RED HAT NETWORK POWER
USER TIPS AND TRICKS
PACKAGING SOFTWARE

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Agenda

- Red Hat and Red Hat Network Satellite Server
  - Spacewalk
- Assumptions
- Packaging internally developed software
- Packaging COTS software
Red Hat and Red Hat Network Satellite Server

- RHN Satellite is the best systems management solution for Red Hat products.
- Mature, robust product with hundreds of thousands of servers under management at customers in practically every vertical you can imagine.
Red Hat and Red Hat Network Satellite Server

- As Fedora is the upstream, community project for Red Hat Enterprise Linux, Spacewalk is the upstream, community project for Red Hat Network Satellite Server

- [http://spacewalk.redhat.com/](http://spacewalk.redhat.com/)
Assumptions

- You are already somewhat familiar with RPMs
  - This is something of an intro, but we're going to be moving rather quickly!
Packaging internally developed software

• We'll use an app for which you can get the source code as an example.

• Say you want to install a new and different version of Apache httpd in `/opt/apache` instead of using the Red Hat provided RPMs.
Packaging internally developed software

- Make sure the “Development tools” package group is installed.
  - `yum groupinstall “Development tools”`
- For convenience, make sure rpmdevtools is installed.
  - `yum install rpmdevtools`
Packaging internally developed software

- First, we'll talk about how you would install from source.
- For much F/OSS software, it's a simple
  - ./configure
  - make
  - make install
Packaging internally developed software

• Since you're installing to a non-standard location and building as a non-root user, maybe:
  • ./configure --prefix=/opt/apache
  • make
  • make DESTDIR=/var/tmp install
[makerpm@host236 ~]$ mkdir /tmp/build
[makerpm@host236 ~]$ cd /tmp/build
[makerpm@host236 build]$ wget http://apache.osuosl.org//httpd/httpd-2.2.17.tar.gz
Resolving apache.osuosl.org... 140.211.166.134
Connecting to apache.osuosl.org|140.211.166.134|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 6597991 (6.3M) [application/x-gzip]
Saving to: “httpd-2.2.17.tar.gz”

100%[===============================================] 6,597,991 620K/s in 11s
2011-04-25 23:47:52 (578 KB/s) - “httpd-2.2.17.tar.gz” saved [6597991/6597991]

[makerpm@host236 build]$ tar zxf httpd-2.2.17.tar.gz
[makerpm@host236 build]$ cd httpd-2.2.17
[makerpm@host236 httpd-2.2.17]$ ./configure --prefix=/opt/apache && make && make DESTDIR=/var/tmp install
done
/usr/bin/install -c -m 644 apr-util.pc /var/tmp/opt/apache/lib/pkgconfig/apr-util-1.pc
list='xml/expat'; for i in $list; do \
    ( cd $i ; make DESTDIR=/var/tmp install ); \
done
make[3]: Entering directory `~/tmp/build/httpd-2.2.17/src/lib/apr-util/xml/expat'
/bin/sh ./conftools/mkinstalldirs /opt/apache/lib /opt/apache/include
mkdir /opt/apache
mkdir: cannot create directory `~/opt/apache': Permission denied
mkdir /opt/apache/lib
mkdir: cannot create directory `~/opt/apache/lib': No such file or directory
mkdir /opt/apache
mkdir: cannot create directory `~/opt/apache': Permission denied
mkdir /opt/apache/include
mkdir: cannot create directory `~/opt/apache/include': No such file or directory
make[3]: *** [installlib] Error 1
make[3]: Leaving directory `~/tmp/build/httpd-2.2.17/src/lib/apr-util/xml/expat'
make[2]: *** [install] Error 2
make[2]: Leaving directory `~/tmp/build/httpd-2.2.17/src/lib/apr-util'
make[1]: *** [install-recursive] Error 1
make[1]: Leaving directory `~/tmp/build/httpd-2.2.17/src/lib'
make: *** [install-recursive] Error 1
make: *** [install] Error 1
[makerpm@host236 httpd-2.2.17]$
Packaging internally developed software

- <grumble>
- “I'm a smart guy, I can do this!”
- Google
- Eureka!
- fix ./srclib/apr-util/xml/expat/Makefile.in
- recompile
- success!
- “tar it up, baby, it's ready to go!”
```bash
[makerpm@host236 build]$ cd httpd-2.2.17
[makerpm@host236 httpd-2.2.17]$ vi ./src/lib/apr-util/xml/expat/Makefile.in
[makerpm@host236 httpd-2.2.17]$ ./configure --prefix=/opt/apache && make && make DESTDIR=/var/tmp install
[makerpm@host236 httpd-2.2.17]$ ./configure --prefix=/opt/apache && make && make DESTDIR=/var/tmp install
```
mkdir /var/tmp/opt/apache/conf/original
mkdir /var/tmp/opt/apache/conf/original/extra
Installing HTML documents
mkdir /var/tmp/opt/apache/htdocs
Installing error documents
mkdir /var/tmp/opt/apache/error
Installing icons
mkdir /var/tmp/opt/apache/icons
mkdir /var/tmp/opt/apache/logs
Installing CGIs
mkdir /var/tmp/opt/apache/cgi-bin
Installing header files
Installing build system files
Installing man pages and online manual
mkdir /var/tmp/opt/apache/man
mkdir /var/tmp/opt/apache/man/man1
mkdir /var/tmp/opt/apache/man/man8
mkdir /var/tmp/opt/apache/manual
make[1]: Leaving directory `/tmp/build/httpd-2.2.17'
[makerpm@host236 httpd-2.2.17]$ cd /var/tmp/opt/
[makerpm@host236 opt]$ tar zcf apache.tgz apache/
[makerpm@host236 opt]$ ls
apache apache.tgz
[makerpm@host236 opt]$
Packaging internally developed software

• Note this does not take into account setting your search path or manpath.
  • Common “solution:” hack /etc/profile
• Also doesn't take into account your SysV init scripts.
  • You're either going to copy from an existing one or just pop a line into rc.local
[makerpm@host236 ~]$ ls -l /var/tmp/opt/
total 5064
drwxr-xr-x. 15 makerpm makerpm  4096 Apr 26 00:07 apache
-rw-rw-r--.  1 makerpm makerpm  5177399 Apr 26 00:07 apache.tgz

[root@host236 ~]$ su -
Password:
[root@host236 ~]# cd /opt/
[root@host236 opt]# ls
[root@host236 opt]# tar zxf /var/tmp/opt/apache.tgz
[root@host236 opt]# ls
apache
[root@host236 opt]#  []
HOSTNAME=`/bin/hostname 2>/dev/null`
HISTSIZE=1000
if [ "$HISTCONTROL" = "ignore SPACE" ]; then
    export HISTCONTROL=ignoreboth
else
    export HISTCONTROL=ignoredupes
fi

# Added by Thomas for my custom Apache installation
PATH="/opt/apache/bin:$PATH"
MANPATH="/opt/apache/man:$MANPATH"
# End
export PATH USER LOGNAME MAIL HOSTNAME HISTSIZE HISTCONTROL

for i in /etc/profile.d/* . sh ; do
    if [ -r "$i" ]; then
        if [ "$PS1" ]; then
            . $i
        else
            . $i > /dev/null 2>&1
        fi
    fi
"/etc/profile" 73L, 1582C written
# This script will be executed *after* all the other init scripts.
# You can put your own initialization stuff in here if you don't
# want to do the full Sys V style init stuff.

touch /var/lock/subsys/local
nohup /opt/apache/bin/httpd &
Packaging internally developed software

• Awesome! Now your company has a custom, bleeding edge version of Apache installed!
  • No one but you knows about the source code change you made (W00T!!! JOB SECURITY!!!).
  • No one but you knows about the hacks to /etc/profile, and even if they did, they'd have to manually add it to every system.
Packaging internally developed software

- Let's say you win the lottery. You're gone, never to darken the door of this joint again.
  - How do they know what version is installed on all the systems?
  - How do they check the integrity of those installations?
  - What if they need to roll out a new version? What about the patch? They'll probably have to figure it out all over again.
DOUBLE FACEPALM

When the Fail is so strong, one Facepalm is not enough.
Packaging internally developed software

- Let's look at how to package internally developed software.
  - Easier to deploy
  - Easier to consistency check
  - Easier to version control
Packaging internally developed software

- As a non-root user, use rpmdev-setuptree. It will create:
  - `~/rpmbuild` directory
  - `~/.rpmmacros` file
  - Comment `%__arch_install_post out`
id
uid=500(makerpm) gid=500(makerpm) groups=500(makerpm) context=unconfined_u:unconfined_r:unconfined_t:s0-s0:c0.c1023
ls -a
... .bash_logout .bash_profile .bashrc
rpmdev-setuptree
ls -a
... .bash_logout .bash_profile .bashrc rpmbuild .rpmmacros
cat .rpmmacros
%_topdir %($HOME)/rpmbuild
%_smp_mflags -j3
%__arch_install_post /usr/lib/rpm/check-rpaths /usr/lib/rpm/check-buildroot

[makerpm@host236 ~]$ find rpmbuild/
rpmbuild/
rpmbuild/SOURCES
rpmbuild/RPMS
rpmbuild/BUILD
rpmbuild/SPECS
rpmbuild/SRPMS
[makerpm@host236 ~]$
Packaging internally developed software

- GNU Privacy Guard (GPG) is a F/OSS implementation of Pretty Good Privacy (PGP). Per the man page, “It is a tool to provide digital encryption and signing services using the OpenPGP standard.”

- For purposes of this presentation, we will use GPG to sign internally developed packages. You should not allow unsigned packages to be installed (in fact, yum will not allow you to by default)!

- Your package building/signing account will generate a keypair. Keep the private key private, make the public key publicly available.
Packaging internally developed software

- We recommend a secure signing process – have a single, or limited number of accounts with which trusted admins can sign packages.
- Multi-factor or checks and balances is not a bad thing. One person or team can build packages, another has to sign them.
Packaging internally developed software

- Your rpm building account will need to generate a gpg keypair on a build system (not the Satellite server) and then export the ascii armor.
  - `gpg --gen-key`
  - `gpg --export -a [name] --armor > [pubkey]`
$ gpg --gen-key

gpg (GnuPG) 2.0.14; Copyright (C) 2009 Free Software Foundation, Inc.
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

gpg: directory `~/home/makerpm/.gnupg` created

gpg: new configuration file `~/home/makerpm/.gnupg/gpg.conf` created

gpg: WARNING: options in `~/home/makerpm/.gnupg/gpg.conf` are not yet active during this run

gpg: keyring `~/home/makerpm/.gnupg/secring.gpg` created

gpg: keyring `~/home/makerpm/.gnupg/pubring.gpg` created

Please select what kind of key you want:

1. RSA and RSA (default)
2. DSA and Elgamal
3. DSA (sign only)
4. RSA (sign only)

Your selection? [ ]
gpg: directory `/home/makerpm/.gnupg` created

gpg: new configuration file `/home/makerpm/.gnupg/gpg.conf` created

gpg: WARNING: options in `/home/makerpm/.gnupg/gpg.conf` are not yet active during this run

Please select what kind of key you want:

1. RSA and RSA (default)
2. DSA and Elgamal
3. DSA (sign only)
4. RSA (sign only)

Your selection? 1

RSA keys may be between 1024 and 4096 bits long.

