

News from the GTA04 Kernel Project

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What we want to achieve

- a modern and up-to date (maintained, tested, optimized) production kernel
- for daily use
- on all our device variants (GTA04/L2804, L3704, Neo900, Pyra-Handheld, ...)
- supporting the available hardware by 100%

Why not use kernel.org?

- does not yet support our devices completely
- may change things because they don't know our device
- is not configured (omap2plus_defconfig) for all peripherals we have

Why not stick with some stable release and improve?

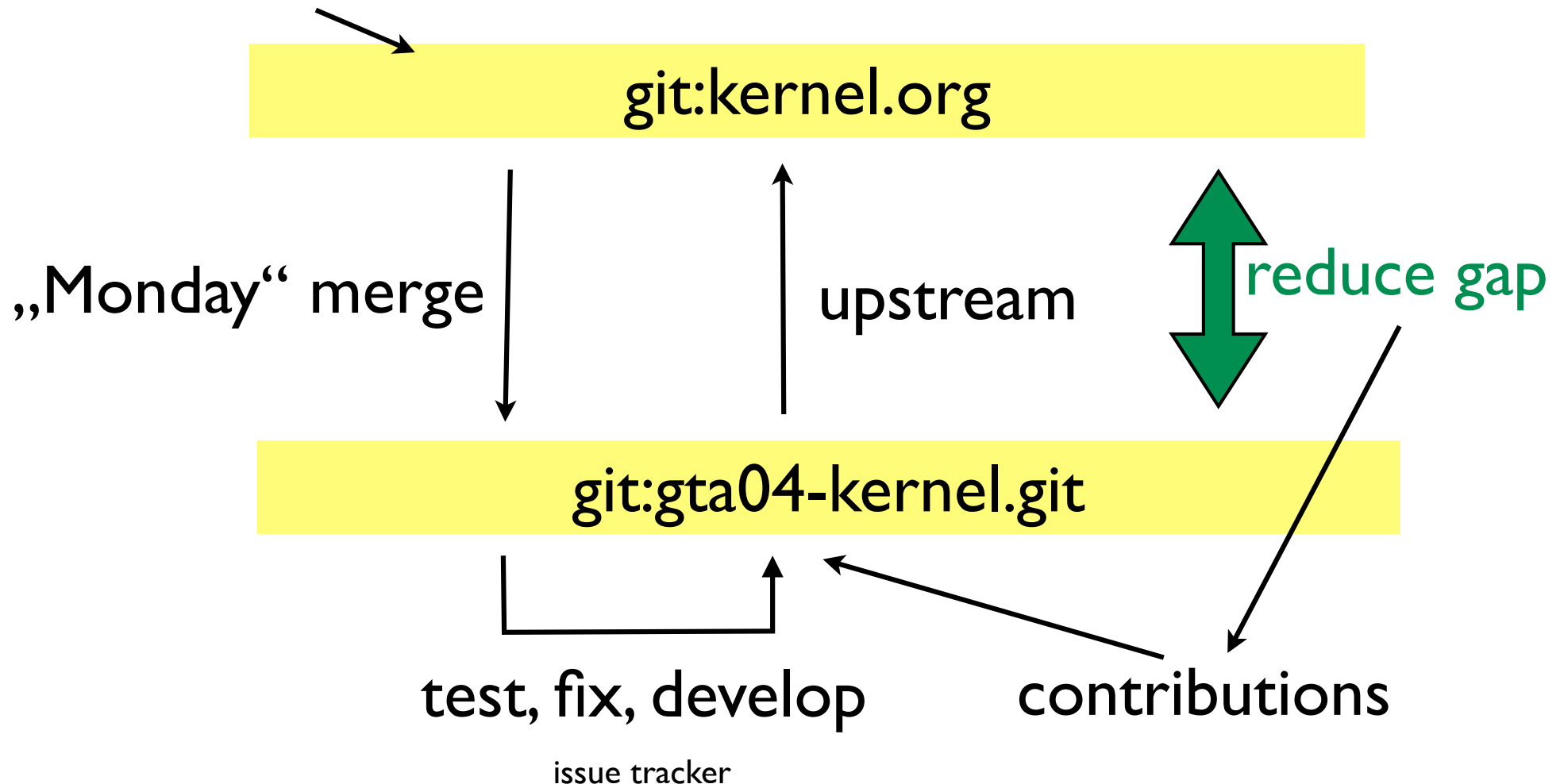
- mainline regularly introduces good new features and subsystems - we would lag behind
- some features are easier to implement by the latest kernel APIs
- it is better to follow improvements by the Linux community for areas that we can't improve ourselves
- there is no „stable“ release yet that supports GTA04 device tree well enough
- if we want to get things upstream, they must be (re)based on linus/master or linux-next - the more we lag behind, the more difficult it becomes

