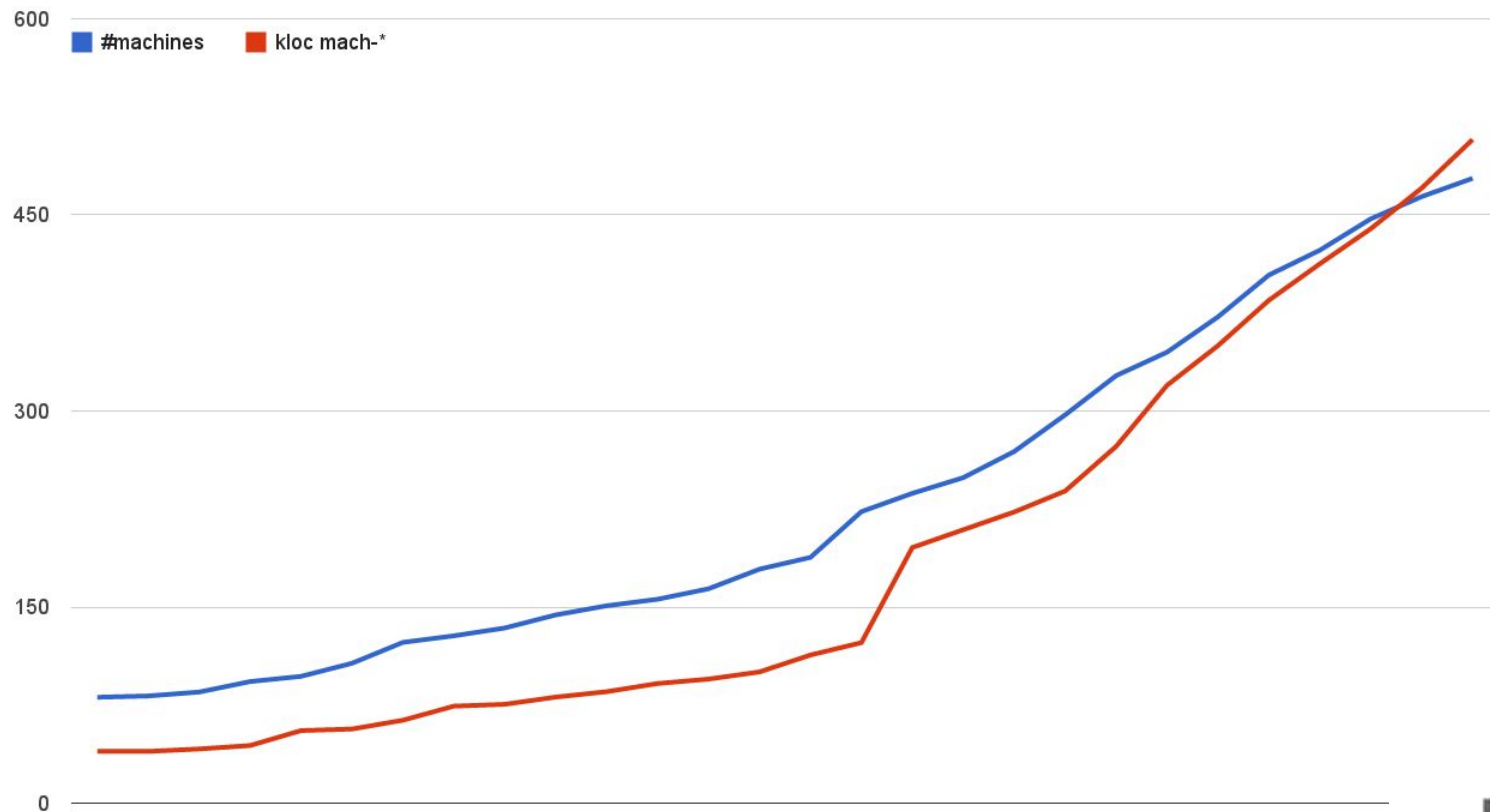


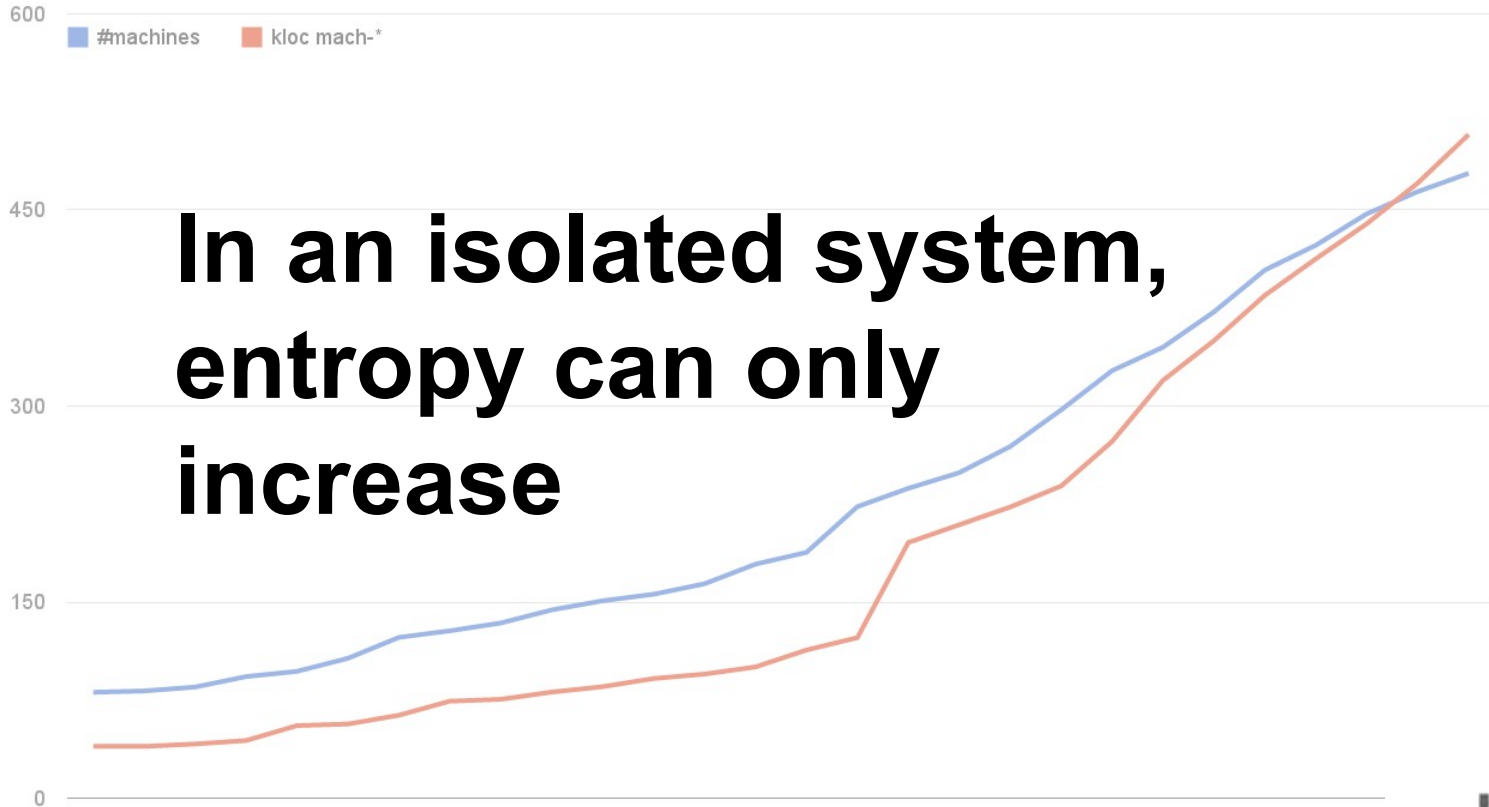
Maintaining a large kernel subsystem

Tuebix 2016

