

RPM and Yum

How to manage your packages without UPS

Nick Urbanik <nicku@nicku.org>

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What is RPM?

- ▶ RPM stands for The RPM Package Manager.
 - ▶ It used to stand for Red Hat Package Manager
- ▶ It is used to manage *packages*.
 - ▶ “Oh, I *see*.”
 - ▶ ... no I don't...

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What is an RPM Package?

- ▶ It's a piece of software, all put in one RPM file
- ▶ For example, I am using the... let's see...

```
$ rpm -q evince ↵
```

```
evince-0.5.1-3
```

... software package to display these notes.
- ▶ The *name* of the package is `evince`.
- ▶ The *version* of the package is `0.5.1`
- ▶ The *release* is `3`.

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An RPM Package usually contains files

- ▶ My `evince` package has files inside:

```
$ rpm -ql evince ↵  
/etc/gconf/schemas/evince-thumbnailer.schemas  
/etc/gconf/schemas/evince.schemas  
/usr/bin/evince  
  
...  
/usr/share/omf/evince/evince-sr.omf  
/usr/share/omf/evince/evince-uk.omf
```

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Why should I have packages? Why not just zip files or something?

- ▶ We could just have zip files, or tar balls, or something like that, with just the files inside?
- ▶ It could work.
- ▶ So why have RPM packages?

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Advantages of RPM packages

- ▶ You can install a new package easily with one operation
- ▶ You can uninstall a package just as easily
- ▶ the package can contain information about what else it needs to work properly
- ▶ RPM won't clobber configuration files, and does sensible things with them
- ▶ The RPM system includes a database with lots of information about how the files should be installed, their size, owner, type, . . .

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RPM Commands

There are seven main RPM operations:

- ▶ For installing software packages:
 - ▶ *update, install, freshen*
- ▶ For making *queries*
- ▶ for *erasing* packages
- ▶ for *verifying* that a software package is correctly installed
- ▶ for *checking signatures* — verifying that an RPM package file is really from the people you trust, and not from Joe Trojan Cracker

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Queries

- ▶ You saw above that I can list the files with
`$ rpm -ql evince` ↩
- ▶ I can also see information about the package with
`$ rpm -qi evince` ↩
- ▶ Try it now!

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Install

- ▶ This will install a software package, regardless of whether there is a previous version installed
- ▶ This is always the right thing to do for kernels.

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Update

- ▶ Install a package if it is not installed, or
- ▶ install a newer version if there is a newer version available...
- ▶ ... otherwise, do nothing.
- ▶ Let's use this command to install the wonderful Planet Penguin Racer game:
 - ▶ `$ cd ~/mnt ↵`
 - ▶ `$ ls -l ↵`
 - ▶ `$ sudo rpm -Uhv $(ls|grep -v kernel) ↵`

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- ▶ Install a new version of a package only if an older one is already installed, otherwise do nothing.

Erasing

- ▶ Remove a package:
`$ sudo rpm -e ppracer ↵`

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Verifying

- ▶ Checking the files in a package all match the original data
- ▶ If it doesn't match, then flags show this:

<i>flag</i>	<i>what it means</i>
S	file S ize differs
M	M ode differs (includes permissions and file type)
5	MD 5 sum differs
D	D evice major/minor number mismatch
L	symbolic L ink points to wrong place
U	U ser ownership differs
G	G roup ownership differs
T	m T ime differs
C	selinux security C ontext differs

```
$ $ rpm -V setup ←  
S.5....T. c /etc/aliases  
S.5....TC c /etc/bashrc  
.....C c /etc/exports  
S.5....T. c /etc/printcap  
S.5....TC c /etc/profile  
S.?....T. c /etc/securetty
```

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- ▶ First, you need to *import* the public keys that are provided by Fedora:

```
$ sudo rpm --import  
/etc/pki/rpm-gpg/RPM-GPG-KEY* ↔
```

- ▶ \$ rpm -K *<package-file.rpm>* ↔

RPM Command Examples

command	effect
<code>rpm -qa less</code>	list all installed software packages
<code>rpm -q httpd</code>	show the version of the <code>httpd</code> package, if it is installed
<code>rpm -qa grep httpd</code>	show all installed packages that have <i>httpd</i> in their name
<code>rpm -ql httpd</code>	<i>list</i> all files in the <code>httpd</code> package
<code>rpm -qd httpd</code>	list all d ocumentation files in the <code>httpd</code> package
<code>rpm -qc httpd</code>	list all c onfiguration files in the <code>httpd</code> package
<code>rpm -qi httpd</code>	display <i>i</i> nformation about the package
<code>rpm -V httpd</code>	v erify that the <code>httpd</code> package is correctly installed
<code>rpm -qf /etc/passwd</code>	determine which package the <code>/etc/passwd</code> f ile belongs to

