengine.framework.tests.test_client_server), 79
test_client_cannot_double_start() (in module decisionengine.framework.tests.test_sample_config), 81		test_client_print_product_not_real() (in module decisionengine.framework.tests.test_client_server), 79
test_client_cannot_wait_on_bad_state() (in module decisionengine.framework.tests.test_client_errors),		test_client_print_product_query() (in module decisionengine.framework.tests.test_client_server), 79
		test_client_print_product_types() (in module decisionengine.framework.tests.test_client_errors),

<code>nengine.framework.tests.test_client_server),</code>	<code>test_configuration_with_nnumy_facts()</code>
79	(in module <i>decisionengine.framework.logicengine.tests.test_construction</i> ),
<code>test_client_print_product_vertical()</code>	63
(in module <i>decisionengine.framework.tests.test_client_server</i> ),	<code>test_create_tables()</code> (in module <i>decisionengine.framework.dataspace.datasources.tests.test_datasource_</i>
79	40
<code>test_client_set_channel_log_fails_cleanly()</code>	<code>test_DataBlock_constructor()</code> (in module <i>decisionengine.framework.dataspace.tests.test_datablock</i> ),
(in module <i>decisionengine.framework.tests.test_sample_config</i> ),	49
82	<code>test_DataBlock_duplicate()</code> (in module <i>decisionengine.framework.dataspace.tests.test_datablock</i> ),
<code>test_client_start_non_real_channel()</code>	49
(in module <i>decisionengine.framework.tests.test_sample_config</i> ),	<code>test_DataBlock_get_dataproducts()</code>
82	(in module <i>decisionengine.framework.dataspace.tests.test_datablock</i> ),
<code>test_client_status_msg_to_stdout()</code>	49
(in module <i>decisionengine.framework.tests.test_client_server</i> ),	<code>test_DataBlock_get_header()</code> (in module <i>decisionengine.framework.dataspace.tests.test_datablock</i> ),
79	49
<code>test_client_stop_non_real_channel()</code>	<code>test_DataBlock_get_metadata()</code> (in module <i>decisionengine.framework.dataspace.tests.test_datablock</i> ),
(in module <i>decisionengine.framework.tests.test_sample_config</i> ),	49
82	<code>test_DataBlock_get_taskmanager()</code>
<code>test_client_wait_timeout_works()</code>	(in module <i>decisionengine.framework.dataspace.tests.test_datablock</i> ),
(in module <i>decisionengine.framework.tests.test_sample_config</i> ),	49
82	<code>test_DataBlock_is_expired()</code> (in module <i>decisionengine.framework.dataspace.tests.test_datablock</i> ),
<code>test_client_with_no_command_says_use_help()</code>	49
(in module <i>decisionengine.framework.engine.tests.test_client_only</i> ),	<code>test_DataBlock_is_expired_with_key()</code>
58	(in module <i>decisionengine.framework.dataspace.tests.test_datablock</i> ),
<code>test_client_with_no_server()</code> (in module <i>decisionengine.framework.engine.tests.test_client_only</i> ),	49
58	<code>test_DataBlock_key_management()</code>
<code>test_client_with_no_server_verbose()</code>	(in module <i>decisionengine.framework.dataspace.tests.test_datablock</i> ),
(in module <i>decisionengine.framework.engine.tests.test_client_only</i> ),	49
58	<code>test_DataBlock_key_management_change_name()</code>
<code>test_compound_fact_with_spaces()</code>	(in module <i>decisionengine.framework.dataspace.tests.test_datablock</i> ),
(in module <i>decisionengine.framework.logicengine.tests.test_facts</i> ),	49
63	<code>test_DataBlock_key_management_change_name()</code>
<code>test_compress()</code> (in module <i>decisionengine.framework.dataspace.tests.test_datablock_test</i> ),	(in module <i>decisionengine.framework.dataspace.tests.test_datablock</i> ),
49	49
<code>test_conditional_fact()</code> (in module <i>decisionengine.framework.logicengine.tests.test_fail_on_test</i> ),	<code>test_DataBlock_mark_expired()</code> (in module <i>decisionengine.framework.dataspace.tests.test_datablock</i> ),
63	49
<code>test_config_templates()</code> (in module <i>decisionengine.framework.tests.test_module_program_options</i> ),	<code>test_DataBlock_no_key_by_name()</code>