What keysize do you want? (2048)

Requested keysize is 2048 bits

Please specify how long the key should be valid.

0 = key does not expire

<n> = key expires in n days

<n>w = key expires in n weeks

<n>m = key expires in n months

<n>y = key expires in n years

Key is valid for? (0)

Key does not expire at all

Is this correct? (y/N)
(4) RSA (sign only)
Your selection? 1
RSA keys may be between 1024 and 4096 bits long.
What keysize do you want? (2048)
Requested keysize is 2048 bits
Please specify how long the key should be valid.
    0 = key does not expire
    <n> = key expires in n days
    <n>w = key expires in n weeks
    <n>m = key expires in n months
    <n>y = key expires in n years
Key is valid for? (0)
Key does not expire at all
Is this correct? (y/N) y

GnuPG needs to construct a user ID to identify your key.

Real name: Make RPM
Email address: makerpm@example.com
Comment:
You selected this USER-ID:
    "Make RPM <makerpm@example.com>"

Change (N)ame, (C)omment, (E)mail or (O)kay/(Q)uit? q
Please re-enter this passphrase

Passphrase ********

<OK> <Cancel>
<n>m = key expires in n months
<n>y = key expires in n years
Key is valid for? (0)
Key does not expire at all
Is this correct? (y/N) y

GnuPG needs to construct a user ID to identify your key.

Real name: Make RPM
Email address: makerpm@example.com
Comment:
You selected this USER-ID:
  "Make RPM <makerpm@example.com>"

Change (N)ame, (C)omment, (E)mail or (O)kay/(Q)uit? o
You need a Passphrase to protect your secret key.

can't connect to `~/home/makerpm/.gnupg/S.gpg-agent': No such file or directory
gpg-agent[5771]: directory `~/home/makerpm/.gnupg/private-keys-v1.d' created
We need to generate a lot of random bytes. It is a good idea to perform
some other action (type on the keyboard, move the mouse, utilize the
disks) during the prime generation; this gives the random number
generator a better chance to gain enough entropy.
can't connect to `/home/makerpm/.gnupg/S.gpg-agent': No such file or directory
gpg-agent[5771]: directory `/home/makerpm/.gnupg/private-keys-v1.d' created

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We need to generate a lot of random bytes. It is a good idea to perform some other action (type on the keyboard, move the mouse, utilize the disks) during the prime generation; this gives the random number generator a better chance to gain enough entropy.

gpg: /home/makerpm/.gnupg/trustdb.gpg: trustdb created
gpg: key 406F995C marked as ultimately trusted
public and secret key created and signed.

gpg: checking the trustdb
gpg: 3 marginal(s) needed, 1 complete(s) needed, PGP trust model
gpg: depth: 0 valid: 1 signed: 0 trust: 0-, 0q, 0n, 0m, 0f, 1u
pub 2048R/406F995C 2011-04-26
   Key fingerprint = 9775 51EB 349D CBB2 DE3A 404C 6B23 7DC0 406F 995C
uid Make RPM <makerpm@example.com>
sub 2048R/B0C11D41 2011-04-26
can't connect to `/home/makerpm/.gnupg/S.gpg-agent': No such file or directory

gpg-agent[5771]: directory `/home/makerpm/.gnupg/private-keys-v1.d' created

We need to generate a lot of random bytes. It is a good idea to perform some other action (type on the keyboard, move the mouse, utilize the disks) during the prime generation; this gives the random number generator a better chance to gain enough entropy.

We need to generate a lot of random bytes. It is a good idea to perform some other action (type on the keyboard, move the mouse, utilize the disks) during the prime generation; this gives the random number generator a better chance to gain enough entropy.

gpg: /home/makerpm/.gnupg/trustdb.gpg: trustdb created

gpg: key 406F995C marked as ultimately trusted

public and secret key created and signed.

gpg: checking the trustdb

gpg: 3 marginal(s) needed, 1 complete(s) needed, PGP trust model

gpg: depth: 0  valid:  1  signed:  0  trust: 0-, 0q, 0n, 0m, 0f, 1u

pub 2048R/406F995C 2011-04-26
   Key fingerprint = 9775 51EB 349D CBB2 DE3A 404C 6B23 7DC0 406F 995C

uid Make RPM <makerpm@example.com>

sub 2048R/B0C11D41 2011-04-26

[makerpm@host236 ~]$ gpg --export -a "Make RPM" > MY-PUBLIC-KEY
[makerpm@host236 ~]$
BEGIN PGP PUBLIC KEY BLOCK
Version: GnuPG v2.0.14 (GNU/Linux)
mQENBE22M2IBCADU7qRLtEufm6v6hNlzEN0tZPSva2Aog4P0bwpi7+KIQJtG0Bh
erPMoTlpMHLEFyPVpftYqKAPt0g3da1eFumaLimgAfwimeKb/4Saba2r3uvRy
Y3QfVZ2LzDsa045+V6fi/swmqlyRBRwXU7gfp8p1IMVjz4lOys2usFagWyoy9qno
fEd0Zdhok5ikk5UsCrU8jxw1PImuBdt0Xpyt1grCpmLBYhODLsPa356W55xyY
vOQ9eVz0lcKvqWx5/72ojHqF1r1QLZodJLJlb4do7VMKcxqjimquRbXqmmDHDr
bxum/kypjhuHUMOSVjfsEcld5lqoxSesNv+PABEEAAG0Hklha2ugulBNIDtXYwl
ctnBtQGV4YWlwGBGUuY29tPokB0AQTQAIAIGUCTbyZyGibAwYLCQgHAwIGFQgCCQoL
BBYCAwECHgECF4A4AcgkQay9n9EBvmVvYTEggAuz435HDwZ6Y5SuJaqz7byiS3Lp8
kF3VmpFRgRlzSwFexdXVeHuqVpDnW0BnNmG6vDavAMR8rbWnF4jG/JS6QolWizPH
VNI5EhzH0hBoSNtNkL0X3t+10u+th6cdec9RgVvVcK8CD5VUJSiW7VNOjgfb
b/wje7NKnIesCV0tc8l11vI9l1X7q2DNGgLL3KiMczyVYh/bSNtgVdGAw5KPdZ79Dx
a6kikhC5g9AZ4oQDQLqF353VIkbYch7/o/h6bA7YwQcPr0XvbIImNCpZTO/5Eh
Y/V/NzmfNEOXqQeKJD8ady1mpXWdjU6mpFpx4+9nvBi9LCwskb4qaruKBDRQRn
tjNIaQgA100Jm294rqh3qzo8Xlj3Wq6Ye6qlnsMOx5DVRBMwRVP8flw1Hzw6Rf
E9lgI-i-jyphXsr/6-jwDwzBD59q9s2ud+F6M53DVE3zq3423tthxWdKKN/h6dJSHe
sLzLtegT5gp/U4+6kvQia21JqVw2e/uT+4ggLq9Ldk1rWjaz4s7Ftbw9KoV/N
ZUCQREwUz40GALuxr5EC0EPWtmvyYkKVBpMemw/4y/94scyj5F1ryGkFPAwNRz
5ihj+6VBIy30x5MUesLynt3WMF3fiB1Z0DXagfd3859MSFLoMeW2sY5r0xdW
vttXnnb4k0MVkKq4FU1qo4a7ZK5ujwARAABiQEfBFbgAaJaBJQJNtjNIaHsMAoJ
EgsjFCAAb5lcICh/iuGL/glswTwyZSsRknu4e/PMzkY29sm5r0jB0DqlyXos11
I4FvCNCBnU00m7msEpA0S3N9gH75LurrF2n0JL136kqkWpze7Ldn57o+V2pNK82pC
v02nTVQP09N3GRN080j6vrtkMQ5junY0EYkHSWqIhwl1D+hLZ2zCjIC42XZaq8Rv
PmTIFqsg+OnOHzq/XjB56S7x6pMvLGl3JX3E18HCQcEFciosIo0qHIF/Lq0uj+W
N7yJHFhrlmLnxLQCjC2TPVG0Z5JD5l1TNI10Ygp0NujkAI9avwHauIjxncV6s5r
6/FN74cLlwMPHEJjseAFGBuw+JQEi+lG+B2QOIE=

END PGP PUBLIC KEY BLOCK

[makerpm@host236 ~]$
Packaging internally developed software

- List your gpg key
- Copy it to your .rpmmacros file
[makerpm@host236 ~]$ gpg --list-keys
/home/makerpm/.gnupg/pubring.gpg

pub  2048R/406F995C  2011-04-26
uid   Make RPM <makerpm@example.com>
sub  2048R/B0C11D41  2011-04-26

[makerpm@host236 ~]$ echo %_signature gpg >> .rpmmacos
[makerpm@host236 ~]$ echo %_gpg_name 406F995C >> .rpmmacos
[makerpm@host236 ~]$ cat .rpmmacos
%_topdir    %%(echo $HOME)/rpmbuild
%_smp_mflags -j3
#%_arch_install_post   /usr/lib/rpm/check-rpaths /usr/lib/rpm/check-buildroot
%_signature gpg
%_gpg_name 406F995C
[makerpm@host236 ~]$
Packaging internally developed software

- Grab your source file. In this case, httpd-2.2.17.tar.gz from [http://httpd.apache.org](http://httpd.apache.org)
- Put it in ~/rpmbuild/SOURCES
[makerpm@host236 ~]$ cd rpmbuild/SOURCES/
[makerpm@host236 SOURCES]$ wget http://apache.osuosl.org//httpd/httpd-2.2.17.tar.gz
Resolving apache.osuosl.org... 140.211.166.134
Connecting to apache.osuosl.org|140.211.166.134|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 6597991 (6.3M) [application/x-gzip]
Saving to: “httpd-2.2.17.tar.gz”