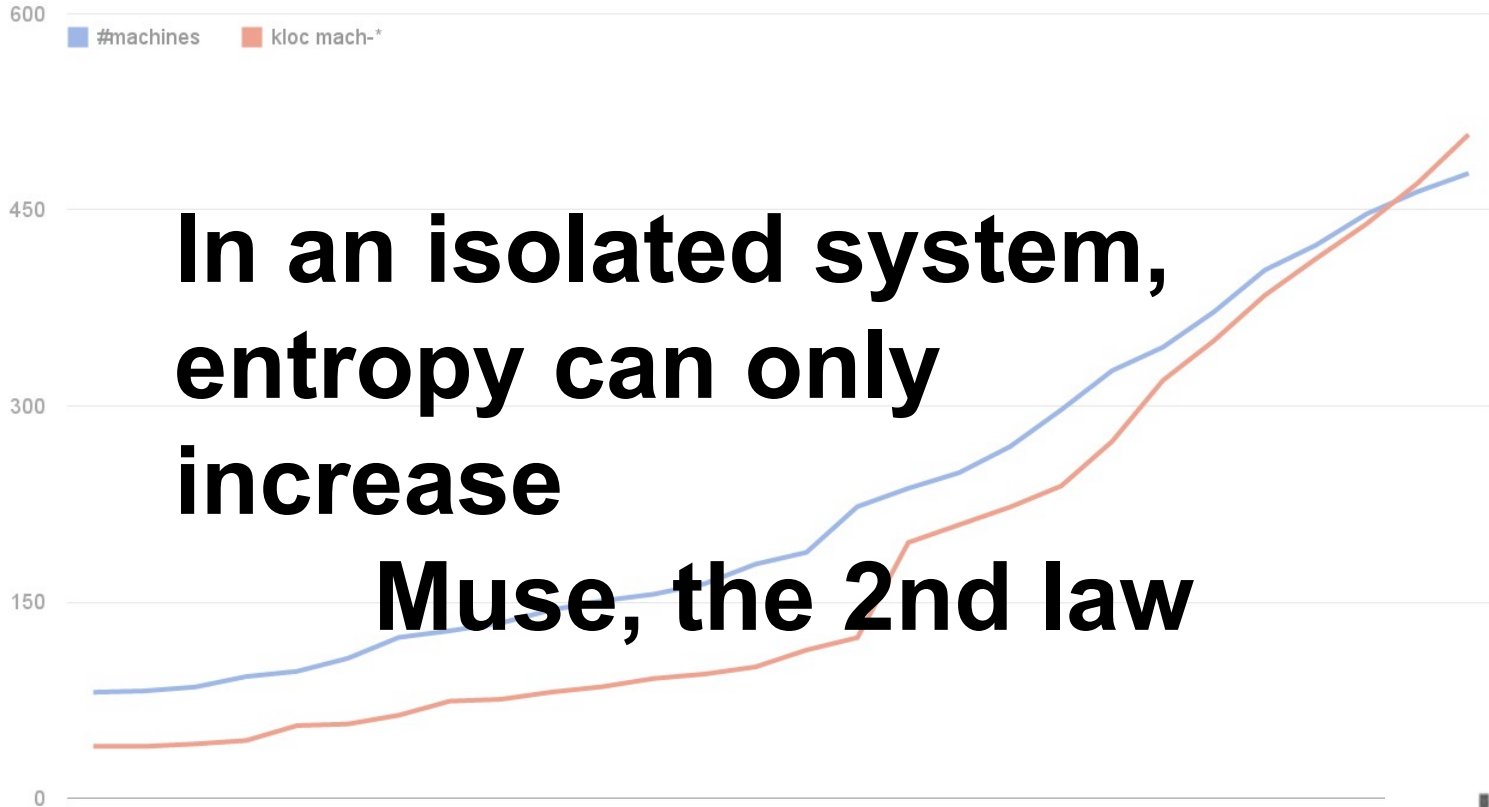
Code size and supported machines



Code size and supported machines



Code size and supported machines