80	(in module <i>decisionengine.framework.dataspace.tests.test_datablock</i> ),
<code>test_configuration_with_fact_using_function()</code>	49
(in module <i>decisionengine.framework.logicengine.tests.test_construction</i> ),	<code>test_DataBlock_to_str()</code> (in module <i>decisionengine.framework.dataspace.tests.test_datablock</i> ),
63	49
	<code>test_dataspace_config_finds_bad()</code>
	(in module <i>decisionengine.framework.dataspace.tests.test_datablock</i> ),



```

    nengine.framework.dataspace.tests.test_dataspace), 63
50 test_fact_with_nested_names() (in module decisio-
    nengine.framework.logicengine.tests.test_facts),
    nengine.framework.engine.tests.test_startup), 63
58 test_fail_bad_config() (in module decisio-
    nengine.framework.dataspace.tests.test_Reaper),
test_default_construction() (in module decisio-
    nengine.framework.logicengine.tests.test_construction), 48
63 test_fail_missing_config() (in module decisio-
    nengine.framework.dataspace.tests.test_Reaper),
test_delete_data_older_than_arg()
    (in module decisio-
    nengine.framework.dataspace.datasources.tests.test_startup), 48
40 test_fail_missing_config_key()
    (in module decisio-
    nengine.framework.dataspace.tests.test_Reaper),
test_descriptions() (in module decisio-
    nengine.framework.tests.test_module_program_options), 48
80 test_fail_on_error() (in module decisio-
    nengine.framework.logicengine.tests.test_fail_on_error),
test_duplicate_datablock() (in module decisio-
    nengine.framework.dataspace.datasources.tests.test_datasource_api), 63
40 test_fail_small_retain() (in module decisio-
    nengine.framework.dataspace.tests.test_Reaper),
test_duplicate_datablock() (in module decisio-
    nengine.framework.dataspace.tests.test_dataspace), 48
50 test_fail_small_run_interval()
    (in module decisio-
    nengine.framework.dataspace.tests.test_Reaper),
test_duplicate_fact_names() (in module decisio-
    nengine.framework.logicengine.tests.test_duplicate_fact_names), 48
63 test_fail_start_two_reapers() (in module decisio-
    nengine.framework.dataspace.tests.test_Reaper),
test_empty_config() (in module decisio-
    nengine.framework.config.tests.test_config), 48
26 test_fail_wrong_config_key() (in module decisio-
    nengine.framework.dataspace.tests.test_Reaper),
test_empty_config() (in module decisio-
    nengine.framework.config.tests.test_validconfig), 48
26 test_false_fact_with_spaces() (in module decisio-
    nengine.framework.logicengine.tests.test_fail_on_error),
test_empty_dict() (in module decisio-
    nengine.framework.config.tests.test_config), 63
26 test_false_literal_fact() (in module decisio-
    nengine.framework.logicengine.tests.test_fail_on_error),
test_empty_dict_with_leading_comment()
    (in module decisio-
    nengine.framework.config.tests.test_config), 63
26 test_generate_insert_query() (in module decisio-
    nengine.framework.dataspace.datasources.tests.test_postgresql),
test_exclusive_options() (in module decisio-
    nengine.framework.engine.tests.test_client_only), 42
58 test_get_datablock() (in module decisio-
    nengine.framework.dataspace.datasources.tests.test_datasource_
test_fact_using_numpy_array() (in module decisio-
    nengine.framework.logicengine.tests.test_facts), 40
63 test_get_datablock() (in module decisio-
    nengine.framework.dataspace.tests.test_dataspace),
test_fact_using_numpy_function()
    (in module decisio-
    nengine.framework.logicengine.tests.test_facts), 50
63 test_get_dataproduct() (in module decisio-
    nengine.framework.dataspace.datasources.tests.test_datasource_
test_fact_with_fail_on_error()
    (in module decisio-
    nengine.framework.logicengine.tests.test_facts), 40
63 test_get_dataproduct() (in module decisio-
    nengine.framework.dataspace.tests.test_dataspace),
test_fact_with_misspecified_attribute()
    (in module decisio-
    nengine.framework.logicengine.tests.test_fail_on_error), 50
test_get_dataproduct_not_exist()
    (in module decisio-
    nengine.framework.dataspace.datasources.tests.test_datasource_

