

```
303     def eta(self):
304         """The datetime when the build job is estimated to complete.
305
306         This is the BuildQueue.estimated_duration plus the
307         Job.date_started or BuildQueue.getEstimatedJobStartTime.
308
309         """
310         if self._queue_record is None:
311             return None
312         queue_record = self.buildqueue_record
313         if queue_record.status == BuildQueueStatus.WAITING:
314             start_time = queue_record.getEstimatedJobStartTime()
315         else:
316             start_time = queue_record.date_started
317         if start_time is None:
318             return None
319         duration = queue_record.estimated_duration
320         return start_time + duration
```

How to Find Your Way Through a Million Lines of Code

PyConDe 2022, Berlin, 13. April 2022

Jürgen Gmach, Software Engineer at Canonical

 [@jugmac00](https://twitter.com/jugmac00)

 juergen.gmach@googlemail.com

 <https://jugmac00.github.io/>

@jugmac00 paths =
339 ".launchpad.yaml",
340)

Pick up a New Code Base



No Panic

Patterns

Canonical



Launchpad

```
> tokei .
```

Language	Files	Lines	Code	Comments	Blanks
Autocof	4	155	147	0	8
C/C++	15	1940	2156	396	488
INI	2	18	16	0	2
JavaScript	229	79386	55691	15649	8046
JSON	13	729	719	0	10
Makefile	5	1070	718	181	171
Mustache	1	90	87	0	3
Perl	3	356	257	25	74
Python	2980	789658	620427	58637	110594
ReStructuredText	25	3940	2857	0	1083
Sass	8	2679	2026	124	529
Shell	9	385	257	63	65
SQL	525	67230	45692	2662	18876
SVG	67	28432	27809	64	559
Plain Text	1151	226323	0	177573	48750
XSL	1	1371	1176	132	63
XML	16	809	742	1	66
YAML	1	47	10	30	7
<hr/>					
HTML	172	24548	20080	1682	2786
- CSS	19	30	26	4	0
- JavaScript	59	2650	2348	192	110
(Total)		27228	22454	1878	2896
<hr/>					
Total	5257	1231566	782167	257219	192180
<hr/>					

Facts about Launchpad

Where to Start?



Use the App



Different Ways to Go Ahead

A close-up photograph of a railway track. The track curves to the right and then splits into two parallel paths, each curving further to the right. The rails are made of dark metal and are set into a bed of dark, irregular stones. Some small green plants are growing between the stones. The background is a soft-focus view of dense green trees and foliage, suggesting a rural or forested area.

Set up Development Environment



Unexpected Side Effects

```
❯ cd ~/launchpad/launchpad/
[WARN] - (starship::utils): Executing command "/usr/bin/git" timed out.
[WARN] - (starship::utils): You can set command_timeout in your config to a higher value to allow longer-running commands to keep executing.
```

Look at the Directory Structure

```
> ls -a
.
..
bin
brzplugins
build
configs
COPYING
cronsheets
.ctags
daemons
database
dist
doc
download-cache
env

.eslintignore
.eslintrc.json
.git
.gitattributes
.git-blame-ignore-revs
.gitignore
lib
librarian.log
LICENSE
logs
Makefile
.mypy_cache
ols-vms.conf
.pre-commit-config.yaml
__pycache__

.pytest_cache
_pythonpath.py
README
.readthedocs.yaml
requirements
scripts
setup.cfg
setup.py
sourcecode
standard_template.py
standard_test_template.html
standard_test_template.js
standard_test_template.py
standard_yuixhr_test_template.js
standard_yuixhr_test_template.py

system-packages.txt
test_on_merge.py
.testr.conf
.tox
tox.ini
utilities
version-info.py
version-info.txt
.vscode
wheels
yarn
zcml
```