**In an isolated system,
entropy can only
increase**

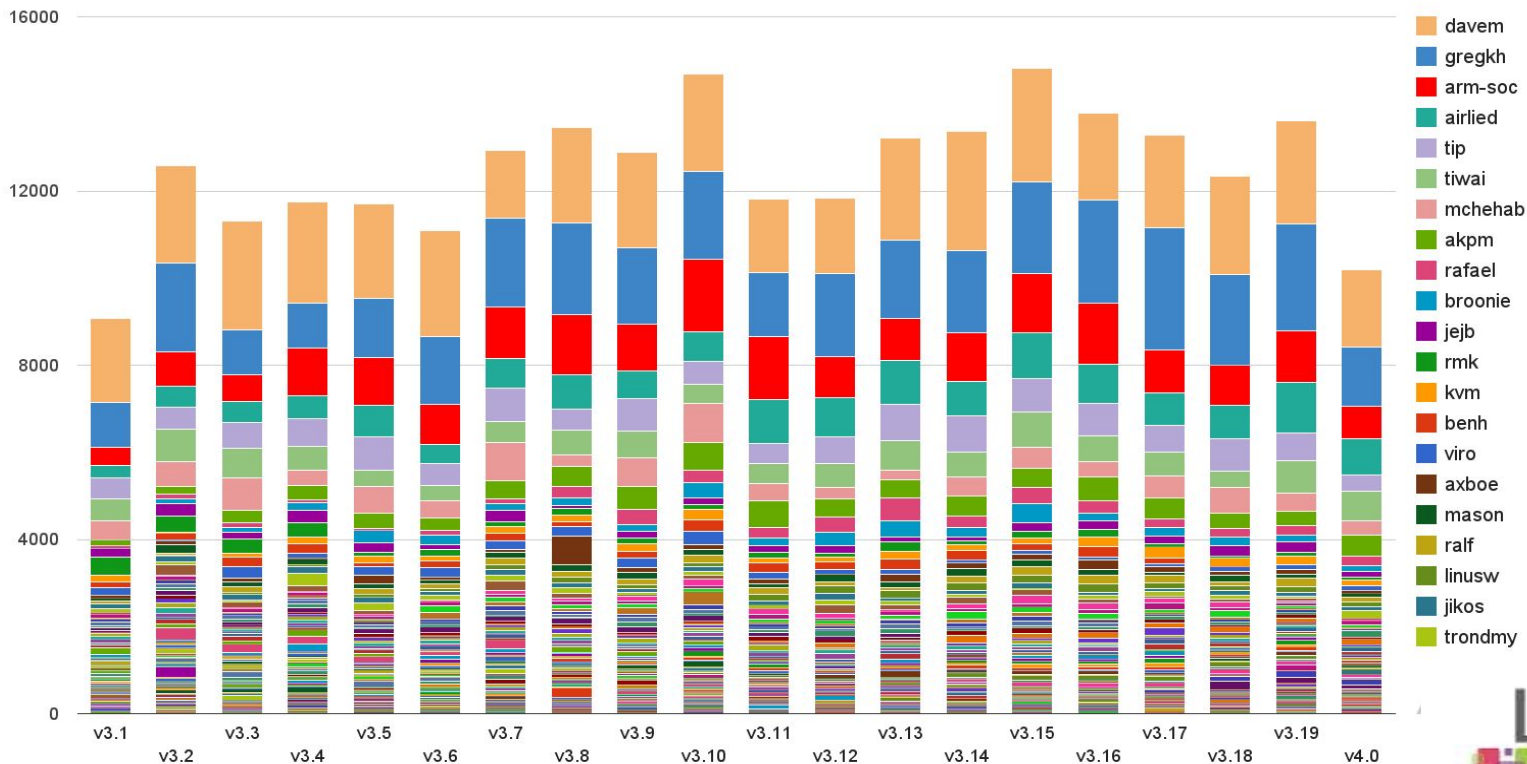
Muse, the 2nd law

Overview

