Package software for any distribution with upt

Cyril Roelandt

Introduction

- Cyril Roelandt
- OpenStack (Red Hat)
- GNU Guix (Do not miss Ludovic's talk at 4:30PM!)

Outline

1. Packaging
2. Automation
3. The Universal Packaging Tool
4. fpm
5. Conclusion

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- Debugging

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- Send/maintain patches

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  - Dependency hell
  - Debugging
- Some tasks can be automated:
  - Package layout
  - Metadata

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Existing tools

	Debian	Fedora	Guix	FreeBSD	OpenBSD
CPAN	dh-make-perl	cpan2rpm	guix import	?	PortGen
NPM	npm2deb	npm2rpm	N/A	?	?
PyPI	pypi2deb	pyp2rpm	guix import	pytoport	PortGen
Ruby	gem2deb	gem2rpm	guix import	?	PortGen

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- Code duplication (write downstream package)

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  - For values not available in the standard classifiers
  - 'BSD2', 'BSD 2', 'BSD-2', 'BSD 2 Clause'. . .

Example: dependencies (PyPI)

pipenv

```
$ curl -s https://pypi.org/pypi/pipenv/json \
    | jq .info.requires_dist
[
  "ordereddict; python_version < \"2.7\"",
  "requests[security]; python_version < \"2.7\"",
  "virtualenv",
  "virtualenv-clone (>=0.2.5)",
  "setuptools (>=36.2.1)",
  "certifi",
  "pip (>=9.0.1)"
]
```

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    | jq .info.requires_dist
null
```

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$ curl -s https://pypi.org/pypi/botocore/json \
    | jq .info.requires_dist
null
$ wget https://.../botocore-1.12.16-py2.py3-none-any.whl
$ unzip botocore-1.12.16-py2.py3-none-any.whl
$ cd botocore-1.12.16.dist-info/
$ jq .run_requires metadata.json
[
  {
    "requires": [
      "jmespath>=0.7.1,<1.0.0",
      "docutils>=0.10",
      "urllib3>=1.20,<1.24"
    ]
  },
  ...
```

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$ curl -s https://pypi.org/pypi/MarkupSafe/json \
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$ pip download --only-binary :all: MarkupSafe
Collecting MarkupSafe
  Could not find a version that satisfies the \
  requirement MarkupSafe (from versions: )
No matching distribution found for MarkupSafe
```

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```
$ curl -s https://pypi.org/pypi/MarkupSafe/json \
    | jq .info.requires_dist
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$ pip download --only-binary :all: MarkupSafe
Collecting MarkupSafe
  Could not find a version that satisfies the \
  requirement MarkupSafe (from versions: )
No matching distribution found for MarkupSafe
$ cat setup.py
...
extras_require={
    'dev': ...
    'docs': ...
}
```

Example: dependencies (PyPI)

- Read the JSON file provided by PyPI
- Read the wheel
- Read the source code
- Install the package, run “pip list”
- What about test dependencies?
- There might be even more ideas!

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- Simple

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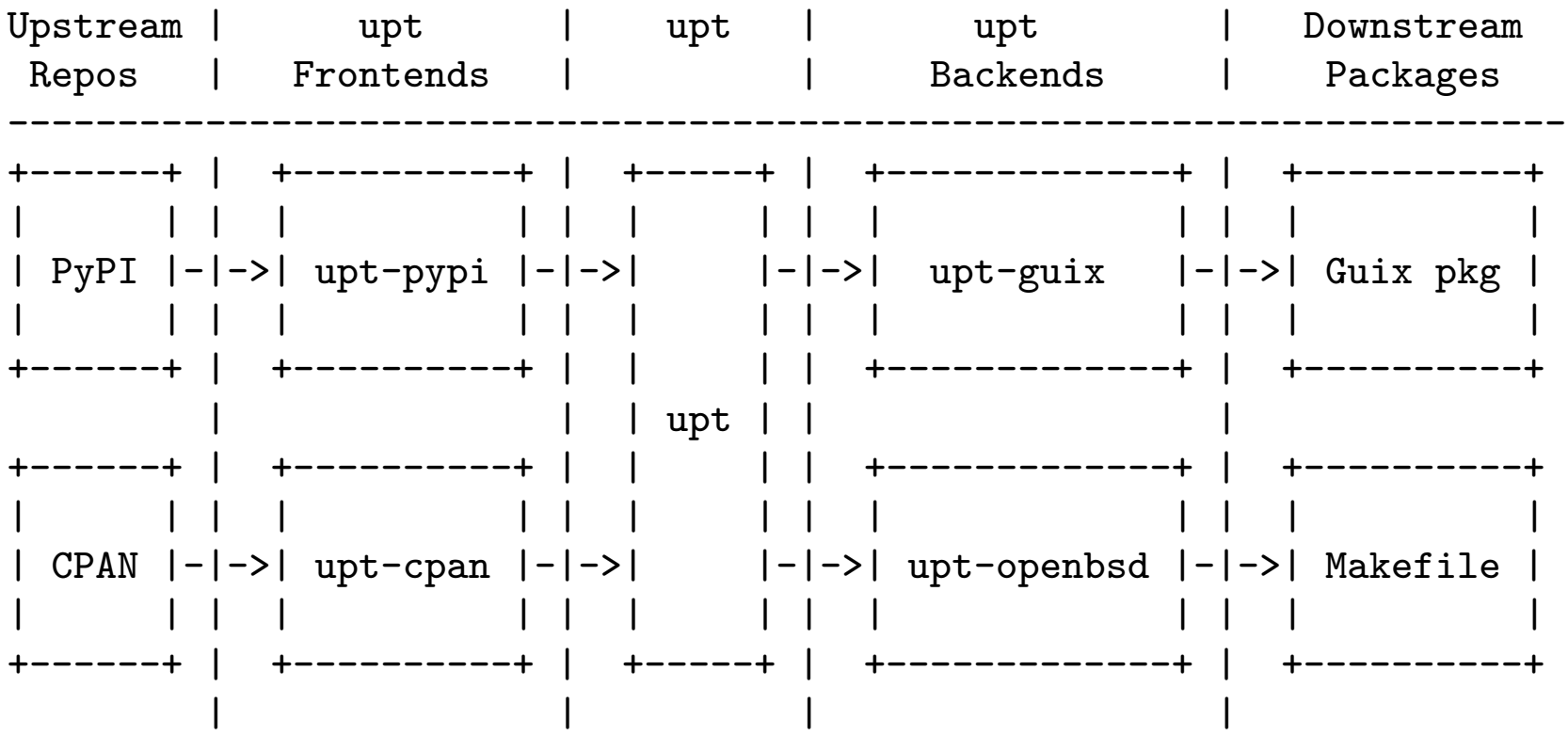
Architecture



