

What's new in RPM

(insider info from upstream development)

Jindřich Nový, jnovy@redhat.com

September 15, 2009

Copyright © 2009 Jindřich Nový

Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.2 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts.

Agenda

- 1 **New RPM features overview**
- 2 **XZ payload support stats**
 - Custom payload settings
- 3 **RPM performance improvement stats**
 - Package installation time test
 - Package removal and memory test
- 4 **Fixes in RPM-4.7.1**
- 5 **Future of RPM**
 - New RPM features for future releases
 - TODO list

Section 1

New RPM features overview

New RPM features overview

- XZ payload compression using XZ-5.0 (4.999.9beta for now)
- support for old LZMA format
- %setup now allows expansion of XZ tarballs
- rpm packages diffing utility - not yet in upstream
- new ObsoleteName index in rpmdb

Section 2

XZ payload support stats

XZ payload support stats

- Fedora 12 is rebuilt with level 7 XZ payload compression
- F11 DVD is 3.5GiB
- F12 DVD is 3.0GiB (F12-Alpha)
 - with newer packages
 - 14% saved
- rawhide as of 29th July 2009: 18.5GiB
- rawhide as of 30th July 2009: 15.5GiB
 - rebuilt packages are tagged after mass rebuild 30th July 2009
 - about 16% saved

XZ payload memory requirements

How much RAM is (roughly) consumed?

Preset	Compression	Decompression
-0	6 MiB	1 MiB
-1	6 MiB	1 MiB
-2	10 MiB	1 MiB
-3	20 MiB	2 MiB
-4	30 MiB	3 MiB
-5	60 MiB	6 MiB
-6	100 MiB	10 MiB
<-7	200 MiB	20 MiB>
-8	400 MiB	40 MiB
-9	800 MiB	80 MiB

XZ vs. LZMA Utils dictionary sizes

XZ vs. LZMA Utils dictionary sizes

Level	xz	LZMA Utils
-1	64 KiB	64 KiB
-2	512 KiB	1 MiB
-3	1 MiB	512 KiB
-4	2 MiB	1 MiB
-5	4 MiB	2 MiB
-6	8 MiB	4 MiB
<-7	16 MiB	8 MiB>
-8	32 MiB	16 MiB
-9	64 MiB	32 MiB

Custom payload compression settings

How to define custom payload compression?

```
# Compression type and level for source/binary package
#   "w9.gzdio"           gzip level 9 (default).
#   "w9.bzdio"          bzip2 level 9.
#   "w7.xzdio"          xz level 7.
#   "w7.lzdio"          lzma-alone level 7, lzma's default
#
#%_source_payload      w9.gzdio
#%_binary_payload      w9.gzdio
```

Where macros are defined?

Order in which rpmbuild processes macros

<code>/usr/lib/rpm/macros</code>	(rpm)
<code>/usr/lib/rpm/redhat/macros</code>	(redhat-rpm-config)
<code>/etc/rpm/macros.*</code>	(various devel packages)
<code>~/.rpmmacros</code>	(per-user default conf)
<code>spec</code>	

File checksum digests in RPM 4.7+

These algorithms are supported (with NSS-3.11.99.5+)

```
# If not specified or 0, MD5 is used.
# 1 MD5 (default)
# 2 SHA1
# 8 SHA256
# 9 SHA384
# 10 SHA512
#
#%_source_filedigest_algorithm 1
#%_binary_filedigest_algorithm 1
```

RPM macros for RHEL5 compatibility

sample .rpmmacros file for RHEL5 compatible RPMs

```
%_source_filedigest_algorithm 1
%_binary_filedigest_algorithm 1
%_binary_payload                w9.gzdio
%_source_payload                 w9.gzdio
%_default_patch_fuzz            2
```

B-Zip2 compression is also supported by RHEL5: w9.bzdio

Section 3

RPM performance improvement stats

RPM 4.4.x - test installation

RPM 4.4.x - test installation of 2776 F10 packages

```
# time ./rpmi -ivh -test -root /tmp/root \  
-nosignature f10-fixed-all.txt  
Preparing...  
##### [100%]  
  
real    3m5.113s  
user    3m3.250s  
sys     0m1.202s
```

