Linux for development boards

Presented by: Igor Pečovnik

Quick facts

- Community project
- Open source
- GPL 2.0

armbian

about me

- Founder, full time maintainer and developer @Armbian
- Small business entrepreneur ever since
- Fields of competence: math, electronics, computer and human science, philosophy

about armbian

- Debian or Ubuntu for more than 70 boards
- More than 30 arm & arm64 kernels
- Unoffical ports for TV boxes
- Powerfull build tools
- Stable and beta packages repository
- Good reputation

about presentation

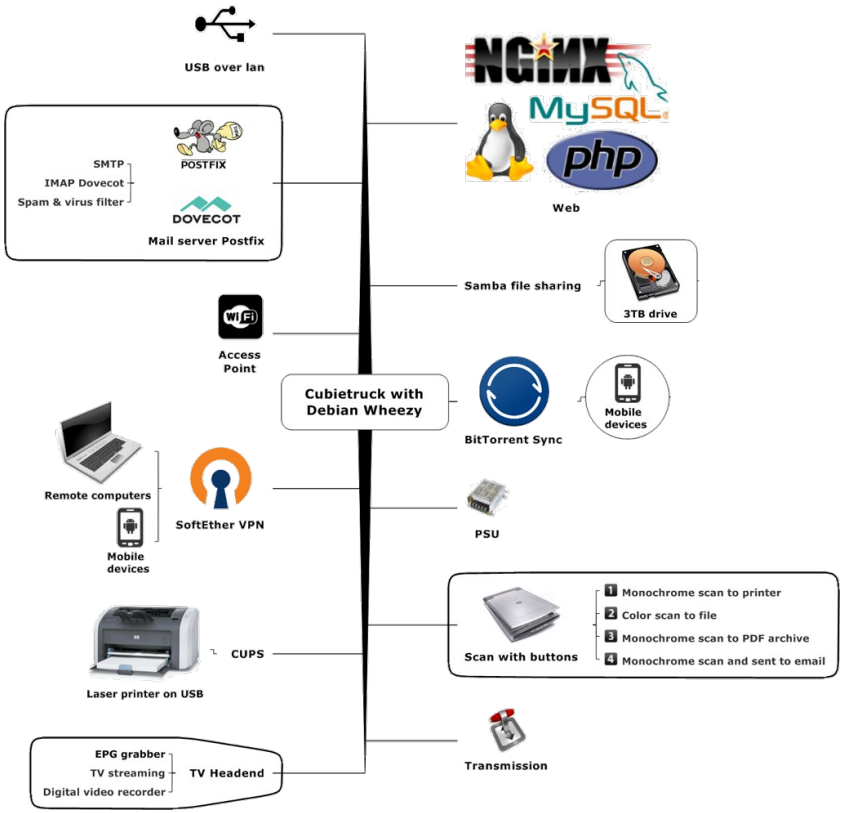
- Motives for start
- Historical overview
- Infrastructure
- Userspace
- Build engine