Look at the Directory Structure

```
> ls -a
.
..
bin
brzplugins
build
configs
COPYING
cronsheets
.ctags
daemons
database
dist
doc
download-cache
env

.eslintignore
.eslintrc.json
.git
.gitattributes
.git-blame-ignore-revs
.gitignore
lib
librarian.log
LICENSE
logs
Makefile
.mypy_cache
ols-vms.conf
.pre-commit-config.yaml
__pycache__

.pytest_cache
__pythonpath__.py
README
.readthedocs.yaml
requirements
scripts
setup.cfg
setup.py
sourcecode
standard_template.py
standard_test_template.html
standard_test_template.js
standard_test_template.py
standard_yuixhr_test_template.js
standard_yuixhr_test_template.py

system-packages.txt
test_on_merge.py
.testr.conf
.tox
tox.ini
utilities
version-info.py
version-info.txt
.vscode
wheels
yarn
zcml
```

Docker / Docker Compose

```
version: "3.9"
services:
  db:
    image: postgres
    volumes:
      - ./data/db:/var/lib/postgresql/data
  web:
    build: .
    command: python manage.py runserver 0.0.0.0:8000
    ports:
      - "8000:8000"
    depends_on:
      - db
```

.pre-commit-config.yaml

```
repos:  
- repo: https://github.com/PyCQA/flake8  
  rev: 3.9.2  
  hooks:  
    - id: flake8  
      exclude: ^lib/contrib/  
- repo: https://github.com/PyCQA/isort  
  rev: 5.9.2  
  hooks:  
    - id: isort
```

.readthedocs.yaml

```
# Required
version: 2

# Set the version of Python and other tools you might need
build:
    os: ubuntu-20.04
    tools:
        python: "3.9"

python:
    install:
        - requirements: requirements.txt
```

tox.ini / Makefile

```
[tox]

[testenv:docs]
basepython = python3
skip_install = true
deps =
    -r {toxinidir}/requirements/docs.txt
commands =
    sphinx-build -W -b html {toxinidir}/doc/ {toxinidir}/doc/_build/html
```

Build and Installation Configuration

- requirements.txt
- setup.cfg/setup.py
- pyproject.toml



Different Types of Dependencies



```
> python3 list_deps.py
```

ampoule	beautifulsoup4	boto3	breezy
celery	cssutils	defusedxml	distro
dkimpy	feedparser	fixtures	gunicorn
mockito-spaces	gitdb	lazr.automobility	launchpad-build
launchpadlib	lazr.browser	lazr.config	lazr.delegates
lazr.enum	lazr.jobrunner	lazr.lifecycle	lazr.restful
lazr.sshserver	lazr.uri	lpjsmin	lxml
Markdown	meliae	multipart	oauth
oauthlib	oops	oops_amqp	paramiko
psutil	pgbouncer	psycopg2	pyasn1
pygettextpo	pygpgme	pymacaroons	pymemcache
pystache	python-debian	python-keystoneclient	python-openid2
python-subunit	python-swiftclient	pytz	PyYAML
rabbitfixture	requests	requests-file	requests-toolbelt
responses	secure-cookie	setproctitle	setuptools
six	soupmatchers	Sphinx	statsd
storm	talisker	tenacity	testscenarios
testtools	timeline	transaction	treq
Twisted	txfixtures	txpkgupload	virtualenv-tools3
wadllib	WebOb	WebTest	Werkzeug
WSGIProxy2	z3c.ptcompat	zope.app.http	zope.app.publication
zope.app.publisher	zope.app.wsgi	zope.authentication	zope.browser
zope.browsermenu	zope.browserpage	zope.browserresource	zope.component
zope.configuration	zope.contenttype	zope.datetime	zope.error
zope.event	zope.exceptions	zope.formlib	zope.i18n
zope.i18nmessageid	zope.interface	zope.lifecycleevent	zope.location
zope.login	zope.pagetemplate	zope.principalregistry	zope.processlifetime
zope.proxy	zope.publisher	zope.schema	zope.security
zope.securitypolicy	zope.sendmail	zope.session	zope.tal
zope.tales	zope.testbrowser	zope.testing	zope.testrunner
zope.universing	zope.vocabularyregistry		