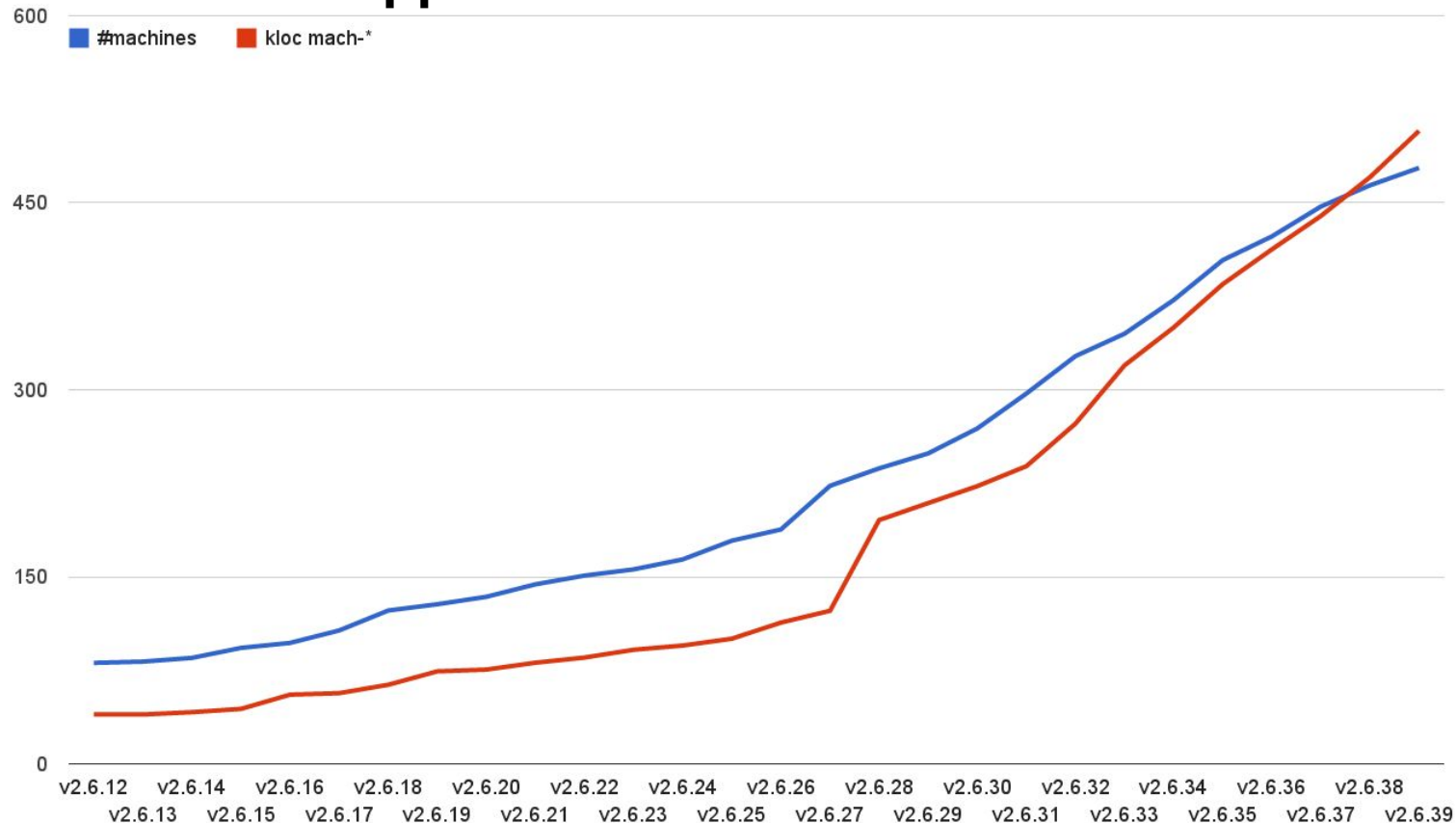
1. Setup of the arm-soc tree
2. Keeping your workload down
3. Keeping your upstream happy
4. Future outlook