1. Motives for start

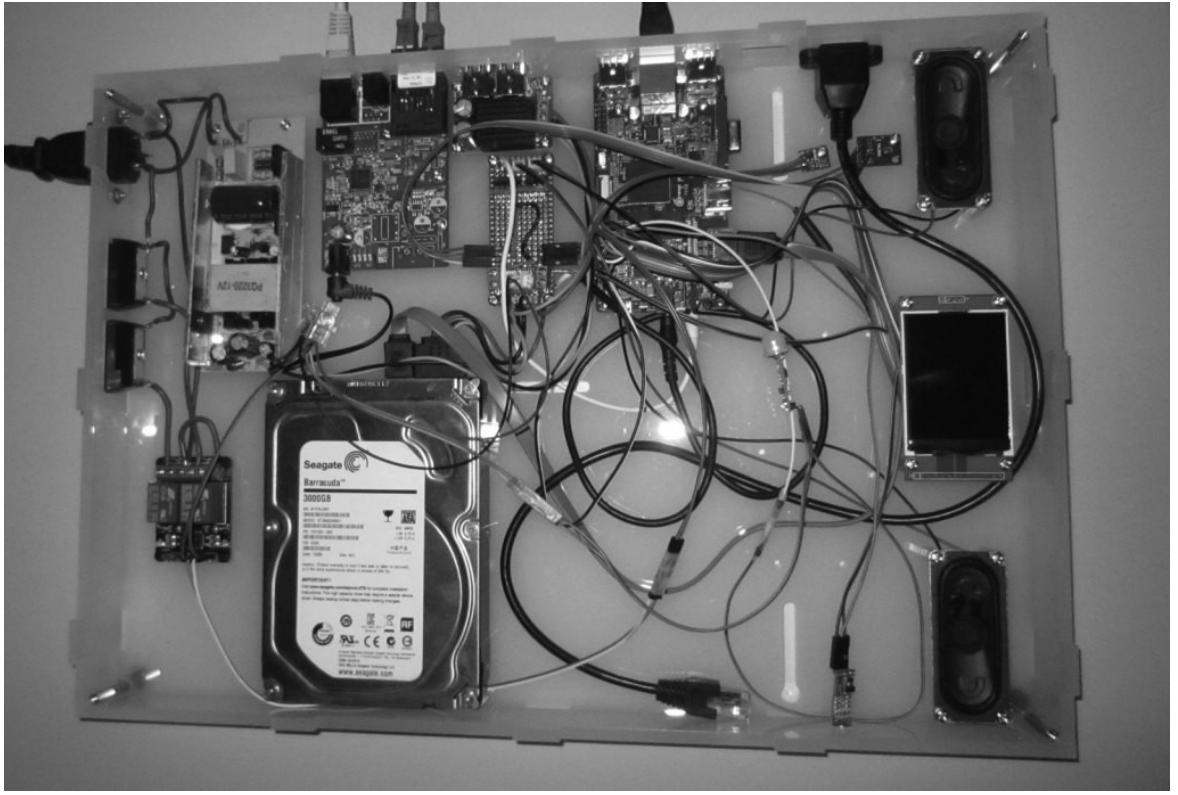
A board for a project

Motivation

- Disappointment
- Curiosity
- Finish the project



Project realisation



2. Historical overview

First

- Joined Cubieboards community
- Started messing with Cubietruck kernel
- Started working on a Bash build script
- Fell into a rapid development cycle
- Others started to join

Early steps

- Moved to Github
- New boards: Banana, Lime, Cubox
- Ubuntu Trusty
- Downloads from public servers
- Project hosted on @A20

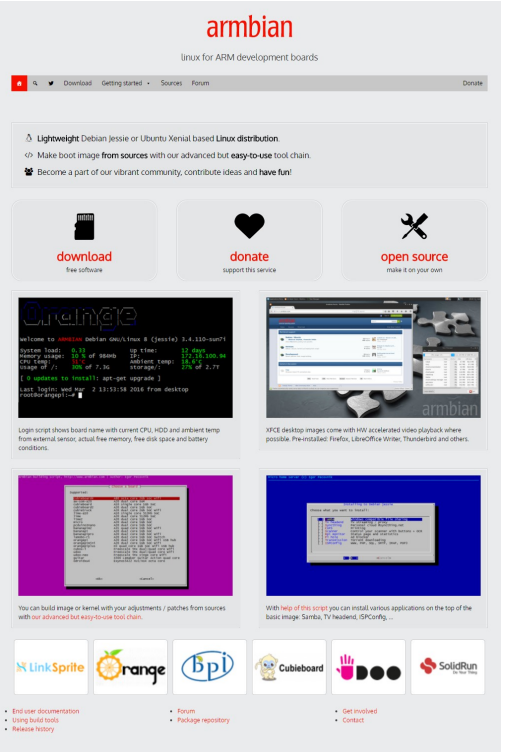
Early problems and motives

- No real equipment
- No project name
- Little special knowledge

- Learning
- Helping
- Making

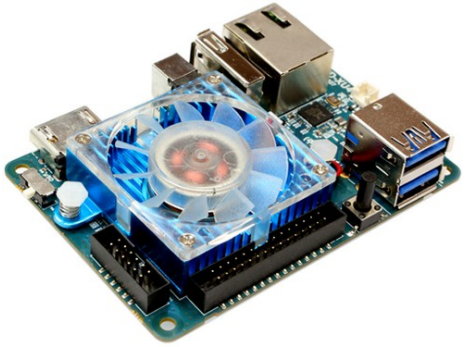
2014: Middle age

- armbian.com
- 17 new boards
- Jessie, Xenial: systemd
- Dedicated download server