100%[===================================>] 6,597,991 1.06M/s in 7.1s

2011-04-25 22:28:35 (907 KB/s) - “httpd-2.2.17.tar.gz” saved [6597991/6597991]

[makerpm@host236 SOURCES]$  

Packaging internally developed software

- Create a shell script for setting PATH and MANPATH variables
  - Add it to `~/rpmbuild/SOURCES` as well
  - This will go in `/etc/profile.d` on systems upon which this RPM is installed.
$ cd /home/makerpm/rpmbuild/SOURCES/
$ cat apache.sh
#!/bin/bash
PATH="/opt/apache/bin:$PATH"
MANPATH="/opt/apache/man:$MANPATH"

Packaging internally developed software

- Generate a patch file
  - In this case, the original file is copied and named `Makefile.in.orig`
  - You can use `gendiff` to create the diff file.
  - Copy the diff over to the SOURCES directory
[tcameron@host236 BUILD]$ tar zxf ..{/SOURCES/httpd-2.2.17.tar.gz
[tcameron@host236 BUILD]$ cp httpd-2.2.17/src/lib/apr-util/xml/expat/Makefile.in
httpd-2.2.17/src/lib/apr-util/xml/expat/Makefile.in.orig
[tcameron@host236 BUILD]$ vi httpd-2.2.17/src/lib/apr-util/xml/expat/Makefile.in
[tcameron@host236 BUILD]$ gendiff httpd-2.2.17 .orig > make_DESTDIR.patch
[tcameron@host236 BUILD]$
[tcameron@host236 BUILD]$ cat make_DESTDIR.patch

diff -up httpd-2.2.17/srclib/apr-util/xml/expat/Makefile.in.orig httpd-2.2.17/src

clib/apr-util/xml/expat/Makefile.in
--- httpd-2.2.17/srclib/apr-util/xml/expat/Makefile.in.orig 2011-04-27 19:23
:29.03007543 -0500
+++ httpd-2.2.17/srclib/apr-util/xml/expat/Makefile.in 2011-04-27 19:23:40.2500
68853 -0500
@@ -85,9 +85,10 @@ check: tests/runtests

install: installlib

installlib: $(LIBRARY) $(APIHEADER)
-
  $(mkenstalldirs) $(libdir) $(includedir)
-
  $(LIBTOOL) --mode=install $(INSTALL) $(LIBRARY) $(libdir)/$(LIBRARY)
-
  $(INSTALL_DATA) $(APIHEADER) $(includedir)
+
  $(mkenstalldirs) $(DESTDIR)$(libdir) $(DESTDIR)$(includedir)
+
  $(LIBTOOL) --mode=install $(INSTALL) $(LIBRARY) $(DESTDIR)$(libdir)/$(LIBRARY)
+
  $(INSTALL_DATA) $(APIHEADER) $(DESTDIR)$(includedir)
+

$(LIBRARY): $(LIB_OBJS)
  $(LINK_LIB) $(LIB_OBJS)

[tcameron@host236 BUILD]$ cp make_DESTDIR.patch ../SOURCES/
[tcameron@host236 BUILD]$
Packaging internally developed software

- Change to your `~/rpmbuild/SOURCES` directory and create a new init script
  - `rpmdev-newinit httpd`
[makerpm@host236 SOURCES]$ rpmdev-newinit httpd
Skeleton init script has been created to "httpd.init".
[makerpm@host236 SOURCES]$
#!/bin/sh
#
# httpd - custom httpd server for Acme Widget
#
# chkconfig:    85 15
# description:  httpd

http://fedoraproject.org/wiki/FCNewInit/Initscripts
### BEGIN INIT INFO
# Provides:
# Required-Start:
# Required-Stop:
# Should-Start:
# Should-Stop:
# Default-Start:
# Default-Stop:
# Short-Description:
# Description:
### END INIT INFO

# Source function library.
. /etc/rc.d/init.d/functions

7,0-1
. /etc/rc.d/init.d/functions

exec="/opt/apache/bin/httpd"

prog=$(basename $exec)

[ -e /etc/sysconfig/$prog ] && . /etc/sysconfig/$prog

lockfile=/var/lock/subsys/$prog

start() {
    echo -n "$Starting $prog: "
    # if not running, start it up here, usually something like "daemon $exec"
    daemon $exec
    retval=$?
    echo
    [ $retval -eq 0 ] && touch $lockfile
    return $retval
}

stop() {
    echo -n "$Stopping $prog: "
    # stop it here, often "killproc $prog"
    -- INSERT --
}
echo -n "$\textit{Stopping \ prog:}\ "$
# stop it here, often "killproc \prog"
killproc \prog
reval=$?

{[ \reval \ -eq \ 0 ] \&& \ rm \ -f \lockfile
return \reval
}

restart() {
    stop
    start
}

case "$1" in
    start|stop|restart)
        $1
    ;;
    force-reload)
        restart
    ;;
    status)
        status \prog
    ;;

\textbf{INSERT}
Packaging internally developed software

- Change to your ~/rpmbuild/SPECS directory and create a new spec file
  - rpmdev-newspec
[makerpm@host236 ~]$ cd rpmbuild/SOURCES/

[makerpm@host236 SOURCES]$ wget http://apache.osuosl.org/httpd/httpd-2.2.17.tar.gz

Resolving apache.osuosl.org... 140.211.166.134
Connecting to apache.osuosl.org|140.211.166.134|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 6597991 (6.3M) [application/x-gzip]
Saving to: “httpd-2.2.17.tar.gz”

100%[====================================================================>]
6,597,991 1.06M/s in 7.1s

2011-04-25 22:28:35 (907 KB/s) - “httpd-2.2.17.tar.gz” saved [6597991/6597991]

[makerpm@host236 SOURCES]$ cd ../SPECS/
[makerpm@host236 SPECS]$ rpmdev-newspec httpd
Skeleton specfile (minimal) has been created to "httpd.spec".
[makerpm@host236 SPECS]$
Packaging internally developed software

- Let's look at the spec file the tool generated to see what it is creating.
Name: httpd
Version: 1
Release: %?dist
Summary:

Group:
License:
URL:
Source0:
BuildRoot: %{_tmppath}/%{name}-%{version}-%{release}-root-%{__id_u} -n

BuildRequires:
Requires:

%description

%prep
%setup -q

%build
%configure

"httpd.spec" 42L, 493C 1,1 Top
%build
%configure
make %{?_smp_mflags}

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

%clean
rm -rf $RPM_BUILD_ROOT

%files
%defattr(-,root,root,-)
%doc

changelog
Packaging internally developed software

- A completed spec file might look like this:
<table>
<thead>
<tr>
<th>Name</th>
<th>httpd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version</td>
<td>2.2.17</td>
</tr>
<tr>
<td>Release</td>
<td>1%{?dist}</td>
</tr>
<tr>
<td>Summary</td>
<td>Apache httpd for Acme Widget</td>
</tr>
<tr>
<td>Group</td>
<td>System Environments/Daemons</td>
</tr>
<tr>
<td>License</td>
<td>ASL 2.0</td>
</tr>
<tr>
<td>URL</td>
<td><a href="http://httpd.apache.org">http://httpd.apache.org</a></td>
</tr>
<tr>
<td>Source0</td>
<td>httpd-2.2.17.tar.gz</td>
</tr>
<tr>
<td>Source1</td>
<td>apache.sh</td>
</tr>
<tr>
<td>Source2</td>
<td>httpd.init</td>
</tr>
<tr>
<td>Patch0</td>
<td>makeDESTDIR.patch</td>
</tr>
<tr>
<td>BuildRoot</td>
<td>%_tmppath%/name-%{version}-%{release}-root-%<strong>id_u</strong> -n</td>
</tr>
<tr>
<td>BuildRequires</td>
<td>autoconf, libtool, make, gcc</td>
</tr>
<tr>
<td>Requires</td>
<td>compat-expat1</td>
</tr>
</tbody>
</table>

**%description**

This is a custom build of Apache for Acme Widget Corp

**%prep**

%setup -q

**%patch0**

-p1
%setup -q
%patch0 -p1

%build
./configure --prefix=/opt/apache
make %{?_smp_mflags}

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

mkdir -p $RPM_BUILD_ROOT/etc/profile.d
mkdir -p $RPM_BUILD_ROOT/etc/rc.d/init.d
install -m 755 $RPM_SOURCE_DIR/apache.sh $RPM_BUILD_ROOT/etc/profile.d
install -m 755 $RPM_SOURCE_DIR/httpd.init $RPM_BUILD_ROOT/etc/rc.d/init.d

%clean
rm -rf $RPM_BUILD_ROOT

%files
%defattr(-,root,root,-)
/opt/apache/build/rules.mk
/opt/apache/build/config.nice
/opt/apache/cgi-bin
/opt/apache/cgi-bin/printenv
/opt/apache/cgi-bin/test-cgi
/opt/apache/conf
/opt/apache/conf/extra
%config /opt/apache/conf/extra/httpd-autoindex.conf
%config /opt/apache/conf/extra/httpd-dav.conf
%config /opt/apache/conf/extra/httpd-default.conf
%config /opt/apache/conf/extra/httpd-info.conf
%config /opt/apache/conf/extra/httpd-languages.conf
%config /opt/apache/conf/extra/httpd-manual.conf
%config /opt/apache/conf/extra/httpd-mpm.conf
%config /opt/apache/conf/extra/httpd-multilang-errordoc.conf
%config /opt/apache/conf/extra/httpd-ssl.conf
%config /opt/apache/conf/extra/httpd-userdir.conf
%config /opt/apache/conf/extra/httpd-vhosts.conf
%config /opt/apache/conf/httpd.conf
%config /opt/apache/conf/magic
%config /opt/apache/conf/mime.types
/opt/apache/conf/original
/opt/apache/conf/original/extra
/opt/apache/conf/original/extra/httpd-autoindex.conf
/opt/apache/conf/original/extra/httpd-dav.conf
Packaging internally developed software

