Lab – Project-Builder.org

Lab Contents

This lab purpose is to install and use Project-Builder.org to produce packages for native and non-native Operating System, as well as experiencing the Continuous Packaging concept.

Lab Writer and Trainer

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Table of content

Objectives....2
Reference documents....3
Environment setup....3
Project-builder.org installation....3
Local subversion setup....4
Using pb with an existing project (tar)....5
Pb setup....5
pb repository setup....7
Tar file creation....9
Dealing with filters....12
Building packages....19
Building for another distribution....29
By using an existing rpm based distribution VM....29
By using an existing deb based distribution VM....43
By creating a new VM....57
By creating a new VE (optional)....58
Using pb with an existing project (SVN)....58
pb setup....58
pb repository setup....59
Tar file and package creation....60

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Overview of the Project-Builder.org Lab

Objectives

At the end of the Lab students should be able to install Project-Builder.org, use pb to create a new project, package it natively, inside a VM and/or a VE for another OS.

Expected duration : 120 minutes

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Reference documents

When dealing with the installation and configuration of Project-Builder.org, the first approach is to look at the reference Web site http://trac.project-builder.org:

The netperf example is the most up to date introduction document at http://trac.project-builder.org/wiki/NetPerfExample as well as man page for pb.

A bootstrap page has been contributed by Bryan Gartner at: http://trac.project-builder.org/wiki/Bootstrapping

All the documentation is provided currently under a wiki format, so contributors are welcome and expected, including those finding issues in that training material. Trac also provides a bug report/enhancement request feature ;-)

A mailing-list dealing with pb is available at http://mondorescue.org/sympa/arc/pb-devel

Estimated time for the lab is placed in front of each part.

Environment setup

Estimated time: 15 minutes

Project-builder.org installation

Project-Builder.org is available externaly from ftp://ftp.project-builder.org/ and internally on the HP LAN from http://eurolinux.gre.hp.com/pub/linux/mondorescue/ or using ftp as well from the same place. An SVN access is also available, Cf the Wiki.

Version 0.9.8 is the current stable release. Version devel is the development version

You may want to use yum to do the installation. For that, download the file under `rhel/5` named `pb.repo` and place it under your `/etc/yum.repos.d` directory. Of course, you can use rpm and deal with the dependencies yourself ;-)

You'll also need for RHEL additional packages not provided in the base distribution, but which are brought by RPMforge (or EPEL). So create the following file:

```
# cd /etc/yum.repos.d/

# wget ftp://ftp.project-builder.org/rhel/5/pb.repo

# cat > /etc/yum.repos.d/rpmforge.repo << EOF

[rpmforge]

name = Red Hat Enterprise $releasever - RPMforge.net - dag

#baseurl =
ftp://eurolinux.gre.hp.com/pub/linux/rpmforge/redhat/el5/en/x86_64/dag

baseurl = http://fr2.rpmfind.net/linux/dag/redhat//el5/en/x86_64/dag

enabled = 1

gpgcheck = 0

EOF
```

Then use `yum` to install the application with all its dependencies:

```
# yum install project-builder
```

Other distributions may be easier to deal with by providing more packages out of the box (Case of most non-commercial distributions such as Debian/Ubuntu, Fedora, Mandriva, OpenSuSE, …)

Check that the correct version is installed and operational:

```
# pb --version

Option version requires an argument

pb (aka project-builder.org) Version 0.9.8-924



Usage:

    pb [-vhSq][-r pbroot][-p project][[-s script -a account -P port][-m
mach-1[,...]]][-i iso] <action> [<pkg1> ...]



    pb [--verbose][--help][--man][--quiet][--snapshot][--revision pbroot]
[--project project][[--script script --account account --port port][--
machine mach-1[,...]]][--iso iso] <action> [<pkg1> …]
```

Local subversion setup

n order to be able to manage you build environment in configuration, we will use a local subversion repository on your machine. If not installed, please install subversion server and client, and create a local repository to manage your local modifications and allow its usage.

```
# yum --disablerepo=rpmforge install subversion.x86_64

# mkdir -p /prj

# svnadmin create /prj/svn

# ls /prj/svn

conf  dav  db  format  hooks  locks  README.txt

# cat >> /prj/svn/conf/authz << EOF

[/]

pblab = rw

* = r

EOF

# cat >> /prj/svn/conf/passwd << EOF

pblab = pblab

EOF
```

```
# cat >> /prj/svn/conf/svnserve.conf << EOF
password-db = passwd
authz-db = authz
EOF
# svnserve -d -r /prj/svn
```

The remaining operations should be done as user `pblab`, as no root access is needed in general for pb to operate. Create It with `adduser` and the passwd you want.

Check that you can logn this acount and that the directory is nearly empty:

```
# su – pblab
$ ls -a
.  ..  .bash_logout  .bash_profile  .bashrc  .emacs  .mozilla
```

As of now this document will use the name of the command (`pb`) to describe the project for easier reading, and because of the writer lazyness.

Using pb with an existing project (tar)

Estimated time: 45 minutes.

Pb setup

The goal of this part is to setup the minimal environment needed by project-builder.org to work correctly with a project whose delivery is accessible through a tar file. In this example we will use the afio project. Feel free to test with another one, the instructors during the lab should be able to adapt ;-)

First to work correctly the pb command needs to find the required information to the project you want to deal with in a configuration file under your home directly called .pbrc.

You can try to first launch pb with one of the recognized commands in order to see what happens:

```
$ pb clean
Use of uninitialized value in concatenation (.) or string at
/usr/lib/perl5/vendor_perl/5.8.8/ProjectBuilder/Conf.pm line 312.
No pbconfurl defined for  at
/usr/lib/perl5/vendor_perl/5.8.8/ProjectBuilder/Conf.pm line 312.
No existing /home/pblab/.pbrc found, creating one as
template[pblab@o185i225 ~]$
[pblab@o185i225 ~]$ ls -a
.  ..  .bash_logout  .bash_profile  .bashrc  .emacs  .mozilla  .pbrc
```

So, first you can remark that there are some perl errors. They are now fixed in the SVN version of pb ;-)

But more importantly, pb has created for you a template of configuration file under your home directory to help you start with its usage. Look at it:

```
[pblab@o185i225 ~]$ cat .pbrc

#

# Define for each project the URL of its pbconf repository

# No default option allowed here as they need to be all different

#

#pbconfurl example =
svn+ssh://svn.example.org/svn/pb/projects/example/pbconf

#pbconfurl pb = svn+ssh://svn.project-builder.org/mondo/svn/pb/pbconf


# Under that dir will take place everything related to pb

# If you want to use VMs/chroot/..., then use $ENV{'HOME'} to make it
portable

# to your VMs/chroot/...

# if not defined then /var/cache

#pbdefdir default = $ENV{'HOME'}/pb/projects

#pbdefdir pb = $ENV{'HOME'}


# If not defined, pbconfdir is under pbdefdir/pbproj/pbconf

#pbconfdir pb = $ENV{'HOME'}/pb/pbconf


# If not defined, pbprojdir is under pbdefdir/pbproj

# Only defined if we have access to the dev of the project

#pbprojdir example = $ENV{'HOME'}/example/svn


# We have commit acces to these

#pburl example =
cvs+ssh://user@example.cvs.sourceforge.net:/cvsroot/example

#pburl pb = svn+ssh://svn.project-builder.org/mondo/svn/pb


# I mask my real login on the ssh machines here

#sshlogin example = user
```

```
# where to find Build System infos:
#vmpath default = /home/qemu
#vepath default = /home/rinse

# Overwrite generic setup
#vmport pb = 2223
#vmport example = 2224
```

pb repository setup

Adapt the file in order to prepare your environment for a pb build of afio, and create the directory that will host your local SVN export content:

```
[pblab@o185i225 ~]$ grep -Ev '^$|^#' .pbrc
pbconfurl afio = svn://localhost/pb/afio/pbconf
pbdefdir default = $ENV{'HOME'}/pb
[pblab@o185i225 ~]$ mkdir pb
[pblab@o185i225 pb]$ svn import pb svn://localhost/pb -m "Initial creation of pb repo"
Committed revision 1.
[pblab@o185i225 ~]$ svn log -v svn://localhost/
------------------------------------------------------------------------
r1 | pblab | 2009-12-01 16:08:39 +0100 (Tue, 01 Dec 2009) | 1 line
Changed paths:
   A /pb
[pblab@o185i225 ~]$ cd pb
[pblab@o185i225 pb]$ ls -a
.  ..
[pblab@o185i225 pb]$ svn co svn://localhost/pb .
[pblab@o185i225 pb]$ ls -a
.  ..  .svn
```

Now that you have a correct SVN structure in your environment; you may try to ask pb to create the project structure of the afio packaging project for you, and start exploring it. As you onlt have a single package to create, you may call it afio and pass it as a parameter to your creation command:

```
[pblab@o185i225 pb]$ pb -p afio newproj afio
Adding /home/pblab/pb/afio to VCS ... OK
Updating /home/pblab/pb/afio ... OK
Adding /home/pblab/pb/afio/pbconf to VCS ... OK
Updating /home/pblab/pb/afio/pbconf ... OK
Checking in /home/pblab/pb/afio ... OK
Updating /home/pblab/pb/afio ... OK
Project: afio
Action: newproj
```

Look at what pb has created for you under that directory:

```
[pblab@o185i225 pb]$ ls -R
.:
afio

./afio:
build  delivery  pbconf

./afio/build:

./afio/delivery:

./afio/pbconf:
afio  afio.pb  pbfilter

./afio/pbconf/afio:
deb  pbfilter  pkg  rpm

./afio/pbconf/afio/deb:
afio.dirs  afio.docs  changelog  compat  control  copyright  rules

./afio/pbconf/afio/pbfilter:
```

```
./afio/pbconf/afio/pkg:

depend  pbbuild  pkginfo



./afio/pbconf/afio/rpm:

afio.spec



./afio/pbconf/pbfilter:

all.pbf         debian-5.0.pbf  fedora-1.pbf  fedora-3.pbf  fedora-5.pbf
fedora-7.pbf  md.pbf      rpm.pbf

debian-4.0.pbf  deb.pbf         fedora-2.pbf  fedora-4.pbf  fedora-6.pbf
fedora.pbf    novell.pbf
```

3 main directories have been created: `build` that will host all local build of packages, `delivery` that will contain the tar files generated as input for the build, and `pbconf` which contains all the metadata to build the packages.

The main configuration file for pb with this project is `./afio/pbconf/afio.pb`. We will have to modify it, in order for pb to have the required info on the afio project. We will do more modifications as we progress towards the knowledge of pb.

As we are on a rpm based distribution, we will have a look at the spec file generated `./afio/pbconf/afio/rpm/afio.spec`. You can also see that template for deb (Debian and Ubuntu) and pkg (Solaris/OpenSolaris) build have been generated as well.Also a `pbfilter` directory has been created to host macro filtering.

