

# RPM BUILDING 101:

## A LAZY ADMIN'S GUIDE FOR BUILDING SOFTWARE TO DEPLOY

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# AGENDA:

- Setup
- What is an RPM?
- The Spec File
- The Building Blocks (rpmbuild)
- Intermediate Tools (mock)

# SETUP

```
$ yum install rpmdevtools
```

```
$ echo '%_topdir /home/bstinson/rpmbuild' > ~/.rpmmacros
```

```
$ rpmdev-setuptree
```

# WHAT IS AN RPM?

- Headers/Metadata
- CPIO archive

```
$ rpm2cpio <your_package>.rpm | cpio -ivmd
```

- *name-version-release.arch.rpm*
- *python-dateutil-1.5-7.el7.noarch.rpm*

# THE SPEC FILE

## STRUCTURE : METADATA

```
Name:      python-dateutil
Version:   1.5
Release:   7%{?dist}
Summary:   Powerful extensions to the standard datetime module
Group:     Development/Languages
License:   Python
URL:       http://labix.org/python-dateutil
Source0:   http://labix.org/download/%{name}/%{name}-%{version}.tar.gz
Patch0:    python-dateutil-1.5-system-zoneinfo.patch
```

# THE SPEC FILE

## STRUCTURE : METADATA

```
BuildArch:      noarch
BuildRequires:  python-devel,python-setuptools
Requires:       tzdata
```

### **%description**

```
The dateutil module provides powerful extensions to the standard datetime module available in Python 2.3+.
```

# THE SPEC FILE

## STRUCTURE : SCRIPTS

```
%prep
%setup -q
%patch0 -p1
iconv --from=ISO-8859-1 --to=UTF-8 NEWS > NEWS.new
mv NEWS.new NEWS

%build
%{__python} setup.py build

%install
%{__python} setup.py install --skip-build --root $RPM_BUILD_ROOT
```

# THE SPEC FILE

## STRUCTURE : SCRIPTS UNMENTIONED

```
%pre          # Just before the package is installed
%post         # Just after the package is installed
%preun       # Just before the package is removed
%postun      # Just after the package is removed
```



# THE SPEC FILE

## STRUCTURE : FILE MANIFEST

```
%files
%doc example.py LICENSE NEWS README
%{python_sitelib}/dateutil/
%exclude %{python_sitelib}/dateutil/zoneinfo/zoneinfo-2010g.tar.gz
%{python_sitelib}/*.egg-info
```

# THE SPEC FILE

## STRUCTURE : CHANGELOG

```
%changelog
```

```
* Fri Dec 27 2013 Daniel Mach <dmach@redhat.com> - 1.5-7  
- Mass rebuild 2013-12-27
```

# MACROS

```
$ rpm --eval '%{__python}'  
/usr/bin/python
```

# MACROS

```
%prep
%setup -q
%patch0 -p1
iconv --from=ISO-8859-1 --to=UTF-8 NEWS > NEWS.new
mv NEWS.new NEWS

%build
%{__python} setup.py build

%install
%{__python} setup.py install --skip-build --root $RPM_BUILD_ROOT
```

# MACROS : EXPANDED

```
%prep
%setup -q
%patch0 -p1
iconv --from=ISO-8859-1 --to=UTF-8 NEWS > NEWS.new
mv NEWS.new NEWS

%build
/usr/bin/python setup.py build

%install
/usr/bin/python setup.py install --skip-build --root $RPM_BUILD_ROOT
```

# LET'S BUILD!

```
$ cd ~/rpmbuild/SOURCES && spectool -g ../SPECS/python-dateutil.spec
```

```
Name:      python-dateutil
Version:   1.5
...
Source0:   http://labix.org/download/{name}/{name}-{version}.tar.gz
```

# WORKING WITH RPMBUILD

```
$ rpmbuild -bp SPECS/python-dateutil.spec
```

```
%prep  
%setup -q  
%patch0 -p1  
iconv --from=ISO-8859-1 --to=UTF-8 NEWS > NEWS.new  
mv NEWS.new NEWS
```

# WORKING WITH RPMBUILD

```
$ rpmbuild [--short-circuit] -bc SPECS/python-dateutil.spec
```

```
%build  
%{__python} setup.py build
```



# WORKING WITH RPMBUILD

```
$ rpmbuild [--short-circuit] -bi SPECS/python-dateutil.spec
```

```
%install  
%{__python} setup.py install --skip-build --root $RPM_BUILD_ROOT
```

# WORKING WITH RPMBUILD

## Build a Binary RPM

```
$ rpmbuild -bb
```

## Build a Source RPM

```
$ rpmbuild -bs
```

## Build both Binary and Source RPMs

```
$ rpmbuild -ba
```

**THAT WAS A LOT OF WORK...**

# PROBLEMS WITH RPMBUILD

- Lots of BuildRequires packages

```
$ rpm -qa | wc -l  
8745
```

- Only one distro-version at a time

# MOCK TO THE RESCUE!

```
$ yum install epel-release  
$ yum install mock  
$ usermod -a -G mock bstinson && newgrp mock
```

Configs for distros/arches are in /etc/mock

# BUILDING WITH MOCK

Build an SRPM from our Spec File

```
$ cd ~/rpmbuild && rpmbuild -bs SPECS/python-dateutil.spec
```

# BUILDING WITH MOCK

Give Mock our SRPM

```
$ mock -r centos-7-x86_64 --rebuild ~/rpmbuild/SRPMS/python-dateutil-1.5-7
```

# BUILD LOGS AND FINAL RPMS

```
/var/lib/mock/centos-7-x86_64/result
```



# MORE MOCK

```
$ mock -r centos-7-x86_64 --init  
$ mock -r centos-7-x86_64 --install ...  
$ mock -r centos-7-x86_64 --no-clean --rebuild ...
```

```
$ mock -r centos-7-x86_64 --shell
```

# FURTHER READING

- Package Guidelines (Fedora & EPEL):  
<https://fedoraproject.org/wiki/Packaging:Guidelines>
- Koji (builds on top of mock):  
<http://www.fedorahosted.org/koji>
- CentOS Community Build System:  
<http://wiki.centos.org/HowTos/CommunityBuildSystem>
- Your Own Local Yum Repo:  
<http://createrepo.baseurl.org/>