Cat-Herding Development Boards

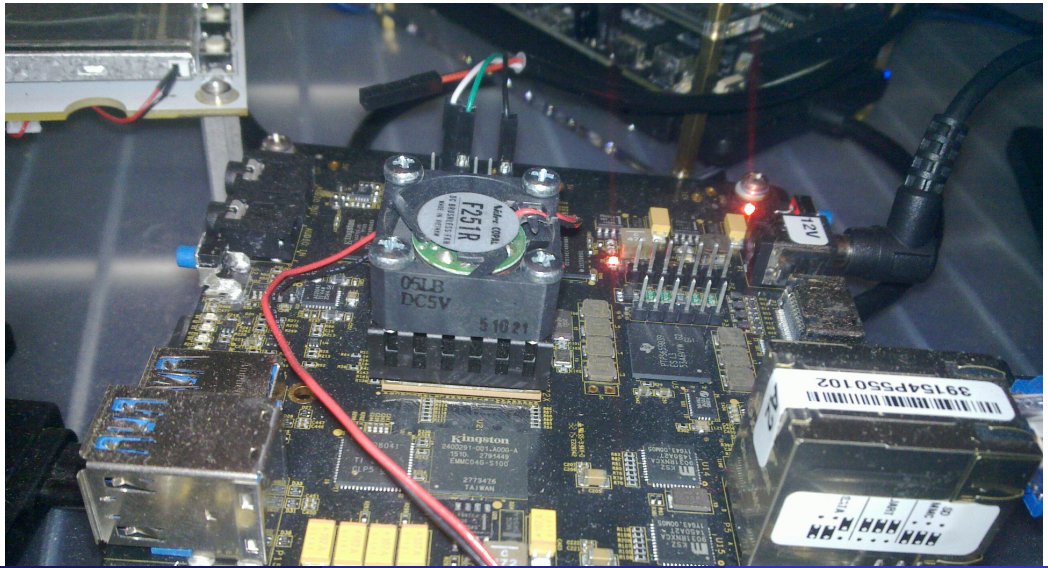
Vagrant Cascadian

DebConf19 2019-07-25

Who am I

	Debian
user	2001
contributor	2004
maintainer	2008
developer	2010

What is a Development Board



Case study: U-boot in debian

In october 2013
Almost 9 months since the last Debian upload.
18 supported platforms

u-boot: the gentle ask

`https://bugs.debian.org/726699`

I've done some work towards updating to the new version and could help with an upload or two if needed... but probably not long-term maintenance.

u-boot: your new job!

https://bugs.debian.org/726699

> I've done some work towards updating to the new version and could help with
> an upload or two if needed... but probably not long-term maintenance.

There's basically no one willing to do long-term maintenance, so
have a blast!

Six years later

Today, 2019:
<blink>89 supported platforms!!!1one!!</blink>
`https://salsa.debian.org/debian/u-boot/blob/master/debian/targets`

Get people involved

How many people does it take to maintain 89 boards?
`https://salsa.debian.org/debian/u-boot/blob/master/debian/targets`