Tar file creation

If at that point, without doing any modification, we try to generate at least the tar files of the project, the result is:

```
[pblab@o185i225 pb]$ pb -p afio cms2build

No defpkgdir defined for afio at
/usr/lib/perl5/vendor_perl/5.8.8/ProjectBuilder/Conf.pm line 312.

[pblab@o185i225 pb]$ pbg defpkgdir

./afio/pbconf/afio.pb:#defpkgdir afio = dir-afio

./afio/pbconf/afio.pb:# Files are mentioned relatively to pbroot/defpkgdir
```

So time to give some content to our conf file:

```
[pblab@o185i225 pb]$ cat >> ./afio/pbconf/afio.pb << EOF

defpkgdir afio = dummy

EOF
```

In the case of a project for which you don't own/contribute to the development, the defpkgdir parameter value is useless. If you have a local repository for the development, it should

correspond to the name of the directory hosting the related development of the corresponding package.

```
[pblab@o185i225 pb]$ pb -p afio cms2build

No pbpackager defined for afio at
/usr/lib/perl5/vendor_perl/5.8.8/ProjectBuilder/Conf.pm line 312.
```

pbpackager is another mandatory tag. It indicates who is doing the job of packaging. You want to be rewarded no ? So indicate it: Here you have 2 choices: you can put it in the configuration file of the project, as done previously, or you can put it in your own .pbrc file which relates to all your activities. As this is a fairly generic parameter in that case, we opt for the second and associate that parameter to all projects, by using the default project name:

```
[pblab@o185i225 pb]$ cat >> $HOME/.pbrc << EOF

pbpackager default = Big Chief <bigchief@hp.com>

EOF
```

So with this, you can remark that there is a notion of inheritance of parameters from the most generic configuration file, up to the most specialized. The order being `/etc/pb/pb.conf, $HOME/.pbc, project.pb, VEPath/.pbrc, VMPath/.pbrc.` New test:

```
[pblab@o185i225 pb]$ pb -p afio cms2build

No projver defined for afio at
/usr/lib/perl5/vendor_perl/5.8.8/ProjectBuilder/Conf.pm line 312.
```

Again, a new required parameter is needed. We have to provide the version of the project. Here we are packaging version 2.5 of the project:

```
[pblab@o185i225 pb]$ cat >> ./afio/pbconf/afio.pb << EOF

projver afio = 2.5

EOF
```

Each project should have a version, which will be used as the default version for every package produced. This can be oberloaded if needed package by package. New test:

```
[pblab@o185i225 pb]$ pb -p afio cms2build

No projtag defined for afio at
/usr/lib/perl5/vendor_perl/5.8.8/ProjectBuilder/Conf.pm line 312.
```

Same story with the tag that needs to be provided to packages. A tag indicates the iteration level of build of a similar content, or said differently a fix on a build process.

```
[pblab@o185i225 pb]$ cat >> ./afio/pbconf/afio.pb << EOF

projtag afio = 1

EOF
```

In a future version, we may consider defaulting to 1. That's not the case yet. Start over again:

```
[pblab@o185i225 pb]$ pb -p afio cms2build
```

```
Project: afio

Action: cms2build

Packages: afio

No pburl defined for afio at
/usr/lib/perl5/vendor_perl/5.8.8/ProjectBuilder/Conf.pm line 312.
```

So we made some progress, as the trace indicates and we have passed the first round of metadata really required by pb to work on our project. Of course, the next request is legitimate. We have not said yet where the software is ! So do it:

```
[pblab@o185i225 pb]$ cat >> ./afio/pbconf/afio.pb << EOF

pburl afio = ftp://ftp.project-builder.org/test/src/afio-2.5.tar.gz

EOF
```

Some comments here: there are multiple possibilities to designate the target we want to package. Here we use the simplest one, which is a pointer to a tar file (pb can use ftp or http or file protocols to access the file, and knows how to handle compressed tar files. But it can also target VCS (Version Control System) such as Subversion, SVK, CVS, Git or Mercurial using direct or ssh encapsulated protocol. We will illustrate it on another section.

So test again !

```
[pblab@o185i225 pb]$ pb -p afio cms2build

Project: afio

Action: cms2build

Packages: afio

No pbrepo defined for afio at
/usr/lib/perl5/vendor_perl/5.8.8/ProjectBuilder/Conf.pm line 312.
```

Again that parameter seems to appear early as a question with regards to where we are in the build process. If possible it may change in the future. But it may be used for filtering possibilities that we will explore later on. It corresponds to the root URL of the final place where your users will find your packages and deliveries, and is used to document some entries in build files, such as the spec file. Here give the name of where we found the source file:

```
[pblab@o185i225 pb]$ cat >> ./afio/pbconf/afio.pb << EOF

pbrepo afio = ftp://ftp.project-builder.org

EOF
```

Once more:

```
[pblab@o185i225 pb]$ pb -p afio cms2build

Project: afio

Action: cms2build

Packages: afio
```

```
Management of afio 2.5-0.20091201181258 (rev flat)

Downloading ftp://ftp.project-builder.org/test/src/afio-2.5.tar.gz with
/usr/bin/wget -nv -O  to /tmp/pb.ZdhHrnw61Y/afio-2.5.tar.gz

... OK

Extracting /tmp/pb.ZdhHrnw61Y/afio-2.5.tar.gz in
/home/pblab/pb/afio/delivery/afio-2.5 ... OK

Generating fake ChangeLog for test version

Build files are being generated for ...

 ... rhel-5.4-x86_64

Delivering and compressing patches

Preserving original tar file Under /home/pblab/pb/afio/delivery/afio-
2.5.tar.gz

Creating pbconf tar files compressed... OK

Under /home/pblab/pb/afio/delivery/afio-2.5.pbconf.tar.gz
```

Hurray ! We have at least produced something from pb. Well you could be doubtful it's easier and quicker than using traditional way, and up to that point, I agree with you. Except that this setup phase just needs to be done once.

Dealing with filters

So pb has downloaded the tar file for us, extracted it and generated 2 new tar files. In fact the first tar file is even not touched (“Preserving original tar file”) in order to satisfy md5sum checks, e.g. This is only true because we deal with a tar based project. The second tar file contains all the metadata needed to build the package for our native platform. You can check its content:

```
[pblab@o185i225 pb]$ tar xvfz /home/pblab/pb/afio/delivery/afio-
2.5.pbconf.tar.gz

afio-2.5/pbconf/

afio-2.5/pbconf/rhel-5.4-x86_64/

afio-2.5/pbconf/rhel-5.4-x86_64/afio.spec

[pblab@o185i225 pb]$ more afio-2.5/pbconf/rhel-5.4-x86_64/afio.spec

#

# $Id$

#

# Used if virtual name != real name (perl, ...)

#%define srcname        afio
```

```
Summary:        PBSUMMARY
Summary(fr):    french bla-bla

Name:           afio
Version:        2.5
Release:        0.20091201181258.rhel5.4
License:        PBLIC
Group:          PBGRP
Url:            PBURL
Source:         ftp://ftp.project-builder.org/test/src//PBSRC
#PBPATCHSRC
BuildRoot:      %{_tmppath}/%{name}-%{version}-%{release}-root-%(id -u -n)
#Requires:       PBDEP

%description
PBDESC

%description -l fr
french desc

%prep
%setup -q
# Used if virtual name != real name (perl, ...)
#%setup -q -n %{srcname}-%{version}
#PBPATCHCMD

%build
%configure
make %{?_smp_mflags}

%install
```

```
%{__rm} -rf $RPM_BUILD_ROOT

make DESTDIR=$RPM_BUILD_ROOT install


%clean

%{__rm} -rf $RPM_BUILD_ROOT


%files

%defattr(-,root,root)

%doc ChangeLog

%doc INSTALL COPYING README AUTHORS NEWS


%changelog

PBLOG
```

As we can see in this file, there are some PB macros (PBLIC, PBGRP, …) that will probably cause an error when trying to build the rpm. If we compare that generated file by pb with the template created earlier here are the differences:

```
[pblab@o185i225 pb]$ diff afio-2.5/pbconf/rhel-5.4-x86_64/afio.spec
afio/pbconf/afio/rpm/afio.spec

5c5

< #%define srcname      afio

---

> #%define srcname      PBPKG

10,12c10,12

< Name:           afio

< Version:        2.5

< Release:        0.20091201181258.rhel5.4

---

> Name:           PBREALPKG

> Version:        PBVER

> Release:        PBTAGPBSUF

16c16

< Source:         ftp://ftp.project-builder.org/test/src//PBSRC

---
```

```
> Source:          PBREPO/PBSRC
```

We can see that some of the macro in the template have already been translated into their metadata content, but not all of them. Because again pb needs our help to have additional information before being able to process it. So we need to edit the main filter file `all.pbf` in the `pbfilter` directory in order to add the adequate content missing in the spec template:

```
[pblab@o185i225 pb]$ grep PB afio-2.5/pbconf/rhel-5.4-x86_64/afio.spec
Summary:        PBSUMMARY
License:        PBLIC
Group:          PBGRP
Url:            PBURL
Source:         ftp://ftp.project-builder.org/test/src//PBSRC
#PBPATCHSRC
#Requires:       PBDEP
PBDESC
#PBPATCHCMD
PBLOG
[pblab@o185i225 pb]$ vi afio/pbconf/pbfilter/all.pbf
[ edition ]
[pblab@o185i225 pb]$ svn diff afio/pbconf/pbfilter/all.pbf
Index: afio/pbconf/pbfilter/all.pbf
===================================================================
--- afio/pbconf/pbfilter/all.pbf        (revision 2)
+++ afio/pbconf/pbfilter/all.pbf        (working copy)
@@ -8,7 +8,7 @@
 filter PBREPO = $pb->{'repo'}


 # PBSRC is replaced by the source package location after the repo
-#filter PBSRC = src/%{name}-%{version}.tar.gz
+filter PBSRC = %{name}-%{version}.tar.gz
 # Used if virtual name != real name (perl, ...)
 #filter PBSRC = src/%{srcname}-%{version}.tar.gz


@@ -43,15 +43,15 @@
```

```
 filter PBPACKAGER = $pb->{'packager'}


 # PBDESC contains the description of the package

-#filter PBDESC = "Bla-Bla"

+filter PBDESC = afio is a cpio compatible archiver with extended
features$/It can compress on a file by file basis.


 # PBSUMMARY contains a short single line description of the package

-#filter PBSUMMARY = "Bla"

+filter PBSUMMARY = afio is a cpio compatible archiver with extended
features


 # PBURL contains the URL of the Web site of the project

-#filter PBURL = http://www.afio.org

+filter PBURL = http://www.boutell.com/lsm/lsmbyid.cgi/000462


 # PBLOG is replaced by the changelog if value is yes

 # and should be last as when used we need the %pb hash filled

-#filter PBLOG = yes

+filter PBLOG = yes
```

You can note in the PBDESC the usage of a perl variable $/ which means a line separator. Ot will be expanded by pb, as well as the other variables such as the one provided by the %pb hash.

All these metadata can be shared across distributions, so they are placed here. However, some are specific to some distributions, such as the way the name licenses, or put software in groups. So we also need to add content in a more specific filter:

```
[pblab@o185i225 pb]$ vi ./afio/pbconf/pbfilter/rpm.pbf

[ edition ]

[pblab@o185i225 pb]$ svn diff ./afio/pbconf/pbfilter/rpm.pbf

Index: afio/pbconf/pbfilter/rpm.pbf

===================================================================

--- afio/pbconf/pbfilter/rpm.pbf        (revision 2)

+++ afio/pbconf/pbfilter/rpm.pbf        (working copy)

@@ -5,10 +5,10 @@
```

```
 #


 # PBGRP is replaced by the RPM group of apps
-#filter PBGRP = Applications/Archiving
+filter PBGRP = Applications/Archiving


 # PBLIC is replaced by the license of the application
-#filter PBLIC = GPL
+filter PBLIC = Afio


 # PBDEP is replaced by the list of dependencies
 #filter PBDEP =
```

So now that our macro have been expanded, we can try to regenerate the spec file for our distribution, and see if this time pb replaces everything correctly. Please also remark that we have still not committed anything in our repository, even if we have differences. pb is able to use the current state of our checked out version. Also note that each time you modify files under pbconf, you have to restart from the cms commands so that the filtering and processing occurs as expected.

```
[pblab@o185i225 pb]$ pb -p afio cms2build
Project: afio
Action: cms2build
Packages: afio


Management of afio 2.5-0.20091201234237 (rev flat)
Downloading ftp://ftp.project-builder.org/test/src/afio-2.5.tar.gz with
/usr/bin/wget -nv -O  to /tmp/pb.YPIsMiURI4/afio-2.5.tar.gz
... OK
Extracting /tmp/pb.YPIsMiURI4/afio-2.5.tar.gz in
/home/pblab/pb/afio/delivery/afio-2.5 ... OK
Generating fake ChangeLog for test version
Build files are being generated for ...
 ... rhel-5.4-x86_64
Delivering and compressing patches
Preserving original tar file Under /home/pblab/pb/afio/delivery/afio-
2.5.tar.gz
```

```
Creating pbconf tar files compressed... OK

Under /home/pblab/pb/afio/delivery/afio-2.5.pbconf.tar.gz

[pblab@o185i225 pb]$ tar xvfz /home/pblab/pb/afio/delivery/afio-
2.5.pbconf.tar.gz

afio-2.5/pbconf/

afio-2.5/pbconf/rhel-5.4-x86_64/

afio-2.5/pbconf/rhel-5.4-x86_64/afio.spec

[pblab@o185i225 pb]$ more afio-2.5/pbconf/rhel-5.4-x86_64/afio.spec

#

# $Id$

#

# Used if virtual name != real name (perl, ...)

#%define srcname        afio


Summary:        "afio is a cpio compatible archiver with extended
features"

Summary(fr):    french bla-bla


Name:           afio

Version:        2.5

Release:        0.20091201234237.rhel5.4

License:        Afio

Group:          Applications/Archiving

Url:            http://www.boutell.com/lsm/lsmbyid.cgi/000462

Source:         ftp://ftp.project-builder.org/test/src//%{name}-%
{version}.tar.gz

#PBPATCHSRC

BuildRoot:      %{_tmppath}/%{name}-%{version}-%{release}-root-%(id -u -n)

#Requires:       PBDEP


%description

"afio is a cpio compatible archiver with extended features

It can compress on a file by file basis."
```

```
%description -l fr
french desc

%prep
%setup -q
# Used if virtual name != real name (perl, ...)
#%setup -q -n %{srcname}-%{version}
#PBPATCHCMD

%build
%configure
make %{?_smp_mflags}

%install
%{__rm} -rf $RPM_BUILD_ROOT
make DESTDIR=$RPM_BUILD_ROOT install

%clean
%{__rm} -rf $RPM_BUILD_ROOT

%files
%defattr(-,root,root)
%doc ChangeLog
%doc INSTALL COPYING README AUTHORS NEWS

%changelog
```