@jugmac00

```
> python3 list_deps.py
```

ampoule
celery
dkimpy
email-test-scenarios
launchpadlib
lazr.enum
lazr.sshserver
Markdown
oauthlib
psutil
pygettextpo
pystache
python-subunit
rabbitfixture
responses
six
storm
testtools
Twisted
wadllib
WSGIProxy2
zope.app.publisher
zope.browsermenu
zope.configuration
zope.event
zope.i18nmessageid
zope.login
zope.proxy
zope.securitypolicy
zope.tales
zope.universing

beautifulsoup4
cssutils
feedparser
jinja2
lazrbatchnavigator
lazr.jobrunner
lazr.uri
meliae
oops
pgbouncer
pygpgme
python-debian
python-swiftclient
requests
secure-cookie
soupmatchers
talisker
timeline
txfixtures
WebOb
z3c.ptcompat
zope.app.wsgi
zope.browserpage
zope.contenttype
zope.exceptions
zope.interface
zope.pagetemplate
zope.publisher
zope.sendmail
zope.testbrowser
zope.vocabularyregistry

boto3
defusedxml
fixtures
lazrbuildout
lazr.config
lazr.lifecycle
lpjsmin
multipart
oops_amqp
psycopg2
pymacaroons
python-keystoneclient
pytz
requests-file
setproctitle
Sphinx
tenacity
transaction
txpkgupload
WebTest
zope.app.http
zope.authentication
zope.browserresource
zope.datetime
zope.formlib
zope.lifecycleevent
zope.principalregistry
zope.schema
zope.session
zope.testing

breezy
distro
qunicorn
launchpad-build
lazr.delegates
lazr.restful
lxml
oauth
paramiko
pyasn1
pymemcache
python-openid2
PyYAML
requests-toolbelt
setuptools
statsd
testscenarios
treq
virtualenv-tools3
Werkzeug
zope.app.publication
zope.browser
zope.component
zope.error
zope.i18n
zope.location
zope.processlifetime
zope.security
zope.tal
zope.testrunner

@jugmac00

Set up Development Environment



Ask Questions



Running Tests



Ready for Your First Task



Where to Start?