- How did we get that file list?
- The process below (plus trial and error)
tcameron@t510:~$ cd /home/tcameron/rpmbuild/BUILD
[tcameron@host236 BUILD]$ tar zxf ../SOURCES/httpd-2.2.17.tar.gz
[tcameron@host236 BUILD]$ patch -p0 < ../SOURCES/make DESTDIR=patch
patching file httpd-2.2.17/src/lib/apr-util/xml/expat/Makefile.in
[tcameron@host236 BUILD]$ cd httpd-2.2.17/
[tcameron@host236 httpd-2.2.17]$ ./configure --prefix=/opt/apache && make && make DESTDIR=/var/tmp install
'libapr-1.la' has not been installed in `/opt/apache/lib`
Installing configuration files
mkdir /var/tmp/opt/apache/conf
mkdir /var/tmp/opt/apache/conf/extra
mkdir /var/tmp/opt/apache/conf/original
mkdir /var/tmp/opt/apache/conf/original/extra
Installing HTML documents
mkdir /var/tmp/opt/apache/htdocs
Installing error documents
mkdir /var/tmp/opt/apache/error
Installing icons
mkdir /var/tmp/opt/apache/icons
mkdir /var/tmp/opt/apache/logs
Installing CGIs
mkdir /var/tmp/opt/apache/cgi-bin
Installing header files
Installing build system files
Installing man pages and online manual
mkdir /var/tmp/opt/apache/man
mkdir /var/tmp/opt/apache/man/man1
mkdir /var/tmp/opt/apache/man/man8
mkdir /var/tmp/opt/apache/manual
make[1]: Leaving directory `~/home/tcameron/rpmbuild/BUILD/httpd-2.2.17'
[tcameron@host236 httpd-2.2.17]$
[tcameron@host236 httpd-2.2.17]$ cd /var/tmp/
[tcameron@host236 tmp]$ find . -type f | sed "s/\./" >> /home/tcameron/rpmbuild/SPECS/httpd.spec
Packaging internally developed software

- Now let's test each section of the spec file.
rpmbuild --help

Usage: rpmbuild [OPTION...]

--quiet

Build options with [ <specfile> | <tarball> | <source package> ]:

- bp  build through %prep (unpack sources and apply patches) from <specfile>
- bc  build through %build (%prep, then compile)
       from <specfile>
- bi  build through %install (%prep, %build, then install) from <specfile>
- bl  verify %files section from <specfile>
- ba  build source and binary packages from <specfile>
- bb  build binary package only from <specfile>
- bs  build source package only from <specfile>
- tp  build through %prep (unpack sources and apply patches) from <tarball>
- tc  build through %build (%prep, then compile)
       from <tarball>
- ti  build through %install (%prep, %build, then install) from <tarball>
- ta  build source and binary packages from <tarball>
- tb  build binary package only from <tarball>
[makerpm@host236 SPECS]$ find ../

../
../SOURCES
../SOURCES/httpd-2.2.17.tar.gz
../SOURCES/httpd.init
../SOURCES/make_DESTDIR.patch
../SOURCES/apache.sh
../RPMS
../BUILD
../SPECS
../SPECS/httpd.spec
../SRPMS
[makerpm@host236 SPECS]$

[makerpm@host236 SPECS]$ rpmbuild -bp httpd.spec
Executing(%prep): /bin/sh -e /var/tmp/rpm-tmp.Ba2gTm
+ umask 022
+ cd /home/makerpm/rpmbuild/BUILD
+ LANG=C
+ export LANG
+ unset DISPLAY
+ cd /home/makerpm/rpmbuild/BUILD
+ rm -rf httpd-2.2.17
+ /bin/tar -xf -
+ /usr/bin/gzip -dc /home/makerpm/rpmbuild/SOURCES/httpd-2.2.17.tar.gz
+ STATUS=0
+ '[' 0 -ne 0 ']
+ cd httpd-2.2.17
+ /bin/chmod -Rf a+rX,u+w,g-w,o-w .
+ echo 'Patch #0 (make_DESTDIR.patch):'
Patch #0 (make_DESTDIR.patch):
+ /usr/bin/patch -s -p1 --fuzz=0
+ /bin/cat /home/makerpm/rpmbuild/SOURCES/make_DESTDIR.patch
+ exit 0
[makerpm@host236 SPECS]$
[makerpm@host236 SPECS]$ find .. | head -20

../
../SOURCES
../SOURCES/httpd-2.2.17.tar.gz
../SOURCES/httpd.init
../SOURCES/make_DESTDIR.patch
../SOURCES/apache.sh
../BUILDROOT
../RPMS
../BUILD
../BUILD/httpd-2.2.17
../BUILD/httpd-2.2.17/.gdbinit
../BUILD/httpd-2.2.17/LAYOUT
../BUILD/httpd-2.2.17/build
../BUILD/httpd-2.2.17/build/nw_export.inc
../BUILD/httpd-2.2.17/build/apr_common.m4
../BUILD/httpd-2.2.17/build/binbuild.sh
../BUILD/httpd-2.2.17/build/find_apu.m4
../BUILD/httpd-2.2.17/build/rpm
../BUILD/httpd-2.2.17/build/rpm/httpd.logrotate
../BUILD/httpd-2.2.17/build/rpm/httpd.init

[makerpm@host236 SPECS]$
$ rpmbuild -bc httpd.spec
Executing(%prep): /bin/sh -e /var/tmp/rpm-tmp.Vnrgqy
+ umask 022
+ cd /home/makerpm/rpmbuild/BUILD
+ LANG=C
+ export LANG
+ unset DISPLAY
+ cd /home/makerpm/rpmbuild/BUILD
+ rm -rf httpd-2.2.17
+ /usr/bin/gzip -dc /home/makerpm/rpmbuild/SOURCES/httpd-2.2.17.tar.gz
+ /bin/tar -xf -
checking for gfortran... gfortran
checking whether we are using the GNU Fortran 77 compiler... yes
checking whether gfortran accepts -g... yes
checking the maximum length of command line arguments... 1966080
checking command to parse /usr/bin/nm -B output from gcc object... ok
checking for objdir... .libs
checking for ar... (cached) ar
checking for ranlib... (cached) ranlib
checking for strip... strip
checking if gcc supports -fno-rtti -fno-exceptions... no
checking for gcc option to produce PIC... -fPIC
checking if gcc PIC flag -fPIC works... yes
checking if gcc static flag -static works... no
checking if gcc supports -c -o file.o... yes
checking whether the gcc linker (/usr/bin/ld -m elf_x86_64) supports shared libraries... yes
checking whether -lc should be explicitly linked in... no
checking dynamic linker characteristics... GNU/Linux ld.so
checking how to hardcode library paths into programs... immediate
checking whether stripping libraries is possible... yes
checking if libtool supports shared libraries... yes
checking whether to build shared libraries... yes
checking whether to build static libraries... yes
make[1]: Leaving directory `/home/makerpm/rpmbuild/BUILD/httpd-2.2.17'
+ exit 0
[makerpm@host236 SPECS]$
[makerpm@host236 SPECS]$ find ../ | head -20

../
../SOURCES
../SOURCES/httpd-2.2.17.tar.gz
../SOURCES/httpd.init
../SOURCES/make_DEstdir.patch
../SOURCES/apache.sh
../BUILDROOT
../RPMS
../BUILD
../BUILD/httpd-2.2.17
../BUILD/httpd-2.2.17/.gdbinit
../BUILD/httpd-2.2.17/LAYOUT
../BUILD/httpd-2.2.17/build
../BUILD/httpd-2.2.17/build/nw_export.inc
../BUILD/httpd-2.2.17/build/apr_common.m4
../BUILD/httpd-2.2.17/build/config_vars.sh
../BUILD/httpd-2.2.17/build/binbuil.sh
../BUILD/httpd-2.2.17/build/rules.mk
../BUILD/httpd-2.2.17/build/find_apu.m4
../BUILD/httpd-2.2.17/build/rpm

[makerpm@host236 SPECS]$
[makerpm@host236 SPECS]$ rpmbuild -bi httpd.spec
Executing(%prep): /bin/sh -e /var/tmp/rpm-tmp.7yNJJZu
  + umask 022
  + cd /home/makerpm/rpmbuild/BUILD
  + LANG=C
  + export LANG
  + unset DISPLAY
  + cd /home/makerpm/rpmbuild/BUILD
  + rm -rf httpd-2.2.17
  + /bin/tar -xf -
  + /usr/bin/gzip -dc /home/makerpm/rpmbuild/SOURCES/httpd-2.2.17.tar.gz
+ /usr/lib/rpm/redhat/brp-strip-comment-note /usr/bin/strip /usr/bin/objdump
+ /usr/lib/rpm/redhat/brp-python-bytecompile
+ /usr/lib/rpm/redhat/brp-python-hardlink
+ /usr/lib/rpm/redhat/brp-java-repack-jars

Processing files: httpd-2.2.17-1.el6.x86_64
Provides: libapr-1.so.0()(64bit) libaprutil-1.so.0()(64bit) libexpat.so.0()(64bit) libtool(/opt/apache/lib/libapr-1.la) libtool(/opt/apache/lib/libaprutil-1.la) libtool(/opt/apache/lib/libexpat.la) pkgconfig(apr-1) = 1.4.2 pkgconfig(apr-util-1) = 1.3.10
Requires(rpmlib): rpmlib(CompressedFileNames) <= 3.0.4-1 rpmlib(FileDigests) <= 4.6.0-1 rpmlib(PayloadFilesHavePrefix) <= 4.0-1 rpmlib(VersionedDependencies) <= 3.0.3-1
Requires: /bin/bash /bin/sh /usr/bin/perl /usr/bin/pkg-config libapr-1.so.0()(64bit) libaprutil-1.so.0()(64bit) libc.so.6()(64bit) libc.so.6(GLIBC_2.10)(64bit) libc.so.6(GLIBC_2.2.5)(64bit) libc.so.6(GLIBC_2.3)(64bit) libc.so.6(GLIBC_2.3.2)(64bit) libc.so.6(GLIBC_2.3.3)(64bit) libc.so.6(GLIBC_2.9)(64bit) libcrypt.so.1()(64bit) libcrypt.so.1(GLIBC_2.2.5)(64bit) libexpat.so.0()(64bit) libm.so.6()(64bit) libm.so.6(GLIBC_2.2.5)(64bit) libpthread.so.0()(64bit) libpthread.so.0(GLIBC_2.2.5)(64bit) libpthread.so.0(GLIBC_2.3.2)(64bit) libpthread.so.0(GLIBC_2.4)(64bit) librt.so.1()(64bit) perl >= 0:5.004 perl(AnyDBM_File) perl(Fcntl) perl(strict) pkgconfig(apr-1) rtdl(GNU_HASH)
Checking for unpackaged file(s): /usr/lib/rpm/check-files /home/makerpm/rpmbuild/BUILDROOT/httpd-2.2.17-1.el6.x86_64
[makerpm@host236 SPECS]$
[makerpm@host236 SPECS]$ find .. | head -20