Building packages

```
[pblab@o185i225 pb]$ pb -p afio build2pkg
Project: afio
Action: build2pkg
```

```
Packages: afio

Extracting spec files from /home/pblab/pb/afio/delivery/afio-
2.5.pbconf.tar.gz... OK

Extracting patch files from /home/pblab/pb/afio/delivery/afio-
2.5.pbconf.tar.gz... N/A

Building package with /home/pblab/pb/afio/build/SPECS/afio.spec under
/home/pblab/pb/afio/build... child (rpmbuild  --define 'packager Big Chief
<bigchief@hp.com>' --define "_topdir /home/pblab/pb/afio/build" -ba
/home/pblab/pb/afio/build/SPECS/afio.spec) exited with value 1

Executing(%prep): /bin/sh -e /var/tmp/rpm-tmp.1499

+ umask 022

+ cd /home/pblab/pb/afio/build/BUILD

+ cd /home/pblab/pb/afio/build/BUILD

+ rm -rf afio-2.5

+ /usr/bin/gzip -dc /home/pblab/pb/afio/build/SOURCES/afio-2.5.tar.gz

+ tar -xf -

+ STATUS=0

+ '[' 0 -ne 0 ']'

+ cd afio-2.5

++ /usr/bin/id -u

+ '[' 500 = 0 ']'

++ /usr/bin/id -u

+ '[' 500 = 0 ']'

+ /bin/chmod -Rf a+rX,u+w,g-w,o-w .

+ exit 0

Executing(%build): /bin/sh -e /var/tmp/rpm-tmp.1499

+ umask 022

+ cd /home/pblab/pb/afio/build/BUILD

+ cd afio-2.5

+ CFLAGS='-O2 -g -m64 -mtune=generic'

+ export CFLAGS

+ CXXFLAGS='-O2 -g -m64 -mtune=generic'

+ export CXXFLAGS

+ FFLAGS='-O2 -g -m64 -mtune=generic'
```

```
+ export FFLAGS

+ ./configure --host=x86_64-redhat-linux-gnu --build=x86_64-redhat-linux-
gnu --target=x86_64-redhat-linux --program-prefix= --prefix=/usr --exec-
prefix=/usr --bindir=/usr/bin --sbindir=/usr/sbin --sysconfdir=/etc
--datadir=/usr/share --includedir=/usr/include --libdir=/usr/lib64
--libexecdir=/usr/libexec --localstatedir=/var --sharedstatedir=/usr/com
--mandir=/usr/share/man --infodir=/usr/share/info

/var/tmp/rpm-tmp.1499: line 29: ./configure: No such file or directory

error: Bad exit status from /var/tmp/rpm-tmp.1499 (%build)




RPM build errors:

    Bad exit status from /var/tmp/rpm-tmp.1499 (%build)
```

Of course, if we try to go to the next step, it fails, because one last remaining set of modifications needs to be performed concerns the spec file itself. The way to generate the binaries and files to be delivered differ from one application to another and pb can not guess it, even if it proposes something to you. In our case, afio doesn't use a configure script.

```
[pblab@o185i225 pb]$ vi afio/pbconf/afio/rpm/afio.spec

[pblab@o185i225 pb]$ svn diff afio/pbconf/afio/rpm/afio.spec

Index: afio/pbconf/afio/rpm/afio.spec

===================================================================

--- afio/pbconf/afio/rpm/afio.spec      (revision 2)

+++ afio/pbconf/afio/rpm/afio.spec      (working copy)

@@ -5,7 +5,6 @@

 #%define srcname       PBPKG


 Summary:        PBSUMMARY

-Summary(fr):    french bla-bla


 Name:           PBREALPKG

 Version:        PBVER

@@ -21,9 +20,6 @@

 %description

 PBDESC
```

```
-%description -l fr
-french desc
-
 %prep
 %setup -q
 # Used if virtual name != real name (perl, ...)
@@ -31,21 +27,28 @@
 #PBPATCHCMD

 %build
-%configure
 make %{?_smp_mflags}
+chmod 644 script*/*

+#%check
+#make regtest
+
 %install
 %{__rm} -rf $RPM_BUILD_ROOT
-make DESTDIR=$RPM_BUILD_ROOT install
+mkdir -p $RPM_BUILD_ROOT%{_bindir}
+mkdir -p $RPM_BUILD_ROOT%{_mandir}/man1
+install -p -m 755 afio $RPM_BUILD_ROOT%{_bindir}
+install -p -m 644 afio.1 $RPM_BUILD_ROOT%{_mandir}/man1

 %clean
 %{__rm} -rf $RPM_BUILD_ROOT

 %files
 %defattr(-,root,root)
-%doc ChangeLog
-%doc INSTALL COPYING README AUTHORS NEWS
```

```
+%doc HISTORY PORTING README SCRIPTS ANNOUNCE-2.5 perl.artistic.license

+%doc afio.lsm script1 script2 script3 script4

+%{_bindir}/%{name}

+%{_mandir}/man1/%{name}.1*


 %changelog

 PBLOG

-

[pblab@o185i225 pb]$ pb -p afio cms2pkg

Project: afio

Action: cms2pkg

Packages: afio


Management of afio 2.5-0.20091202000038 (rev flat)

Downloading ftp://ftp.project-builder.org/test/src/afio-2.5.tar.gz with
/usr/bin/wget -nv -O  to /tmp/pb.dJWhO2ZyX0/afio-2.5.tar.gz

... OK

Extracting /tmp/pb.dJWhO2ZyX0/afio-2.5.tar.gz in
/home/pblab/pb/afio/delivery/afio-2.5 ... OK

Generating fake ChangeLog for test version

Build files are being generated for ...

 ... rhel-5.4-x86_64

Delivering and compressing patches

Preserving original tar file Under /home/pblab/pb/afio/delivery/afio-
2.5.tar.gz

Creating pbconf tar files compressed... OK

Under /home/pblab/pb/afio/delivery/afio-2.5.pbconf.tar.gz

Packages: afio

Extracting spec files from /home/pblab/pb/afio/delivery/afio-
2.5.pbconf.tar.gz... OK

Extracting patch files from /home/pblab/pb/afio/delivery/afio-
2.5.pbconf.tar.gz... N/A

Building package with /home/pblab/pb/afio/build/SPECS/afio.spec under
/home/pblab/pb/afio/build... OK
```

```
Executing(%prep): /bin/sh -e /var/tmp/rpm-tmp.22879
+ umask 022
+ cd /home/pblab/pb/afio/build/BUILD
+ cd /home/pblab/pb/afio/build/BUILD
+ rm -rf afio-2.5
+ /usr/bin/gzip -dc /home/pblab/pb/afio/build/SOURCES/afio-2.5.tar.gz
+ tar -xf -
+ STATUS=0
+ '[' 0 -ne 0 ']'
+ cd afio-2.5
++ /usr/bin/id -u
+ '[' 500 = 0 ']'
++ /usr/bin/id -u
+ '[' 500 = 0 ']'
+ /bin/chmod -Rf a+rX,u+w,g-w,o-w .
+ exit 0
Executing(%build): /bin/sh -e /var/tmp/rpm-tmp.22879
+ umask 022
+ cd /home/pblab/pb/afio/build/BUILD
+ cd afio-2.5
+ make -j2
gcc -Wall -Wstrict-prototypes -s -O2 -fomit-frame-pointer
-D_FILE_OFFSET_BITS=64 -D_LARGEFILE_SOURCE   -DMEMCPY -DMKDIR   -DVOIDFIX
-DHAVEFCNTL    -DHAVEMEMCMP -DDEFFMTCMD='"fdformat /dev/fd0H1440"'
-DHAVE_LCHOWN -DPRG_COMPRESS='"gzip"' -DHAVEFNMATCH    -c -o afio.o afio.c
gcc -Wall -Wstrict-prototypes -s -O2 -fomit-frame-pointer
-D_FILE_OFFSET_BITS=64 -D_LARGEFILE_SOURCE   -DMEMCPY -DMKDIR   -DVOIDFIX
-DHAVEFCNTL    -DHAVEMEMCMP -DDEFFMTCMD='"fdformat /dev/fd0H1440"'
-DHAVE_LCHOWN -DPRG_COMPRESS='"gzip"' -DHAVEFNMATCH    -c -o compfile.o
compfile.c
compfile.c: In function 'setupgzip':
compfile.c:182: warning: missing sentinel in function call
afio.c: In function 'incheckdata':
afio.c:1588: warning: missing sentinel in function call
```

```
afio.c: In function 'opencontrolscript':

afio.c:3007: warning: missing sentinel in function call

afio.c: In function 'openotty':

afio.c:3269: warning: missing sentinel in function call

gcc -Wall -Wstrict-prototypes -s -O2 -fomit-frame-pointer
-D_FILE_OFFSET_BITS=64 -D_LARGEFILE_SOURCE   -DMEMCPY -DMKDIR   -DVOIDFIX
-DHAVEFCNTL    -DHAVEMEMCMP -DDEFFMTCMD='"fdformat /dev/fd0H1440"'
-DHAVE_LCHOWN -DPRG_COMPRESS='"gzip"' -DHAVEFNMATCH    -c -o exten.o
exten.c

gcc -Wall -Wstrict-prototypes -s -O2 -fomit-frame-pointer
-D_FILE_OFFSET_BITS=64 -D_LARGEFILE_SOURCE   -DMEMCPY -DMKDIR   -DVOIDFIX
-DHAVEFCNTL    -DHAVEMEMCMP -DDEFFMTCMD='"fdformat /dev/fd0H1440"'
-DHAVE_LCHOWN -DPRG_COMPRESS='"gzip"' -DHAVEFNMATCH    -c -o match.o
match.c

gcc  afio.o compfile.o exten.o match.o  -o afio

afio.o: In function `syserr':

afio.c:(.text+0x5f9): warning: `sys_errlist' is deprecated; use `strerror'
or `strerror_r' instead

afio.c:(.text+0x5d1): warning: `sys_nerr' is deprecated; use `strerror' or
`strerror_r' instead

+ chmod 644 script1/DONTDUMP script1/backup script2/README script2/backup
script2/restore script2/x.dot script2/x.home script3/gnupg_read
script3/gnupg_write script3/pgp_read script3/pgp_write script4/tapechange
script5/secbak script5/secrestore

+ exit 0

Executing(%install): /bin/sh -e /var/tmp/rpm-tmp.14394

+ umask 022

+ cd /home/pblab/pb/afio/build/BUILD

+ cd afio-2.5

+ /bin/rm -rf /var/tmp/afio-2.5-0.20091202000038.rhel5.4-root-pblab

+ mkdir -p /var/tmp/afio-2.5-0.20091202000038.rhel5.4-root-pblab/usr/bin

+ mkdir -p /var/tmp/afio-2.5-0.20091202000038.rhel5.4-root-
pblab/usr/share/man/man1

+ install -p -m 755 afio /var/tmp/afio-2.5-0.20091202000038.rhel5.4-root-
pblab/usr/bin

+ install -p -m 644 afio.1 /var/tmp/afio-2.5-0.20091202000038.rhel5.4-
root-pblab/usr/share/man/man1

+ /usr/lib/rpm/brp-compress
```

```
+ /usr/lib/rpm/brp-strip

+ /usr/lib/rpm/brp-strip-static-archive

+ /usr/lib/rpm/brp-strip-comment-note

Processing files: afio-2.5-0.20091202000038.rhel5.4

Executing(%doc): /bin/sh -e /var/tmp/rpm-tmp.14394

+ umask 022

+ cd /home/pblab/pb/afio/build/BUILD

+ cd afio-2.5

+ DOCDIR=/var/tmp/afio-2.5-0.20091202000038.rhel5.4-root-
pblab/usr/share/doc/afio-2.5

+ export DOCDIR

+ rm -rf /var/tmp/afio-2.5-0.20091202000038.rhel5.4-root-
pblab/usr/share/doc/afio-2.5

+ /bin/mkdir -p /var/tmp/afio-2.5-0.20091202000038.rhel5.4-root-
pblab/usr/share/doc/afio-2.5

+ cp -pr HISTORY PORTING README SCRIPTS ANNOUNCE-2.5 perl.artistic.license
/var/tmp/afio-2.5-0.20091202000038.rhel5.4-root-pblab/usr/share/doc/afio-
2.5

+ cp -pr afio.lsm script1 script2 script3 script4 /var/tmp/afio-2.5-
0.20091202000038.rhel5.4-root-pblab/usr/share/doc/afio-2.5

+ exit 0

Requires(rpmlib): rpmlib(CompressedFileNames) <= 3.0.4-1
rpmlib(PayloadFilesHavePrefix) <= 4.0-1

Requires: libc.so.6()(64bit) libc.so.6(GLIBC_2.2.5)(64bit)
libc.so.6(GLIBC_2.4)(64bit) rtld(GNU_HASH)

Checking for unpackaged file(s): /usr/lib/rpm/check-files /var/tmp/afio-
2.5-0.20091202000038.rhel5.4-root-pblab

Wrote: /home/pblab/pb/afio/build/SRPMS/afio-2.5-
0.20091202000038.rhel5.4.src.rpm

Wrote: /home/pblab/pb/afio/build/RPMS/x86_64/afio-2.5-
0.20091202000038.rhel5.4.x86_64.rpm

Executing(%clean): /bin/sh -e /var/tmp/rpm-tmp.14394

+ umask 022

+ cd /home/pblab/pb/afio/build/BUILD

+ cd afio-2.5

+ /bin/rm -rf /var/tmp/afio-2.5-0.20091202000038.rhel5.4-root-pblab
```

```
+ exit 0



rpm packages generated:  SRPMS/afio-2.5-0.20091202000038.rhel5.4.src.rpm
RPMS/x86_64/afio-2.5-0.20091202000038.rhel5.4.x86_64.rpm
```