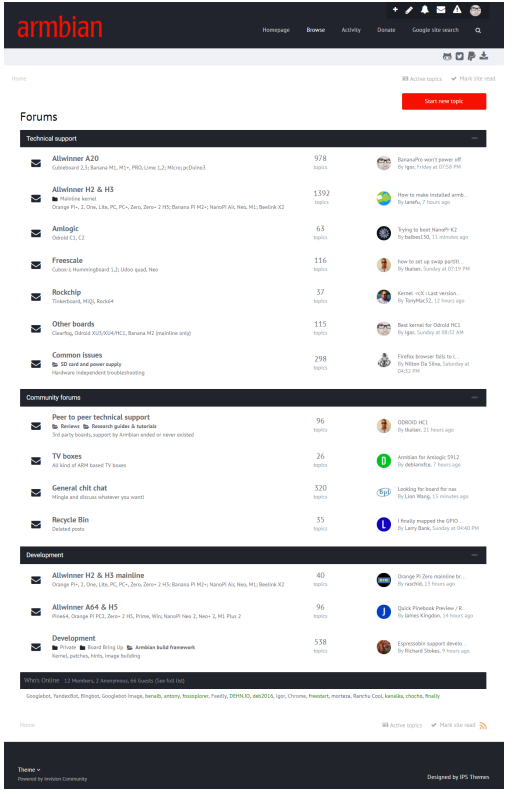
Middle age

- Repository (aptly)
- Community forums (IPS)
- Tapatalk mobile friendly access
- Project hosting @Odroid XU4



tapatalk

IPBoard



Middle age problems

- Bad, false or nonexisting documentation
- Boards comes with its own low quality kernel & uboot
- Little to no support from chip or board makers
- Still too small group for the size of the problems
- A lot of users with little experience and high expectations

Steady growth in 2016

- 3D (MALI) and accelerated video decoding on Allwinner boards
- 24 new boards
- First ARM64 board
- eMMC boards start to show up
- dedicated build server

Present situation

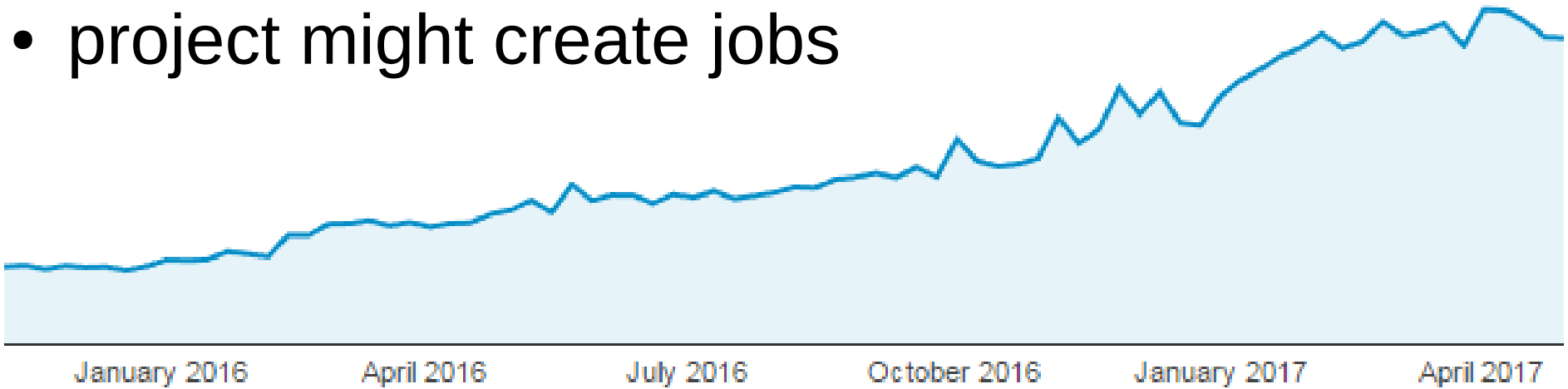
- 26 new boards in 2017
- Torrent download service
- First notebook support
- Merging sources to github.com/armbian
- Adding Twitter @armbian
- Project hosting went to highend servers

Current problems

- Strong pressure on our support
- Users failing to use prepared documentation
- Users have unrealistic expectations
- Donations does not follow project expansion
- Big hardware diversity