./
./SOURCES
./SOURCES/httpd-2.2.17.tar.gz
./SOURCES/httpd.init
./SOURCES/make_DESTDIR.patch
./SOURCES/apache.sh
./BUILDROOT
./BUILDROOT/httpd-2.2.17-1.el6.x86_64
./BUILDROOT/httpd-2.2.17-1.el6.x86_64/opt
./BUILDROOT/httpd-2.2.17-1.el6.x86_64/opt/apache
./BUILDROOT/httpd-2.2.17-1.el6.x86_64/opt/apache/build
./BUILDROOT/httpd-2.2.17-1.el6.x86_64/opt/apache/build/rules.mk
./BUILDROOT/httpd-2.2.17-1.el6.x86_64/opt/apache/build/config.nice
./BUILDROOT/httpd-2.2.17-1.el6.x86_64/opt/apache/build/make_var_export.awk
./BUILDROOT/httpd-2.2.17-1.el6.x86_64/opt/apache/build/instdso.sh
./BUILDROOT/httpd-2.2.17-1.el6.x86_64/opt/apache/build/config_vars.mk
./BUILDROOT/httpd-2.2.17-1.el6.x86_64/opt/apache/build/libtool
./BUILDROOT/httpd-2.2.17-1.el6.x86_64/opt/apache/build/make_exports.awk
./BUILDROOT/httpd-2.2.17-1.el6.x86_64/opt/apache/build/ltlib.mk
./BUILDROOT/httpd-2.2.17-1.el6.x86_64/opt/apache/build/program.mk

[makerpm@host236 SPECS]$
Packaging internally developed software

- Hint: This is also a good place to go and make sure your package manifest (the \%files section) is correct.
[makerpm@host236 SPECS]$ rpmbuild -bb httpd.spec
Executing(%prep): /bin/sh -e /var/tmp/rpm-tmp.d0BdYF
  + umask 022
  + cd /home/makerpm/rpmbuild/BUILD
  + LANG=C
  + export LANG
  + unset DISPLAY
  + cd /home/makerpm/rpmbuild/BUILD
  + rm -rf httpd-2.2.17
  + /bin/tar -xf -
  + /usr/bin/gzip -dc /home/makerpm/rpmbuild/SOURCES/httpd-2.2.17.tar.gz
4.6.0-1 rpmlib(PayloadFilesHavePrefix) <= 4.0-1 rpmlib(VersionedDependencies) 

3.0.3-1

Requires: /bin/bash /bin/sh /usr/bin/perl /usr/bin/pkg-config libapr-1.so.0()(64bit) libaprutil-1.so.0()(64bit) libc.so.6()(64bit) libc.so.6(GLIBC_2.10)(64bit) libc.so.6(GLIBC_2.2.5)(64bit) libc.so.6(GLIBC_2.3)(64bit) libc.so.6(GLIBC_2.3.2)(64bit) libc.so.6(GLIBC_2.3.3)(64bit) libc.so.6(GLIBC_2.9)(64bit) libcrypt.so.1()(64bit) libcrypt.so.1(GLIBC_2.2.5)(64bit) libexpat.so.0()(64bit) libm.so.6()(64bit) libm.so.6(GLIBC_2.2.5)(64bit) libpthread.so.0()(64bit) libpthread.so.0(GLIBC_2.3.2)(64bit) libpthread.so.0(GLIBC_2.4)(64bit) librt.so.1()(64bit) perl >= 0:5.004 perl(AnyDBM_File) perl(Fcntl) perl(strict) pkgconfig(apr-1) rtld(GNU_HASH)

Processing files: httpd-debuginfo-2.2.17-1.el6.x86_64
Checking for unpackaged file(s): /usr/lib/rpm/check-files /home/makerpm/rpmbuild /BUILDROOT/httpd-2.2.17-1.el6.x86_64
Wrote: /home/makerpm/rpmbuild/RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm
Wrote: /home/makerpm/rpmbuild/RPMS/x86_64/httpd-debuginfo-2.2.17-1.el6.x86_64.rpm

Executing(%clean): /bin/sh -e /var/tmp/rpm-tmp.ptzByC
+ umask 022
+ cd /home/makerpm/rpmbuild/BUILD
+ cd httpd-2.2.17
+ rm -rf /home/makerpm/rpmbuild/BUILDROOT/httpd-2.2.17-1.el6.x86_64
+ exit 0

[makerpm@host236 SPECS]$
[makerpm@host236 SPECS]$ find .. | head -20

./
./SOURCES
./SOURCES/httpd-2.2.17.tar.gz
./SOURCES/httpd.init
./SOURCES/make_DESTDIR.patch
./SOURCES/apache.sh
./BUILDROOT
./RPMS
./RPMS/x86_64
./RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm
./RPMS/x86_64/httpd-debuginfo-2.2.17-1.el6.x86_64.rpm
./BUILD
./BUILD/httpd-2.2.17
./BUILD/httpd-2.2.17/.gdbinit
./BUILD/httpd-2.2.17/debugsources.list
./BUILD/httpd-2.2.17/LAYOUT
./BUILD/httpd-2.2.17/build
./BUILD/httpd-2.2.17/build/nw_export.inc
./BUILD/httpd-2.2.17/build/apr_common.m4
./BUILD/httpd-2.2.17/build/config_vars.sh

[makerpm@host236 SPECS]$
[makerpm@host236 SPECS]$ rpmbuild -ba httpd.spec
Executing(%prep): /bin/sh -e /var/tmp/rpm-tmp.mYxBgD
+ umask 022
+ cd /home/makerpm/rpmbuild/BUILD
+ LANG=C
+ export LANG
+ unset DISPLAY
+ cd /home/makerpm/rpmbuild/BUILD
+ rm -rf httpd-2.2.17
+ /bin/tar -xf -
+ /usr/bin/gzip -dc /home/makerpm/rpmbuild/SOURCES/httpd-2.2.17.tar.gz
3.0.3-1

Requires: /bin/bash /bin/sh /usr/bin/perl /usr/bin/pkg-config libapr-1.so.0()(64bit) libaprutil-1.so.0()(64bit) libc.so.6()(64bit) libc.so.6(GLIBC_2.10)(64bit) libc.so.6(GLIBC_2.2.5)(64bit) libc.so.6(GLIBC_2.3)(64bit) libc.so.6(GLIBC_2.3.2)(64bit) libc.so.6(GLIBC_2.3.3)(64bit) libc.so.6(GLIBC_2.9)(64bit) libcrypt.so.1()(64bit) libcrypt.so.1(GLIBC_2.2.5)(64bit) libexpat.so.0()(64bit) libm.so.6()(64bit) libm.so.6(GLIBC_2.2.5)(64bit) libpthread.so.0()(64bit) libpthread.so.0(GLIBC_2.2.5)(64bit) libpthread.so.0(GLIBC_2.3.2)(64bit) libpthread.so.0(GLIBC_2.4)(64bit) librt.so.1()(64bit) perl >= 0:5.004 perl(AnyDBM_File) perl(Fcntl) perl(strict) pkgconfig(apr-1) rtld(GNU_HASH)
Processing files: httpd-debuginfo-2.2.17-1.el6.x86_64
Checking for unpackaged file(s): /usr/lib/rpm/check_files /home/makerpm/rpmbuild/BUILDROOT/httpd-2.2.17-1.el6.x86_64
Wrote: /home/makerpm/rpmbuild/SRPMs/httpd-2.2.17-1.el6.src.rpm
Wrote: /home/makerpm/rpmbuild/RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm
Wrote: /home/makerpm/rpmbuild/RPMS/x86_64/httpd-debuginfo-2.2.17-1.el6.x86_64.rpm
Executing(%clean): /bin/sh -e /var/tmp/rpm-tmp.KWRfr6
+ umask 022
+ cd /home/makerpm/rpmbuild/BUILD
+ cd httpd-2.2.17
+ rm -rf /home/makerpm/rpmbuild/BUILDROOT/httpd-2.2.17-1.el6.x86_64
+ exit 0
[makerpm@host236 SPECS]$
[makerpm@host236 SPECS]$ find ../ | head -20

./
./SOURCES
./SOURCES/httpd-2.2.17.tar.gz
./SOURCES/httpd.init
./SOURCES/make_DESTDIR.patch
./SOURCES/apache.sh
./BUILDROOT
./RPMS
./RPMS/x86_64
./RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm
./RPMS/x86_64/httpd-debuginfo-2.2.17-1.el6.x86_64.rpm
./BUILD
./BUILD/httpd-2.2.17
./BUILD/httpd-2.2.17/.gdbinit
./BUILD/httpd-2.2.17/debugsources.list
./BUILD/httpd-2.2.17/LAYOUT
./BUILD/httpd-2.2.17/build
./BUILD/httpd-2.2.17/build/nw_export.inc
./BUILD/httpd-2.2.17/build/apr_common.m4
./BUILD/httpd-2.2.17/build/config_vars.sh

[makerpm@host236 SPECS]$
Packaging internally developed software

• About debuginfo RPMs:
  • To disable stripping binaries and creating the debug packages, add this to the spec file:
    • %define debug_package %{nil}
  • You will probably have to change your %files section
Name: httpd
Version: 2.2.17
Release: 1%{?dist}
Summary: Apache httpd for Acme Widget

Group: System Environments/Daemons
License: ASL 2.0
URL: http://httpd.apache.org
Source0: httpd-2.2.17.tar.gz
Source1: apache.sh
Source2: httpd.init
Patch0: make_DESTDIR.patch

BuildRoot: %__tmppath%/%{name}-%{version}-%{release}-root-%{_id_u} -n

BuildRequires: autoconf, libtool, make, gcc
#Requires:

%define debug_package %{nil}
%
description
This is a custom build of Apache for Acme Widget Corp