```

```

40 test_get_metadata_not_exist() (in module decisio-
test_get_dataproduct_not_exist() engine.framework.dataspace.tests.test_dataspace),
(in module decisio- 50
engine.framework.dataspace.tests.test_dataspace) test_get_taskmanager_exists() (in module decisio-
50 engine.framework.dataspace.datasources.tests.test_datasource_
test_get_dataproducts() (in module decisio- 41
engine.framework.dataspace.datasources.tests.test_dataspace) test_get_taskmanager_exists() (in module decisio-
41 engine.framework.dataspace.tests.test_dataspace),
test_get_dataproducts() (in module decisio- 50
engine.framework.dataspace.tests.test_dataspace) test_get_taskmanager_not_exists()
50 (in module decisio-
engine.framework.dataspace.datasources.tests.test_datasource_
test_get_dataproducts_not_exist() 41
(in module decisio-
engine.framework.dataspace.datasources.tests.test_datasource_
41 test_get_taskmanager_not_exists()
(in module decisio-
engine.framework.dataspace.tests.test_dataspace),
test_get_dataproducts_not_exist() 50
(in module decisio-
engine.framework.dataspace.tests.test_dataspace) test_get_taskmanagers() (in module decisio-
50 engine.framework.dataspace.datasources.tests.test_datasource_
test_get_header() (in module decisio- 41
engine.framework.dataspace.datasources.tests.test_dataspace) test_get_taskmanagers() (in module decisio-
41 engine.framework.dataspace.tests.test_dataspace),
test_get_header() (in module decisio- 50
engine.framework.dataspace.tests.test_dataspace) test_get_taskmanagers_not_exist()
50 (in module decisio-
engine.framework.dataspace.datasources.tests.test_datasource_
test_get_header_not_exist() (in module decisio-
engine.framework.dataspace.datasources.tests.test_datasource_
41 test_get_taskmanagers_not_exist()
41 test_get_header_not_exist() (in module decisio-
engine.framework.dataspace.tests.test_dataspace),
50 engine.framework.dataspace.tests.test_dataspace),
50
test_get_last_generation_id() (in module decisio- test_global_channel_log_level_in_config()
engine.framework.dataspace.datasources.tests.test_datasource_
41 (in module decisio-
engine.framework.tests.test_defaults), 80
test_get_last_generation_id() (in module decisio- test_global_config_dir() (in module decisio-
engine.framework.dataspace.tests.test_dataspace), engine.framework.config.tests.test_policies),
50 26
test_get_last_generation_id_not_exist() test_global_config_file() (in module decisio-
(in module decisio- engine.framework.config.tests.test_policies),
engine.framework.dataspace.datasources.tests.test_datasource_
41 26
test_get_last_generation_id_not_exist() test_has_config() (in module decisio-
(in module decisio- engine.framework.dataspace.datasources.tests.test_datasource_
engine.framework.dataspace.tests.test_dataspace) 41
50 test_has_config() (in module decisio-
engine.framework.dataspace.tests.test_dataspace),
test_get_metadata() (in module decisio- 50
engine.framework.dataspace.datasources.tests.test_datasource_
41 test_has_methods_we_expect() (in module decisio-
engine.framework.dataspace.tests.test_datasource),
test_get_metadata() (in module decisio- 49
engine.framework.dataspace.tests.test_dataspace) test_Header_constructor() (in module decisio-
50 engine.framework.dataspace.tests.test_datablock),
test_get_metadata_not_exist() (in module decisio- 49
engine.framework.dataspace.datasources.tests.test_datablock),
41 test_Header_is_valid() (in module decisio-
engine.framework.dataspace.tests.test_datablock),

