

Debian  
GNU/kFreeBSD

Aurelien Jarno

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Portable packaging

Portable programs

Additional  
information

# Debian GNU/kFreeBSD

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FOSDEM

26/02/2006



# What is Debian GNU/kFreeBSD?

## Debian GNU/kFreeBSD

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### Additional information

- Debian port
- FreeBSD kernel (kFreeBSD for short)
  - kFreeBSD 5.4
  - experimental version of kFreeBSD 6.0
- GNU userland
- GNU libc
- Cool Debian tools (dpkg, apt, ...)

A Gentoo port has been started recently.

# Why would you prefer Debian GNU/kFreeBSD to GNU/Linux?

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- Because you like the FreeBSD kernel
  - Jails
  - UFS 2+
  - IPv6 statefull firewalling
  - Stable kernel API
- Better or worse device support
- To add diversity among your machines
- To be able to run FreeBSD and Linux binaries
- Debian is the "universal OS"

# Why would you prefer Debian GNU/kFreeBSD to FreeBSD ?

## Debian GNU/kFreeBSD

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- Because you don't like FreeBSD ports system (or just because you like the Debian package system :-)
- Because you prefer the GNU userland to the BSD one
- ext2fs, reiserfs, upcoming xfs and upcoming Xbox ethernet drivers enabled by default (GPL contaminated kernel)
- 100% free system according to the DFSG

# Supported architectures

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information

- Currently x86 only (kfreebsd-i386.deb)
- An alpha port of the GNU libc has existed.
- An AMD64 port is underway. The toolchain is ported, but there are still bugs to fix.

# Status of the toolchain

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## ■ GCC

- Support in upstream, except for Ada
- Support all languages but Java
- Version 3.3, 3.4, 4.0 and 4.1 are available

## ■ Binutils

- Support in upstream

## ■ GNU libc

- GNU libc ported by Bruno Haible in 2002
- Not yet integrated in upstream, set of patches
- Patches to remove "linuxisms" are being merged
- Sysdeps/ directory will go to glibc-ports
- Uses linuxthreads (how about the future ?)

# Integration in Debian

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information

- Follows unstable and experimental
- "unreleased" repository for patched packages
- 77% of the packages have been ported (4700 source packages)
- The most advanced Debian non-Linux port
- [popcon.debian.org](http://popcon.debian.org) shows 17 machines
- A few machines using it in production (web server, database)

# Some available packages

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- Xorg, KDE 3.5, most parts of Gnome, WindowMaker, ...
- Apache, PHP, MySQL, Postgresql, Samba...
- Abiword, KOffice, The Gimp, ...
- Frozen Bubble, GTetrinet, Pingus, ...
- Totem, Kaffeine, XMMS, ...

MPlayer (not a Debian package) also works out of the box

# Some missing packages

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Additional  
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- Gecko based browsers
- Mozilla Thunderbird
- Openoffice.org

# Infrastructure

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Additional  
information

- Primary mirror ([ftp.gnuab.org](http://ftp.gnuab.org)) + a few mirrors
- Packages are searchable on <http://pdo.debian.net>
- 2 autobuilders
- Build status on <http://buildd.net>
- Build logs on <http://experimental.ftbs.de>
- Developer accessible machine ([io.debian.net](http://io.debian.net))

# The future

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Additional  
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- Reach 95% of source packages built
- Port integrated into the archive
- Release architecture
- Debian installer (currently it uses the FreeBSD installer)
- Other architectures

We need help !

# How to try it?

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information

- Installing it <http://glibc-bsd.alioth.debian.org/install>
- LiveCD  
<http://ftp.gnuab.org/pub/ging/>
- Debian Developer machine  
<http://io.debian.net/ssh.html>

Report bugs, and tell friends about it !

# How to help as a Debian maintainer

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- Try to build your packages on [io.debian.net](http://io.debian.net)
- Try to port them
  - Out of date `config.guess` and `config.sub`
  - Out of date `libtool`
  - <http://glibc-bsd.alioth.debian.org/PORTING>
  - FreeBSD CVS
- Don't ignore our patches sent to the BTS

Our policy is to send a bug report only when we have a patch.