%prep

19.0-1
<table>
<thead>
<tr>
<th>Requires(rpmlib): rpmlib(CompressedFileNames) &lt;= 3.0.4-1 rpmlib(FileDigests) &lt;= 4.6.0-1 rpmlib(PayloadFilesHavePrefix) &lt;= 4.0-1 rpmlib(VersionedDependencies) &lt;= 3.0.3-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requires: /bin/bash /bin/sh /usr/bin/perl /usr/bin/pkg-config libapr-1.so.0(64bit) libaprutil-1.so.0(64bit) libc.so.6(64bit) libc.so.6(GLIBC_2.10)(64bit) libc.so.6(GLIBC_2.2.5)(64bit) libc.so.6(GLIBC_2.3)(64bit) libc.so.6(GLIBC_2.3.2)(64bit) libc.so.6(GLIBC_2.3.3)(64bit) libc.so.6(GLIBC_2.9)(64bit) libcrypt.so.1(64bit) libcrypt.so.1(GLIBC_2.2.5)(64bit) libexpat.so.0(64bit) libm.so.6(64bit) libm.so.6(GLIBC_2.2.5)(64bit) libpthread.so.0(64bit) libpthread.so.0(GLIBC_2.2.5)(64bit) libpthread.so.0(GLIBC_2.3.2)(64bit) libpthread.so.0(GLIBC_2.4)(64bit) librt.so.1(64bit) perl &gt;= 0:5.004 perl(AnyDBM_File) perl(Fcntl) perl(strict) pkgconfig(apr-1) rtld(GNU_HASH)</td>
</tr>
</tbody>
</table>

Checking for unpackaged file(s): /usr/lib/rpm/check-files /home/makerpm/rpmbuild/BUILDROOT/httpd-2.2.17-1.el6.x86_64
Wrote: /home/makerpm/rpmbuild/SRPMS/httpd-2.2.17-1.el6.src.rpm
Wrote: /home/makerpm/rpmbuild/RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm
Executing(%clean): /bin/sh -e /var/tmp/rpm-tmp.1b40ID
+ umask 022
+ cd /home/makerpm/rpmbuild/BUILD
+ cd httpd-2.2.17
+ rm -rf /home/makerpm/rpmbuild/BUILDROOT/httpd-2.2.17-1.el6.x86_64
+ exit 0
[makerpm@host236 SPECS]$
Packaging internally developed software

- Sign your RPM
rpm --resign ../RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm
Enter pass phrase:
Pass phrase is good.
../RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm:

Packaging internally developed software

- Import the gpg key into the RPM database and install and test
[makerpm@host236 SPECS]$ su -
Password:
[root@host236 ~]# rpm --checksig /home/makerpm/rpmbuild/RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm
/home/makerpm/rpmbuild/RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm: RSA sha1 ((MD5) PGP) ((MD5) PGP) md5 NOT OK (MISSING KEYS: (MD5) PGP#406f995c (MD5) PGP#406f995c)
[root@host236 ~]#
[root@host236 ~]# rpm --import /home/makerpm/ACME-WIDGET-GPG-KEY
[root@host236 ~]# rpm --checksig /home/makerpm/rpmbuild/RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm
/home/makerpm/rpmbuild/RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm: rsa sha1 (md5) pgp (md5) pgp md5 OK
[root@host236 ~]# rpm --checksig -v /home/makerpm/rpmbuild/RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm
/home/makerpm/rpmbuild/RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm:
  Header V4 RSA/SHA1 Signature, key ID 406f995c: OK
  Header SHA1 digest: OK (f88a2d3b6be50e12628569bcb267dad58653d905)
  V4 RSA/SHA1 Signature, key ID 406f995c: OK
  V4 RSA/SHA1 Signature, key ID 406f995c: OK
  MD5 digest: OK (6948bf7d59d357b9645e9ed6ba5d3661)
[root@host236 ~]#
[root@host236 ~]# yum localinstall /home/makerpm/rpmbuild/RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm
Loaded plugins: rhnplugin
Setting up Local Package Process
Examining /home/makerpm/rpmbuild/RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm: httpd-2.2.17-1.el6.x86_64
Marking /home/makerpm/rpmbuild/RPMS/x86_64/httpd-2.2.17-1.el6.x86_64.rpm to be installed
rhel-x86_64-server-6 | 1.5 kB 00:00
rhel-x86_64-server-ha-6 | 1.5 kB 00:00
rhel-x86_64-server-lb-6 | 1.2 kB 00:00
rhel-x86_64-server-optional-6 | 1.3 kB 00:00
rhel-x86_64-server-rs-6 | 1.5 kB 00:00
rhel-x86_64-server-supplementary-6 | 1.5 kB 00:00
rhn-tools-rhel-x86_64-server-6 | 1.3 kB 00:00
Resolving Dependencies --> Running transaction check
----> Package httpd.x86_64 0:2.2.17-1.el6 set to be updated
--> Finished Dependency Resolution

Dependencies Resolved

<table>
<thead>
<tr>
<th>Package</th>
<th>Arch</th>
<th>Version</th>
<th>Repository</th>
<th>Size</th>
</tr>
</thead>
</table>

SUMMIT JBoss WORLD
PRESENTED BY RED HAT
Installing:

httpd  x86_64  2.2.17-1.el6  /httpd-2.2.17-1.el6.x86_64  16 M

Transaction Summary

Install  1 Package(s)
Upgrade  0 Package(s)

Total size: 16 M
Installed size: 16 M
Is this ok [y/N]: y
Downloading Packages:
Running rpm_check_debug
Running Transaction Test
Transaction Test Succeeded
Running Transaction
  Installing      : httpd-2.2.17-1.el6.x86_64

Installed:
  httpd.x86_64  0:2.2.17-1.el6

Complete!
[root@host236 ~]#
[root@host236 ~]# service httpd.init start
Starting httpd: (2)No such file or directory: httpd: could not open error log file /opt/apache/logs/error_log.
Unable to open logs

[FAILED]
Packaging internally developed software

- Back to the spec file!
- In this case, adding only files was not the right choice, we needed to add the directories the packages owns, as well!
Name: httpd
Version: 2.2.17
Release: 2%{?dist}
Summary: Apache httpd for Acme Widget
Group: System Environments/Daemons
License: ASL 2.0
URL: http://httpd.apache.org
Source0: httpd-2.2.17.tar.gz
Source1: apache.sh
Source2: httpd.init
Patch0: makeDESTDIR.patch
BuildRoot: %{_tmppath}/%{name}-%{version}-%{release}-root-%{__id_u} -n

BuildRequires: autoconf, libtool, make, gcc
Requires: compat-expat1

%define debug_package %{nil}

%description
This is a custom build of Apache for Acme Widget Corp

%prep
%setup -q
%patch0 -p1

%build
./configure --prefix=/opt/apache
make %{?_smp_mflags}

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

mkdir -p $RPM_BUILD_ROOT/etc/profile.d
mkdir -p $RPM_BUILD_ROOT/etc/rc.d/init.d
mkdir -p $RPM_BUILD_ROOT/opt/apache/logs
install -m 755 $RPM_SOURCE_DIR/apache.sh $RPM_BUILD_ROOT/etc/profile.d
install -m 755 $RPM_SOURCE_DIR/httpd.init $RPM_BUILD_ROOT/etc/rc.d/init.d

%clean
rm -rf $RPM_BUILD_ROOT

%files
%defattr(-,root,root,-)
/opt/apache/build/rules.mk
-- INSERT --
%doc

%changelog
* Sat Apr 30 2011 Make RPM <makerpm@example.com>
  - Fixed lack of log file directory

* Wed Apr 27 2011 Make RPM <makerpm@example.com>
-- INSERT --
root@host236:~

Requires: /bin/bash /bin/sh /usr/bin/perl libapr-1.so.0()(64bit) libaprutil-1.so.0()(64bit) libc.so.6()(64bit) libc.so.6(GLIBC_2.2.5)(64bit) libc.so.6(GLIBC_2.3)(64bit) libcrypt.so.1()(64bit) libexpat.so.0()(64bit) libgcc_s.so.1(64bit) libidm.so.6(GLIBC_2.2.5)(64bit) libpthread.so.0()(64bit) libpthread.so.0(GLIBC_2.2.5)(64bit) librt.so.1()(64bit) perl >= 0:5.004 perl(AnyDBM_File) perl(Fcntl) perl(strict) rtld(GNU_HASH)

Checking for unpackaged file(s): /usr/lib/rpm/check-files /home/makerpm/rpmbuild/BUILDROOT/httpd-2.2.17-2.el6.x86_64
Wrote: /home/makerpm/rpmbuild/SRPMS/httpd-2.2.17-2.el6.src.rpm
Wrote: /home/makerpm/rpmbuild/RPMS/x86_64/httpd-2.2.17-2.el6.x86_64.rpm
Executing(%clean): /bin/sh -e /var/tmp/rpm-tmp.OTomOT + umask 022
 + cd /home/makerpm/rpmbuild/BUILD
 + cd httpd-2.2.17
 + rm -rf /home/makerpm/rpmbuild/BUILDROOT/httpd-2.2.17-2.el6.x86_64
 + exit 0
[makerpm@host236 SPECS]$ rpm --resign /home/makerpm/rpmbuild/RPMS/x86_64/httpd-2.2.17-2.el6.x86_64.rpm
Enter pass phrase:
Pass phrase is good.
/home/makerpm/rpmbuild/RPMS/x86_64/httpd-2.2.17-2.el6.x86_64.rpm:
[makerpm@host236 SPECS]$ su -
Password:
[root@host236 ~]#
Installing:

httpd  x86_64  2.2.17-2.el6  /httpd-2.2.17-2.el6.x86_64  16 M

Transaction Summary

<table>
<thead>
<tr>
<th>Action</th>
<th>Packages (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install</td>
<td>1 Package(s)</td>
</tr>
<tr>
<td>Upgrade</td>
<td>0 Package(s)</td>
</tr>
</tbody>
</table>

Total size: 16 M
Installed size: 16 M
Is this ok [y/N]: y

Downloading Packages:
Running rpm_check_debug
Running Transaction Test
Transaction Test Succeeded
Running Transaction
  Installing  : /httpd-2.2.17-2.el6.x86_64

Installed:
  httpd.x86_64  0:2.2.17-2.el6

Complete!
[root@host236 ~]#
[root@host236 ~]# service httpd.init start
Starting httpd:
[root@host236 ~]# ps ax | grep httpd
17493 ? Ss 0:00 /opt/apache/bin/httpd
17495 ? S 0:00 /opt/apache/bin/httpd
17496 ? S 0:00 /opt/apache/bin/httpd
17497 ? S 0:00 /opt/apache/bin/httpd
17498 ? S 0:00 /opt/apache/bin/httpd
17499 ? S 0:00 /opt/apache/bin/httpd
17501 pts/0 R+ 0:00 grep httpd
[root@host236 ~]#
It works!
httpd  x86_64   2.2.17-2.el6      @/httpd-2.2.17-2.el6.x86_64  16 M

Transaction Summary
================================================================================
Remove  1 Package(s)
Reinstall  0 Package(s)
Downgrade  0 Package(s)
================================================================================