```

```

49                                     nengine.framework.modules.tests.test_module_decorators),
test_help()      (in      module      decisio-      68
nengine.framework.tests.test_module_program_options),
80                                     (in      module      decisio-
test_index_error() (in      module      decisio-      nengine.framework.modules.tests.test_module_decorators),
nengine.framework.logicengine.tests.test_fail_on_error), 68
63                                     test_no_such_file() (in      module      decisio-
test_insert()      (in      module      decisio-      nengine.framework.config.tests.test_validconfig),
nengine.framework.dataspace.datasources.tests.test_datasource_api),
41                                     test_publisher_structure() (in      module      decisio-
test_insert()      (in      module      decisio-      nengine.framework.modules.tests.test_Publisher),
nengine.framework.dataspace.tests.test_dataspace), 67
50                                     test_query_tool_csv() (in      module      decisio-
test_invalid_config() (in      module      decisio-      nengine.framework.tests.test_query_tool_server),
nengine.framework.config.tests.test_validconfig), 80
26                                     test_query_tool_default() (in      module      decisio-
test_just_stop_no_error() (in      module      decisio-      nengine.framework.tests.test_query_tool_server),
nengine.framework.dataspace.tests.test_Reaper), 80
48                                     test_query_tool_help() (in      module      decisio-
test_logicengine_structure() (in      module      decisio-      nengine.framework.engine.tests.test_query_tool_only),
nengine.framework.modules.tests.test_LogicEngine), 58
67                                     test_query_tool_invalid_product()
test_loop_of_start_stop_in_clumps()      (in      module      decisio-
(in      module      decisio-      nengine.framework.tests.test_query_tool_server),
nengine.framework.dataspace.tests.test_Reaper), 80
48                                     test_query_tool_json() (in      module      decisio-
test_Metadata_constructor() (in      module      decisio-      nengine.framework.tests.test_query_tool_server),
nengine.framework.dataspace.tests.test_datablock), 80
49                                     test_query_tool_since() (in      module      decisio-
test_Metadata_set_state() (in      module      decisio-      nengine.framework.tests.test_query_tool_server),
nengine.framework.dataspace.tests.test_datablock), 80
49                                     test_query_tool_with_no_server()
test_minimal_jsonnet_right_extension()      (in      module      decisio-
(in      module      decisio-      nengine.framework.engine.tests.test_query_tool_only),
nengine.framework.config.tests.test_config), 58
26                                     test_query_tool_with_no_server_verbose()
test_minimal_jsonnet_wrong_extension()      (in      module      decisio-
(in      module      decisio-      nengine.framework.engine.tests.test_query_tool_only),
nengine.framework.config.tests.test_config), 58
26                                     test_reap_default_state() (in      module      decisio-
test_minimal_python() (in      module      decisio-      nengine.framework.dataspace.tests.test_Reaper),
nengine.framework.config.tests.test_config), 48
26                                     test_reaper_can_reap() (in      module      decisio-
test_misspecified_fact() (in      module      decisio-      nengine.framework.dataspace.tests.test_Reaper),
nengine.framework.logicengine.tests.test_fail_on_error), 48
64                                     test_reset_connections() (in      module      decisio-
test_module_alias() (in      module      decisio-      nengine.framework.dataspace.datasources.tests.test_datasource_
nengine.framework.tests.test_module_program_options), 41
80                                     test_restart_channel() (in      module      decisio-
test_module_structure() (in      module      decisio-      nengine.framework.tests.test_restart_channel),
nengine.framework.modules.tests.test_Module), 81
67                                     test_rule_that_does_not_fire()
test_multiple_consumes_declarations()      (in      module      decisio-
(in      module      decisio-      nengine.framework.logicengine.tests.test_cascaded_rules),