Have a Closer Look



Search

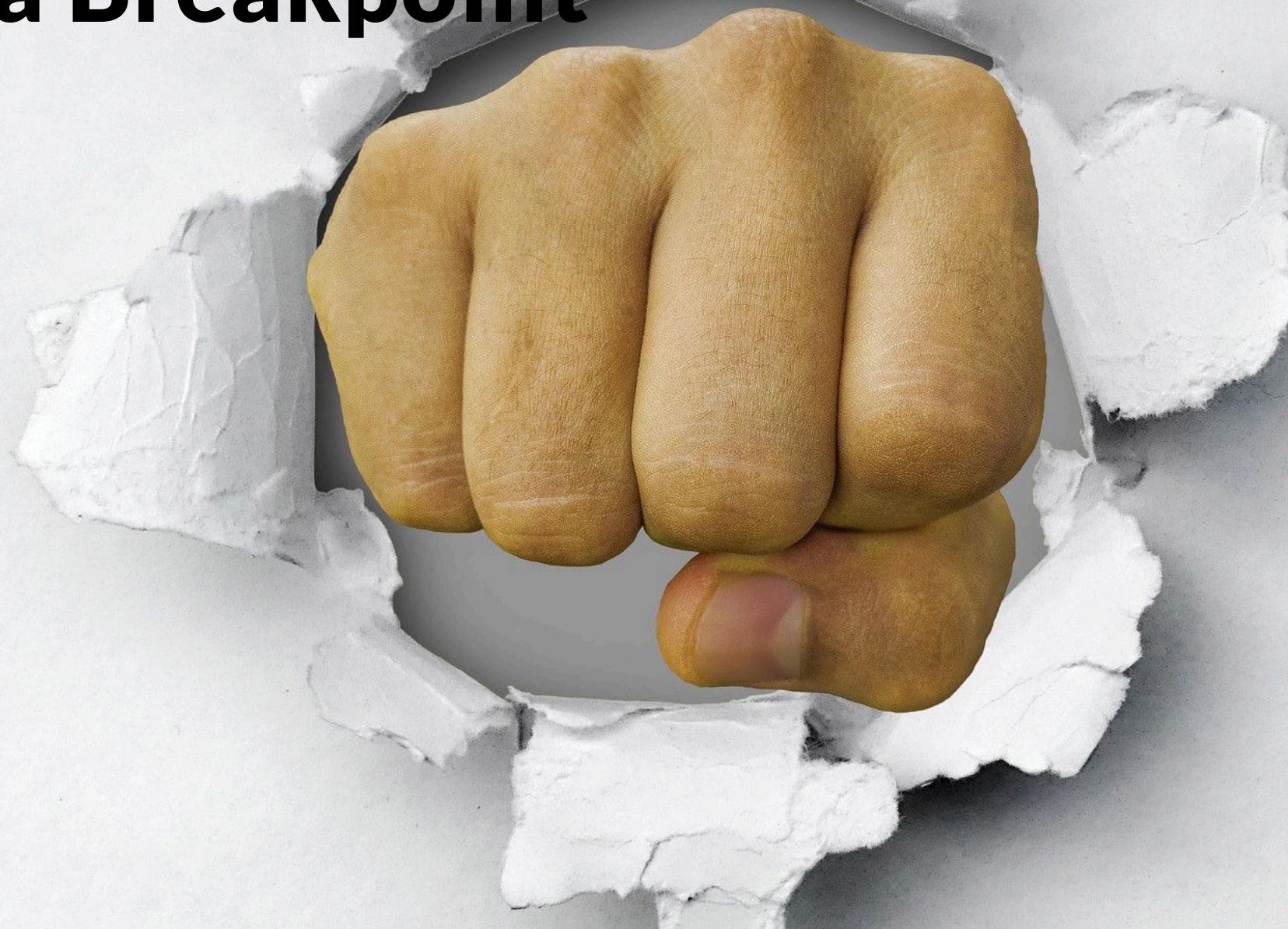


@jugmac00

Tips for Your First Test



Set a Breakpoint



Coverage

```
313     if folder is None and name is not None and "/" in name:          ► 12 ctx
314         folder, name = os.path.split(name)                                ► 1 ctx
315     if storage.filename is None:                                         ► 12 ctx
316         raise ValueError("Filename must not be empty!")                 ► 1 ctx
317     basename = self.get_basename(storage.filename)                      ► 11 ctx
318
319     if not self.file_allowed(storage, basename):                         ► 11 ctx
320         raise UploadNotAllowed()                                         ► 1 ctx
321
322     if name:                                                          ► 10 ctx
323         if name.endswith('.'):                                         ► 4 ctx
324             basename = name + extension(basename)                      ► 3 ctx
325         else:                                                       ► 1 ctx
326             basename = name
327
328     if folder:                                                        ► 10 ctx
329         target_folder = os.path.join(self.config.destination, folder)    ▾ 3 ctx
330
331     else:                                                       ► 7 ctx
332         target_folder = self.config.destination                         ► 10 ctx
333     if not os.path.exists(target_folder):                                ► 10 ctx
334         os.makedirs(target_folder)
```