Setup of the arm-soc tree

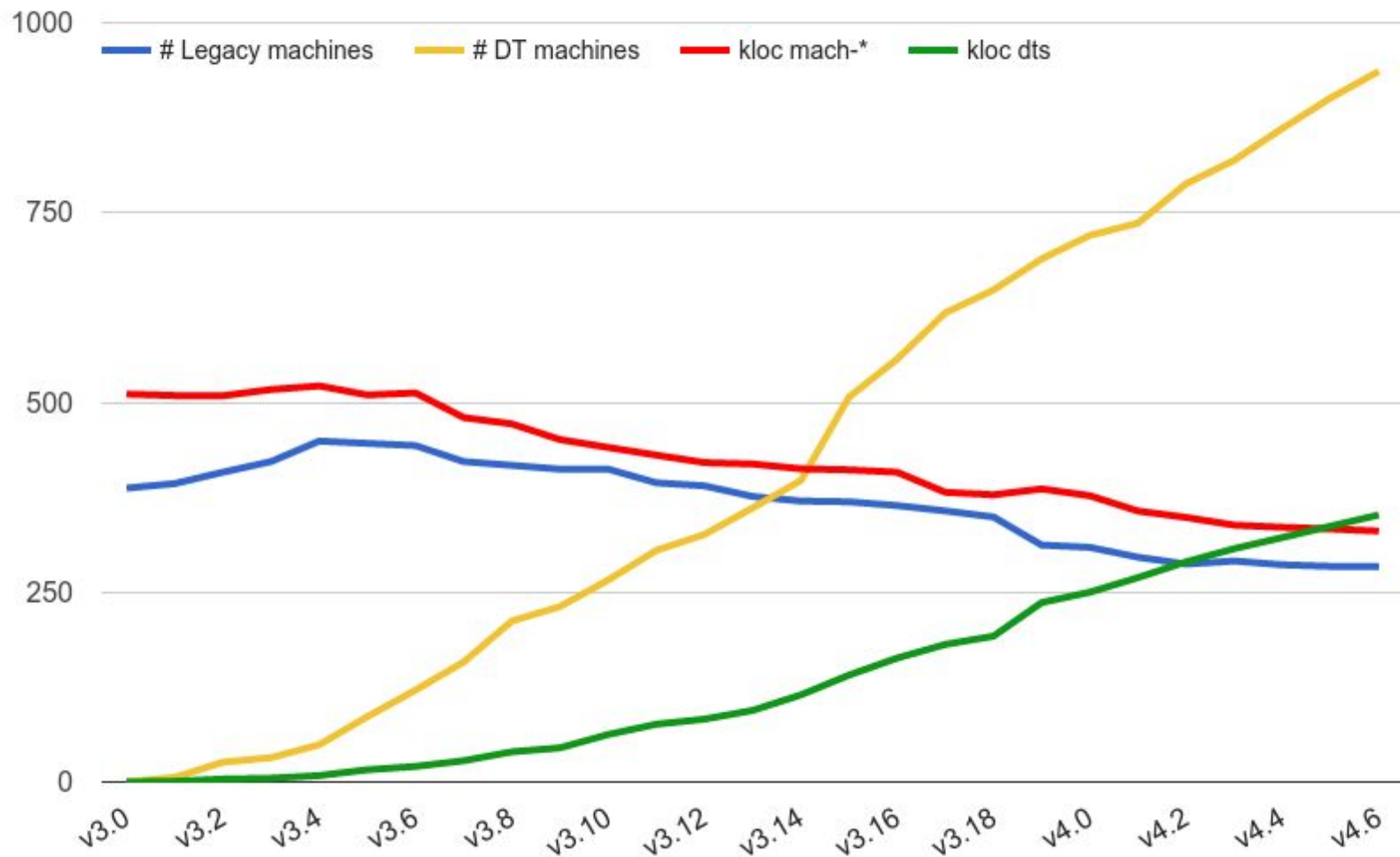
Changesets per kernel version and subsystem maintainer