So we now have our first packages built with pb for afio. Time to take a coffee no ? (If you don't have that result, check that you don't miss some packages ;-)

As you can see, you don't need to have a knowledge of building rpm, as pb deals with that for you. What you do need to know is how the software is built, which are the files produced as an output, and which are the metadata related to the project.

Also you have seen a new command cms2pkg, which chains cms2build (which produces tar files from project) and build2pkg (which produces packages from tar files).

You can check your package and install it to verify it. Note that if `rpmlint` is available on your system, pb will automatically call it at the end of the build.

```
[pblab@o185i225 pb]$ rpm -qlvp /home/pblab/pb/afio/build/RPMS/x86_64/afio-
2.5-0.20091202001741.rhel5.4.x86_64.rpm

-rwxr-xr-x    1 root    root            73879 Dec  2 00:17 /usr/bin/afio

drwxr-xr-x    2 root    root                0 Dec  2 00:17
/usr/share/doc/afio-2.5

-rw-r--r--    1 root    root             1634 Dec 21  2003
/usr/share/doc/afio-2.5/ANNOUNCE-2.5

-rw-r--r--    1 root    root            33879 Dec 21  2003
/usr/share/doc/afio-2.5/HISTORY

-rw-r--r--    1 root    root             7202 Dec 21  2003
/usr/share/doc/afio-2.5/PORTING

-rw-r--r--    1 root    root             3116 Dec 21  2003
/usr/share/doc/afio-2.5/README

-rw-r--r--    1 root    root             2179 Dec 21  2003
/usr/share/doc/afio-2.5/SCRIPTS

-rw-r--r--    1 root    root              707 Dec 21  2003
/usr/share/doc/afio-2.5/afio.lsm

-rw-r--r--    1 root    root             4919 Nov 25  1999
/usr/share/doc/afio-2.5/perl.artistic.license

drwxr-xr-x    2 root    root                0 Oct 16  1999
/usr/share/doc/afio-2.5/script1

-rw-r--r--    1 root    root               54 Jul 20  1998
/usr/share/doc/afio-2.5/script1/DONTDUMP

-rw-r--r--    1 root    root             1320 Oct 16  1999
/usr/share/doc/afio-2.5/script1/backup
```

```
drwxr-xr-x    2 root    root                0 Oct 16  1999
/usr/share/doc/afio-2.5/script2

-rw-r--r--    1 root    root             1088 Jul 20  1998
/usr/share/doc/afio-2.5/script2/README

-rw-r--r--    1 root    root             1510 Oct 16  1999
/usr/share/doc/afio-2.5/script2/backup

-rw-r--r--    1 root    root              840 Jul 20  1998
/usr/share/doc/afio-2.5/script2/restore

-rw-r--r--    1 root    root              165 Jul 20  1998
/usr/share/doc/afio-2.5/script2/x.dot

-rw-r--r--    1 root    root               32 Jul 20  1998
/usr/share/doc/afio-2.5/script2/x.home

drwxr-xr-x    2 root    root                0 Oct  4  1999
/usr/share/doc/afio-2.5/script3

-rw-r--r--    1 root    root             1169 Oct  4  1999
/usr/share/doc/afio-2.5/script3/gnupg_read

-rw-r--r--    1 root    root             1190 Oct  4  1999
/usr/share/doc/afio-2.5/script3/gnupg_write

-rw-r--r--    1 root    root              579 Sep 19  1999
/usr/share/doc/afio-2.5/script3/pgp_read

-rw-r--r--    1 root    root              665 Sep 19  1999
/usr/share/doc/afio-2.5/script3/pgp_write

drwxr-xr-x    2 root    root                0 Sep 28  1998
/usr/share/doc/afio-2.5/script4

-rw-r--r--    1 root    root             1164 Sep 28  1998
/usr/share/doc/afio-2.5/script4/tapechange

-rw-r--r--    1 root    root            15913 Dec 14  2003
/usr/share/man/man1/afio.1.gz

[pblab@o185i225 pb]$ rpm -qip /home/pblab/pb/afio/build/RPMS/x86_64/afio-
2.5-0.20091202001741.rhel5.4.x86_64.rpm

Name        : afio                          Relocations: (not relocatable)

Version     : 2.5                                Vendor: (none)

Release     : 0.20091202001741.rhel5.4      Build Date: Wed 02 Dec 2009
12:17:43 AM CET

Install Date: (not installed)               Build Host:
o185i225.gre.hp.com

Group       : Applications/Archiving        Source RPM: afio-2.5-
0.20091202001741.rhel5.4.src.rpm

Size        : 153204                           License: Afio
```

```
Signature   : (none)

Packager    : Big Chief <bigchief@hp.com>

URL         : http://www.boutell.com/lsm/lsmbyid.cgi/000462

Summary     : afio is a cpio compatible archiver with extended features

Description :

afio is a cpio compatible archiver with extended features

It can compress on a file by file basis.
```

It could also be a good time now to commit our changes in our SVN repository (hint: `svn ci`)

Building for another distribution

Estimated time: 45 minutes.

By using an existing rpm based distribution VM

(Only valid inside the HP LAN)

You can get the prepared VM at ftp://eurolinux.gre.hp.com/pub/linux/qemu/fedora-10-i386.qemu. Create a new directory to host this VM. Also install KVM on your system as root.

```
[pblab@o185i225 pb]$ mkdir $HOME/vm

[pblab@o185i225 pb]$ cd $HOME/vm

[pblab@o185i225 vm]$ lftp  ftp://eurolinux.gre.hp.com/pub/linux/qemu

cd ok, cwd=/pub/linux/qemu

lftp eurolinux.gre.hp.com:/pub/linux/qemu> get fedora-10-i386.qemu

3752185856 bytes transferred in 325 seconds (11.00M/s)

lftp eurolinux.gre.hp.com:/pub/linux/qemu> quit

# yum install kvm
```

Now that we have a working package for an rpm based distribution, it's easy to make another one for another rpm based one.

```
[pblab@o185i225 pb]$ pb -p afio -m fedora-10-i386 launchvm

Project: afio

Action: launchvm

No vmtype defined for afio at
/usr/lib/perl5/vendor_perl/5.8.8/ProjectBuilder/Conf.pm line 312.
```

So we're back to a known problem (except if you have done previous part which already solved it). Pb needs again some parameters in order to make the work for us. First it needs the type of VM that we are dealing with. In our case we want a KVM one whose type is

kvm (qemu is also supported and more could be added). As pb will need more content to deal with VM, it will be detailed right now, instead of step by step. Also the location of those parameters will be in a dedicated configuration file that we will place alongside the VMs themselves. So we will first create a new directory to host our VMs, let pb know it through our main `.pbrc`, and create another `.pbrc` conf file in it to store the parameters linked to VM management:

```
[pblab@o185i225 pb]$ cat >> $HOME/.pbrc << EOF
vmpath default = /home/pblab/vm
EOF

[pblab@o185i225 pb]$ cat >> $HOME/vm/.pbrc << EOF
vmtype default = kvm
vmsize default = 7G
vmhost default = localhost
vmport afio = 2222
vmlogin default = pb
vmntp default = 0.pool.ntp.org
vmmonport default = 4444
vmlist default = fedora-10-i386,debian-5.0-i386
EOF
```

Some explanations. The vmpath parameter is global, and points to the directory where VMs will be created and used. Then in that directory, pb will load a .pbrc file if it finds it, in which are parameters related to the type of VMs we deal with in here.

The vmsize parameter is used at creation to give the size of the VM container. The vmhost, vmport and vmlogin parameters indicate how the host will communicate with the guest by ssh, using a port redirection to the vmport port on localhost of the ssh (22) port in the VM, and it will log on the VM using the pb account. The vmntp indicates where is the NTP server (as for builing software there is a strong need to have a good time synchronization). The vmmonport is the port used for monitoring the VM (planned usage for snapshot VM feature). And the vmlist last parameter indicate separated by comas, the list of all VM for which pb will be able to build in the format distribution_name-version-architecture.

pb has the capability to detect automatically on which system it runs, and adapt itself to that context. You can have more information on this by doing:

```
[pblab@o185i225 pb]$ pbdistrocheck
distro tuple: rhel,5.4,rh,rpm,.rhel5.4,sudo yum clean all; sudo yum -y
update ; sudo yum -y install ,x86_64
```

This commands outputs details for pb of the underlying distribution: its name, version, tag name, build type, package extension, update command and architecture. If you disagree with

the choices made by pb, nothing more simple than to adapt it to your needs, or to add support for a new distribution. Edit the `/etc/pb/pb.conf` file and give feedback !

So now pb is aware of how to deal with VMs, try again to launch it:

```
[pblab@o185i225 pb]$ pb -p afio -m fedora-10-i386 launchvm

Project: afio

Action: launchvm

Launching the VM /home/pblab/vm/fedora-10-i386.qemu... OK

Waiting 120 s for VM fedora-10-i386 to come up... sh: /usr/bin/kvm: No
such file or directory

with

VM /home/pblab/vm/fedora-10-i386.qemu launched (pid 0)
```

This problem is linked to the current hardcoding of the invocation of the emulation tools. This is planned to be fixed in 0.9.9. In the mean time, fix it with a symlink:

```
# ln -sf /usr/libexec/qemu-kvm /usr/bin/kvm
```

Retry again:

```
[pblab@o185i228 vm]$ pb -p afio -m fedora-10-i386 launchvm

Project: afio

Action: launchvm

Launching the VM /home/pblab/vm/fedora-10-i386.qemu... OK

Waiting 120 s for VM fedora-10-i386 to come up... open /dev/kvm: No such
file or directory

Could not initialize KVM, will disable KVM support

OK

VM /home/pblab/vm/fedora-10-i386.qemu launched (pid 8834)
```

You VM may or not come up correctly. Typically KVM launches the VM with only 128 MB of RAM, which may not be sufficient for the distribution you deal with. pb allows you adapt it in 2 ways. One is in the above mentioned configuration file:

```
[pblab@o185i228 vm]$ cat >> $HOME/vm/.pbrc << EOF

vmopt default = -m 384 -daemonize

EOF
```

Which is the most suited when the modification is permanent. Please note that the parameter for vmopt is the name of a distribution, from the most precise tuple definition to the least. So you can have a `vmopt fedora-11-i386`, a `vmopt fedora-11` a `vmopt fedora`, as well as for the distribution family (`vmopt rh`) or type (`vmopt rpm`). Useful for inheritance purposes.