Downloading Packages:
Running rpm_check_debug
Running Transaction Test
Transaction Test Succeeded
Running Transaction
  Erasing : httpd-2.2.17-2.el6.x86_64  1/1
warning: /opt/apache/conf/httpd.conf saved as /opt/apache/conf/httpd.conf.rpmsave
warning: /opt/apache/conf/extra/httpd-vhosts.conf saved as /opt/apache/conf/extra/httpd-vhosts.conf.rpmsave

Removed:
  httpd.x86_64 0:2.2.17-2.el6

Complete!
[root@host236 ~]#
Running Transaction Test
Transaction Test Succeeded
Running Transaction
  Erasing : httpd-2.2.17-2.el6.x86_64 1/1
warning: /opt/apache/conf/httpd.conf saved as /opt/apache/conf/httpd.conf.rpmsave
warning: /opt/apache/conf/extra/httpd-vhosts.conf saved as /opt/apache/conf/extra/httpd-vhosts.conf.rpmsave

Removed:
  httpd.x86_64 0:2.2.17-2.el6

Complete!
[root@host236 ~]# find /opt/
/opt/
/opt/apache
/opt/apache/logs
/opt/apache/logs/access_log
/opt/apache/logs/error_log
/opt/apache/conf
/opt/apache/conf/httpd.conf.rpmsave
/opt/apache/conf/extra
/opt/apache/conf/extra/httpd-vhosts.conf.rpmsave
[root@host236 ~]#
Packaging third party COTS software

- Often times software is installed from tarballs and shell scripts or other installers.
  - Makes it very hard to centralize version control
  - Makes it very hard to centralize integrity checking
  - Makes it very hard to centralize deployment
    - And, no, "for i in host1 host2 host3; do scp my.tgz root@$i; done" is not an enterprise centralized deployment mechanism!
Packaging third party COTS software

For this example, we are going to create an RPM from an application which has been installed by an installer program into which we have no visibility.

- First, get a baseline of what is installed. You can run the `/etc/cron.daily/mlocate` script to update the locate database. Dump that to a text file.
- Install your app, run the `mlocate` script again, and dump it to a text file.
- Diff the text files.
- Use `/bin/find` to find anything on the filesystem modified since your first text file was made.
[root@t510 ~]# /etc/cron.daily/mlocate.cron
[root@t510 ~]# locate */ > before.txt
[root@t510 ~]# cd tmp/
[root@t510 tmp]# sh install.sh
[root@t510 tmp]# cd ..
[root@t510 ~]# /etc/cron.daily/mlocate.cron
[root@t510 ~]# locate */ > after.txt
[root@t510 ~]# diff before.txt after.txt

272a273
> /etc/foo.conf
1443a1445
> /etc/ld.so.conf.d/foo-x86_64.conf
33843a33846,33855
> /opt/myapp
> /opt/myapp/bin
> /opt/myapp/lib
> /opt/myapp/sbin
> /opt/myapp/bin/bar
> /opt/myapp/bin/foo
> /opt/myapp/lib/libbar.so
> /opt/myapp/lib/libbaz.so
> /opt/myapp/lib/libfoo.so
> /opt/myapp/sbin/baz
314662c314674
< /var/lib/mlocate/mlocate.db.XQMUCv
---
> /var/lib/mlocate/mlocate.db.lzsVyC
[root@t510 ~]#
```bash
[root@t510 ~]# find / -newer before.txt 2> /dev/null | egrep -v "\/sys\|\/proc\|\/dev\|\/tmp"
/var/lib/mlocate
/var/lib/mlocate/mlocate.db
/var/run/pcscd.events
/var/run/pcscd.events/event.6022.17011352
/etc
/etc/ld.so.conf.d
/etc/ld.so.conf.d/foo-x86_64.conf
/etc/profile
/etc/foo.conf
/opt
/opt/myapp
/opt/myapp/bin
/opt/myapp/bin/bar
/opt/myapp/bin/foo
/opt/myapp/lib
/opt/myapp/lib/libfoo.so
/opt/myapp/lib/libbaz.so
/opt/myapp/lib/libbar.so
/opt/myapp/sbin
/opt/myapp/sbin/baz
/root/after.txt
[root@t510 ~]# 
```
Packaging third party COTS software

So in this case, we see that the following files have been added to the system or modified:

- `/etc/foo.conf`
- `/etc/ld.so.conf.d/foo-x86_64.conf`
- `/etc/profile` (we know it changed, but not how)
- `/opt/myapp/bin`
  - `/opt/myapp/bin/bar`
  - `/opt/myapp/bin/foo`
Packaging third party COTS software

- So in this case, we see that the following files have been added to the system or modified:
  - `/opt/myapp/lib`
    - `/opt/myapp/lib/libbar.so`
    - `/opt/myapp/lib/libbaz.so`
    - `/opt/myapp/lib/libfoo.so`
  - `/opt/myapp/sbin`
    - `/opt/myapp/sbin/baz`
Packaging third party COTS software

- Look for any files which will need to be customized
  - Inspect `/etc/profile`
fi

HOSTNAME=`/bin/hostname 2>/dev/null`
HISTSIZE=1000
if [ "$HISTCONTROL" = "ignoreback" ]; then
  export HISTCONTROL=ignoreboth
else
  export HISTCONTROL=ignoredups
fi

# Added by foo installer
PATH="/opt/myapp/bin:$PATH"
if [ `id -u` -eq 0 ] || [ `id -g` -eq 0 ]; then
  PATH="/opt/myapp/sbin:$PATH"
fi
# end added by foo installer

export PATH USER LOGNAME MAIL HOSTNAME HISTSIZE HISTCONTROL

for i in /etc/profile.d/*.sh ; do
  if [ -r "$i" ]; then
    if [ "$PS1" ]; then
      . $i
    fi
fi

::
Packaging third party COTS software

- Look for any files which will need to be customized
  - The only one of these which might change from system to system is the config file, `/etc/foo.conf`
[root@host236 ~]# cat /etc/foo.conf
# this is the foo config file
fooclient=host236.tc.redhat.com
fooserver=fooserver.tc.redhat.com
[root@host236 ~]#
Packaging third party COTS software

• For now, just remember that the config file has settings which will need to be changed from host to host.
Packaging third party COTS software

• For now, just remember that the config file has settings which will need to be changed from host to host.
  • Remember config file macros in RHN Satellite...?
Packaging third party COTS software

- Create a directory called [app]-[version].[release]
  - For instance, ~/myapp-1.0
- Copy the installed software into this directory. Can be hierarchical or just dumped into the directory, but hierarchical is more human recognizable. The directory you create will be the “root” of the RPM.
[root@host236 ~]# mkdir foo-1.0
[root@host236 ~]# tar c /opt/myapp/ | tar x -C foo-1.0/
tar: Removing leading `/' from member names
[root@host236 ~]# tar c /etc/ld.so.conf.d/foo-x86_64.conf | tar x -C foo-1.0/
tar: Removing leading `/' from member names
[root@host236 ~]# tar c /etc/foo.conf | tar x -C foo-1.0/
tar: Removing leading `/' from member names
[root@host236 ~]#
[root@host236 ~]# find foo-1.0/
foo-1.0/
  foo-1.0/etc
  foo-1.0/etc/ld.so.conf.d
  foo-1.0/etc/ld.so.conf.d/foo-x86_64.conf
  foo-1.0/etc/foo.conf
  foo-1.0/opt
  foo-1.0/opt/myapp
  foo-1.0/opt/myapp/bin
  foo-1.0/opt/myapp/bin/bar
  foo-1.0/opt/myapp/bin/foo
  foo-1.0/opt/myapp/lib
  foo-1.0/opt/myapp/lib/libfoo.so
  foo-1.0/opt/myapp/lib/libbaz.so
  foo-1.0/opt/myapp/lib/libbar.so
  foo-1.0/opt/myapp/sbin
  foo-1.0/opt/myapp/sbin/baz
[root@host236 ~]#
Packaging third party COTS software

- Since we don't want to modify the system-provided `/etc/profile`, we'll create a script to go in `/etc/profile.d` called `foo.sh` and add it to our tree:
#!/bin/bash
PATH="/opt/myapp/bin:$PATH"
if [ `id -u` -eq 0 ] || [ `id -g` -eq 0 ]; then
    PATH="/opt/myapp/sbin:$PATH"
fi
[root@host236 ~]# chmod 755 foo.sh
[root@host236 ~]# mkdir foo-1.0/etc/profile.d
[root@host236 ~]# mv foo.sh foo-1.0/etc/profile.d
[root@host236 ~]#
[root@host236 ~]# find foo-1.0/
foo-1.0/
foo-1.0/etc
foo-1.0/etc/ld.so.conf.d
foo-1.0/etc/ld.so.conf.d/foo-x86_64.conf
foo-1.0/etc/profile.d
foo-1.0/etc/profile.d/foo.sh
foo-1.0/etc/foo.conf
foo-1.0/opt
foo-1.0/opt/myapp
foo-1.0/opt/myapp/bin
foo-1.0/opt/myapp/bin/bar
foo-1.0/opt/myapp/bin/foo
foo-1.0/opt/myapp/lib
foo-1.0/opt/myapp/lib/libfoo.so
foo-1.0/opt/myapp/lib/libbaz.so
foo-1.0/opt/myapp/lib/libbar.so
foo-1.0/opt/myapp/sbin
foo-1.0/opt/myapp/sbin/baz
[root@host236 ~]#
Packaging third party COTS software

- Create a tar.gz or tar.bz2 file from this directory. The name should be something like:
  - `[name]-[version].[build].tar.gz` or
  - `[name]-[version].[build].tgz` or
  - `[name]-[version].[build].tar.bz2`
[root@host236 ~]# tar jcvf foo-1.0.tar.bz2 foo-1.0/
foo-1.0/
foo-1.0/etc/
foo-1.0/etc/ld.so.conf.d/
foo-1.0/etc/ld.so.conf.d/foo-x86_64.conf
foo-1.0/etc/profile.d/
foo-1.0/etc/profile.d/foo.sh
foo-1.0/etc/foo.conf
foo-1.0/opt/
foo-1.0/opt/myapp/
foo-1.0/opt/myapp/bin/
foo-1.0/opt/myapp/bin/bar
foo-1.0/opt/myapp/bin/foo
foo-1.0/opt/myapp/lib/
foo-1.0/opt/myapp/lib/libfoo.so
foo-1.0/opt/myapp/lib/libbaz.so
foo-1.0/opt/myapp/lib/libbar.so
foo-1.0/opt/myapp/sbin/
foo-1.0/opt/myapp/sbin/baz
[root@host236 ~]# ls
after.txt  before.txt  foo-1.0  foo-1.0.tar.bz2  tmp
[root@host236 ~]#
Packaging third party COTS software