```



```

63                                     (in module decisio-
test_rule_that_does_not_fire()      nengine.framework.dataspace.tests.test_Reaper),
(in module decisio-                  48
nengine.framework.logicengine.tests.test_pandas_fact, test_stop_failing_source_proxy()
64                                     (in module decisio-
test_rule_that_does_not_fire()      nengine.framework.tests.test_source_proxy),
(in module decisio-                  82
nengine.framework.logicengine.tests.test_rule_with_test_store_taskmanager() (in module decisio-
64                                     nengine.framework.dataspace.datasources.tests.test_datasource_
test_rule_that_does_not_fire()      41
(in module decisio- test_store_taskmanager() (in module decisio-
nengine.framework.logicengine.tests.test_simple_configuration, nengine.framework.dataspace.tests.test_dataspace),
64                                     50
test_rule_that_fires() (in module decisio- test_supports_config() (in module decisio-
nengine.framework.logicengine.tests.test_cascaded_rules), nengine.framework.modules.tests.test_module_decorators),
63                                     68
test_rule_that_fires() (in module decisio- test_syntax_error() (in module decisio-
nengine.framework.logicengine.tests.test_pandas_fact), nengine.framework.logicengine.tests.test_facts),
64                                     63
test_rule_that_fires() (in module decisio- test_syntax_error_in_config_names_bad_file()
nengine.framework.logicengine.tests.test_rule_with_negated_ifact), module decisio-
64                                     nengine.framework.config.tests.test_config),
test_rule_that_fires() (in module decisio- 26
nengine.framework.logicengine.tests.test_simple_configuration, test_transform_structure() (in module decisio-
64                                     nengine.framework.modules.tests.test_Transform),
test_simple_fact() (in module decisio- 67
nengine.framework.logicengine.tests.test_facts), test_translate_all() (in module decisio-
63                                     nengine.framework.modules.tests.test_translate_product_name),
test_source_fail_can_be_fixed()      68
(in module decisio- test_translate_illegal_characters()
nengine.framework.dataspace.tests.test_Reaper), (in module decisio-
48                                     nengine.framework.modules.tests.test_translate_product_name),
test_source_only_channel() (in module decisio- 68
nengine.framework.tests.test_error_on_acquire), test_translate_none() (in module decisio-
80                                     nengine.framework.modules.tests.test_translate_product_name),
test_source_structure() (in module decisio- 68
nengine.framework.modules.tests.test_Source), test_translate_simple() (in module decisio-
67                                     nengine.framework.modules.tests.test_translate_product_name),
test_start_delay() (in module decisio- 68
nengine.framework.dataspace.tests.test_Reaper), test_translate_with_underscores()
48                                     (in module decisio-
test_start_from_nothing() (in module decisio- nengine.framework.modules.tests.test_translate_product_name),
nengine.framework.tests.test_start_with_no_channels), 68
82                                     test_trivial_configuration() (in module decisio-
test_start_stop() (in module decisio- nengine.framework.logicengine.tests.test_construction),
nengine.framework.dataspace.tests.test_Reaper), 63
48                                     test_true_fact() (in module decisio-
test_start_stop_stop() (in module decisio- nengine.framework.logicengine.tests.test_fail_on_error),
nengine.framework.dataspace.tests.test_Reaper), 64
48                                     test_true_literal_fact() (in module decisio-
test_state_can_be_active() (in module decisio- nengine.framework.logicengine.tests.test_fail_on_error),
nengine.framework.dataspace.tests.test_Reaper), 64
48                                     test_update() (in module decisio-
test_state_sets_timer_and_uses_it() nengine.framework.dataspace.datasources.tests.test_datasource_