Get people involved, really

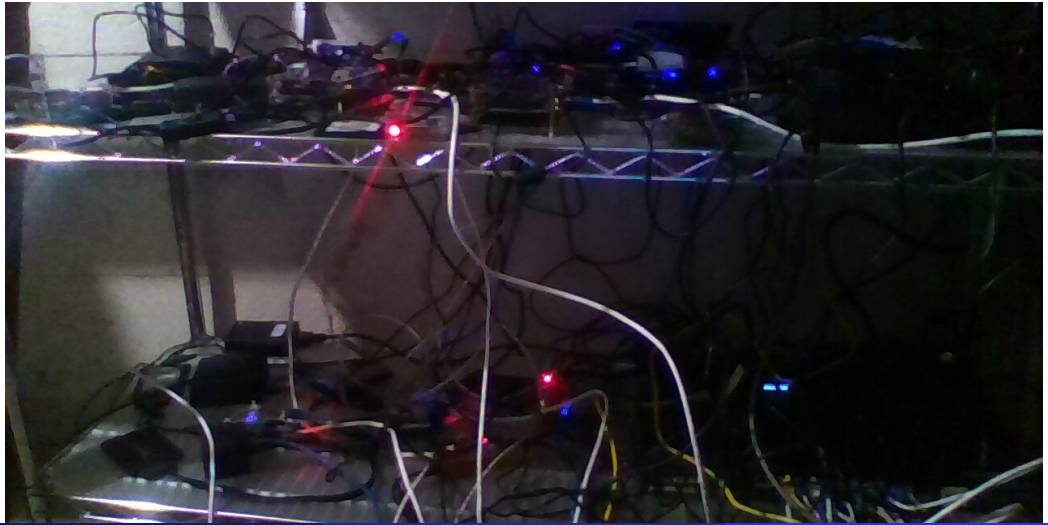
`https://wiki.debian.org/U-boot/Status`

u-boot: upstream

irc.freenode.net: #u-boot
https://lists.denx.de/pipermail/u-boot/
https://patchwork.ozlabs.org/project/uboot/list/?q=SOMEBOARD

The Zoo

The Reproducible Builds Zoo



linux kernel: upstream

`https://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git`
`https://git.kernel.org/pub/scm/linux/kernel/git/stable/linux-stable`

linux kernel: patch hunting

```
https://git.kernel.org/pub/scm/linux/kernel/git/next/linux-next.git
https://patchwork.kernel.org/project/linux-arm-kernel/list/?q=SOMETHING
```

linux kernel: debian

`https://salsa.debian.org/kernel-team/linux/`

- multiplatform kernels only
- modular

flash-kernel

`https://salsa.debian.org/installer-team/flash-kernel/`

- Generates boot scripts
- Copies around .dtb (device-tree-blob)

debian-installer

`https://salsa.debian.org/installer-team/debian-installer`

- bootloader
- kernel
- flash-kernel

debian-installer: the easy bit

```
diff --git a/build/boot/arm/u-boot-image-config b/build/boot/arm/u-boot-image-c
index 271fdf270..44bca5b33 100644
--- a/build/boot/arm/u-boot-image-config
+++ b/build/boot/arm/u-boot-image-config
@@ -21,6 +21,7 @@ A20-OLinuXino-Lime /usr/lib/u-boot/A20-OLinuXino-Lime/u-boot-
 A20-OLinuXino-Lime2 /usr/lib/u-boot/A20-OLinuXino-Lime2/u-boot-sunxi-with-spl.
 A20-OLinuXino-MICRO /usr/lib/u-boot/A20-OLinuXino_MICRO/u-boot-sunxi-with-spl.
 BananaPi /usr/lib/u-boot/Bananapi/u-boot-sunxi-with-spl.bin 16
+BananaPiM2Berry /usr/lib/u-boot/bananapi_m2_berry/u-boot-sunxi-with-spl.bin 16
 BananaPro /usr/lib/u-boot/Bananapro/u-boot-sunxi-with-spl.bin 16
 Cubieboard /usr/lib/u-boot/Cubieboard/u-boot-sunxi-with-spl.bin 16
 Cubieboard2 /usr/lib/u-boot/Cubieboard2/u-boot-sunxi-with-spl.bin 16
```

debian-installer: the hard bit

Kernel modules in .udeb

crc-modules crypto-dm-modules crypto-modules fb-modules i2c-modules input-modules md-modules mmc-modules mtd-core-modules nic-modules nic-shared-modules nic-usb-modules nic-wireless-modules sata-modules scsi-core-modules scsi-modules scsi-nic-modules usb-modules usb-storage-modules