Code size and supported machines



Code size and supported machines



arm-soc maintainers

Primary maintainers:

- Olof Johansson (ex-Google)
- Arnd Bergmann (Linaro)

Backup maintainer:

- Kevin Hilman (Baylibre)

Setup of the arm-soc tree

- Shared git tree

`git://git.kernel.org/pub/scm/linux/kernel/git/arm/arm-soc.git`

- Access locking over IRC

- Documenting merges in file `arch/arm/arm-soc-for-next-contents.txt`

- One local branch per incoming pull request

- 5-15 topic branches for Linus

- One `for-next` branch for linux-next



arm-soc-for-next-contents.txt excerpt

```
next/fixes-non-critical
    reset/fixes
        git://git.pengutronix.de/git/pza/linux reset/fixes
    omap/fixes-not-urgent
        git://git.kernel.org/pub/scm/linux/kernel/git/tmlind/linux-omap t
    patch
        ARM: msm: Silence readb/writeb warnings due to missing IOMEM()
    renesas/fixes
        git://git.kernel.org/pub/scm/linux/kernel/git/horms/renesas tags/

next/cleanup
    versatile/leds
        git://git.kernel.org/pub/scm/linux/kernel/git/linusw/linux-integr
    renesas/cleanup
        git://git.kernel.org/pub/scm/linux/kernel/git/horms/renesas tags/
        contains renesas/fixes
    patch
        leds: Fix build for LEDS CLASS=m on versatile
```



Changesets by author

1478 Olof Johansson	406 Linus Walleij
1425 Arnd Bergmann	388 Fabio Estevam
658 Laurent Pinchart	336 Linus Torvalds
588 Tony Lindgren	312 Maxime Ripard
540 Shawn Guo	255 Paul Walmsley
453 Thomas Petazzoni	251 Simon Horman
452 Magnus Damm	244 Kevin Hilman
417 Lee Jones	241 Tomasz Figa
416 Kuninori Morimoto	235 Kukjin Kim
411 Stephen Warren	233 Alexander Shiyan

Typical arm-soc topic branches

fixes

~~fixes-non-critical~~

cleanup

soc

defconfig

dt

dt64

~~board~~

drivers

~~multiplatform~~

arm64

Typical arm-soc topic branches

fixes

~~fixes-non-critical~~

cleanup

soc

defconfig

dt

dt64

~~board~~

drivers

~~multiplatform~~

arm64

Typical arm-soc topic branches

fixes

fixes-non-critical

cleanup

soc

defconfig

dt

board

drivers

multiplatform

arm64

Example pull request

ARM: SoC platform changes

New and updated SoC support. Also included are some cleanups here the platform maintainers hadn't separated cleanups from new development in separate branches.

Some of the larger things worth pointing out:

- A large set of changes from Alexandre Belloni and Nicolas Ferre preparing at91 platforms for multiplatform and cleaning up quite a bit in the process.
- Removal of CSR's "Marco" SoC platform that never made it out to the market. We love seeing these since it means the vendor published support before product was out, which is exactly what we want!

New platforms this release are:

- Conexant Digicolor (CX92755 SoC)
- Hisilicon HiP01 SoC
- CSR/sirf Atlas7 SoC
- ST STiH418 SoC
- Common code changes for Nvidia Tegra132 (64-bit SoC)

We're seeing more and more platforms having a harder time labelling changes as cleanups vs new development -- which is a good sign that we've come quite far on the cleanup effort. So over time we might start combining the cleanup and new-development branches more.