- Now that you've created the tarball, put it where a non-root user can get it. Make sure the non-root user can read it!
# tar jcvf foo-1.0.tar.bz2 foo-1.0/
foo-1.0/
foo-1.0/etc/
foo-1.0/etc/ld.so.conf.d/
foo-1.0/etc/ld.so.conf.d/foo-x86_64.conf
foo-1.0/etc/profile.d/
foo-1.0/etc/profile.d/foo.sh
foo-1.0/etc/foo.conf
foo-1.0/opt/
foo-1.0/opt/myapp/
foo-1.0/opt/myapp/bin/
foo-1.0/opt/myapp/bin/bar
foo-1.0/opt/myapp/bin/foo
foo-1.0/opt/myapp/lib/
foo-1.0/opt/myapp/lib/libfoo.so
foo-1.0/opt/myapp/lib/libbaz.so
foo-1.0/opt/myapp/lib/libbar.so
foo-1.0/opt/myapp/sbin/
foo-1.0/opt/myapp/sbin/baz

# ls
after.txt before.txt foo-1.0 foo-1.0.tar.bz2 tmp

# cp foo-1.0.tar.bz2 /tmp/

# chmod 644 /tmp/foo-1.0.tar.bz2

#
Packaging third party COTS software

- Make sure you have the “Development tools” package group installed. For convenience sake, we recommend you also install the rpmdevtools package.
- As a non-root user, create your RPM build tree using rpmdev-setuptree.
[tcameron@host236 ~]$ ls
Desktop
[tcameron@host236 ~]$ rpmdev-setuptree
[tcameron@host236 ~]$ ls
Desktop  rpmbuild
[tcameron@host236 ~]$ find rpmbuild/
rpmbuild/
rpmbuild/RPMS
rpmbuild/SRPMS
rpmbuild/SPECS
rpmbuild/SOURCES
rpmbuild/BUILD
[tcameron@host236 ~]$
Packaging third party COTS software

• Copy the tarball into your ~/rpmbuild/SOURCES directory
Packaging third party COTS software

- Change your `~/rpmbuild/SPECS` directory and create a spec file
  - `rpmdev-newspec  [name]`
[tcameron@host236 ~]$ cd rpmbuild/SPECS/
[tcameron@host236 SPECS]$ rpmdev-newspec foo
Skeleton specfile (minimal) has been created to "foo.spec".
[tcameron@host236 SPECS]$
Packaging third party COTS software

- In this case, we want to setup and prep, but we do not want to `./configure or make or make DESTDIR install`.

- We also do not want to strip the binaries of debug symbols – they may have been compiled and/or stripped in a non-GNU tools environment and we could break them.
Name: foo
Version: 1.0
Release: 1%{?dist}
Summary: Foo for ACME Widget Corporation

Group: Applications/Communications
License: Commercial
URL: http://www.acmewidgetcorporation.com
Source0: /tmp/foo-1.0.tar.bz2
BuildRoot: %{_tmppath}/%{name}-%{version}-%{release}-root-%{_id_u} -n

%define debug_package %{nil}

#BuildRequires:
#Requires:

%description
This is the foo application

%prep
%setup -q

#%install
#%install
rm -rf $RPM_BUILD_ROOT
#make install DESTDIR=$RPM_BUILD_ROOT
mkdir -p $RPM_BUILD_ROOT/opt/myapp/bin
mkdir -p $RPM_BUILD_ROOT/opt/myapp/lib
mkdir -p $RPM_BUILD_ROOT/opt/myapp/sbin
mkdir -p $RPM_BUILD_ROOT/etc/profile.d
mkdir -p $RPM_BUILD_ROOT/etc/ld.so.conf.d
install -m 755 ./opt/myapp/bin/foo $RPM_BUILD_ROOT/opt/myapp/bin/foo
install -m 755 ./opt/myapp/bin/bar $RPM_BUILD_ROOT/opt/myapp/bin/bar
install -m 644 ./opt/myapp/lib/libbar.so $RPM_BUILD_ROOT/opt/myapp/lib/libbar.so
install -m 644 ./opt/myapp/lib/libbaz.so $RPM_BUILD_ROOT/opt/myapp/lib/libbaz.so
install -m 644 ./opt/myapp/lib/libfoo.so $RPM_BUILD_ROOT/opt/myapp/lib/libfoo.so
install -m 755 ./opt/myapp/sbin/baz $RPM_BUILD_ROOT/opt/myapp/sbin/baz
install -m 755 ./etc/profile.d/foo.sh $RPM_BUILD_ROOT/etc/profile.d/foo.sh
install -m 644 ./etc/ld.so.conf.d/foo-x86_64.conf $RPM_BUILD_ROOT/etc/ld.so.conf.d/foo-x86_64.conf
install -m 644 ./etc/foo.conf $RPM_BUILD_ROOT/etc/foo.conf
%clean
rm -rf $RPM_BUILD_ROOT
install -m 755 ./etc/ld.so.conf.d/foo-x86_64.conf $RPM_BUILD_ROOT/etc/ld.so.conf.d/foo-x86_64.conf
install -m 755 ./etc/foo.conf $RPM_BUILD_ROOT/etc/foo.conf

%clean
rm -rf $RPM_BUILD_ROOT

%files
%defattr(-,root,root,-)
/etc/foo.conf
/etc/ld.so.conf.d/foo-x86_64.conf
/etc/profile.d/foo.sh
/opt/myapp/bin/bar
/opt/myapp/bin/foo
/opt/myapp/lib/libbar.so
/opt/myapp/lib/libbaz.so
/opt/myapp/lib/libfoo.so
/opt/myapp/sbin/baz
%doc

%changelog
* Thu Apr 28 2011 Thomas Cameron
- first try
[tcameron@host236 SPECS]$ rpmbuild -ba foo.spec
+ /usr/lib/rpm/check-buildroot
+ /usr/lib/rpm/redhat/brp-compress
+ /usr/lib/rpm/redhat/brp-strip /usr/bin/strip
+ /usr/lib/rpm/redhat/brp-strip-static-archive /usr/bin/strip
+ /usr/lib/rpm/redhat/brp-strip-comment-note /usr/bin/strip /usr/bin/objdump
+ /usr/lib/rpm/brp-python-bytecompile
+ /usr/lib/rpm/redhat/brp-python-hardlink
+ /usr/lib/rpm/redhat/brp-java-repack-jars
Processing files: foo-1.0-1.el6.x86_64
Requires(rpmlib): rpmlib(CompressedFileNames) <= 3.0.4-1 rpmlib(FileDigests) <= 4.6.0-1 rpmlib(PayloadFilesHavePrefix) <= 4.0-1
Requires: /bin/bash libc.so.6()()(64bit) libc.so.6(GLIBC_2.2.5)(64bit) rtld(GNU_HASH)
Checking for unpackaged file(s): /usr/lib/rpm/check-files /home/tcameron/rpmbuild/BUILDROOT/foo-1.0-1.el6.x86_64
Wrote: /home/tcameron/rpmbuild/SRPMS/foo-1.0-1.el6.src.rpm
Wrote: /home/tcameron/rpmbuild/RPMS/x86_64/foo-1.0-1.el6.x86_64.rpm
Executing(%clean): /bin/sh -e /var/tmp/rpm-tmp.YxN8Ji
+ umask 022
+ cd /home/tcameron/rpmbuild/BUILD
+ cd foo-1.0
+ rm -rf /home/tcameron/rpmbuild/BUILDROOT/foo-1.0-1.el6.x86_64
+ exit 0
[tcameron@host236 SPECS]$
tcameron@host236 SPECS]$ find ../

../RPMS
../RPMS/x86_64
../RPMS/x86_64/foo-1.0-1.el6.x86_64.rpm
../SRPMS
../SRPMS/foo-1.0-1.el6.src.rpm
../BUILDROOT
../SPECS
../SPECS/foo.spec
../SOURCES
../SOURCES/foo-1.0.tar.bz2
../BUILD
../BUILD/foo-1.0
../BUILD/foo-1.0/opt
../BUILD/foo-1.0/opt/myapp
../BUILD/foo-1.0/opt/myapp/bin
../BUILD/foo-1.0/opt/myapp/bin/foo
../BUILD/foo-1.0/opt/myapp/bin/bar
../BUILD/foo-1.0/opt/myapp/lib
../BUILD/foo-1.0/opt/myapp/lib/libbar.so
../BUILD/foo-1.0/opt/myapp/lib/libbaz.so
../BUILD/foo-1.0/opt/myapp/lib/libfoo.so
../BUILD/foo-1.0/opt/myapp/sbin
Packaging third party COTS software

- Sign your packages with gpg as described previously.
tcameron@host236 ~]$ sudo rpm -Uvh rpmbuild/RPMS/x86_64/foo-1.0-1.el6.x86_64.rpm
Preparing...                                        ####### [100%]
  1:foo                                             ####### [100%]
[tcameron@host236 ~]$  

$ sudo rpm -Uvh rpmbuild/RPMS/x86_64/foo-1.0-1.el6.x86_64.rpm
Preparing... [100%]
  1:foo [100%]
$ ssh localhost
tcameron@localhost's password:
Last login: Thu Apr 28 22:49:23 2011 from localhost.localdomain
$ foo
foo
$ bar
bar
$ baz
-bash: baz: command not found
$ echo $PATH
/usr/lib64/qt-3.3/bin:/opt/myapp/bin:/usr/local/bin:/bin:/usr/bin:/usr/local/sbin:
/usr/sbin:/sbin:/sbin:/home/tcameron/bin
$
```
[tcameron@host236 ~]$ ssh root@localhost
root@localhost's password:
Last login: Thu Apr 28 22:50:11 2011 from localhost.localdomain
[root@host236 ~]# baz
baz
[root@host236 ~]# echo $PATH
/usr/lib64/qt-3.3/bin:/opt/myapp/sbin:/opt/myapp/bin:/usr/local/sbin:/usr/local/bin:
/sbin:/bin:/usr/sbin:/usr/bin:/root/bin
[root@host236 ~]#
```
And That's It!

- You've gotten a glimpse into how to package from source and with COTS binaries!
Thank you!

- If you liked today's presentation, please let us know!
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Questions?