The gta04-kernel.git approach

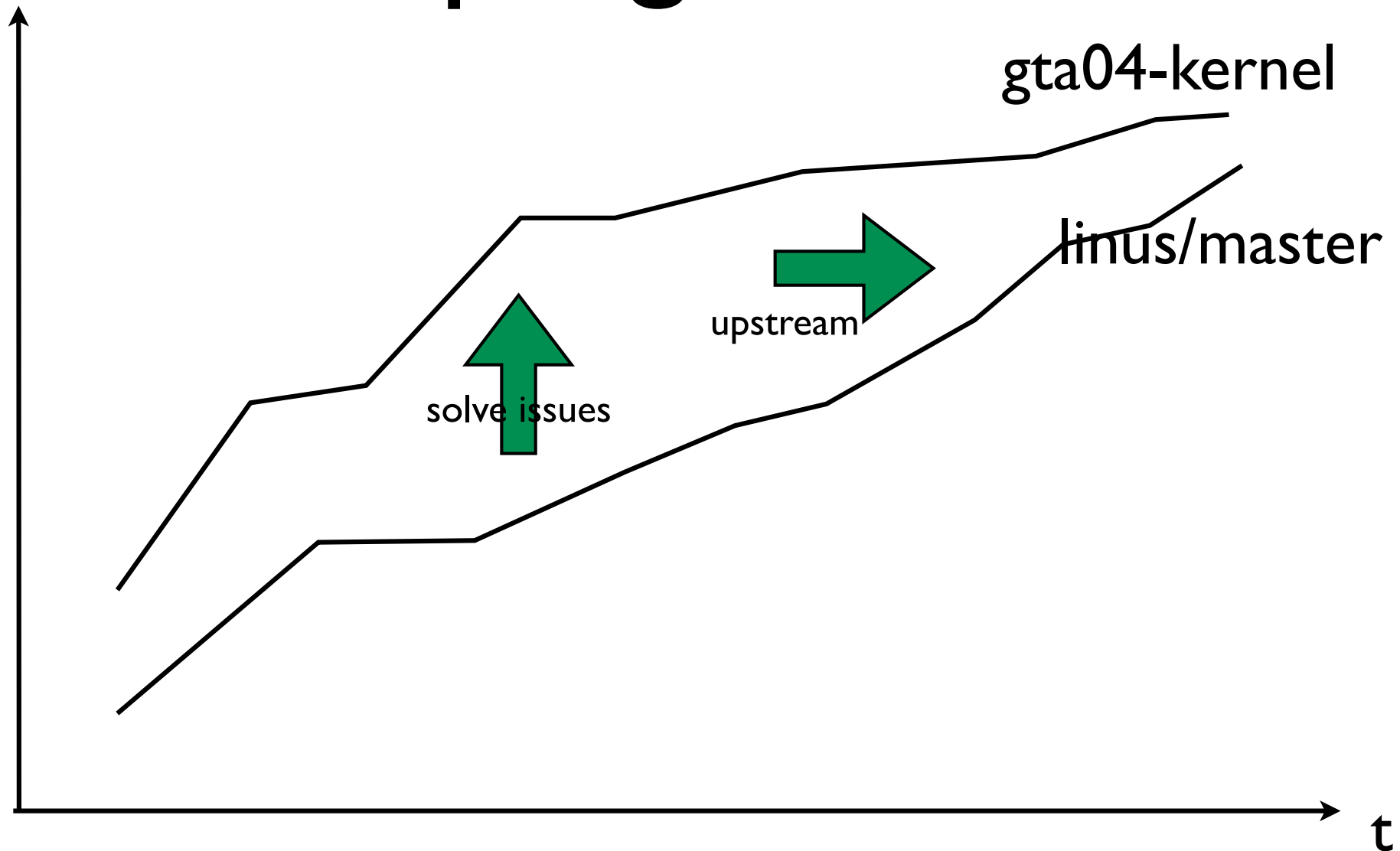
- aims at a (almost) feature complete „distribution“ kernel for daily use
- (re)based regularly on latest linus/master, currently 3.18-rc6
- carries along a set of patches to add functions still missing in kernel.org
- we work to get differences „upstream“ - so that they are maintained „automatically“ in the future
- development guided by „issue tracker“