Now if you just want to change the execution of the instance of VM you're about to start, you can also use the `PBVMOPT` environment variable for this, in addition to the previous parameters. For example, if you just want the VM to start without X-Window interface as you're remote on a serial line, you can use the following:

```
[pblab@o185i228 vm]$ export PBVMOPT="-nographic"
```

that way the VM will be lauched both with `-m 284 -daemonize -nographic`.

Same way if you want to use a VNC redirection if you're on Windows as a client without cygwin and X11 installed locally.

Relaunch the VM and check that you can have access to with with ssh (account root/linux1). The configuration done on ssh avoids painful authentication messages on the validity of localhost (accessed in fact here with anther machine than the regular localhost).

```
[pblab@o185i228 vm]$ pb -p afio -m fedora-10-i386 launchvm

Project: afio

Action: launchvm

Launching the VM /home/pblab/vm/fedora-10-i386.qemu... OK

Waiting 120 s for VM fedora-10-i386 to come up... open /dev/kvm: No such
file or directory

Could not initialize KVM, will disable KVM support

OK

VM /home/pblab/vm/fedora-10-i386.qemu launched (pid 8938)

[pblab@o185i228 vm]$ cat >> $HOME/.ssh/config << EOF

host localhost

    StrictHostKeyChecking no

EOF

[pblab@o185i228 vm]$ ssh -p 2222 root@localhost

The authenticity of host 'localhost (127.0.0.1)' can't be established.

RSA key fingerprint is f4:36:92:96:9e:a1:b6:ff:5f:aa:4e:d9:af:94:5c:b3.

Are you sure you want to continue connecting (yes/no)? yes

Warning: Permanently added 'localhost' (RSA) to the list of known hosts.

root@localhost's password:

Last login: Sun Jan 25 12:02:51 2009

[root@localhost ~]# pb --version

Option version requires an argument

pb (aka project-builder.org) Version 0.9.7.1-807
```

```
Usage:
    pb [-vhSq][-r pbroot][-p project][[-s script -a account -P port][-m
    mach-1[,...]]][-i iso] <action> [<pkg1> ...]

    pb [--verbose][--help][--man][--quiet][--snapshot][--revision
    pbroot][--project project][[--script script --account account --port
    port][--machine mach-1[,...]]][--iso iso] <action> [<pkg1> …]
[root@localhost ~]# ^D
```

Looks fine, and you even have an older version of pb there. Now you can try to use it to build packages for Fedora 10 i386, after solving yet some additional requested parameters, and updating the VM with the latest pb version, as well as using the current context (ssh keys). Also on the HP LAN a proxy will need to be defined (pb will propagate it in the VM as needed).

```
[pblab@o185i228 vm]$ cat >> $HOME/vm/.pbrc << EOF
vmntpcmd default = /usr/sbin/ntpdate
vmtmout default = 180
EOF
[pblab@o185i228 vm]$ pb -p afio -m fedora-10-i386 setupvm
Project: afio
Action: setupvm
Found an existing VM /home/pblab/vm/fedora-10-i386.qemu (pid 8938)
Generating SSH keys for pb... OK
Copying local keys to vm. This may require the root password...
root@localhost's password:
OK
Found an existing VM /home/pblab/vm/fedora-10-i386.qemu (pid 8938)
Packages: afio
Sources handled (VMScript): /home/pblab/pb/afio/delivery/pbscript
Preparing pb/test/src on root@localhost:pb/test/src...OK
VMScript delivery in root@localhost:pb/test/src...OK
Executing pbscript on root@localhost:pb/test/src if needed...OK
[...]
Finish setting up the account env for pb... OK
```

```
distro tuple: fedora,10,rh,rpm,.fc10,i386

Cleaning yum env... OK

[…]

pb 2>&1 | head -5... OK

pb (aka project-builder.org) Version 0.9.8-924


Usage:

    pb [-vhSq][-r pbroot][-p project][[-s script -a account -P port][-m

    mach-1[,...]]][-i iso] <action> [<pkg1> …]

[pblab@o185i228 vm]$ pb -p afio -m fedora-10-i386 cms2vm

Project: afio

Action: cms2vm

Packages: afio


Management of afio 2.5-0.20091203035131 (rev flat)

Downloading ftp://ftp.project-builder.org/test/src/afio-2.5.tar.gz with
/usr/bin/wget -nv -O  to /tmp/pb.XADx5zndkc/afio-2.5.tar.gz

... OK

Extracting /tmp/pb.XADx5zndkc/afio-2.5.tar.gz in
/home/pblab/pb/afio/delivery/afio-2.5 ... OK

Generating fake ChangeLog for test version

Build files are being generated for ...

 ... debian-5.0-i386,fedora-10-i386,rhel-5.4-x86_64

Delivering and compressing patches

Preserving original tar file Under /home/pblab/pb/afio/delivery/afio-
2.5.tar.gz

Creating pbconf tar files compressed... OK

Under /home/pblab/pb/afio/delivery/afio-2.5.pbconf.tar.gz

Packages: afio

Found an existing VM /home/pblab/vm/fedora-10-i386.qemu (pid 8938)

Packages: afio

Sources handled (VMbuild): /home/pblab/pb/afio/delivery/afio-2.5.tar.gz
/home/pblab/pb/afio/delivery/afio-2.5.pbconf.tar.gz
/home/pblab/pb/afio/pbconf/afio.pb /home/pblab/pb/afio/delivery/2.5-
```

```
0.20091203035131.pb /home/pblab/.pbrc /home/pblab/pb/afio/delivery/pbrc
/home/pblab/pb/afio/delivery/pbscript

Preparing pb/afio/delivery on pb@localhost:pb/afio/delivery... OK

VMbuild delivery in pb@localhost:pb/afio/delivery... OK

Executing pbscript on pb@localhost:pb/afio/delivery if needed... OK

... Execution needed

setting up date with echo sudo /usr/sbin/ntpdate 0.pool.ntp.org

[….]

building packages on vm...

Project: afio

Action: build2pkg

Packages: afio

Extracting spec files from /home/pb/pb/afio/delivery/afio-
2.5.pbconf.tar.gz... OK

Extracting patch files from /home/pb/pb/afio/delivery/afio-
2.5.pbconf.tar.gz... N/A

Building package with /home/pb/pb/afio/build/SPECS/afio.spec under
/home/pb/pb/afio/build... OK

Executing(%prep): /bin/sh -e /var/tmp/rpm-tmp.EXDXnG

+ umask 022

+ cd /home/pb/pb/afio/build/BUILD

+ cd /home/pb/pb/afio/build/BUILD

+ rm -rf afio-2.5

[…]

Checking for unpackaged file(s): /usr/lib/rpm/check-files
/home/pb/pb/afio/build/BUILDROOT/afio-2.5-0.20091203035131.fc10.i386

Wrote: /home/pb/pb/afio/build/SRPMS/afio-2.5-0.20091203035131.fc10.src.rpm

Wrote: /home/pb/pb/afio/build/RPMS/i386/afio-2.5-
0.20091203035131.fc10.i386.rpm

Executing(%clean): /bin/sh -e /var/tmp/rpm-tmp.I8kVch

+ umask 022

+ cd /home/pb/pb/afio/build/BUILD

+ cd afio-2.5
```

```
+ /bin/rm -rf /home/pb/pb/afio/build/BUILDROOT/afio-2.5-
0.20091203035131.fc10.i386

+ exit 0



rpm packages generated:  SRPMS/afio-2.5-0.20091203035131.fc10.src.rpm
RPMS/i386/afio-2.5-0.20091203035131.fc10.i386.rpm

Get package names in pb@localhost:pb/afio/build... OK

Recovery of package afio-2.5-0.20091203035131.fc10.src.rpm in
/home/pblab/pb/afio/build/fedora/10... OK

Recovery of package afio-2.5-0.20091203035131.fc10.i386.rpm in
/home/pblab/pb/afio/build/fedora/10... OK

VMbuild cleanup... OK

Packages: afio

Sources handled (Packages): fedora/10/afio-2.5-
0.20091203035131.fc10.src.rpm fedora/10/afio-2.5-
0.20091203035131.fc10.i386.rpm /home/pblab/pb/afio/build/pbscript

No sshhost defined for afio at
/usr/lib/perl5/vendor_perl/5.8.8/ProjectBuilder/Conf.pm line 312.
```

So we now have fedora 10 packages ! You can look at them locally under `/home/pblab/pb/afio/build/fedora/10/`. We have had to add `vmntpcmd` paramater to our configuration file to indicate which command should be used to synchronize the VM for time aspects. As well the `vmtmout` parameter gives to pb the time to wait in seconds before trying to dialog with the VM (boot time) if it has to launch it (which wasn't our case). That timeout can be drastically reduced if you use the snapshot feature of the VM (can be done manually with pb, and is being added automatically in the devel version). These 2 parameters use as well distribution_name-version-architecture as a key.

Then we have to setup a proxy because we will download in `setupvm` packages from CPAN to resolve pb dependencies. On the HP LAN we need that proxy in order for our download to succeed. The `setupvm` phase is required here for 2 reasons. One is to update pb in the VM at the same version as the one we used locally, for coherency (even if 0.9.7.1 and 0.9.8 are compatible from that point of view on Linux). The second is to create dedicated SSH keys for further exchanges with the pb and the root accounts inside the VM. The pb account in the VM is used to launch all pb related activities, and has to be declared for pb to work with VMs at all. It has o be noted that this is a case where pb install itself in the VM under a tar format, to manage the chicken and egg problem. To avoid any issue, do not install pb as a package in the VM in parallel.

Then we invoked `cms2vm` which first does the `cms2build` phase and then send in the VM all the required tar balls, configuration files and one script to launch pb in the VM, doing the right setup and invoking in it the `build2pkg` phase we have done previously locally.

Of course, pb still could do more providing we give it some more info. Just do it:

```
[pblab@o185i228 vm]$ cat >> $HOME/pb/afio/pbconf/afio.pb << EOF

sshhost afio = localhost
```

```
sshlogin afio = delivery

sshdir afio = /var/ftp/pub/afio

sshport afio = 22

EOF
```

Here we define where to deliver our built packages: the machine (`sshhost`), the account used to log on it through ssh (`sshlogin`), the directory (`sshdir`) in which we will setup the repository and the port on which ssh is working on that system (`sshport`)

PLEASE NOTE that no security is considered here (no pass phrase for ssh accounts). This shold be considered for production environments.

And as root:

```
[root@o185i228 home]# yum install vsftpd createrepo

[root@o185i228 home]# /etc/init.d/vsftpd start

Starting vsftpd for vsftpd:                                [  OK  ]

[root@o185i228 home]# chkconfig vsftpd on

[root@o185i228 home]# wget ftp://fr2.rpmfind.net/linux/epel/5/x86_64/yum-
arch-2.2.2-2.el5.noarch.rpm

[root@o185i228 home]# rpm -Uvh  yum-arch-2.2.2-2.el5.noarch.rpm

[root@o185i228 home]# useradd delivery

[root@o185i228 home]# perl -pi -e 's/delivery:!!/delivery:*/' /etc/shadow

[root@o185i228 home]# mkdir ~delivery/.ssh

[root@o185i228 home]# chmod 700  ~delivery/.ssh

[root@o185i228 home]# cp ~pblab/.ssh/pb_dsa.pub
~delivery/.ssh/authorized_keys

[root@o185i228 home]# chmod 600  ~delivery/.ssh/authorized_keys

[root@o185i228 home]# chown -R delivery ~delivery/.ssh

[root@o185i228 home]# mkdir -p mkdir -p /var/ftp/pub/afio

[root@o185i228 home]# chown -R delivery /var/ftp/pub/afio
```

We install newly needed packages to provide ftp acces (and set it up) and yum repository management. We also create an account having the rights to manage the afio ftp zone, and able to receive our updates by ssh.