@jugmac00

Factories



Tooling Support

```
finally:  
    should_clean_environment = getattr(args, "clean", False)  
  
    if should_clean_environment:  
        cwd = Path.cwd()  
        provider.clean_project_environments(  
            project_name=cwd.name,  
            project_path=cwd,  
            instances=launched_instances,  
        )
```

```
def getattr(o: Any, /, name: str, default:  
    getattr(object, name[, default]) -> value  
  
Get a named attribute from an object; getat  
When a default argument is given, it is ref  
exist; without it, an exception is raised :  
    Full name: builtinsgetattr
```

commit bdc00aeabb2ba24bb584447989204a4c9ab0b45cc
Merge: 9996942467f 673619b893f
Author: Colin Watson <cjwatson@canonical.com>
Date: Thu Oct 7 11:14:20 2021 +0000

Your First Commit

Add AccessToken model

Merged from <https://code.launchpad.net/~cjwatson/launchpad/+git/launchpad/+merge/409769>

commit d0f1bd7c2867d0251800f02e0226ede29c40a4fa (**fork/prevent-committing-debug-statements**)
Author: Jürgen Gmach <juergen.gmach@canonical.com>
Date: Thu Oct 7 11:40:09 2021 +0200

prevent committing debug statements

`lib/lp/testing/systemdocs.py` needs to be excluded as it contains a legitimate use of `pdb`.

commit 673619b893f535924b73a166de90c4572b5c3c35
Author: Colin Watson <cjwatson@canonical.com>
Date: Wed Oct 6 20:08:28 2021 +0100

Add AccessToken model

This will be used for personal access tokens for the webservice API.

@jugmac00 We have to take some care to avoid bloat and locks when updating last-used dates.

Your First Merge Proposal

Proposed by  Jürgen Gmach on 2021-10-28

Status: Merged 

Approved by:  Jürgen Gmach on 2021-10-29

Approved revision: 99adcc9cffa75e69a2e0cb64b0ef76ec73c8c11f

Merge reported by:  Otto Co-Pilot

Merged at revision: not available 

Proposed branch: ~jugmac00/launchpad:sqlobject-is-a-first-party-import

Merge into: launchpad:master

Diff against target: 2238 lines (+333/-340)

▷ 89 files modified

Merge guidelines: git remote add jugmac00 git+ssh://jugmac00@git.launchpad.net/~jugmac00/launchpad
git remote update jugmac00
git checkout master
git merge jugmac00/sqlobject-is-a-first-party-import