Information flow

new features



progress



We have a statistics tool

| | |
|--|------------------|
| GTA04 3.12.0 is away from Linus/v3.12 by 85 files with differences to be upstreamed | |
| GTA04 3.12.7 is away from Linus/v3.12.7 by 85 files with differences to be upstreamed | |
| GTA04 3.13.0 is away from Linus/v3.13 by 84 files with differences to be upstreamed | DT added |
| GTA04 3.14-rc2 is away from Linus/v3.14-rc2 by 133 files with differences to be upstreamed | |
| GTA04 3.16-rc6 is away from Linus/v3.16-rc6 by 104 files with differences to be upstreamed | patches accepted |
| GTA04 3.16-rc7 is away from Linus/v3.16-rc7 by 109 files with differences to be upstreamed | |
| GTA04 3.17-rc1 is away from Linus/v3.17-rc1 by 108 files with differences to be upstreamed | |
| GTA04 3.17-rc2 is away from Linus/v3.17-rc2 by 115 files with differences to be upstreamed | |
| GTA04 3.17-rc3 is away from Linus/v3.17-rc3 by 113 files with differences to be upstreamed | Pyra added |
| GTA04 3.17-rc4 is away from Linus/v3.17-rc4 by 118 files with differences to be upstreamed | |
| GTA04 3.17-rc6 is away from Linus/v3.17-rc6 by 125 files with differences to be upstreamed | |
| GTA04 3.17-rc7 is away from Linus/v3.17-rc7 by 132 files with differences to be upstreamed | |
| GTA04 3.17.0 is away from Linus/v3.17 by 132 files with differences to be upstreamed | |
| GTA04 3.18-rc1 is away from Linus/v3.18-rc1 by 131 files with differences to be upstreamed | patch accepted |
| GTA04 3.18-rc2 is away from Linus/v3.18-rc2 by 133 files with differences to be upstreamed | |
| GTA04 3.18-rc3 is away from Linus/v3.18-rc3 by 132 files with differences to be upstreamed | |
| GTA04 3.18-rc4 is away from Linus/v3.18-rc4 by 132 files with differences to be upstreamed | |
| GTA04 3.18-rc5 is away from Linus/v3.18-rc5 by 137 files with differences to be upstreamed | BB XM added |
| GTA04 3.18-rc6 is away from Linus/v3.18-rc6 by 138 files with differences to be upstreamed | |
| GTA04 *.*-rc1 is away from Linus/v*.*-rc1 by 0 files with differences to be upstreamed | Target: 0 |

Some differences (I)

```
***
GTA04 specific configs -- upstreaming difficult
***
arch/arm/configs/gta04_defconfig | 4166 0+ 4166-
***
Other -- work on upstreaming
***
arch/arm/mach-omap2/Kconfig | 9 0+ 9-
arch/arm/mach-omap2/Makefile | 4 2+ 2-
arch/arm/mach-omap2/omap_hwmod_54xx_data.c | 6 0+ 6-
arch/arm/mach-omap2/pm34xx.c | 10 0+ 10-
arch/arm/mach-omap2/twl-common.c | 2 1+ 1-
drivers/extcon/extcon-gpio.c | 70 3+ 67-
drivers/gpio/gpio-pca953x.c | 15 0+ 15-
drivers/hwmon/ina2xx.c | 1 0+ 1-
drivers/hwmon/twl4030-madc-hwmon.c | 10 0+ 10-
drivers/input/keyboard/gpio_keys.c | 7 5+ 2-
drivers/input/misc/Kconfig | 4 0+ 4-
drivers/input/misc/Makefile | 1 0+ 1-
drivers/input/misc/as5013.c | 913 0+ 913-
drivers/input/touchscreen/tsc2007.c | 103 5+ 98-
drivers/media/i2c/Kconfig | 8 0+ 8-
drivers/media/i2c/Makefile | 1 0+ 1-
drivers/media/i2c/ov9655.c | 1824 0+ 1824-
***
PVR extensions -- upstreaming difficult
***
drivers/gpu/Makefile | 2 1+ 1-
drivers/gpu/pvr/omap3/Kconfig | 92 0+ 92-
drivers/gpu/pvr/omap3/Makefile | 265 0+ 265-
drivers/gpu/pvr/omap3/ORIGIN.txt | 5 0+ 5-
drivers/gpu/pvr/omap3/TSPA.txt | 54 0+ 54-
drivers/gpu/pvr/omap3/include4/dbgdrvif.h | 381 0+ 381-
```

kernel defconfig is omap2plus_defconfig
but does not enable all drivers for full support

some system and driver extensions that are being
upstreamed asap

driver for Pyra-Handheld nubs

our touch screen driver extensions

camera used in GTA04 (not yet working)

we have some (older and currently incompatible)
PVR SGX kernel driver (the GPLed parts) in our tree
(did work for 3.8) - no chance to get that upstream