Check that you can access the newly created account with ssh without password, and then launch the build again:

```
[pblab@o185i228 vm]$ ssh -i ~/.ssh/pb_dsa delivery@localhost touch
/var/ftp/pub/afio/README

[pblab@o185i228 vm]$ pb -p afio -m fedora-10-i386 cms2vm
```

```
Project: afio

Action: cms2vm

Packages: afio

[…]

VMbuild cleanup... OK

Packages: afio

Sources handled (Packages): fedora/10/afio-2.5-
0.20091203124630.fc10.src.rpm fedora/10/afio-2.5-
0.20091203124630.fc10.i386.rpm /home/pblab/pb/afio/build/pbscript

Preparing /var/ftp/pub/afio/test/fedora/10 on
delivery@localhost:/var/ftp/pub/afio/test/fedora/10... OK

Packages delivery in
delivery@localhost:/var/ftp/pub/afio/test/fedora/10... OK

Executing pbscript on delivery@localhost:/var/ftp/pub/afio/test/fedora/10
if needed... OK





THIS PROGRAM IS DEPRECATED!

You should be generating xml metadata instead.

Please see http://linux.duke.edu/metadata



Digesting rpms 100 % complete: afio-2.5-0.20091203124630.fc10.i386.rpm

   Total: 4

   Used: 2

   Src: 0


Writing header.info file

2/2 - afio-2.5-0.20091203124630.fc10.i386.rpm

Saving Primary metadata

Saving file lists metadata

Saving other metadata

afio.spec
```

```
[pblab@o185i228 ~]$ ls -alR ~ftp/pub/afio
/var/ftp/pub/afio:
total 12
drwxr-xr-x 3 delivery root     4096 Dec  3 12:37 .
drwxr-xr-x 3 root     root     4096 Dec  3 12:19 ..
-rw-rw-r-- 1 delivery delivery    0 Dec  3 12:35 README
drwxrwxr-x 3 delivery delivery 4096 Dec  3 12:37 test

/var/ftp/pub/afio/test:
total 12
drwxrwxr-x 3 delivery delivery 4096 Dec  3 12:37 .
drwxr-xr-x 3 delivery root     4096 Dec  3 12:37 ..
drwxrwxr-x 3 delivery delivery 4096 Dec  3 12:37 fedora

/var/ftp/pub/afio/test/fedora:
total 12
drwxrwxr-x 3 delivery delivery 4096 Dec  3 12:37 .
drwxrwxr-x 3 delivery delivery 4096 Dec  3 12:37 ..
drwxrwxr-x 4 delivery delivery 4096 Dec  3 12:48 10

/var/ftp/pub/afio/test/fedora/10:
total 536
drwxrwxr-x 4 delivery delivery   4096 Dec  3 12:48 .
drwxrwxr-x 3 delivery delivery   4096 Dec  3 12:37 ..
-rw-r--r-- 1 delivery delivery  79986 Dec  3 12:48 afio-2.5-
0.20091203124630.fc10.i386.rpm
-rw-r--r-- 1 delivery delivery 169185 Dec  3 12:48 afio-2.5-
0.20091203124630.fc10.src.rpm
-rw-r--r-- 1 delivery delivery    117 Dec  3 12:48 afio.repo
-rw-r--r-- 1 delivery delivery   1299 Dec  3 12:46 afio.spec
drwxr-xr-x 2 delivery delivery   4096 Dec  3 12:48 headers
drwxr-xr-x 2 delivery delivery   4096 Dec  3 12:48 repodata
```

```
/var/ftp/pub/afio/test/fedora/10/headers:
total 20
drwxr-xr-x 2 delivery delivery 4096 Dec  3 12:48 .
drwxrwxr-x 4 delivery delivery 4096 Dec  3 12:48 ..
-rw-r--r-- 1 delivery delivery 2161 Dec  3 12:48 afio-0-2.5-
0.20091203124630.fc10.i386.hdr
-rw-r--r-- 1 delivery delivery  156 Dec  3 12:48 header.info


/var/ftp/pub/afio/test/fedora/10/repodata:
total 24
drwxr-xr-x 2 delivery delivery 4096 Dec  3 12:48 .
drwxrwxr-x 4 delivery delivery 4096 Dec  3 12:48 ..
-rw-r--r-- 1 delivery delivery  662 Dec  3 12:48 filelists.xml.gz
-rw-r--r-- 1 delivery delivery  383 Dec  3 12:48 other.xml.gz
-rw-r--r-- 1 delivery delivery 1098 Dec  3 12:48 primary.xml.gz
-rw-r--r-- 1 delivery delivery  951 Dec  3 12:48 repomd.xml
```

So pb has prepared and delivered for us a repository for afio. It created a test subdirectory, as we are working on a test version (`testver` in the `afio.pb` configuration file). For a stable release it would have created the same structure directly at the `sshdir` point.

If we want to use the repo file locally to check everything works as expected, we have to do the same for our local build:

```
[pblab@o185i228 ~]$ pb -p afio cms2pkg
Project: afio
Action: cms2pkg
Packages: afio


Management of afio 2.5-0.20091203125549 (rev flat)
[…]
rpm packages generated:  SRPMS/afio-2.5-0.20091203125549.rhel5.4.src.rpm
RPMS/x86_64/afio-2.5-0.20091203125549.rhel5.4.x86_64.rpm
[pblab@o185i228 ~]$ pb -p afio pkg2ssh
Project: afio
Action: pkg2ssh
```

```
Packages: afio

Sources handled (Packages): SRPMS/afio-2.5-
0.20091203125549.rhel5.4.src.rpm RPMS/x86_64/afio-2.5-
0.20091203125549.rhel5.4.x86_64.rpm /home/pblab/pb/afio/build/pbscript

Preparing /var/ftp/pub/afio/test/rhel/5.4 on
delivery@localhost:/var/ftp/pub/afio/test/rhel/5.4... OK

Packages delivery in delivery@localhost:/var/ftp/pub/afio/test/rhel/5.4...
OK

Executing pbscript on delivery@localhost:/var/ftp/pub/afio/test/rhel/5.4
if needed... OK





THIS PROGRAM IS DEPRECATED!

You should be generating xml metadata instead.

Please see http://linux.duke.edu/metadata




Digesting rpms 100 % complete: afio-2.5-0.20091203125549.rhel5.4.src.rpm

   Total: 2

   Used: 1

   Src: 0


Writing header.info file

2/2 - afio-2.5-0.20091203125549.rhel5.4.src.rpm

Saving Primary metadata

Saving file lists metadata

Saving other metadata
```

And as root:

```
[root@o185i228 home]# cp ~ftp/pub/afio/test/rhel/5.4/afio.repo
/etc/yum.repos.d/

[root@o185i228 home]# export ftp_proxy=

[root@o185i228 home]# yum install afio

Loaded plugins: rhnplugin, security
```

```
This system is not registered with RHN.

RHN support will be disabled.

afio                                                     |  951 B
00:00

afio/primary                                             |  948 B
00:00

afio
2/2

Setting up Install Process

Resolving Dependencies

--> Running transaction check

---> Package afio.i386 0:2.4.7-1 set to be updated

---> Package afio.x86_64 0:2.5-2.el5.rf set to be updated

--> Finished Dependency Resolution


Dependencies Resolved


 Package       Arch            Version                  Repository
Size

Installing:

 afio          i386            2.4.7-1                  pb
60 k

 afio          x86_64          2.5-2.el5.rf             rpmforge
79 k


Transaction Summary

================================================================================
======

Install      2 Package(s)

Update       0 Package(s)

Remove       0 Package(s)


Total download size: 139 k

Is this ok [y/N]:
```

```
Exiting on user Command

Complete!
```

We don't continue as we are not on the right architecture, but we can see our package in the list as expected.

Note that you can also deliver the tar sources using the `cms2ssh` command of pb.

By using an existing deb based distribution VM

(Only valid inside the HP LAN)

You can get the prepared VM at ftp://eurolinux.gre.hp.com/pub/linux/qemu/debian-5.0-i386.qemu.

```
[pblab@o185i225 pb]$ cd $HOME/vm

[pblab@o185i225 vm]$ lftp  ftp://eurolinux.gre.hp.com/pub/linux/qemu

cd ok, cwd=/pub/linux/qemu

lftp eurolinux.gre.hp.com:/pub/linux/qemu> get debian-5.0-i386.qemu
```

Building for another type of distribution is much more easy now with pb, as most of what we need is already there. We can concentrate on the build files specific to Debian distribution:

```
[pblab@o185i228 ~]$ pb -p afio -m debian-5.0-i386 setupvm

Project: afio

Action: setupvm

[…]

pb (aka project-builder.org) Version 0.9.8-924


Usage:

    pb [-vhSq][-r pbroot][-p project][[-s script -a account -P port][-m

    mach-1[,...]]][-i iso] <action> [<pkg1> ...]



[pblab@o185i228 ~]$ pb -p afio -m debian-5.0-i386 cms2vm

Project: afio

Action: cms2vm

Packages: afio

[…]

building packages on vm...
```

```
Project: afio

Action: build2pkg

Packages: afio

Extracting sources... OK

Extracting pbconf... OK

Installing dependencies (PBDEP)... Get:1 http://security.debian.org
lenny/updates Release.gpg [835B]

[…]

child (sudo apt-get update ; sudo apt-get -y install  PBDEP) exited with
value 100

Reading package lists...

Building dependency tree...

Reading state information...

E: Couldn't find package PBDEP


Building package... child (dpkg-buildpackage -us -uc -rfakeroot) exited
with value 255

[…]

parsechangelog/debian: warning:     debian/changelog(l1): found blank line
where expected first heading

parsechangelog/debian: warning:     debian/changelog(l2): found blank line
where expected first heading

parsechangelog/debian: warning:     debian/changelog(l2): found eof where
expected first heading

dpkg-buildpackage: error: unable to determine source package

[…]

Executing pbscript on delivery@localhost:/var/ftp/pub/afio/test/debian/5.0
if needed... OK

./pbscript: line 10: dpkg-scanpackages: command not found

./pbscript: line 10: dpkg-scanpackages: command not found

./pbscript: line 10: dpkg-scanpackages: command not found

./pbscript: line 10: dpkg-scansources: command not found
```

OK, so as expected, it can not working magically. Even if some read HP as Harry Potter ;-)

A specificity of Debian is that it needs a working changelog, in order to determine metadata correctly. Pb can help building a sensible changelog for Debian (as well as for rpm packages).

Also if we want to be able to build a local Debian repository, we will need an additional application (dpkg-scanpackages). There is no native pckage for RHEL 5, so we will use the package currently in Mandriva, which is compatible (why do you think I'm commiter for it ;-):

```
[root@o185i228 home]# wget
ftp://fr2.rpmfind.net/linux/dag/redhat/el5/en/i386/dag/RPMS/po4a-0.33.2-
1.el5.rf.noarch.rpm

[root@o185i228 home]# yum install perl-gettext

[root@o185i228 home]# rpm -Uvh po4a-0.33.2-1.el5.rf.noarch.rpm

[root@o185i228 home]# wget   http://ftp.u-
picardie.fr/mirror/ftp.mandriva.com/Mandrakelinux//mandrakelinux/official/
2010.0/SRPMS/contrib/release/dpkg-1.13.26-1mdv2010.0.src.rpm

[root@o185i228 home]# rpm -ivh  dpkg-1.13.26-1mdv2010.0.src.rpm

[root@o185i228 home]# perl -pi -e 's/%mkrel//'
/usr/src/redhat/SPECS/dpkg.spec

[root@o185i228 home]# perl -pi -e 's/%configure2_5x/%configure/'
/usr/src/redhat/SPECS/dpkg.spec

[root@o185i228 home]# perl -pi -e 's/%make/make  %{?_smp_mflags}/'
/usr/src/redhat/SPECS/dpkg.spec

[root@o185i228 home]# perl -pi -e 's/%makeinstall_std/make DESTDIR=%
{buildroot} install/'  /usr/src/redhat/SPECS/dpkg.spec

[root@o185i228 home]# perl -pi -e 's/--enable-shared/--enable-shared
--without-selinux/' /usr/src/redhat/SPECS/dpkg.spec

[root@o185i228 home]# yum install  gettext-devel.x86_64  zlib-devel.x86_64

[root@o185i228 home]# rpm -Uvh –nodeps /usr/src/redhat/RPMS/x86_64/dpkg-
1.13.26-1.x86_64.rpm
```