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A quick comparison with `dpkg`

command	effect
<code>dpkg -list less</code>	list all installed software packages
<code>dpkg -l httpd</code>	show the version of the <code>httpd</code> package, if it is installed
<code>dpkg -list grep httpd</code>	show all installed packages that have <i>httpd</i> in their name
<code>dpkg -getfiles httpd</code>	list all files in the <code>httpd</code> package
<code>dpkg -get-avail httpd</code>	display information about the package
<code>dpkg -S /etc/passwd</code>	determine which package the <code>/etc/passwd</code> file belongs to

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- ▶ Yum is a high level wrapper for RPM
- ▶ Uses the information in the RPM packages to figure out what things to install
- ▶ downloads the files you need, and installs them, lovingly taking care of which packages depend on what.

Why not stick with RPM?

- ▶ RPM is good, but it's too low level to easily manage all the packages on the system
- ▶ Yum uses the information in the RPM database, and the RPM files themselves to make sure that each software package has everything it needs.

What's all this primitive text stuff?

- ▶ There are many GUI programs that use yum as their backend
- ▶ I have never used any of them, so your exercise is to Google for them!

Updates

- ▶ Software has bugs
- ▶ Fedora particularly has many new versions of software that are being made available, since it aims to provide the current version of most pieces of software.
- ▶ Fedora has more updates than any other stable distribution I know of.
- ▶ Only a few are for security reasons, most are for updates.

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Why update? Why not update?

Why update?

- ▶ The easiest systems to crack have no updates.

Why not update?

- ▶ Updating can break a working system
- ▶ But that doesn't stop me from keeping my systems updated!
- ▶ ... but not good if your business loses thousands of dollars per second of downtime.
 - ▶ In such cases, you have a test system where you test the updates first, check they don't stop your applications from working

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How to update

Do this once only:

- ▶ Ensure your own account is in the `sudoers` file
 - ▶ see the `sudo` handout
- ▶ set your `http_proxy` environment variable
 - ▶ See the next section: 39 on the following page

Do this for each update:

- ▶ then do:
\$ **sudo yum -y update** ↵
- ▶ and watch it go.

Setting `http_proxy`

If access to web servers on the Internet is blocked by a firewall, and a proxy server is required, such as here in the TAFE:

- ▶ You need to set the `http_proxy` environment variable.
- ▶ The proxy server here has the DNS name “gw”, and listens on port 5865 ...

- ▶ ... so set the `http_proxy` like this:

```
export http_proxy=http://gw:5865/
```

- ▶ The best thing to do is to edit your login script `~/.bash_profile` and add it at the end:

```
emacs ~/.bash_profile &
```

- ▶ Then log out and log in...
- ▶ You should be able to see the value now:

```
$ echo $http_proxy ↵  
http://gw:5865/
```


The “repos”: repositories

- ▶ In the `/etc/yum.repos.d` directory are some files that end with “.repo”
- ▶ You can change these, add other repos (such as dag, freshrpms, atrpms, livna)
- ▶ You can also change the `baseurl` to a local Australian mirror (see `http://fedora.redhat.com/Download/mirrors.html` for a list of Australian mirrors)

Adding extras

- ▶ Well, the fedora extras repository is already enabled, so nothing to do here.

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- ▶ If you add the `dag`, `freshrpms`, `atrpms` or `livna` repositories, you should import their public keys, and enable checking the GPG signatures of the packages.


- ▶ For example, here is my

```
/etc/yum.repos.d/dag.repo file: [dag]
name=Dag RPM Repository for Fedora Core
baseurl=http://apt.sw.be/fedora/$releasever/en/$basearch
enabled=1
gpgcheck=1
```

Resources

 **Dr. Peter Salus.**
The Daemon, the GNU & the Penguin.
Groklaw 2006.
<http://www.groklaw.net/staticpages/index.php?page=20051013231901859>.

 **Eric Foster-Johnson.**
RPM Guide.
<http://fedora.redhat.com/docs/drafts/rpm-guide-en/>

 **The RPM Package Manager.**
<http://rpm.org/>

 **Wikipedia entry.**
Yellow dog Updater, Modified.
http://en.wikipedia.org/wiki/Yellow_dog_Updater,_Modified

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