Today and tomorrow

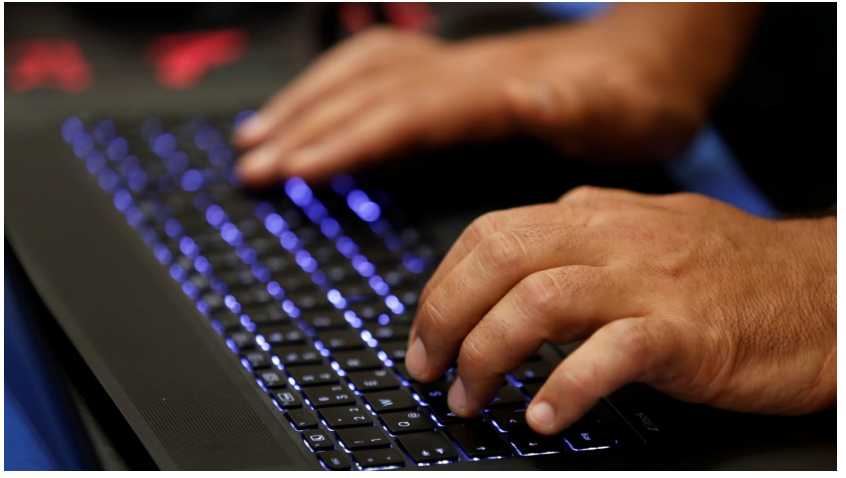
- we are admired 😊
- defacto standard Linux on SBC
- project might create jobs



3. Infrastructure

Brainware

- Project developers. 5-10 people
- 3rd party:
  - Linux-sunxi
  - Board makers
  - Random participant
- General knowlege community.
  - Feedback
  - Dedicated testings
  - Demand and wishes



Software

Text editor

CLI and GUI Git tools

Self developed build toolchain

Ubuntu Xenial

3rd party utils

Services

- Website — www.
- Forums — forum.
- Toolchain — git.
- Download server — dl.
- Repository. Stable — apt.
  Unstable — beta.

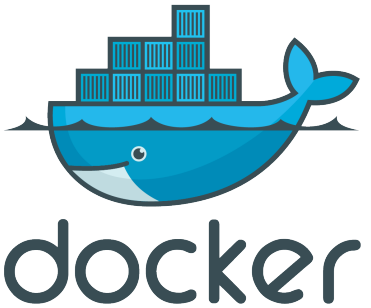
armbian.com

- Twitter @armbian
- IRC #armbian, #linux-sunxi @IgorPec

4. Userspace introduction

Main features

- Debian or Ubuntu
- CLI or XFCE based desktop with Chromium
- Serial console enabled by default
- Forced root password change
- Wireless enabled