# A few tricks for portable packages

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- Don't suppose a GNU/Linux system :

```
./configure --host='dpkg'  
--print-architecture'-linux
```

but

```
./configure --host='dpkg-architecture'  
-qDEB_HOST_GNU_TYPE'
```

- Don't build depends on `libc6-dev` ! The `glibc` development package is `libc0.1-dev`
- Don't build depends on `linux-kernel-headers` if you don't need kernel headers

# A few tricks for portable packages (2)

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information

- If your package supports Linux specific stuff (alsa, hal, ...), enable them for GNU/Linux only :  

```
DEB_HOST_ARCH_OS := $(shell dpkg-architecture  
-qDEB_HOST_ARCH_OS)  
ifeq (linux,$(DEB_HOST_ARCH_OS))  
  linux specific stuff  
endif
```
- Build-depends : field such as [linux-any], [any-i386] will be available soon
- Use DEB\_HOST\_ARCH\_CPU to test for a specific CPU, not DEB\_HOST\_ARCH
- For x86 packages, add kfreebsd-i386 to the Architecture : field.

# Writing portable programs

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Additional  
information

- Avoid Linux specific functions when possible
- Provide a way to bootstrap compilers
- Kernel != userland
- Use autotools instead of #ifdef (use a recent version)
- `__FreeBSD__` = plain FreeBSD system (kernel + userland)
- `__FreeBSD_kernel__` = FreeBSD kernel only

# Writing portable programs (2)

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Additional  
information

## ■ Wrong solution :

```
#ifdef __linux__
#include <endian.h>
#elif __FreeBSD__
#include <sys/endian.h>
#error "Unknown system"
#endif
```

# Writing portable programs (2)

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Additional

information

- Wrong solution :

```
#ifdef __linux__
#include <endian.h>
#elif __FreeBSD__
#include <sys/endian.h>
#error "Unknown system"
#endif
```

- Better solution :

```
#ifdef __GLIBC__
#include <endian.h>
#elif __FreeBSD__
#include <sys/endian.h>
#error "Unknown system"
#endif
```

# Writing portable programs (2)

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Additional  
information

- Wrong solution :

```
#ifdef __linux__  
#include <endian.h>  
#elif __FreeBSD__  
#include <sys/endian.h>  
#error "Unknown system"  
#endif
```
- Better solution :

```
#ifdef __GLIBC__  
#include <endian.h>  
#elif __FreeBSD__  
#include <sys/endian.h>  
#error "Unknown system"  
#endif
```
- Best solution : use autotools!

# Writing portable programs (3)

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Additional  
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- Wrong solution :  
`#include <linux/soundcard.h>`



# Writing portable programs (3)

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Additional  
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- Wrong solution :  
`#include <linux/soundcard.h>`
- Better solution :  
`#include <sys/soundcard.h>`

# Writing portable programs (3)

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information

- Wrong solution :  
`#include <linux/soundcard.h>`
- Better solution :  
`#include <sys/soundcard.h>`
- You can also use autotools, but don't use them to move the problem :

...

```
case $host_os in
```

```
linux*) AC_DEFINE(HAVE_LINUX_SOUNDCARD)
```

```
freebsd*) AC_DEFINE(HAVE_FREEBSD_SOUNDCARD)
```

```
esac
```

...

# Writing portable programs (4)

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information

## ■ Wrong solution :

...

```
case $host_os in  
  linux*) AC_DEFINE(_GNU_SOURCE)  
esac
```

...

## ■ Best solution :

...

```
case $host_os in  
  *-gnu) AC_DEFINE(_GNU_SOURCE)  
esac
```

...

# Additional information

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- Wiki : [http://wiki.debian.org/Debian\\_GNU/kFreeBSD](http://wiki.debian.org/Debian_GNU/kFreeBSD)
- Mailing-list : [debian-bsd@lists.debian.org](mailto:debian-bsd@lists.debian.org)
- IRC : [#gnu-kbsd@freenode](irc://freenode.net/#gnu-kbsd)
- Patches, various stuff :  
<http://glibc-bsd.alioth.debian.org/>