what’s happening with pbuilder?

Debian Conference 2007

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June 2007
Who is this guy?

- Junichi Uekawa, dancer@debian.org
- Debian Developer since 2000
- Interests: Audio-processing related tools, and Debian quality maintenance related tools, Japanese localization, shared library packaging, and more recently, Debian/MacBook related.
Agenda?

- pbuilder
- pbuilder-uml
- cowbuilder
- qemubuilder
pbuilder, what is the concept?
What is a chroot?
concept of a chroot

# chroot
/var/cache/pbuilder/build/XXX
bin/bash
concept of pbuilder

# pbuilder --XXXX
How do I use pbuilder?
installing pbuilder

# apt-get install pbuilder
# vi /etc/pbuilderrc
# evince
/usr/share/doc/pbuilder/
pbuilder-doc.pdf
pbuilder basics

- `pbuilder create`
  - done once to create base filesystem.
- `pbuilder update`
  - twice a day to follow unstable updates, to revise base filesystem.
- `pbuilder build`
  - for each package build to build Debian package inside chroot.
pbuilder --create

# pbuilder --create
Distribution is sid.
Building the build environment
  -> running debootstrap
  /usr/sbin/sbin/debootstrap
I: Retrieving Release
I: Retrieving Packages
I: Validating Packages
.
.
.
# pbuilder --update

W: /home/dancer/.pbuilderrc does not exist

Building the build Environment
  -> extracting base tarball [/var/cache/pbuilder/base.tgz]

.
pbuilder --build

# pbuilder --build dsh_*.dsc
I: using fakeroot in build.
Current time: Sat Jan 20 12:03:34 JST
pbuilder-time-stamp: 1169262214
Building the build Environment
  -> extracting base tarball [/home/dancer/DEBIAN/pbuilder/pbuilder/testsuite/tmp.FeeAX18779/testimage]
  -> creating local configuration
  .
  .
pbuilder --login

# pbuilder --login --bindmount ${HOME}
I: using fakeroot in build.
Current time: Sat Jan 20 12:03:34 JST
pbuilder-time-stamp: 1169262214
Building the build Environment
  -> extracting base tarball [/home/dancer/DEBIAN/pbuilder/pbuilder/testsuite/tmp.FeeAX18779/testimage]
  -> creating local configuration
$ ls debian/rules
debian/rules
$ pdebuild
W: /home/dancer/.pbuilderrc does not exist
dpkg-buildpackage: source package is cowdancer
dpkg-buildpackage: source version is 0.26
dpkg-buildpackage: source changed by Junichi Uekawa <dancer@debian.org>
make[1]: Entering directory '/home/dancer/DEBIAN/cowdancer/cowdancer'
rm -f *~ *.o *.lo libcowdancer.so cow-shell cowbuilder
make[1]: Leaving directory '/home/dancer/DEBIAN/cowdancer/cowdancer'
dh_clean
dpkg-source -b cowdancer
dpkg-source: warning: source directory './cowdancer' is not <sourcepackage>-<upstreamversion> 'cowdancer-0.26'
dpkg-source: building cowdancer in cowdancer_0.26.tar.gz
How do you maintain your package today?
pbuilder backend variations

- LVM
- UML
- cowdancer
- qemu

Motivation
- limitation in chroot segregation (process space, filesystem)
- COW filesystem optimization (tarball extraction slow.)
different method of segregation
COW block device support
cowbuilder

Speed up through use of copy-on-write filesystem.
Just a matter of:

# cp -al
/var/cache/pbuilder/base.cow
/var/cache/pbuilder/build/XXX

# chroot
/var/cache/pbuilder/build/XXX
cow-shell
Concepts of cowdancer

- Usage: hardlink files, LD_PRELOAD libcowdancer.so; trap libc calls likely to cause file writes (open, etc) and break the hardlink.
- light-weight compared to other solutions (no extra partition, no LVM, no extra kernel modules/patches)
- cow-shell into it.
qemubuilder

Try running other architectures at your fingertips?
qemubuilder example config

KERNEL_IMAGE=2.6.18-4-mips-di-vmlinux
INITRD=2.6.18-4-mips-di-initrd.gz
ARCH=mips
BASEPATH=
   /var/cache/pbuilder/base-mips.qemu
qemubuilder details... create

debootstrap --cross

/ var/cache/pbuilder

build/XXX

base.qcow

loop-mount

base.qcow

"RAW" device
qemubuilder details... build

qemu
- kernel XX
- initrd XX
- append ""

hda
base.qcow

hdb
data device

root filesystem
init:
mount /dev/hdb
run script there

Files for building
.dsc
.orig.tar.gz
etc..
qemubuilder
--create --config
mips.config
qemubuilder
–build –config
mips.config
XXX.dsc
qemubuilder --login

$ sudo qemubuilder --login --config pbuilder-qemu-mips.config
bash: /root/.pbuilderrc: No such file
fsck 1.40-WIP (14-Nov-2006)
e2fsck 1.40-WIP (14-Nov-2006)
/home/dancer/tmp/base-mips.qemu: clean
1+0 records in
1+0 records out
1048576 bytes (1.0 MB) copied, 0.0229856 seconds, 45.6 MB/s
mke2fs 1.40-WIP (14-Nov-2006)

hostname: the specified hostname is invalid.
bound to 10.0.2.15 -- renewal in 35272 seconds.
bash: no job control in this shell
root@pbuilder-coreduo:/#
further ideas

- install testing
- package testing
related tools

- schroot
- piuparts
- autopkgtest
thanks to

- Loïc Minier
- Mattia Dongili
- Matt Kraai
- ... others as in AUTHORS / THANKS file.
References

- Information:

- alioth project:
  http://alioth.debian.org/projects/pbuilder

- git repository:
  git-clone
  
  git://git.debian.org/git/pbuilder/pbuilder.git
Questions?