



Android Kernel Upstreaming: Overview & Status

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Feb 18th 2013

Android Builders Summit



What I'll cover

- Overview of the Android™ kernel patch set
- Status of what has made it upstream and what hasn't
- Why upstreaming is important



Overview of Android Patch Set



Carving up the Bugdroid





Core Platform Components





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- Binder
- Ashmem
- Logger
- Monotonic event timestamps



Power/Performance Improvements





Power/Performance Improvements

- Wakelock infrastructure
- Alarm-dev
- low-memory-killer
- Interactive cpufreq governor



Platform Debugging Features



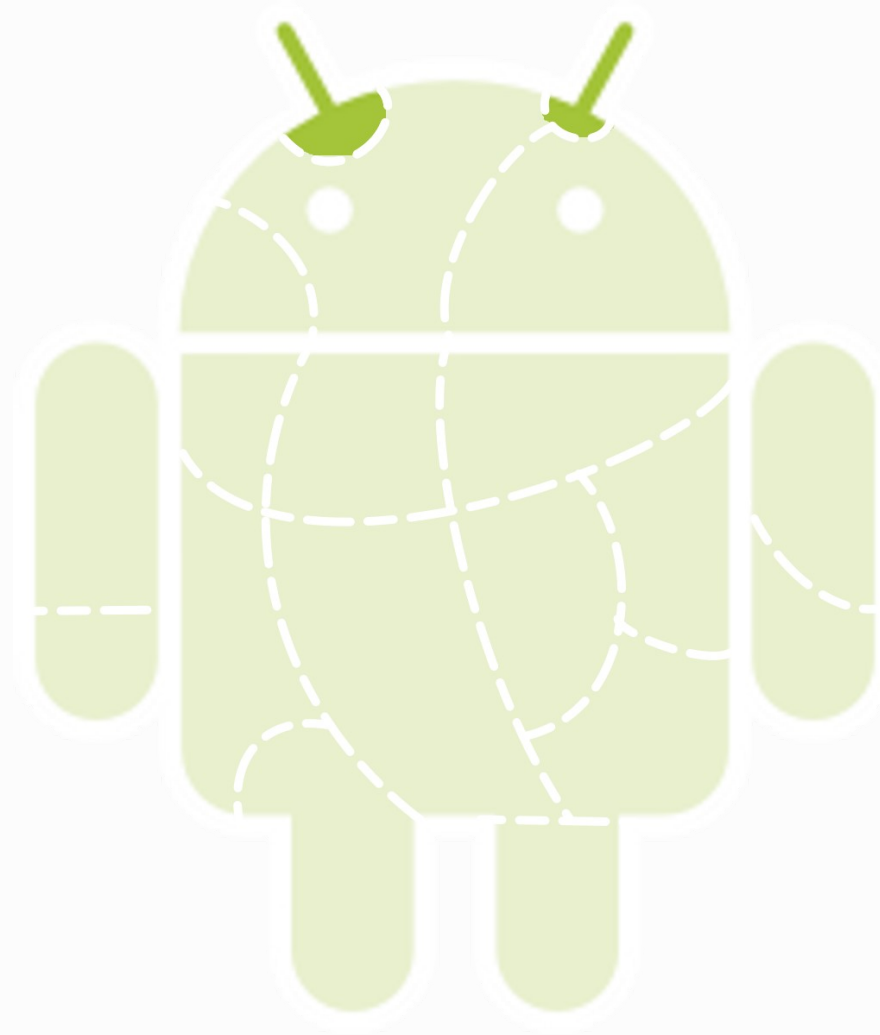


Platform Debugging Features

- Android Gadget Driver (for ADB)
- FIQ Debugger
- ram_console/persistent_ram
- Keyreset driver
- ETM/ETB improvements
- Goldfish emulator support



Networking Changes





Networking Changes

- Paranoid networking framework
- Netfilter changes
- Bluetooth improvements
- bcmhd driver



