

# The Many ARMed Monster of Reproducibility

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Debconf16, 2016-07-04

# About reproducible builds

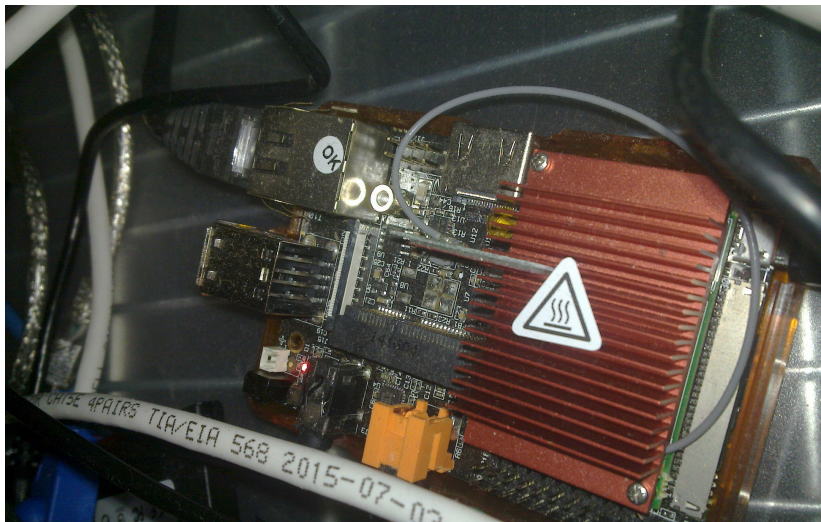
- Packages with the same source code, built with the same toolchain, should come out identical.
- [reproducible-builds.org](http://reproducible-builds.org)

# What lead to the creation of a monster?

- u-boot was marked as reproducible
- I knew it was wrong:  
U-Boot SPL 2016.01+dfsg1-3 (Feb 21 2016 - 21:39:10)
- Handful of arm systems

# Humble Beginnings

- In August of 2015, work was done to enable two dual-core and two quad-core build machines.



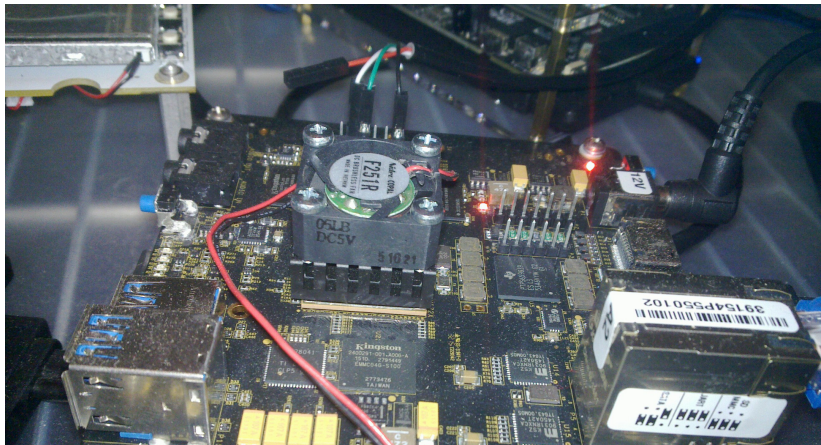


# It Lives!

- In September, the network went live, building around 200 source packages a day.
- With over 20,000 packages in the archive, it would take over 100 days to build everything in unstable...

# The Monster Grows In Strength and Numbers

- I bought a couple more boards. . .
- Donation from beagleboard.org of a beagleboard-x15
- In December 2015, the Debian Project Leader approved a proposal to triple the capacity of our build network.



# Recent Sightings



# Current configuration

- Three dual-core, 1gb ram
- Two quad-core, 1gb ram
- Two dual-core, 2gb ram
- Eight quad-core, 2gb ram
- Three quad-core, ~4gb ram
- Three octa-core, 2gb ram

# How many Whatsits?

$$(3*2)+(2*4)+(2*2)+(8*4)+(3*4)+(3*8) =$$

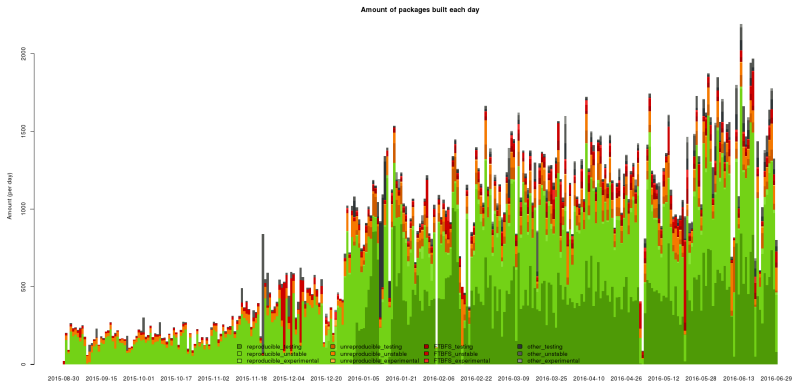
86 cores!!!!

$$(3*1)+(2*1)+(2*2)+(8*2)+(3*4)+(3*2) =$$

43 gb ram!!!!

# Devouring the archive

- Builds about 1400 or more packages a day!



- Builds unstable, testing and experimental in around 45 days.

# Building in Power

- The whole armhf build network runs in under 180 watts!





- A space heater used at debconf16 uses 400-800 watts!



# Hungry for Bandwidth

June 2016

	received	transmitted
firewall	137.37 GiB	643.67 GiB
proxy	115.68 GiB	4.99 TiB

# Boards of a feather

- Cubox-i4pro and i4x4
- Hummingboard-i2ex
- Wandboard Quad and Dual
- Firefly-RK3288
- Beagleboard-x15
- Cubietruck
- Bananapi
- OrangePI Plus2
- Raspberry PI 2
- Odroid-XU4
- Odroid-U3

# Platforms enabled in the Debian

- linux: Odroid-U3, Firefly-RK3288, Odroid-XU4, BeagleBoard-X15
- u-boot: Odroid-XU4, Firefly-RK3288, BeagleBoard-X15, Cubietruck plus, OrangePI plus
- debian-installer: BeagleBoard-X15, Firefly-RK3288

# Platforms to pout about

- lack mainline kernel and u-boot:
  - Cubieboard4, Odroid-C1+
- lack mainline kernel:
  - Cubietruck plus, Lemaker HiKey
- Non-free firmware blobs:
  - raspberry pi 2, Odroid-U3, Odroid-XU4, Odroid-C1+, Firefly(??)
- Mainline u-boot support for all ram:
  - Firefly-RK3288 4gb variant, Cubox-i4x4

# In December of 2017, the reproducible build network became aware

- Other boards:
  - Pine64, Odroid-C2
  - Lemaker Cello, HP Moonshot
- Build architecture-independent packages on different architecture for first and second build.

- The Autonomous Reproducible Build Network Produced a bit-for-bit copy of the entire earth.

# Thanks

- Holger for all the work to integrate armhf and continued maintenance of jenkins.debian.net
- Hardware donations: Debian, LeMaker, BeagleBoard.org Solid-Run
- All the great reproducible builds folks!
- Most photos by delib

