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# what's happening with pbuilder?

Debian Conference 2007

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# Who is this guy?

- ▶ Junichi Uekawa, [dancer@debian.org](mailto:dancer@debian.org)
- ▶ Lives in Japan, Leading Debian JP for 2007
- ▶ 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



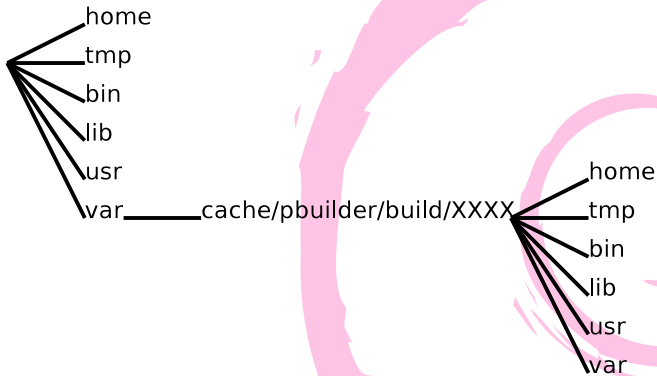
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pbuilder, what is  
the concept?

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What is a chroot?

# concept of a chroot

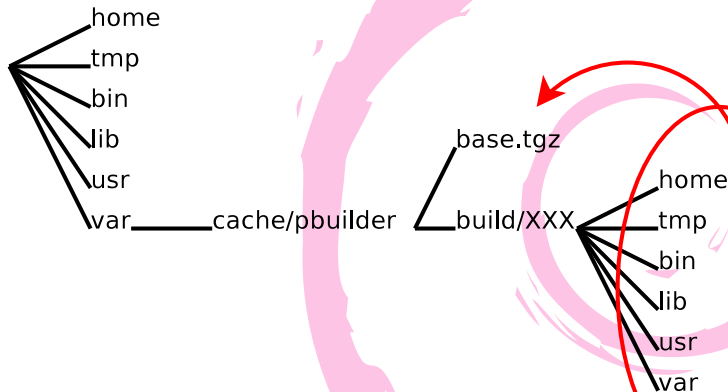


```
# chroot
```

```
/var/cache/pbuilder/build/XXX
```

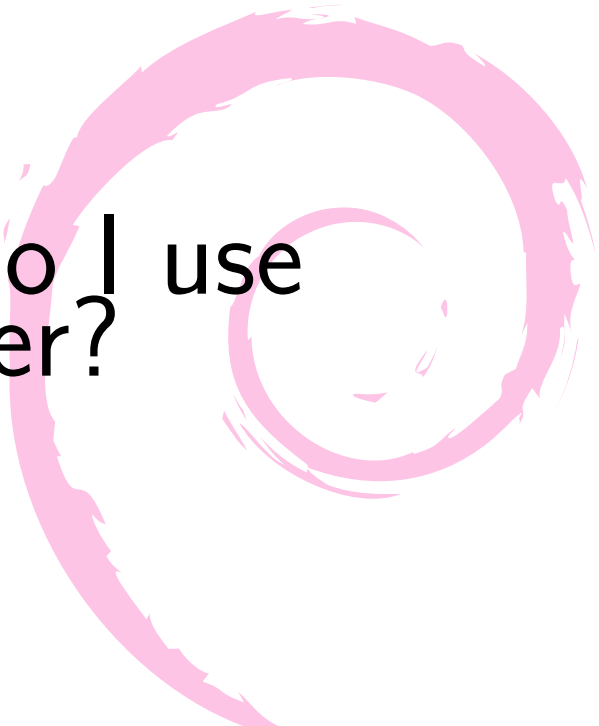
```
bin/bash
```

# concept of pbuilder



```
# pbuilder --XXXX
```

How do I use  
pbuilder?

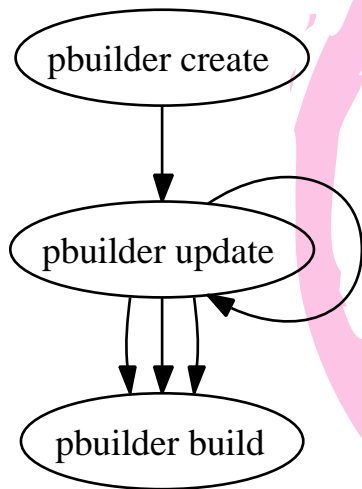




# installing pbuilder

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

# pbuilder basics



- ▶ done once to create base filesystem.
- ▶ twice a day to follow unstable updates, to revise base filesystem.
- ▶ 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/debootstrap
I: Retrieving Release
I: Retrieving Packages
I: Validating Packages
.
.
```

# pbuilder --update

```
# pbuilder --update
```

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