Graphics Infrastructure





Graphics Infrastructure

- ION
- Sync



Misc Items



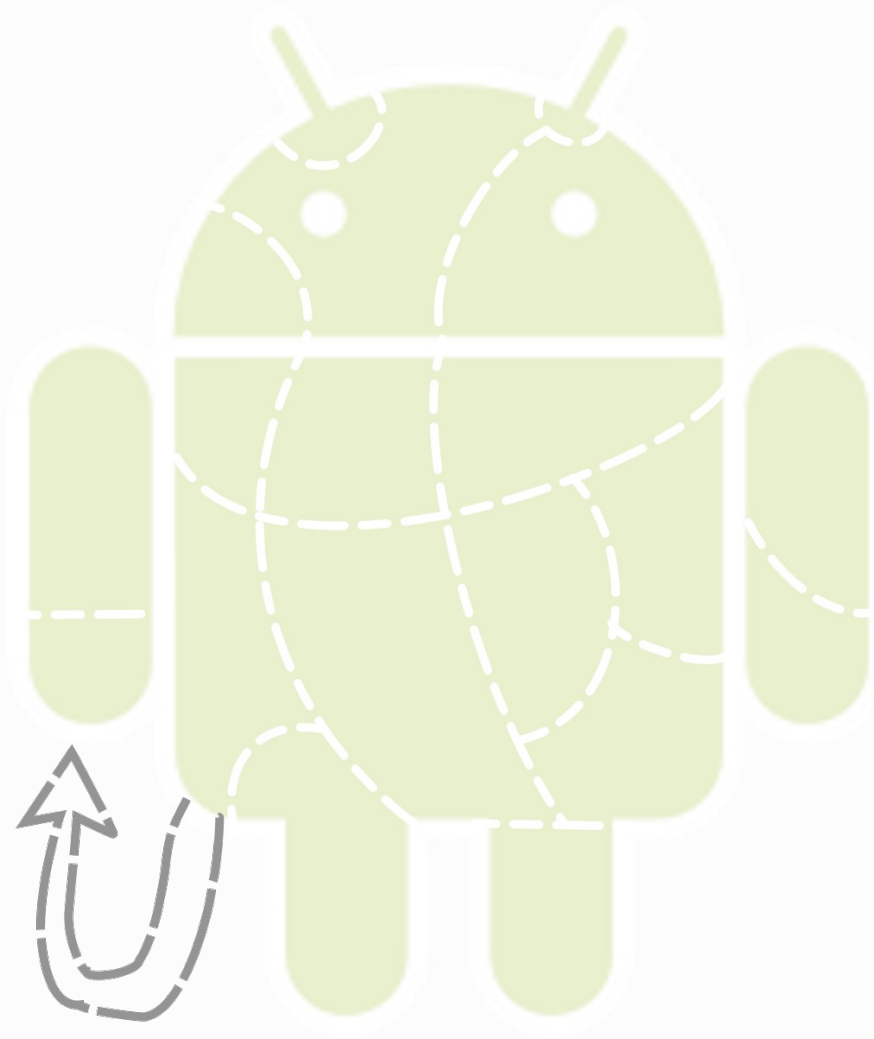


Misc Items

- Android battery meta-driver
- Input drivers & tweaks
- Switch class
- Timed gpio
- MMC tweaks
- Smaller changes all over



Deprecated (mostly) features





Deprecated (mostly) features

- pmem
- earlysuspend
- apanic
- yaffs2 (sort of)



Upstream Status





Already upstream

- Wakelocks
- Monotonic event stamps
- Ram_console/persistent_memory
 - via pstore/ramoops
- Switch class
 - via ExtConn driver



In the staging directory

- Binder
- Ashmem
- Logger
- Low-memory-killer
- Alarm-dev
- Android-gadget-driver (as CCG driver)
- Timed GPIO



In development

- FIQ Debugger
 - Integrated w/ KDB, Portions upstream
- Key-reset-driver
 - Some functionality queued for 3.9
- Low-memory-killer
 - Mempressure cgroup
- Ashmem unpinning functionality
 - Volatile ranges
- Goldfish platform support



Work to be done

- Graphics (Ion/Sync)
- Interactive cpufreq gov
- Netfilter changes / Paranoid networking
- Alarm-dev timerfd integration
- ETM/ETB improvements
- Non-staging path for binder/logger
- Lot of small misc items



Thank you!