```

41 test\_update() (in module decisio- 78 translate() (in module decisio-  
 nengine.framework.dataspace.tests.test\_dataspace), nengine.framework.modules.translate\_product\_name),  
 50 71  
 test\_update\_bad() (in module decisio- translate\_all() (in module decisio-  
 nengine.framework.dataspace.datasources.tests.test\_datasources), nengine.framework.modules.translate\_product\_name),  
 41 71  
 test\_update\_bad() (in module decisio- U  
 nengine.framework.dataspace.tests.test\_dataspace), 50  
 test\_valid\_dir() (in module decisio- unguarded\_access() (decisio-  
 nengine.framework.config.tests.test\_policies), nengine.framework.engine.Workers.Workers  
 26 method), 61  
 test\_working\_source\_proxy() (in module decisio- update() (decisionengine.framework.dataspace.datasource.DataSource  
 nengine.framework.tests.test\_source\_proxy), 82 method), 55  
 test\_wrong\_configuration() (in module decisio- update() (decisionengine.framework.dataspace.datasources.null.NullData  
 nengine.framework.logicengine.tests.test\_construction), 63 method), 44  
 test\_wrong\_product\_names() (in module decisio- update() (decisionengine.framework.dataspace.datasources.postgresql.PostgreSQL  
 nengine.framework.modules.tests.test\_module\_decorators), method), 32 update() (decisionengine.framework.dataspace.datasources.sqlalchemy\_d  
 68 method), 39  
 test\_wrong\_product\_types() (in module decisio- update() (decisionengine.framework.dataspace.dataspace.DataSpace  
 nengine.framework.modules.tests.test\_module\_decorators), method), 68 method), 56  
 test\_wrong\_type() (in module decisio- V  
 nengine.framework.config.tests.test\_config), 26  
 test\_wrong\_type\_config() (in module decisio- valid\_dir() (in module decisio-  
 nengine.framework.config.tests.test\_validconfig), 26 nengine.framework.config.policies), 28  
 test\_zdumps() (in module decisio- valid\_states (decisio-  
 nengine.framework.dataspace.tests.test\_datablock\_zlib), 49 nengine.framework.dataspace.datablock.Metadata  
 attribute), 52  
 test\_zloads() (in module decisio- ValidConfig (class in decisio-  
 nengine.framework.dataspace.tests.test\_datablock\_zlib), 49 nengine.framework.config.ValidConfig),  
 Transform (class in decisio- 27  
 nengine.framework.modules.Transform), 70 value (decisionengine.framework.dataspace.datasources.sqlalchemy\_ds.db  
 attribute), 33  
 transform() (decisio- verify\_products() (in module decisio-  
 nengine.framework.modules.Transform.Transform method), 70 nengine.framework.modules.Module), 68  
 transform() (decisio- W  
 nengine.framework.tests.TransformNOP.TransformNOP wait\_for\_all() (decisio-  
 method), 78 nengine.framework.taskmanager.TaskManager.TaskManager  
 method), 74  
 transform() (decisio- wait\_for\_any() (decisio-  
 nengine.framework.tests.TransformWithMissingProducesConsumes.TransformWithMissingProducesConsumes  
 method), 78 method), 74  
 TransformNOP (class in decisio- wait\_until() (decisio-  
 nengine.framework.tests.TransformNOP), 78 nengine.framework.engine.Workers.Worker  
 method), 61  
 TransformWithMissingProducesConsumes wait\_until() (decisio-  
 (class in decisio- nengine.framework.taskmanager.ProcessingState.ProcessingState  
 method), 72  
 nengine.framework.tests.TransformWithMissingProducesConsumes),

`wait_while()` (*decisionengine.framework.engine.Workers.Worker* method), [61](#)

`wait_while()` (*decisionengine.framework.taskmanager.ProcessingState.ProcessingState* method), [72](#)

`Worker` (class in *decisionengine.framework.engine.Workers*), [61](#)

`Worker` (class in *decisionengine.framework.taskmanager.TaskManager*), [74](#)

`Workers` (class in *decisionengine.framework.engine.Workers*), [61](#)

`Workers.Access` (class in *decisionengine.framework.engine.Workers*), [61](#)

`WorkingSourceProxy` (class in *decisionengine.framework.tests.WorkingSourceProxy*), [78](#)

## Z

`z.dumps()` (in module *decisionengine.framework.dataspace.datablock*), [53](#)

`z.loads()` (in module *decisionengine.framework.dataspace.datablock*), [53](#)