Related bugs:  Link a bug report

@jugmac00

Many Many Questions

What

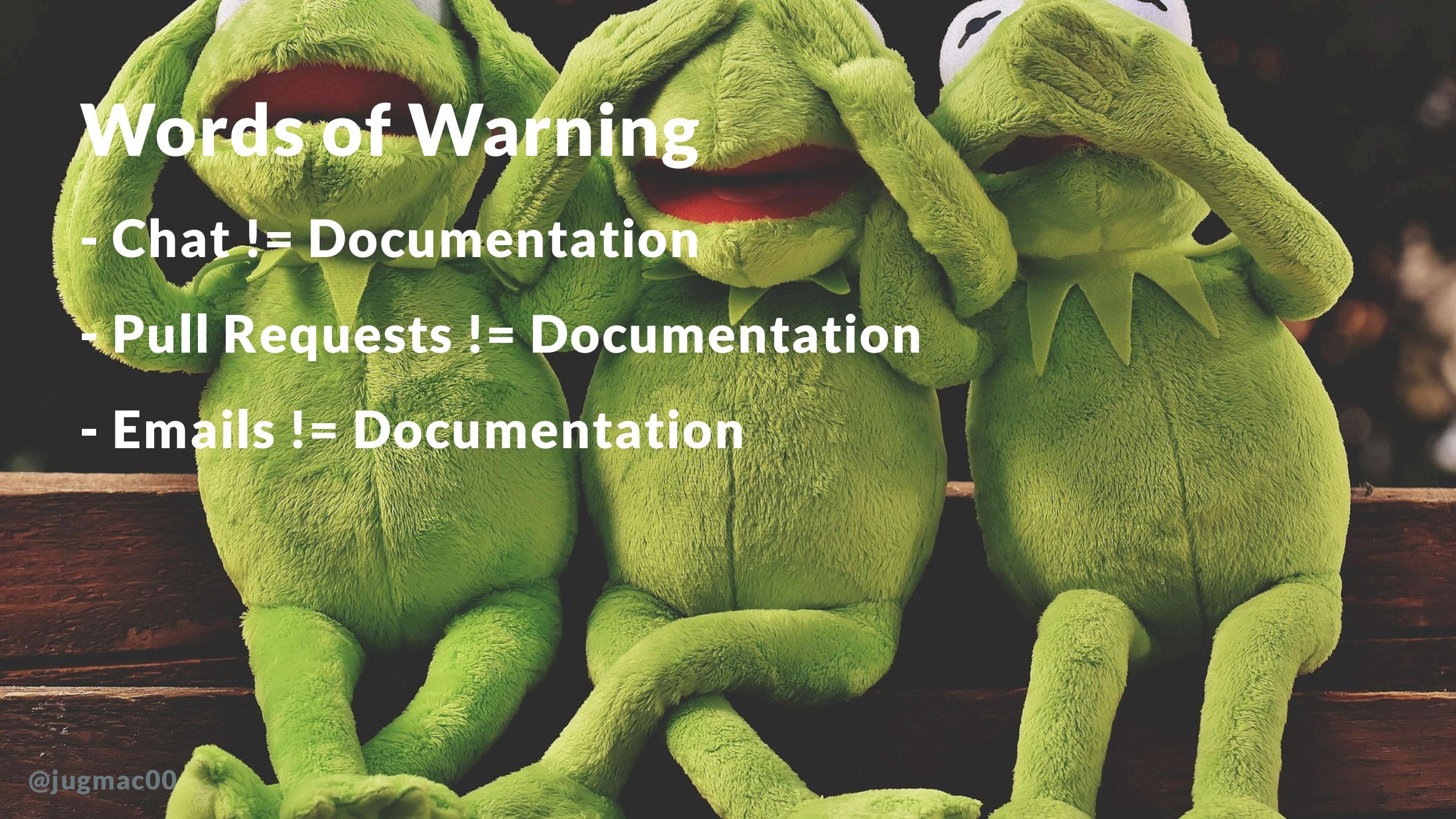
Who

Where

When

How

Why

A large, bright green frog plush toy is the central focus. It has a textured, fuzzy surface and is positioned on top of several thick, dark brown wooden books. The frog's head is turned slightly to the right, and its mouth is wide open as if it's speaking or shouting. Its hands are clasped together in front of its chest. The background is dark and out of focus.

Words of Warning

- Chat != Documentation
- Pull Requests != Documentation
- Emails != Documentation

Diátaxis by Daniele Procida

TUTORIALS

LEARNING-ORIENTED

Serve our study

UNDERSTANDING-ORIENTED

EXPLANATION

Practical steps

Theoretical knowledge

HOW-TO GUIDES

TASK-ORIENTED

Serve our work

INFORMATION-ORIENTED

REFERENCE

Deployment



Other Ways to Learn



Key Concepts

- look for familiar patterns**
- ask questions**
- take down notes**
- be aware of what works and what does not work**
- you can add value from day one**



Thank you for the pictures!

- <https://pixabay.com/>
- <https://canonical.com/>
- <https://pre-commit.com/>
- <https://www.docker.com/>
- <https://readthedocs.org/>
- <https://tox.wiki/>
- <https://setuptools.pypa.io/en/latest/artwork.html>
- <https://www.python.org/>
- <https://diataxis.fr/>

Thank you!

Yuki Hattori

<https://marp.app/>

Thank you!

We Are Hiring

<https://jugmac00.github.io/hiring/>

Contact

 [@jugmac00](https://twitter.com/jugmac00)

 juergen.gmach@googlemail.com

 <https://github.com/jugmac00>

@jugmac00