Andy Green

Anton Vorontsov

Arve Hjønnenvåg

Axel Lin

Bjorn Bringert

Chanwoo Choi

Christopher Lais

Colin Cross

Corentin Chary

Dan Carpenter

David Howells

David Rientjes

Devendra Naga

Dima Zavin

Emil Goode

Greg Dietsche

Greg Kroah-Hartman

H Hartley Sweeten

Hugh Dickins

Jesper Juhl

Joe Perches

Johannes Thumshirn

John Stultz

JP Abgrall

Justin P. Mattock

Kim, Milo

Konstantin Khlebnikov

Marco Navarra

Mark Brown

Masanari Iida

Mike Lockwood

MyungJoo Ham

Nick Kralevich

Paul E. McKenney

Praneeth Kumar Bajjuri

Rabin Vincent

Rafael J. Wysocki

Randy Dunlap

Rebecca Schultz

Robert Love

Sachin Kamat

San Mehat

Sherwin Soltani

Shuah Khan

Stephen Boyd

Thomas Meyer

Tim Bird

Tracey Dent

Zhengwang Ruan



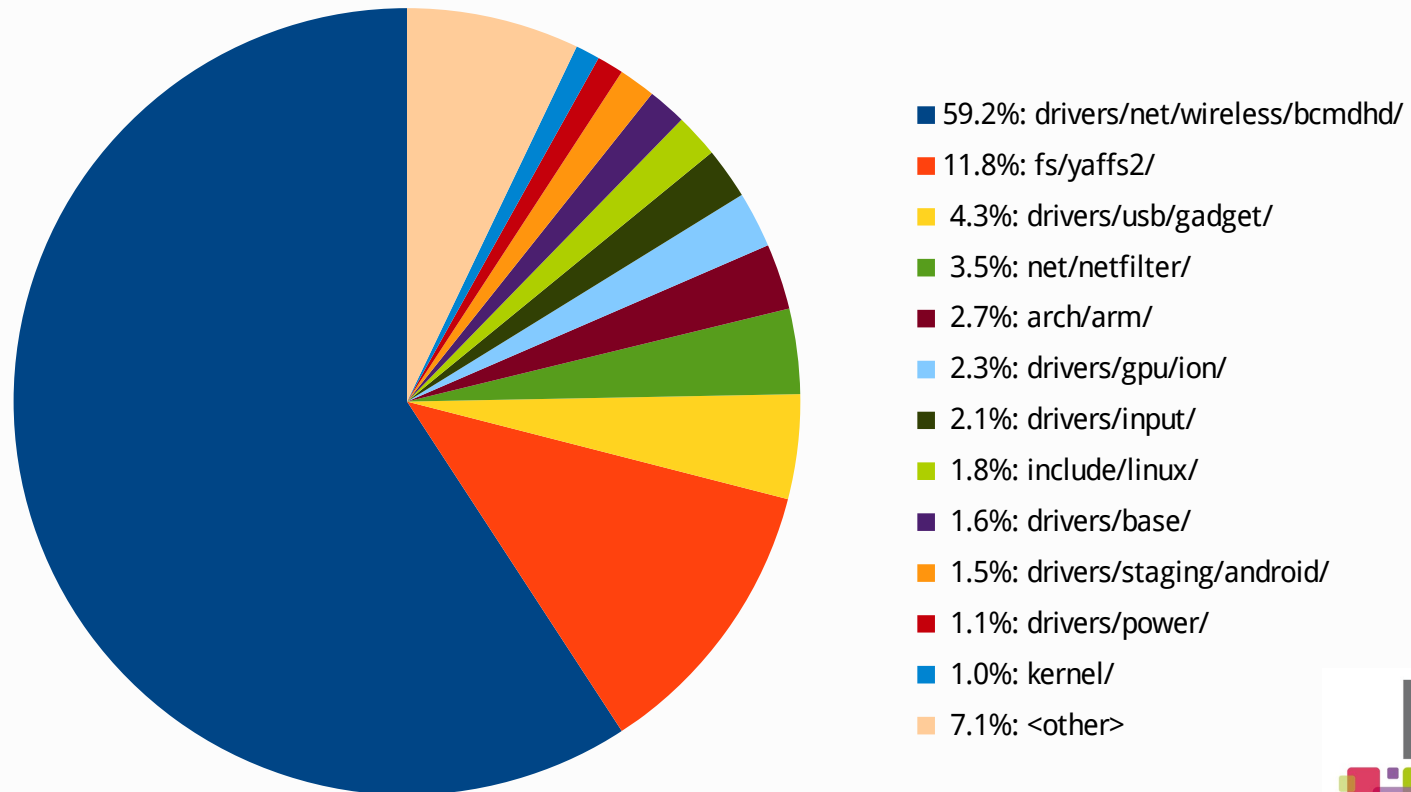


Upstream Status



Out of tree stats

- ~568 patches
- Diffstat:
 - 500 files changed, 127518 insertions(+), 2179 deletions(-)