Some differences (II)

Documentation changes by being ahead -- upstreaming difficult

Documentation/devicetree/bindings/input/touchscreen/tsc2007.txt | 17 3+ 14-

Documentation/devicetree/bindings/leds/tca6507.txt | 15 2+ 13-

Documentation/devicetree/bindings/mfd/twl4030-madc.txt | 18 0+ 18-

Documentation/devicetree/bindings/misc/wi2wi,w2sg0004.txt | 26 0+ 26-

GTA04 specific user space kernel support -- upstreaming difficult

GTA04/README | 33 0+ 33-

GTA04/boot/bootargs.txt | 59 0+ 59-

GTA04/etc/udev/rules.d/charging.rules | 27 0+ 27-

GTA04/etc/udev/rules.d/charging.sh | 10 0+ 10-

GTA04/etc/udev/rules.d/hso.rules | 4 0+ 4-

GTA04/etc/udev/rules.d/input.rules | 9 0+ 9-

GTA04/etc/udev/rules.d/sensor.rules | 3 0+ 3-

GTA04/root/charger | 62 0+ 62-

GTA04/root/debugdsi | 5 0+ 5-

GTA04/root/dial | 93 0+ 93-

GTA04/root/femto.com.c | 57 0+ 57-

GTA04/root/hw-test | 459 0+ 459-

GTA04 specific Device Tree definitions -- work on upstreaming

arch/arm/boot/dts/Makefile | 18 1+ 17-

arch/arm/boot/dts/omap3-beagle-xm-ab+gta04b1.dts | 377 0+ 377-

arch/arm/boot/dts/omap3-gta04+b2.dtsi | 139 0+ 139-

arch/arm/boot/dts/omap3-gta04+b7.dts | 118 0+ 118-

arch/arm/boot/dts/omap3-gta04.dtsi | 783 128+ 655-

arch/arm/boot/dts/omap3-gta04a3.dts | 32 3+ 29-

arch/arm/boot/dts/omap3-gta04a4.dts | 5 2+ 3-

arch/arm/boot/dts/omap3-gta04a5.dts | 7 1+ 6-

arch/arm/boot/dts/omap4-panda-es+gta04.dts | 16 0+ 16-

arch/arm/boot/dts/omap5-pyra+boe.dts | 22 0+ 22-

← some will appear in 3.19

← submitted but under discussion

← does not fit in kernel.org policy

← our device trees are more complete
and not all files have been submitted

Status 3.18-rc6

| Area | Status | Upstream |
|------------------------------|---|--|
| boot with DT | DT almost complete | partially upstreamed |
| display | works | accepted |
| backlight | only on/off | - |
| TV out | works (except one xorg.conf issue) | submitted |
| charging | works | - |
| USB / OTG | works | - |
| fuel gauge driver | works | almost upstream |
| touch | works; dejitter not yet reintegrated | accepted |
| GPS | works fine different solution by Neil B. | virtual GPIO rejected |
| WiFi | partially works power management | Neil B. has submitted something unrelated |
| Modem power control | works almost | unclear what can be accepted |
| Camera | no DT support for ISP cameras | - |
| Sound / Si4721 / Jack detect | not working (well) | not clear how to integrate |
| IrDA, Flash/Torch | not in DT | - |
| PVR/SGX | - | won't be accepted if we submit |

Device Trees

- Letux 2804 (GTA04A3/A4/A5) - works
- Letux 3704 (GTA04b2) - works
- Letux 7004 (GTA04b3) - works
- Neo900 (GTA04b7) - nothing tested
- BeagleBoard - not tested
- BeagleBoard XM - works (with „Openmoko-Beagle-Hybrid“ LCD cape)
- BeagleBoneBlack - incomplete
- PandaBoard ES - works
- OMAP5432EVM / Pyra Prototype - works
- others...

Some issues

- GTA04 distributions and GTA04 owners are reluctant to use/support this kernel (at least as config option)
- would give us much more users and bug reports
- upstreaming is sometimes very easy and sometimes tough work and argumentation with maintainers - more workforce would help
- nobody knows everything: we need help for fixing bugs in sound, power management, sdio/wifi

How upstreaming works

- Marek will tell us now ...