Do the following to address our issues:

```
[pblab@o185i228 ~]$ cd /home/pblab/pb/afio/pbconf/afio/deb/

[pblab@o185i228 deb]$ vi control

[… modifications...]

# there is an issue in the generation of the rules files in that version,
# you ned to change the 8 spaces at the beginning of line by a TAB.

[pblab@o185i228 deb]$ perl -pi -e 's/^        /^I/' rules

[pblab@o185i228 deb]$ vi rules
```

```
[… modifications...]
[pblab@o185i228 deb]$ vi afio.docs
[… modifications...]
[pblab@o185i228 deb]$ cat > ../pbcl << EOF
# $Id$

AFIO CHANGES

2.5 (2009-12-03)
- First packages created
EOF
[pblab@o185i228 deb]$ perl -pi -e 's/DBDEBCOMP/PBDEBCOMP/' compat
[pblab@o185i228 deb]$ svn -x -b diff
Index: control
===================================================================
--- control     (revision 2)
+++ control     (working copy)
@@ -3,7 +3,7 @@
 Section: PBGRP
 Priority: optional
 Maintainer: PBPACKAGER
-Build-Depends: debhelper (>= 4.2.20), PBDEP
+Build-Depends: debhelper (>= 4.2.20)
 Standards-Version: PBDEBSTD
 Vcs-Svn: svn://svn.PBPROJ.org/svn/PBVER/PBPKG
 Vcs-Browser: http://trac.PBPROJ.org/browser/PBVER/PBPKG
@@ -14,7 +14,7 @@
 # http://www.debian.org/doc/debian-policy/ch-archive.html#s-subsections
 Section: PBGRP
 Priority: optional
-Depends: ${shlibs:Depends}, ${misc:Depends}, PBDEP
-Recommends: PBREC
```

```
-Suggests: PBSUG
+Depends: ${shlibs:Depends}, ${misc:Depends}
 Description: PBSUMMARY
Index: compat
===================================================================
--- compat      (revision 2)
+++ compat      (working copy)
@@ -1 +1 @@
-DBDEBCOMP
+PBDEBCOMP
Index: afio.docs
===================================================================
--- afio.docs   (revision 2)
+++ afio.docs   (working copy)
@@ -1,5 +1,12 @@
-INSTALL
-COPYING
-AUTHORS
-NEWS
+HISTORY
+PORTING
 README
+SCRIPTS
+ANNOUNCE-2.5
+perl.artistic.license
+afio.lsm
+script1
+script2
+script3
+script4
+
Index: rules
```

```
===================================================================
--- rules       (revision 2)
+++ rules       (working copy)
@@ -27,13 +27,9 @@
 ifeq (,$(findstring nostrip,$(DEB_BUILD_OPTIONS)))
         INSTALL_PROGRAM += -s
 endif
-config.status: configure
+config.status: Makefile
         dh_testdir
 -        # Configure the package.
-        CFLAGS="$(CFLAGS)" ./configure --host=$(DEB_HOST_GNU_TYPE)
--build=$(DEB_BUILD_GNU_TYPE) --prefix=/usr
- --mandir=\$${prefix}/share/man
-
 # Build both architecture dependent and independent
 build: build-arch build-indep


@@ -86,9 +82,9 @@


         # Install the package files into build directory:
         # - start with upstream make install
-        $(MAKE) install prefix=$(CURDIR)/debian/$(PACKAGE_NAME)/usr
mandir=$(CURDIR)/debian/$(PACKAGE_NAME)/us
-r/share/man
-        # - copy html manual to temporary location for renaming
+       mkdir -p $(CURDIR)/debian/$(PACKAGE_NAME)/usr/bin $
(CURDIR)/debian/$(PACKAGE_NAME)/usr/share/man/man1
+       install -p -m 755 afio $(CURDIR)/debian/$(PACKAGE_NAME)/usr/bin
+       install -p -m 644 afio.1 $(CURDIR)/debian/$
(PACKAGE_NAME)/usr/share/man/man1
         mkdir -p debian/doc-temp
         dh_install -s
```

So there are fixes, due to typo (that have been fixed since in SVN of pb). The other adaptations are similar to the one done for building the RPM of afio: list of files/dirs to manage, and way to build the software.

Now time to generate our deb packages:

```
[pblab@o185i228 deb]$ pb -p afio -m debian-5.0-i386 cms2vm

Project: afio

Action: cms2vm

Packages: afio



Management of afio 2.5-0.20091204131057 (rev flat)

Downloading ftp://ftp.project-builder.org/test/src/afio-2.5.tar.gz with
/usr/bin/wget -nv -O  to /tmp/pb.IaVyBLZAkW/afio-2.5.tar.gz

... OK

Extracting /tmp/pb.IaVyBLZAkW/afio-2.5.tar.gz in
/home/pblab/pb/afio/delivery/afio-2.5 ... OK

Generating fake ChangeLog for test version

Build files are being generated for …

 ... debian-5.0-i386,fedora-10-i386,rhel-5.4-x86_64

Delivering and compressing patches

Preserving original tar file Under /home/pblab/pb/afio/delivery/afio-
2.5.tar.gz

Creating pbconf tar files compressed... OK

Under /home/pblab/pb/afio/delivery/afio-2.5.pbconf.tar.gz

Packages: afio

Found an existing VM /home/pblab/vm/debian-5.0-i386.qemu (pid 19099)

Packages: afio

Sources handled (VMbuild): /home/pblab/pb/afio/delivery/afio-2.5.tar.gz
/home/pblab/pb/afio/delivery/afio-2.5.pbconf.tar.gz
/home/pblab/pb/afio/pbconf/afio.pb /home/pblab/pb/afio/delivery/2.5-
0.20091204131057.pb /home/pblab/.pbrc /home/pblab/pb/afio/delivery/pbrc
/home/pblab/pb/afio/delivery/pbscript

Preparing pb/afio/delivery on pb@localhost:pb/afio/delivery... OK

VMbuild delivery in pb@localhost:pb/afio/delivery... OK

Executing pbscript on pb@localhost:pb/afio/delivery if needed...  OK

... Execution needed
```

```
setting up date with echo sudo /usr/sbin/ntpdate 0.pool.ntp.org
building packages on vm...
Project: afio
Action: build2pkg
Packages: afio
Extracting sources... OK
Extracting pbconf... OK
Building package... OK
dpkg-buildpackage: set CFLAGS to default value: -g -O2
dpkg-buildpackage: set CPPFLAGS to default value:
dpkg-buildpackage: set LDFLAGS to default value:
dpkg-buildpackage: set FFLAGS to default value: -g -O2
dpkg-buildpackage: set CXXFLAGS to default value: -g -O2
dpkg-buildpackage: source package afio
dpkg-buildpackage: source version 2.5-0.20091204131057
dpkg-buildpackage: source changed by Big Chief <bigchief@hp.com>
dpkg-buildpackage: host architecture i386
 fakeroot debian/rules clean
dh_testdir
dh_testroot
rm -f build-arch-stamp build-indep-stamp #CONFIGURE-STAMP#
# Clean temporary document directory
rm -rf debian/doc-temp
# Clean up.
/usr/bin/make distclean
make[1]: Entering directory `/home/pb/pb/afio/build/afio-2.5'
make[1]: *** No rule to make target `distclean'.  Stop.
make[1]: Leaving directory `/home/pb/pb/afio/build/afio-2.5'
make: [clean] Error 2 (ignored)
rm -f config.log
dh_clean
 dpkg-source -b afio-2.5
```

```
dpkg-source: info: using source format `1.0'

dpkg-source: info: building afio in afio_2.5-0.20091204131057.tar.gz

dpkg-source: info: building afio in afio_2.5-0.20091204131057.dsc

 debian/rules build

dh_testdir

dh_testdir

# Compile the package.

/usr/bin/make

make[1]: Entering directory `/home/pb/pb/afio/build/afio-2.5'

gcc -Wall -Wstrict-prototypes -s -O2 -fomit-frame-pointer
-D_FILE_OFFSET_BITS=64 -D_LARGEFILE_SOURCE   -DMEMCPY -DMKDIR   -DVOIDFIX
-DHAVEFCNTL    -DHAVEMEMCMP -DDEFFMTCMD='"fdformat /dev/fd0H1440"'
-DHAVE_LCHOWN -DPRG_COMPRESS='"gzip"' -DHAVEFNMATCH    -c -o afio.o afio.c

[…]

make[1]: Leaving directory `/home/pb/pb/afio/build/afio-2.5'

touch build-stamp

# Nothing to do, the only indep item is the manual which is available as
html in original source

touch build-indep-stamp

 fakeroot debian/rules binary

dh_testdir

dh_testdir

# Compile the package.

/usr/bin/make

make[1]: Entering directory `/home/pb/pb/afio/build/afio-2.5'

make[1]: `afio' is up to date.

make[1]: Leaving directory `/home/pb/pb/afio/build/afio-2.5'

touch build-stamp

dh_testdir

dh_testroot

dh_clean -k -s

dh_installdirs -s

# Install the package files into build directory:
```

```
# - start with upstream make install

mkdir -p /home/pb/pb/afio/build/afio-2.5/debian/afio/usr/bin
/home/pb/pb/afio/build/afio-2.5/debian/afio/usr/share/man/man1

install -p -m 755 afio /home/pb/pb/afio/build/afio-2.5/debian/afio/usr/bin

install -p -m 644 afio.1 /home/pb/pb/afio/build/afio-
2.5/debian/afio/usr/share/man/man1

mkdir -p debian/doc-temp

dh_install -s

/usr/bin/make -f debian/rules DH_OPTIONS=-a binary-common

make[1]: Entering directory `/home/pb/pb/afio/build/afio-2.5'

dh_testdir

dh_testroot

dh_installchangelogs ChangeLog

dh_installdocs

dh_installman

dh_link

dh_strip

dh_compress

dh_fixperms

dh_installdeb

dh_shlibdeps

dh_gencontrol

dpkg-gencontrol: warning: unknown substitution variable ${misc:Depends}

dh_md5sums

dh_builddeb

dpkg-deb: building package `afio' in `../afio_2.5-
0.20091204131057_i386.deb'.

make[1]: Leaving directory `/home/pb/pb/afio/build/afio-2.5'

# Nothing to do, the only indep item is the manual which is available as
html in original source

touch build-indep-stamp

dh_testdir

dh_testroot
```

```
dh_clean -k -i

dh_clean: I have no package to build

dh_installdirs -i

dh_installdirs: I have no package to build

dh_install -i

dh_install: I have no package to build

/usr/bin/make -f debian/rules DH_OPTIONS=-i binary-common

make[1]: Entering directory `/home/pb/pb/afio/build/afio-2.5'

dh_testdir

dh_testdir: I have no package to build

dh_testroot

dh_installchangelogs ChangeLog

dh_installchangelogs: I have no package to build

[…]

dh_builddeb

dh_builddeb: I have no package to build

make[1]: Leaving directory `/home/pb/pb/afio/build/afio-2.5'

 dpkg-genchanges  >../afio_2.5-0.20091204131057_i386.changes

dpkg-genchanges: including full source code in upload

dpkg-buildpackage: full upload; Debian-native package (full source is
included)


Checking validity of debs with lintian... child (lintian ../afio_2.5-
0.20091204131057_*.changes ) exited with value 1

W: afio source: debian-rules-ignores-make-clean-error line 62

W: afio source: maintainer-upload-has-incorrect-version-number 2.5-
0.20091204131057

W: afio: extra-license-file usr/share/doc/afio/perl.artistic.license.gz

W: afio: copyright-without-copyright-notice

E: afio: description-starts-with-package-name

E: afio: description-synopsis-is-duplicated
```

```
Get package names in pb@localhost:pb/afio/build... OK

Recovery of package afio_2.5-0.20091204131057.dsc in
/home/pblab/pb/afio/build/debian/5.0... OK

Recovery of package afio_2.5-0.20091204131057.tar.gz in
/home/pblab/pb/afio/build/debian/5.0... OK

Recovery of package afio_2.5-0.20091204131057_*.deb in
/home/pblab/pb/afio/build/debian/5.0... OK

Recovery of package afio_2.5-0.20091204131057_*.changes in
/home/pblab/pb/afio/build/debian/5.0... OK

VMbuild cleanup... OK

Packages: afio

Sources handled (Packages): debian/5.0/afio_2.5-0.20091204131057.dsc
debian/5.0/afio_2.5-0.20091204131057.tar.gz debian/5.0/afio_2.5-
0.20091204131057_*.deb debian/5.0/afio_2.5-0.20091204131057_*.changes
/home/pblab/pb/afio/build/pbscript

Preparing /var/ftp/pub/afio/test/debian/5.0 on
delivery@localhost:/var/ftp/pub/afio/test/debian/5.0... OK

Packages delivery in
delivery@localhost:/var/ftp/pub/afio/test/debian/5.0... OK

Executing pbscript on delivery@localhost:/var/ftp/pub/afio/test/debian/5.0
if needed... OK

 ! Package afio (filename 5.0/afio_2.5-0.20091204122251_i386.deb) is
repeat;

   ignored that one and using data from 5.0/afio_2.5-
0.20091204131057_i386.deb !

 ** Packages in archive but missing from override file: **

  afio



 Wrote 1 entries to output Packages file.

 Wrote 0 entries to output Packages file.

 Wrote 0 entries to output Packages file.

[pblab@o185i228 deb]$ dpkg -I ~ftp/pub/afio/test/debian/5.0/afio_2.5-
0.20091204131057_i386.deb

 new debian package, version 2.0.

 size 75366 bytes: control archive= 1163 bytes.

     414 bytes,    13 lines      control

    1603 bytes,    24 lines      md5sums
```

```
 Package: afio
 Version: 2.5-0.20091204131057
 Architecture: i386
 Maintainer: Big Chief <bigchief@hp.com>
 Installed-Size: 232
 Depends: libc6 (>= 2.7-1)
 Section: utils
 Priority: optional
 Homepage: http://www.boutell.com/lsm/lsmbyid.cgi/000462
 Description: afio is a cpio compatible archiver with extended features
  afio is a cpio compatible archiver with extended features
  It can compress on a file by file basis.
  .
[pblab@o185i228 deb]$ dpkg -x ~ftp/pub/afio/test/debian/5.0/afio_2.5-
0.20091204131057_i386.deb /tmp/x
[pblab@o185i228 deb]$ dpkg -x ~ftp/pub/afio/test/debian/5.0/afio_2.5-
0.20091204131057_i386.deb /tmp/x
[pblab@o185i228 deb]$ ls -R /tmp/x
/tmp/x:
usr

/tmp/x/usr:
bin  share

/tmp/x/usr/bin:
afio

/tmp/x/usr/share:
doc  man

/tmp/x/usr/share/doc:
afio
```

```
/tmp/x/usr/share/doc/afio:

afio.lsm             changelog.gz  perl.artistic.license.gz  script1
script4

ANNOUNCE-2.5         copyright     PORTING.gz                script2
SCRIPTS

changelog.Debian.gz  HISTORY.gz    README                    script3


/tmp/x/usr/share/doc/afio/script1:

backup  DONTDUMP


/tmp/x/usr/share/doc/afio/script2:

backup  README  restore  x.dot  x.home


/tmp/x/usr/share/doc/afio/script3:

gnupg_read  gnupg_write  pgp_read  pgp_write


/tmp/x/usr/share/doc/afio/script4:

tapechange


/tmp/x/usr/share/man:

man1


/tmp/x/usr/share/man/man1:

afio.1.gz
```