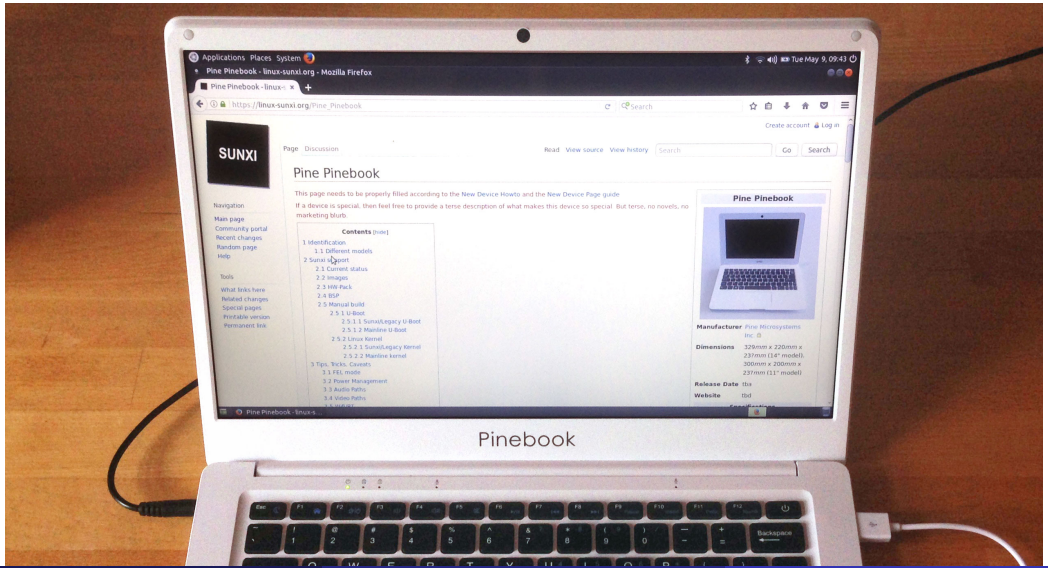
debian-installer: the quick bits

`https://d-i.debian.org/daily-images/armhf/daily/netboot/SD-card-images/`
zcat firmware.none.img.gz partition.img.gz > test.img
dd if=/usr/lib/u-boot/NEWBOARD/u-boot.img of=test.img seek=N
sudo mount -o loop test.img /mnt

debian-installer: my favorite workaround

```
apt download linux-image-VERSION-armmp
dpkg-deb -x linux-image-VERSION-armmp .
find lib/ cpio –quiet -o -H newc | gzip > cpio.modules.gz
cat initrd.gz cpio.modules.gz > initrd-with-all-the-modules.gz
cp initrd-with-all-the-modules.gz /mnt/initrd.gz
```

Working on a pinebook



arm-trusted-firmware

`https://salsa.debian.org/debian/arm-trusted-firmware`

- Nearly all 64-bit ARM platforms need it
- Upstream recently migrated to trustedfirmware.org

Getting people involved: IRC

irc.freenode.net
#u-boot
#linux-sunxi
#linux-rockchip
#linux-amlogic
irc.oftc.net
#debian-arm

Thanks

- Debian
- #debian-arm
- #u-boot
- #debian-kernel
- #debian-boot
- #linux-sunxi
- And so many individuals others...

More quick hacks!

Only the basic kernel

```
    [amd64,arm64,i386] Disable rt featureset.

diff --git a/debian/config/amd64/defines b/debian/config/amd64/defines
index 6ab7192fdb00..b61fd089f7dc 100644
--- a/debian/config/amd64/defines
+++ b/debian/config/amd64/defines
@@ -1,7 +1,6 @@
 [base]
 featuresets:
  none
- rt
 kernel-arch: x86

 [build]
```

Sign like you have no access to the kernel signing keys

```
    [amd64,arm64,i386] Disable signed-code.

diff --git a/debian/config/amd64/defines b/debian/config/amd64/defines
index 75705b2a8af3..6ab7192fdb00 100644
--- a/debian/config/amd64/defines
+++ b/debian/config/amd64/defines
@@ -7,7 +7,7 @@ kernel-arch: x86
 [build]
 debug-info: true
 image-file: arch/x86/boot/bzImage
-signed-code: true
+signed-code: false
 vdso: true

 [image]
```

Cross building kernel timesavers

```
DEB_KERNEL_DISABLE_DEBUG=yes sbuild \
--profiles='pkg.linux.notools nodoc nopython
    pkg.linux.udeb-unsigned-test-build cross' \
--no-arch-all \
--host=arm64
```

Copyright