RPM 4.6.x - test installation

RPM 4.6.x - test installation of 2776 F10 packages

```
# time ./rpmi -ivh -test -root /tmp/root \  
-nosignature f10-fixed-all.txt  
Preparing...  
##### [100%]  
  
real    0m22.203s  
user    0m21.225s  
sys     0m0.955s
```


RPM 4.7.x - test installation

RPM 4.7.x - test installation of 2776 F10 packages

```
# time ./rpmi -ivh -test -root /tmp/root \  
-nosignature f10-fixed-all.txt  
Preparing...  
##### [100%]  
  
real    0m21.674s  
user    0m20.649s  
sys     0m0.890s
```

RPM upstream - test installation

RPM upstream - test installation of 2776 F10 packages

```
# time ./rpmi -ivh -test -root /tmp/root \  
-nosignature f10-fixed-all.txt  
Preparing...  
##### [100%]  
  
real    0m7.552s  
user    0m6.648s  
sys     0m0.847s
```

RPM 4.6.x - erasure and memory test

RPM 4.6.x - erasure test of 2776 F10 packages

```
# time ./rpm -e -nosignature -test -root /tmp/root/ \  
`rpm -qa -root /tmp/root/`
```

```
VmRSS:      156208 kB
```

```
real      5m13.749s
```

```
user      4m10.267s
```

```
sys       1m2.776s
```

RPM 4.7.x - erasure and memory test

RPM 4.7.x - erasure test of 2776 F10 packages

```
# time ./rpm -e -nosignature -test -root /tmp/root/ \  
`rpm -qa -root /tmp/root/`
```

```
VmRSS:          88220 kB
```

```
real    0m14.224s
```

```
user    0m12.242s
```

```
sys     0m1.928s
```

RPM upstream - erasure and memory test

RPM upstream - erasure test of 2776 F10 packages

```
# time ./rpm -e -nosignature -test -root /tmp/root/ \  
`rpm -qa -root /tmp/root/`
```

```
VmRSS:      88156 kB
```

```
real      0m14.837s
```

```
user      0m12.846s
```

```
sys       0m1.937s
```

Section 4

Fixes in RPM-4.7.1

RPM 4.7.1 - Selected general fixes from 4.7.0

- Fix crash on symlink fingerprinting
- Avoid bogus errors from chrooted verify due to dependency caching issues
- Honor Requires(pre,preun) style dependencies on erase dependency checking
- Create the directory used for transaction lock if necessary
- Add `-h/--help` option to `rpm2cpio`

RPM 4.7.1 - Regression fixes from 4.6.0/4.7.0

- Fix `--excludepath`
- Honor `--nofiledigest` on install
- Log an error on short lead section
- Fix parsing of PGP public key signature packets

RPM 4.7.1 - Package building fixes

- Fix calculation of hardlinked file sizes
- Map legacy PreReq tag into Requires(pre,preun) at build for closer mapping to former semantics
- Add DWARF-3 support to debugedit (gcc-4.4+)
- Multiple filelists support: `%files -f list1 list2 ...`
- Allow %ghost files not to be present in build root
 - need to specify file attributes such as:
`%attr(0644,root,root) %ghost myghost`

Section 5

Future of RPM

New RPM features to be in the next releases

- RPM diffing utility
- header compression support
- new BugURL tag in spec for bug reporting reference
- BuildPreReq equals to BuildRequires
- %doc(type) namespacing for FAQ, license, NEWS, README, etc.
- correct %attr inheritance from %defattr

TODO list

- preprocessor based RPMbuild
- internal package database representation
- dependency resolver plugins
- getting rid of multilib hacks?

References



RPM homepage

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



Upstream mailing list

rpm-maint@lists.rpm.org



Or archives:

<https://lists.rpm.org/mailman/listinfo/rpm-maint>



IRC on freenode, channel rpm.org

<http://www.freenode.net/>

Questions?

Thanks for listening.