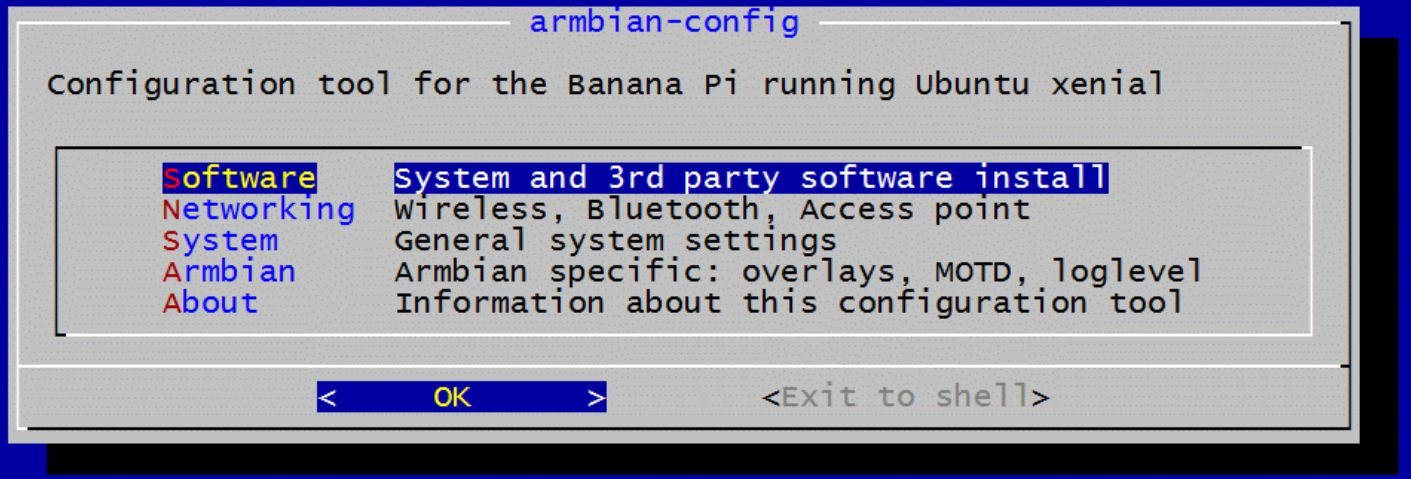
Optimisations

- Reduced write frequency to save card and gain speed
- Unified boot with ramdisk and UUID
- DT overlays (Allwinner)
- Optimised DVFS
- Auto filesystem expand (ext4, btrfs)
- Headers and build essentials are installed by default

Low level tools and scripts

- armbianmonitor
- h3consumption
- armhwinfo
- firstrun
- armbian-config

armbian-config

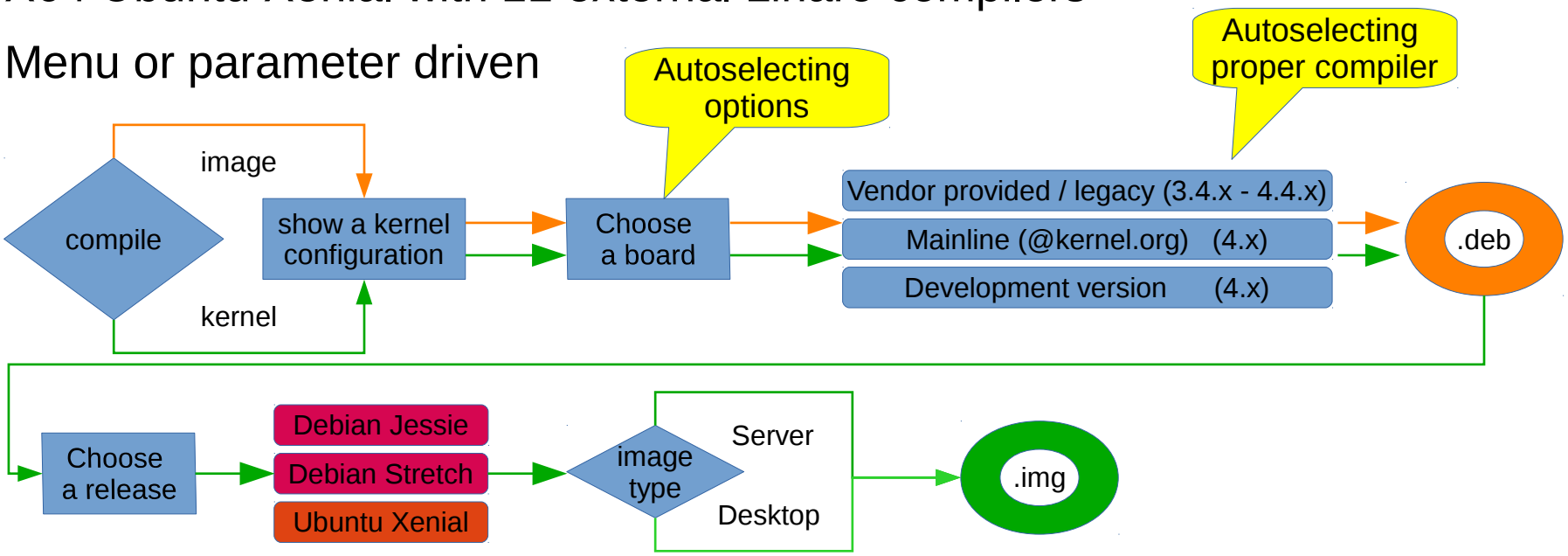


Users problems

- Failed to read warnings and documentation
- Failed to understand powering issues (microUSB)
- Usage of old, low cost or fake SD cards
- Lack of basic Linux knowledge
- Unrealistic expectations