So we have built our deb package, and check its metadata and its content.

By creating a new VM

pb can also help you making new VM from scratch. Using LinuxCOE to design a Fedora install, we will build a QEMU/KVM VM hosting a Fedora release, set it up and build our afio package in it.

For this to work, you'll have to install at least a text based browser such as lynx on your RHEL 5 distribution and the KVM tool if not already done (you also may need xauth). Outside the HP LAN, refer to http://www.instalinux.com)

```
[pblab@o185i225 pb]$ lynx http://linuxcoe.corp.hp.com/designer
```

```
Choose Generate a boot floppy

Distro Rev Arch: OpenSUSE 11.1 - x86_64

Continue

Continue

Waystation: eurolinux.grenoble.hp.com - EMEA – Grenoble FR

Continue

Continue

Continue

Give passwd for root and a pblab user.

Go For It!

Download the ISO image generated

Save to disk as opensuse-11.1-x86_64-coe.iso

q

y
```

Now that you have designed your installation, use that ISO image as a boot image for your new VM with the help of pb:

```
[root@o185i228 home]# yum install kvm-qemu-img

[pblab@o185i228 ~]$ pb -p afio -i opensuse-11.1-x86_64-coe.iso -m
opensuse-11.1-x86_64 newvm

Project: afio

Action: newvm

Creating the QEMU VM... OK

Launching the VM /home/pblab/vm/opensuse-11.1-x86_64.qemu... OK

Waiting 180 s for VM opensuse-11.1-x86_64 to come up... open /dev/kvm: No
such file or directory

Could not initialize KVM, will disable KVM support

Please ensure that sshd is running in your VM by default

and that it allows remote root login (PermitRootLogin yes in
/etc/ssh/sshd_config)

# In the VM type install and during the installation do the next chapter.

# When it's done, log on the system and check the above items are valid.

[pblab@o185i228 ~]$ pb -p afio -m opensuse-11.1-x86_64 setupvm

Project: afio
```

```
Action: setupvm

Launching the VM /home/pblab/vm/opensuse-11.1-x86_64.qemu... OK

[…]
```

After the automatic providing of the VM with LinuxCOE, you just have to set it up with `setupvm`, and then you can add it to your list of VM to build for, and rapidly generate new afio packages for that distribution. On a slow system you may have to use `launchvm` to finish the setup before being able to use `setupvm`.

By creating a new VE (optional)

TBD later

Using pb with an existing project (SVN)

Estimated time: 15 minutes.

pb setup

Now that we have done it once, it will be much quicker to adapt our setup to build for a new project. You just have to adapt the `.pbrc` file that way:

```
[pblab@o185i225 ~]$ cat >> $HOME/.pbrc << EOF

pbconfurl mondorescue =  svn+socks://svn.project-
builder.org/pb/projects/mondorescue/pbconf

EOF
```

And inside the HP LAN, setup a SVN proxy with tsocks:

```
[root@o185i228 home]# yum install tsocks

[root@o185i228 home]# cat > /etc/tsocks.conf << EOF

server = socks-server

local = 15.0.0.0/255.0.0.0

local = 16.0.0.0/255.0.0.0

EOF

[pblab@o185i225 ~]$ cat >> $HOME/.pbrc << EOF

pbsockscmd default = tsocks

EOF
```

pb repository setup

```
[pblab@o185i225 pb]$ pb -p mondorescue cms2pkg

Checking out svn://svn.project-builder.org/pb/projects/mondorescue/pbconf
to /home/pblab/pb/mondorescue/pbconf ... OK
```

```
ERROR: no pbroot defined, used /home/pblab/pb/mondorescue/pbconf, without
finding mondorescue.pb in it

       Please use -r release in order to be able to initialize your
environment correctly

Unable to open /home/pblab/pb/mondorescue/pbconf/mondorescue.pb at
/usr/lib/perl5/vendor_perl/5.8.8/ProjectBuilder/Env.pm line 1041.
```

Of course, we need to say which version we want to build. Try building the development one named branches/2.2.10. Remark also that pb extracted the whole pbconf content for mondorescue from the SVN.

```
[pblab@o185i225 pb]$ pb -p mondorescue -r branches/2.2.10 cms2pkg

Project: mondorescue

Action: cms2pkg

Packages: mondo,mindi

Checking out svn+ssh://svn.mondorescue.org/mondo/svn/mondorescue/2.2.10 to
/home/pblab/pb/mondorescue//branches/2.2.10 ... The authenticity of host
'svn.mondorescue.org (213.30.161.23)' can't be established.

RSA key fingerprint is 58:7f:66:05:4e:c1:b0:60:89:7a:b7:09:1c:10:18:5b.

Are you sure you want to continue connecting (yes/no)? yes

pblab@svn.mondorescue.org's password:
```

Of course, the setup of the project leader is different from us. He is using SSH to have SVN access, which is not our case. So we need to overload that configuration to have access to the project sources:

```
[pblab@o185i228 ~]$ grep svn
pb/mondorescue/pbconf/branches/2.2.10/mondorescue.pb

pburl mondorescue = svn+ssh://svn.mondorescue.org/mondo/svn/mondorescue

[pblab@o185i225 ~]$ cat >> $HOME/.pbrc << EOF

pburl mondorescue = svn+socks://svn.mondorescue.org/mondorescue/branches

EOF
```

Tar file and package creation

If at that point, without doing any modification, we try to generate at least the tar files of the project, the result is:

```
[pblab@o185i225 pb]$ pb -p afio cms2pkg

Project: mondorescue

Action: cms2pkg

Packages: mondo,mindi
```

```
Checking out svn://svn.mondorescue.org/mondorescue/branches/2.2.10 to
/home/pblab/pb/mondorescue//branches/2.2.10 ... OK


Management of mondo 2.2.10-0.20091204174124 (rev 2497)

Exporting /home/pblab/pb/mondorescue//branches/2.2.10/mondo from svn+socks
to /home/pblab/pb/mondorescue/delivery/mondo-2.2.10 ... OK

Generating fake ChangeLog for test version

Build files are being generated for ...

 ... debian-5.0-i386,fedora-10-i386,rhel-5.4-x86_64

Delivering and compressing patches

Executing init script from
/home/pblab/pb/mondorescue/pbconf/branches/2.2.10/mondo/pbinit... OK

./bootstrap: line 5: automake: command not found

./bootstrap: line 8: autoconf: command not found

[…]

./bootstrap: line 29: libtoolize: command not found

./bootstrap: line 30: aclocal: command not found

./bootstrap: line 31: autoheader: command not foun

[…]

make: convert: Command not found

[…]

Installing dependencies (newt-devel libtool)...

We trust you have received the usual lecture from the local System

Administrator. It usually boils down to these three things:


    #1) Respect the privacy of others.

    #2) Think before you type.

    #3) With great power comes great responsibility.


Password:

[…]

error: Failed build dependencies:
```

```
        newt-devel >= 0.50 is needed by mondo-2.2.10-
0.20091204174124.rhel5.4.x86_64

        gcc-c++ is needed by mondo-2.2.10-0.20091204174124.rhel5.4.x86_64

        autoconf is needed by mondo-2.2.10-0.20091204174124.rhel5.4.x86_64

        automake is needed by mondo-2.2.10-0.20091204174124.rhel5.4.x86_64

        libtool is needed by mondo-2.2.10-0.20091204174124.rhel5.4.x86_64

[…]

rpm packages generated:  SRPMS/mindi-2.0.8-
0.20091204174124.rhel5.4.src.rpm RPMS/noarch/mindi-2.0.8-
0.20091204174124.rhel5.4.noarch.rpm
```

Ok, so we were able to generate one of the 2 packages planned. The reason for the lack of success for mondo is linked to a lack of packages needed at build time. Some are part of the initialization of the project (automake and the likes) others are dependencies in RPM that pb tries unsuccessfully to install as our build account is not in the sudoers here (you may not want to adopt the solution below for obvious security reason). Fix these issues:

```
[root@o185i228 home]# yum install autoconf automake libtool ImageMagick
docbook-utils-pdf gcc-c++

[root@o185i228 home]# cat >> /etc/sudoers << EOF

pblab ALL=(ALL) ALL

EOF

[pblab@o185i228 ~]$ pb -p mondorescue -r branches/2.2.10 cms2pkg mondo

Project: mondorescue

Action: cms2pkg

Packages: mondo



Management of mondo 2.2.10-0.20091204175959 (rev 2497)

[…]

Executing init script from
/home/pblab/pb/mondorescue/pbconf/branches/2.2.10/mondo/pbinit...

Creating mondo tar files compressed... OK

Under /home/pblab/pb/mondorescue/delivery/mondo-2.2.10.tar.gz

Creating pbconf tar files compressed... OK

Under /home/pblab/pb/mondorescue/delivery/mondo-2.2.10.pbconf.tar.gz

Packages: mondo

Extracting spec files from /home/pblab/pb/mondorescue/delivery/mondo-
2.2.10.pbconf.tar.gz... OK
```

```
Extracting patch files from /home/pblab/pb/mondorescue/delivery/mondo-
2.2.10.pbconf.tar.gz... N/A

Installing dependencies (newt-devel)... Password:

Loaded plugins: rhnplugin, security

Cleaning up Everything

Loaded plugins: rhnplugin, security

This system is not registered with RHN.

RHN support will be disabled.

afio                                                     |  951 B
00:00

afio/primary                                             |  948 B
00:00

afio
2/2

[…]

Building package with /home/pblab/pb/mondorescue/build/SPECS/mondo.spec
under /home/pblab/pb/mondorescue/build...

[…]

rpm packages generated:  SRPMS/mondo-2.2.10-
0.20091204184315.rhel5.4.src.rpm RPMS/x86_64/mondo-2.2.10-
0.20091204184315.rhel5.4.x86_64.rpm
```

If you have problems building it, you may have to solve a current build issue with recent autotools:

```
[pblab@o185i228 pbconf]$ svn diff

Index: branches/2.2.10/mondo/rpm/mondo.spec

===================================================================

--- branches/2.2.10/mondo/rpm/mondo.spec        (revision 930)

+++ branches/2.2.10/mondo/rpm/mondo.spec        (working copy)

@@ -57,6 +57,7 @@

 %setup -q


 %build

+mkdir m4

 %configure

 make %{?_smp_mflags} VERSION=%{version}
```

It could also be possible at that point to build for your existing VMs.

There is much more to discover around pb (management of patches, other DVCS, managing announces to mailing list, website, managing official vs test versions, …) but I leave that for an update of this document.