```
Building the build Environment
```

```
-> extracting base tarball [/var/cache
```

```
.
```

```
.
```

# 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/dan
-> 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/dan
-> creating local configuration
.
.
```

pdebuild

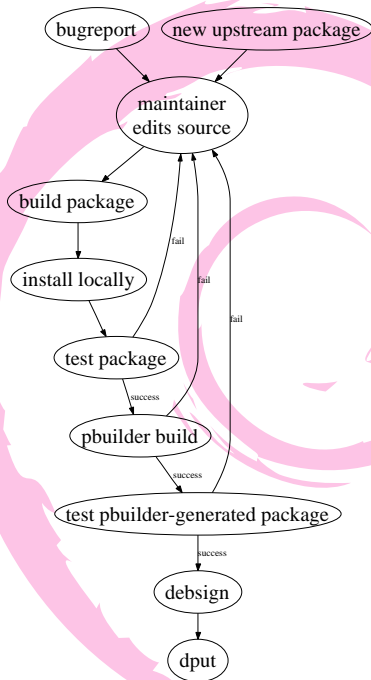


# pdebuild

```
$ ls debian/rules
debian/rules
$ pdebuild
W: /home/dancer/.pbuilder.rc does not exist
dpkg-buildpackage: source package is c
dpkg-buildpackage: source version is 0
dpkg-buildpackage: source changed by J
dpkg-buildpackage: source version with
 fakeroot debian/rules clean
dh_testdir
```



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.)

uml

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

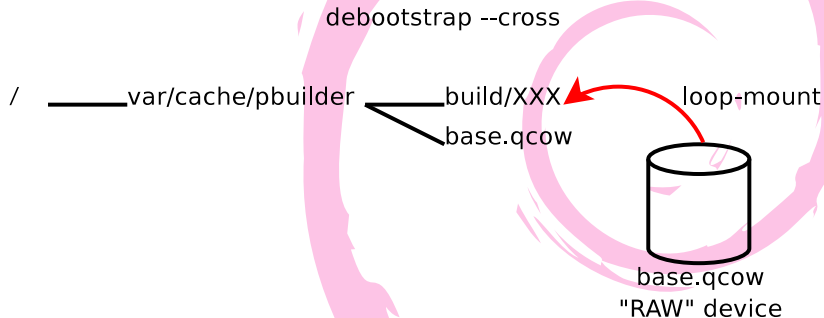
Try running other architectures at your fingertips?



# qemubuilder example config

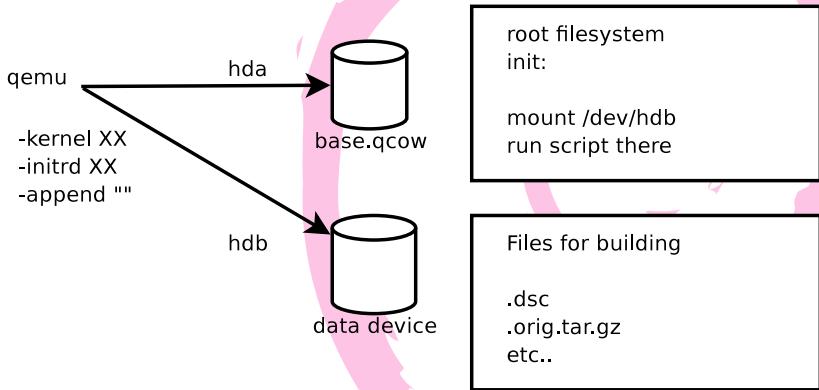
```
KERNEL_IMAGE=2.6.18-4-mips-di-vmlinux  
INITRD=2.6.18-4-mips-di-initrd.gz  
ARCH=mips  
BASEPATH=  
    /var/cache/pbuilder/base-mips.qemu
```


# qemubuilder details... create






# qemubuilder details... build

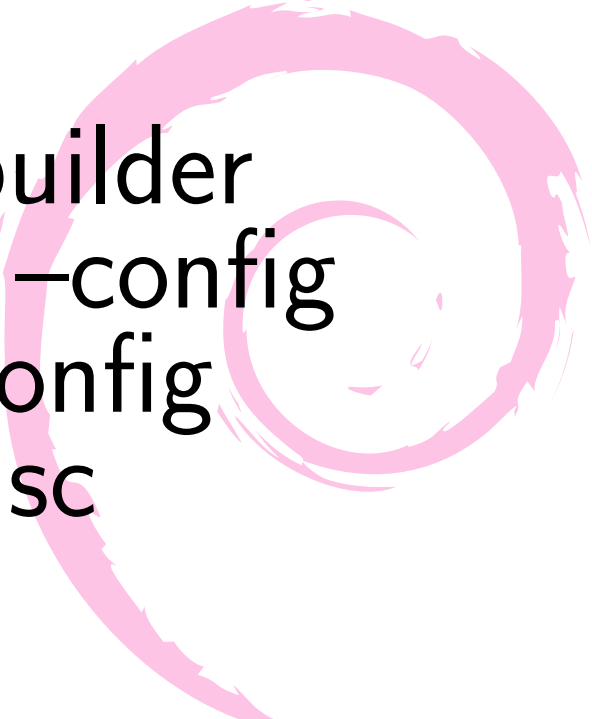


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qemubuilder  
-create -config  
mips.config

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qemubuilder  
-update -config  
mips.config

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qemubuilder  
-build -config  
mips.config  
XXX.dsc

# qemubuilder --login

```
$ sudo qemubuilder --login --config pb  
bash: /root/.pbuildererrc: 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, 0.02298  
mke2fs 1.40-WIP (14-Nov-2006)
```

# qemubuilder --login

```
.  
.br/>.br/>hostname: the specified hostname is in  
bound to 10.0.2.15 -- renewal in 35272  
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:  
`/usr/share/doc/pbuilder/  
pbuilder-doc.pdf`, `http:  
//pbuilder.alioth.debian.org/`
- ▶ alioth project:  
`http://alioth.debian.org/projects/pbuilder`
- ▶ git repository:  
`git-clone`  
`git://git.debian.org/git/pbuilder/pbuilder.git`

Questions?