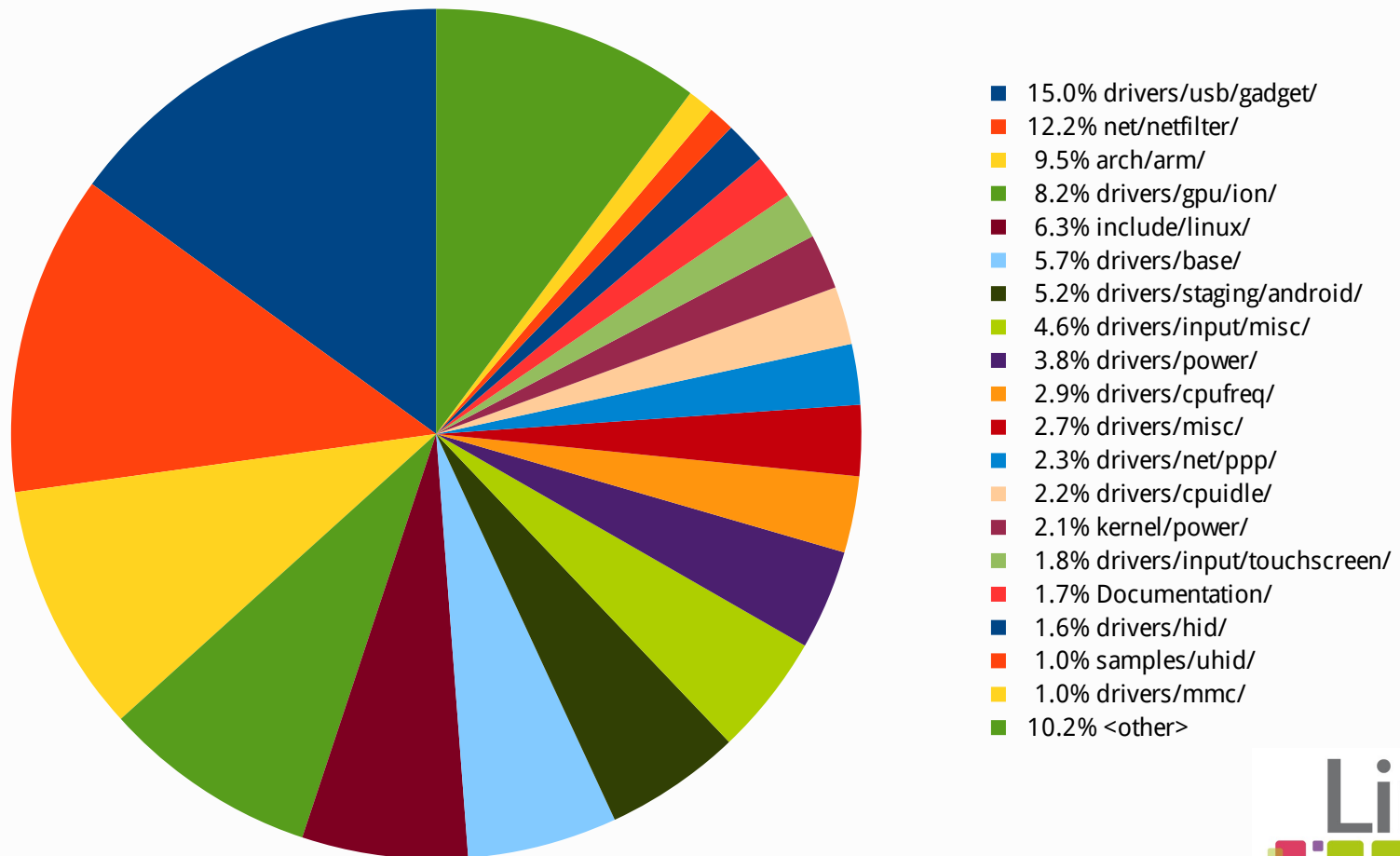


Generated with git diffstat -dirstat=lines,0,cumulative

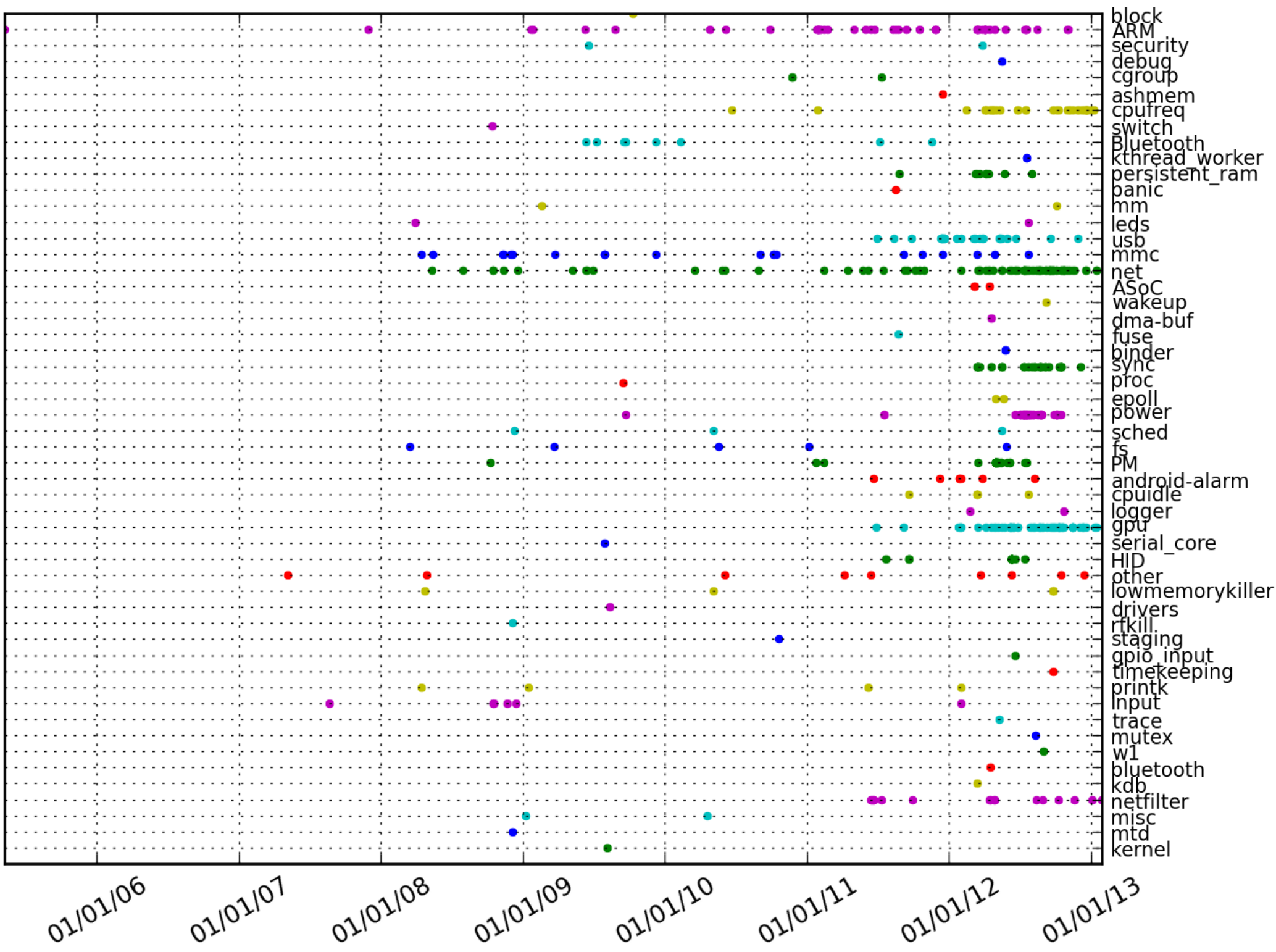
Dropping bcmhd & yaffs2

- Diffstat:

- 349 files changed, 35358 insertions(+), 2179 deletions(-)



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Google isn't standing still

- Fair amount of recent development around:
 - Bcmhd (net)
 - ION (gpu)
 - Sync
 - Interactive cpufreq gov (cpufreq)
 - Android battery driver (power)
 - Netfilter



Why does upstreaming matter?



Code forks aren't bad

- The Android patch set is in effect a fork of the Linux kernel
- Kernel code forks are common, and actually good.
 - PREEMPT_RT
 - 4g/4g split
 - Most filesystems
- GPL allows for eventual re-merging, or at least learning from the fork



Community forks are less positive

- ARM SoCs almost exclusively focused on Android
 - Very large community of developers
 - Writing drivers with out-of-tree dependencies
- Android kernel became standard for ARM BSPs
 - Many non-android platforms ship with Android kernel
 - WebOS
 - FirefoxOS



Increasing collaboration

- Getting the functionality upstream allows for more collaboration
- If you're an Android system developer, the upstream kernel community is **your** community
 - It's like a family, for good and bad



Join in!

<http://www.linaro.org>

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