Build engine overview

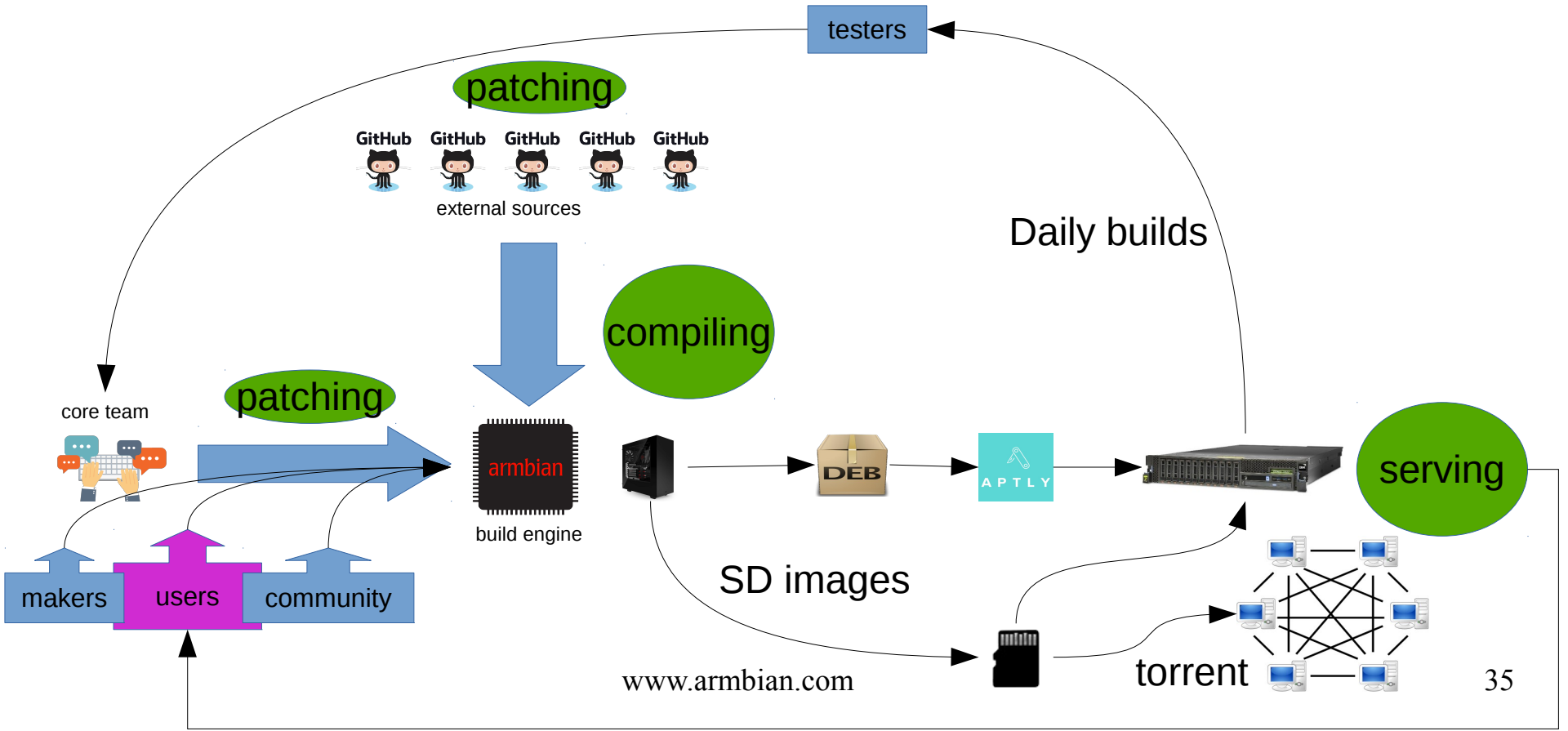
- 24 source configs with up to 3 kernel branches for each SoC
- X64 Ubuntu Xenial with 11 external Linaro compilers
- Menu or parameter driven



Build engine optimizations

- apt-cacher
- Script parallelisation
- Compiler cache (CCACHE)
- Userspace remain cached
- Building is using memory

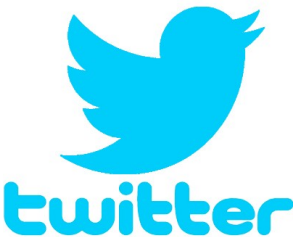
Release cycle



Project legacy

1) Community
2) Knowledge
3) Tools
4) Universal system
5) Promoting OSS

Thank you for your attention!



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Questions before the beer ? :)