# R packages from a Fedora perspective

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### Overview

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(Linux) software distribution Free/Open software languages

#### Fedora

General Languages

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### Conclusions



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(Linux) software distribution			

## Common characteristics

- distribute a coherent set of packages
- have a package system that deals with software with software inter-dependencies
- follows well established rules regarding the source code
- associated with a free/open source software
- works in multiple platforms (for some in even more than 20! hardware platforms)
- worldwide mirrors network to fetch and update packages easily



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(Linux) software distribution			



- Release cycles
- packaging policies (package names, granularity, boundaries)
- update policies
- support periods
- packaging method/tools



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#### (Linux) software distribution



#### Linux

- Fedora
- OpenSuse
- gentoo
- Slackware
- Debian
  - Ubuntu

Other Unixes

\*BSD

- ► Free, Open, Net, ...
- OpenSolaris
  - Indiana
  - Nexenta



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Free/Open software languages			

## Characteristics

- Free/Open Source license
- strong set of public available libraries
- common set of package rules
- worldwide mirrors network to fetch and update packages easily



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#### Free/Open software languages

### Examples

#### Languages

- ► R (S)
- Python
- Perl
- ► PHP
- ► T<sub>E</sub>X

#### Repositories

- CRAN
- ▶ руру
- CPAN
- pear
- CTAN



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- Release often/release earlier (~ 6 month release cycles)
- Advance of free software (on the front edge)
- Strong commitment to free/open software (only free licenses are accepted for software)
- Documented guidelines for building packages



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## Derived distributions

- RHEL Red Hat (TM) Enterprise Linux
- CentOS
- Scientific Linux



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#### General

# Supported Architectures

- Primary Architectures
  - ▶ i\*86
  - ▶ x86-64
  - ppc/ppc64/cell (PS3)

- Secondary Architectures
  - Alpha
  - Sun Sparc 32/64
  - ▶ ia64
  - ▶ arm\*



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General			

# Some counting

<ul> <li>R packages in Fedora</li> </ul>	~40
<ul> <li>Fedora packages for F-9</li> </ul>	~9000
<ul> <li>Rate of new packages per week</li> </ul>	~20
<ul> <li>Debian (for comparison - not)</li> </ul>	>20000



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Languages			

Library update

- The library defines the language (in a sense)
- There are two incompatible ways to update libraries inside Fedora
  - system
    - maintains internal coherence on the installed packages
    - resolves external packages dependencies
  - language
    - does not depend on the availability of packages for the distribution



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Package structure			

R

### DESCRIPTION file Package: waveslim Version: 1.6.1 Date: 2007-10-9 Title: Basic wavelet routines for one-, two- and threedimensional signal processing Author: Brandon Whitcher <brandon.j.whitcher@gsk.com> Maintainer: Brandon Whitcher <brandon.j.whitcher@gsk.co Depends: R (>= 2.0), stats, graphics, grDevices ZipData: no LazyLoad: yes LazyData: yes **U.**PORTO

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Package structure			

R (cont)

DESCRIPTION file

Description: Basic wavelet routines for time series
(1D), image (2D)...
License: GPL (>= 2)
URL: http://www.image.ucar.edu/~whitcher/
 http://www.image.ucar.edu/~whitcher/book/
Packaged: Tue Oct 9 11:55:13 2007; bjw34032
Built: R 2.6.2; i386-redhat-linux-gnu; 2008-02-14 07:51



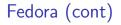
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Package structure			

### Fedora

```
rpm spec file
 %define packname waveslim
 Summary: R module, Basic wavelet routines for 1,2
   and 3-dimensional signal processing
 Name: R-%{packname}
 Version: 1.6.1
 Release: 2%{?dist}
 License: GPLv2+
 Source0:ftp://cran.r-project.org/pub/R/contrib/main/\
 %{packname} %{version}.tar.gz
 URL: http://www.image.ucar.edu/staff/whitcher/
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```

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#### Package structure



rpm spec (cont)

```
Requires: R
BuildRequires: R-devel, tetex-latex, gcc-gfortran
Requires: R-stats, R-stats, R-grDevices
%description Basic wavelet routines for
time series (1D), image (2D) and array (3D) analysis...
```



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# Naming

All R packages are named with R- prefixed

- R-Biobase
- R-mAr
- R-zoo

### Note

The package name capitalization is kept!



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Fedora R Guidelines			



- https://fedoraproject.org/wiki/Packaging/R
- compile the best way to create R packages for Fedora



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Fedora R Guidelines			

## How to create rpm spec files for Fedora R packages

- generic templates (arch and noarch) contained in fedora-devtools
- Taking advantage of the information contained in DESCRIPTION
  - cran2rpmspec: http://jamatos.fedorapeople.org/cran2rpmspec
  - R2spec: https://fedorahosted.org/r2spec/
  - the resulting spec files needs sometimes to be fine tuned
- using the Fedora R SIG mailing list: fedora-r-devel-list@redhat.com http://www.redhat.com/mailman/listinfo/fedora-r-devel-list



### Future

- better tools to create and maintain spec files updated with corresponding meta-information in R package
- increased the number of R packages in Fedora
- allow rpm to automatically verify what R packages provides and requires (such as it does now for Perl and python packages)
- ease new system installations and maintenance using distribution specific tools



### Question for the assistance

- What do you do with the package recomended Suggests when installing new R packages?
  - 1. Always installs.
  - 2. Install on a basis to basis case.
  - 3. Never install, do not care about it.