Keeping the workload down

Introducing new subsystems

clk

cpufreq

cpuidle

dmaengine

gpio

iommu

irqchip

led

mailbox

pci-host

pinctrl

pwm

regulator

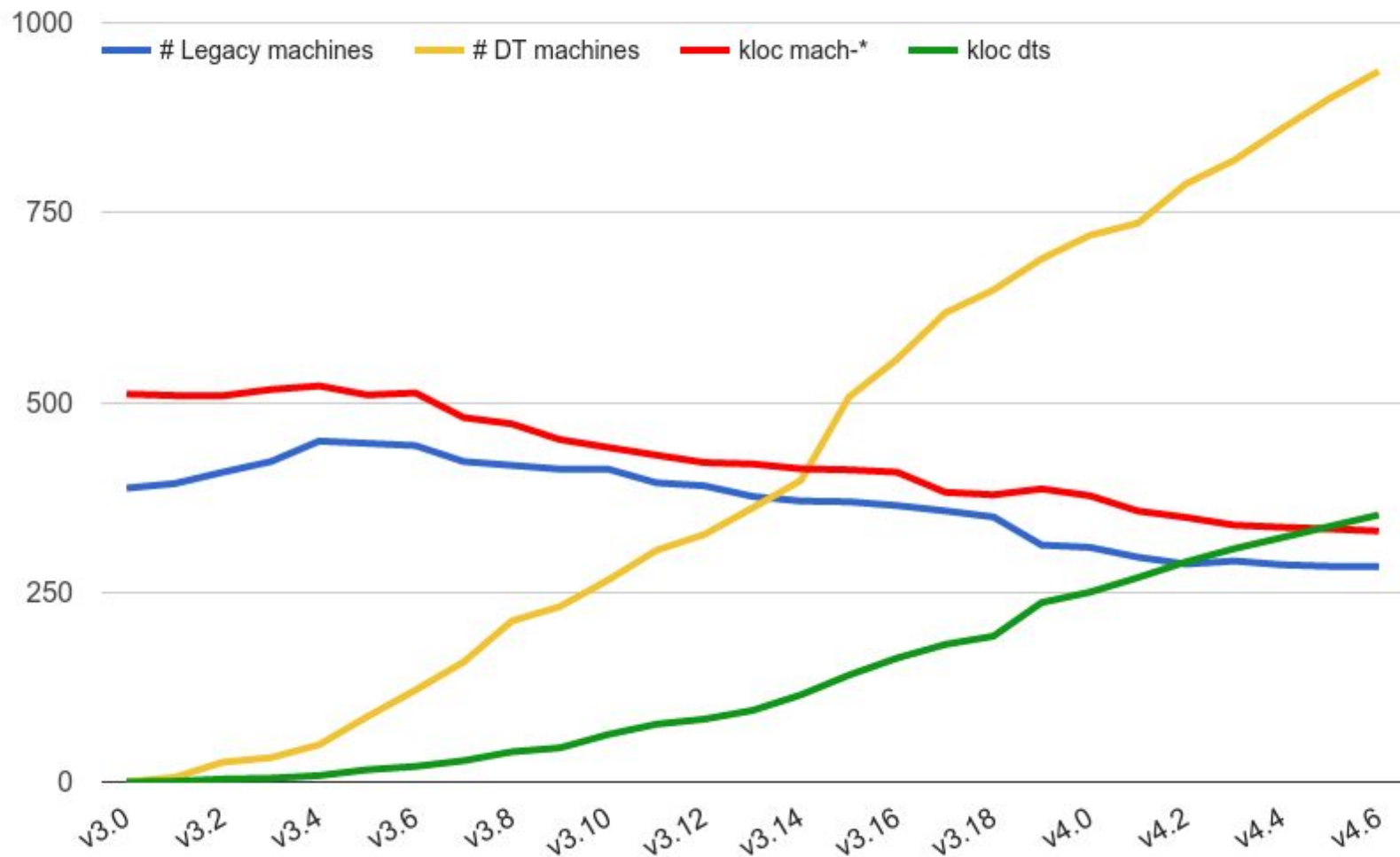
syscon

timers

Moving boards out to devicetree

- Avoid the largest source of code explosion
- Decouple drivers from boards

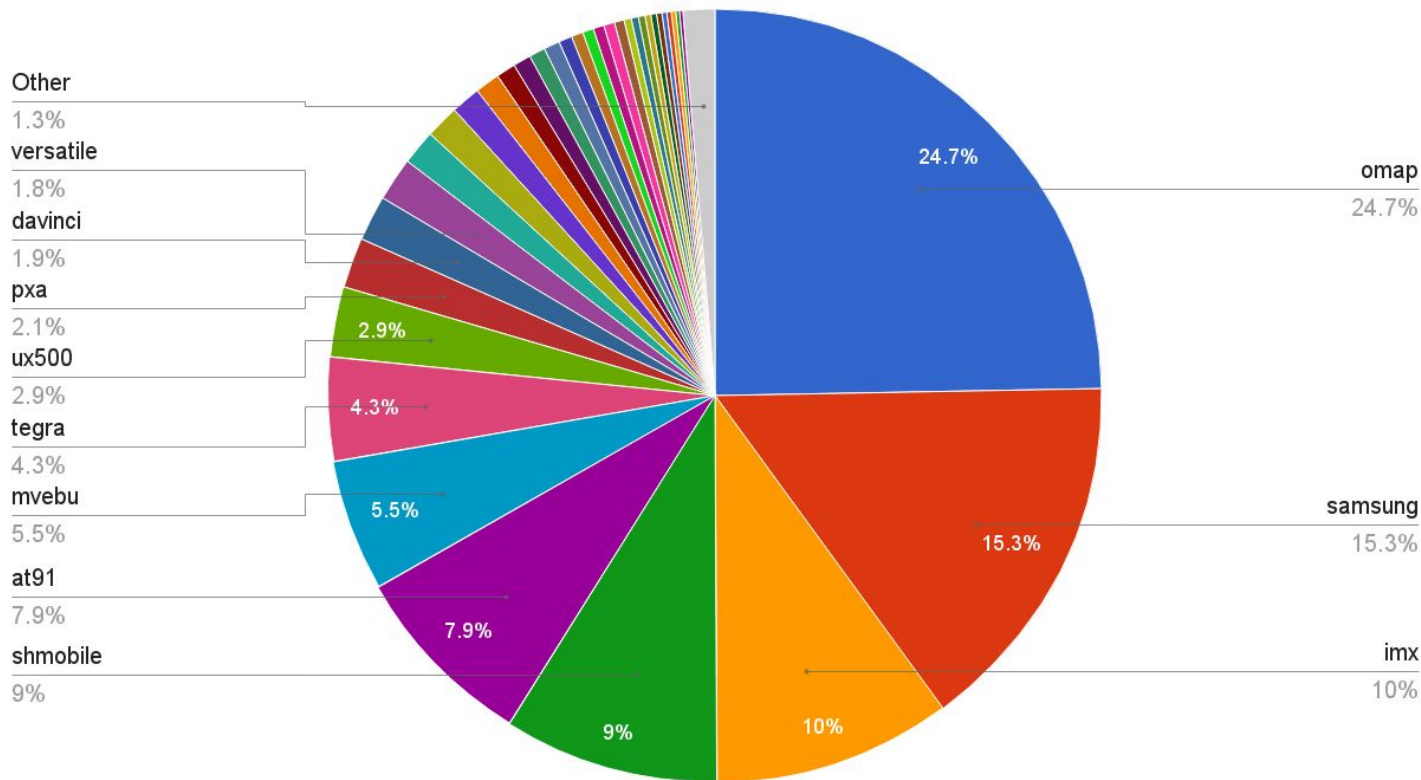
Code size and supported machines



Delegating to submaintainers

- Build a trusted work relationship
- Provide guidance when needed
- Special care for hobbyists

arm-soc changes by submaintainer



Rejecting submissions

- Most important part of the job
- Most stressful part of the job
- Only way to effect changes
- Careful balance
- Always explain what should be done instead

Creating arbitrary rules

Undocumented arm-soc rules:

- Send pull requests to arm@kernel.org
- Split changes into our topic branches
- No patch tracker / patchwork
- One maintainer per platform
- Ping us after a week if we didn't apply it

Keeping your upstream happy

How to make your upstream grumpy

- Send all your changes late



How to make your upstream grumpy

- Introduce a regression and when asked about it, say it was intentional



Side note:

Solving cross-tree dependencies

- a. Stage out changes across multiple releases
- b. Send the same branch to multiple maintainers
- c. Make a shared branch with common changes
- d. Get an Ack from one maintainer to merge changes through another tree

How to make your upstream grumpy

- Sneak changes in that you know are unwelcome



Future outlook

What's coming for 4.x



[Photo](#) by tillwe / (CC BY-SA)

What's coming for 4.x

- Code size keeps going down
- Continue DT conversion
- Multiplatform for all ARMv6/v7
- Multiplatform for ARM9
- More arm64 platforms
- More Cortex-M platforms

What's coming for 4.x

Job complete before 5.0?

Questions?