



Deploying software with RPM

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Background

Red Hat Packaging Method

Used by: Red Hat, Turbo Linux,
SuSE, Mandrake, Yellow Dog, Caldera et al

Architected by Eric Troan & Marc Ewing.

Current version 3.0.

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Features

Upgradability

Powerful querying

System verification

Pristine sources

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Querying

Associate file with package

Associate package with dependent package(s)

Query on both installed packages and package files.

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Upgrading

Without an object based approach to software components, upgrading a program or the whole system is impractical.

Core OS vs add-on distinction no longer useful (eg /usr/local now less useful).

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Verification

Things checked on each file:

**owner, group, mode
MD5 checksum,
size,
minor, major number
sym link string
modification time**

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Verification

Can check the integrity of installed package.

```
rpm --checksig foo
```

Can check integrity of package file.

```
rpm -checksig --nospg foo-4.16-1.i386.rpm
```

Can check package origin (pgp signature).

```
rpm -checksig foo-4.16-1.i386.rpm
```



Pristine sources

Packager and author different.

**Keeps separate the requirements of
the packager from the original source.**

Dealing with new versions is easier.

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Package naming

foo-2.1-4.i386.rpm

foosh-1.0-1.noarch.rpm

foo-2.1-4.src.rpm

name-version-iteration-architecture

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Locations

RPM database
`/var/lib/rpm/`

RPM-related files
`/usr/lib/rpm`

RPM build area
`/usr/src/redhat/`

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Installing packages

From local file, ftp or http.

Steps:
check dependencies & conflicts,
pre-install actions,
handling config files (.rpmsave),
unpacking and loading files,
post-install actions,
updating database.

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Drop-in applications

Application configuration handled easily:

Log Rotation (/etc/logrotate.d/)

User environment (/etc/profile.d/)

Scheduling (/etc/cron.daily etc)

Service management (/etc/rc.d)

Documentation (/usr/doc)

User setup (/etc/skel)

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Build stages from source

Prep: unpack & prepare sources for compile

Build: compile the source

**Install: install the compiled programs
into /usr/src/redhat/ tree (relocatable).**

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Directory build structure

under `/usr/src/redhat/`

SOURCES/

sources, patches, icons.

SPECS/

spec files to control build.

BUILD/

where source is unpacked

and compilation happens.

RPMS/

binary packages put here.

SRPMS/

source packages put here.

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SPEC file

foo-2.1-3.spec

Specifies how to build and what to use.

preamble

%prep

%setup

%build

%insall

%files

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Example SPEC file

```
%define name x11amp
%define version 0.9_alpha3
%define release 6
%define serial 1
```

```
Summary: X11 mp3 player with features not unlike
WinAMP.
Name: %{name}
Version: %{version}
Release: %{release}
Serial: %{serial}
Copyright: GPL
```




Example SPEC file (cont'd)

```
Group: Applications/Multimedia
URL: http://www.x11amp.org
Source: %{name}-0.9-alpha3.tar.gz
Source1: x11amp.desktop
Source2: mp3license
Source3: README.ESD
Patch: x11amp-0.9-alpha3-plugin-fallback.patch
Requires: gtk+ >= 1.1.15
BuildRoot: /var/tmp/%{name}-%{version}
Obsoletes: x11amp0.7-1-1
```

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Example SPEC file (cont'd)

%description

```
X11amp is a X Windows based mp3 player with a  
nice interface  
borrowed from WinAMP.
```

For information on the MP3 License, please visit:

<http://www.mpeg.org/>



Example SPEC file (cont'd)

```
%package devel  
Summary: Static libraries and header files for  
x11lamp.  
Group: Development/Libraries  
Requires: %{name}  
  
%description devel  
Static libraries and header files for building  
x11lamp plugins.
```



Example SPEC file (cont'd)

```
%prep
%setup -q -n x11amp-0.9-alpha3
if [ ! -e configure ]; then
    CFLAGS=$RPM_OPT_FLAGS \
    ./autogen.sh --prefix=/usr/X11R6
else
    CFLAGS=$RPM_OPT_FLAGS \
    ./configure --prefix=/usr/X11R6
fi

%patch -p1 -b .plugin-fallback
```

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Example SPEC file (cont'd)

```
%build
make

%install
rm -rf $RPM_BUILD_ROOT
mkdir $RPM_BUILD_ROOT
make DESTDIR=$RPM_BUILD_ROOT install

mkdir -p $RPM_BUILD_ROOT/...
install -m 644 $RPM_SOURCE_DIR/x11amp.desktop \
$RPM_BUILD_ROOT/etc/X11/applnk/Multimedia/

strip $RPM_BUILD_ROOT/usr/X11R6/bin/x11amp
```



Example SPEC file (con'td)

```
%post  
/sbin/ldconfig  
  
%postun -p /sbin/ldconfig  
  
%clean  
rm -rf $RPM_BUILD_ROOT
```



Example SPEC file (cont'd)

```
%files
%defattr(-,root,root)
%doc AUTHORS COPYING ChangeLog INSTALL README
%doc $RPM_SOURCE_DIR/README.ESD
/usr/X11R6/bin/x11amp
/usr/X11R6/lib/libx11amp.so.0
/usr/X11R6/lib/libx11amp.so.0.9.0
/usr/X11R6/lib/x11amp
/etc/X11/applnk/Multimedia/x11amp.desktop

%files devel
%defattr(-,root,root)
/usr/X11R6/include/x11amp .....
```

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Pre- and Post-install

```
%prein  
%postin  
%preun  
%postun
```

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Multi-architecture issues

```
%ifarch i386 i586  
%patch 1 -P  
%endif
```

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Build process

1. `copy src rpm to /usr/src/redhat/SRPMs`
2. `rpm -ivh foo-2.0-4.src.rpm`
3. `cd /usr/src/redhat/SPECS`
4. `rpm -ba foo.spec`
5. `cd /usr/src/redhat/RPMS`
6. `rpm -i foo-2.0-4.i386.rpm`

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