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Install (with modules)

```
$ pip install upt[frontends,backends]
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$ upt list-frontends
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Available backends

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$ upt list-backends
fedora
freebsd
guix
nix
openbsd
```

Usage

Package upt for OpenBSD

```
$ upt package -f pypi -b openbsd -o /tmp/py-upt upt
[INFO    ] [Backend] Creating the directory \
                     structure in /tmp/py-upt
[INFO    ] [Backend] Creating the Makefile
[INFO    ] [Backend] Creating pkg/DESCR
[INFO    ] [Backend] You still need to create \
                     /tmp/py-upt/distinfo
[INFO    ] [Backend] You still need to create \
                     /tmp/py-upt/pkg/PLIST
```

Usage

$ less /tmp/py-upt/Makefile

```
# $OpenBSD$
COMMENT=                    package software from any package m
MODPY_EGG_VERSION=          0.4.1
DISTNAME=                   upt-${MODPY_EGG_VERSION}
PKGNAME=                    py-upt-${MODPY_EGG_VERSION}
CATEGORIES=                 XXX
HOMEPAGE=                   https://framagit.org/upt/upt
MAINTAINER=                 XXX <xxx@xxx.xxx>
# BSD-3-Clause
PERMIT_PACKAGE_CDROM =      Yes
MODULES=                    lang/python
MODPY_SETUPTOOLS=           Yes
MODPY_PI=                   Yes
RUN_DEPENDS=                xxx/py-spdx-lookup${MODPY_FLAVOR}
.include <bsd.port.mk>
```

Usage

$ upt package -f pypi -b nix upt

```
{ stdenv, buildPythonPackage, fetchPypi
, spdx-lookup }:
buildPythonPackage rec {
  name = "${pname}-${version}";
  version = "0.4.1";
  pname = "upt";
  src = fetchPypi {
    inherit pname version;
    sha256 = "TODO";
  };
  propagatedBuildInputs = [ spdx-lookup ];
  meta = with stdenv.lib; {
    description = ...
    homepage = https://framagit.org/upt/upt;
    license = [ licenses.bsd3 ];
  }
```

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- One module (backend or frontend) -> one Git repo
- Easier for “small” projects
- More independence

Add a backend or frontend

$ cookiecutter https://framagit.org/upt/cookiecutter-upt

```
project_name []: upt-archlinux
project_slug [upt_archlinux]:
author []: John Doe
email []: john@doe.org
short_description []: Arch Linux backend for upt.
url [https://framagit.org/upt/upt-archlinux]:
Select license:
1 - BSD-3
2 - other
Choose from 1, 2 (1, 2) [1]: 1
Select kind:
1 - backend
2 - frontend
Choose from 1, 2 (1, 2) [1]: 1
Initialized empty Git repository in /tmp/upt-archlinux/.git
```

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- Ruby
- Modules are distributed along with the core
- Generates a .rpm instead of a .spec (or .deb instead of a debian/ folder)
- Useful for users who need to use their distro's package manager
- Not the best tool for package maintainers?

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Future work

- More modules (written by you?)

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- Type hints

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- More modules (written by you?)
- Type hints
- Need a standard format for all upstream package archives

Join me!

- Code: https://framagit.org/upt
- Emails: cyril.roelandt@aquilenet.fr, cyril@redhat.com
- Freenode: #upt-packaging, Steap
- Questions?