• What is sunxi?
• About me
• Allwinner history
• Community info
• Bootloader
• Operating Systems
• Distros
• Kernels

• FEX
• Hardware
• Allwinner SoC's
• Closed blobs
• Demonstration
• How to contribute
• Questions
What is a sunxi?
Sunxi is not sushi!
What is sunxi?
What is sunxi?

Sun Tzu's
THE ART OF WAR
What is sunxi?

A System on a Chip (SoC)
The sun architectures

sun?
sunii
sun3i
sun4i
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About me

- Linux enthusiast, admin and user for 15+ years
- Sunxi user/dev for 1 ½ years
- Official DTV-Scan-files maintainer
- Small time kernel contributer
- Writing about sunxi (Packt Publishing) ~july
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AW Corporate History

- Founded in 2007
- 550 Employees
- 450+ Engineers (50% Master's)
- Zhuhai, Shenzhen, Hong Kong
AW 2013 Market Share

- Apple: 43%
- Allwinner: 15%
- Nvidia: 9%
- TI: 8%
- Samsung: 8%
- Rx: 8%
- Qualcomm: 6%
- MediaTek: 2%
- Others: 1%
- Apple, Allwinner, and Nvidia together account for 67% of the market share.
AW Product History

- Initially Power Management Units (PMU) 2007 - 2010
- AXP152, AXP209 and many more
AW Product History

- F-series (sunii?, sun3i) (2010)
- A10 (2011)
- A13, A10s (2012)
- A20 (2013)
AW Marketing

**Strengths**

- Integrated Circuit Design
- Total Platform Solutions
- Open Source Support

**SoC Design**
- Total Solution
- Open Source
Open Source Projects

- GPL
- Linux

Strengths
- SoC Design
- Total Solution
- Open Source
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Community History
Rhombus-Tech, early-days

- Community gathering around EOMA68 board ~2010
- #arm-netbook @freenode, @lists.phcomp.co.uk
Sunxi-community

- Growing steadily!
- 600+ Mailing list users and ~130 IRC users
- ~20 active developers
Where to find us

http://linux-sunxi.org
#linux-sunxi @free-node
dev@linux-sunxi.org
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The Bootloader

- U-Boot (lichee) **NAND**-only (requires boot0/boot1)
- U-Boot (sunxi) **MMC**-only
- Barebox
- Coreboot (very early)
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The OS

- Linux
- FreeBSD
- Tizen
- Firefox OS
- Minix
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The Distro

- Fedora 18/19
- Linaro (Arm Linux Internet Platform)
- Arch / Gentoo
- Mer / Kali
- Debian / (X)ubuntu (debootstrap)
- (Xen)
- and of course not Android
No Android?

- No community android
- Replicant/Cyanogen WiP
- AW SDK Android
  - Violating blobs (touchscreen mostly)
  - Violating bootloader (but not needed)
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The Kernel

- Lichee
  - 3.0
  - 3.3
  - 3.4 with a sprinkle of 3.8
- Sunxi
  - (stage)-3.0
  - (stage)-3.4
  - experimental-3.10
  - mainline
• DEPRECATED
• Possibly still needed – touselreen blobs!
Sunxi-3.4

- Mostly in 'maintenance state'
- Patches backported from lichee kernels and upstream
- Lots and lots and lots of bugfixes
- Minimal cleanups
Experimental-3.10

- Long Term Support (LTS)
- Android 5.0 likely
- Actual mainline support
- Later patches backported
- Features! (KVM, CMA, etc)
Mainline

- All community work!
- Upstream
- sunxi-devel
- sunxi-next
Mainline support

- CPU
- Interrupt Controller (AW (sun4i/sun6i) / GIC (sun7i))
- Timer
- RTC
- Watchdog
- Ethernet
- I²C
Mainline status

http://linux-sunxi.org/Mainlining_Effort
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FEX

- ini-style config
- driver parses ini to configure itself
- No Magic!
- Might predate device tree
- Origins in Melis, AW's OS before Linux
- Still important
- Replaced by DT in mainline
- A happy couple in experimental-3.10
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• Various development platforms (even OSHW!)
OSHW: Olimex Lime
OSHW: Olimex
Open Schematic HW: Cubietech
Could be OSHW: EOMA68
Hardware

- Various development platforms (even OSHW!)
- Gigantic number of consumer tablets/sticks!
Consumer hardware
Hardware

• Various development platforms (even OSHW!)
• Gigantic number of consumer tablets/sticks!
• Very easy to hack on, always unbrickable!
  – Always boots from MMC first
  – 'FEL'-mode can inject over USB
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SoC's

- Various generations now
That is sunxi!

A10
sun4i

A10s
sun5i

A13
sun5i

A20
sun7i
SoC's

- Various generations now
- Open source drivers for most components
- Theoretically FSF endorsable
That is sunxi!

A10
sun4i

A10s
sun5i

A13
sun5i

A20
sun7i
Uh-oh

A10
sun4i

A13
sun5i

A20
sun7i
PowerVR

A31(s) / A80
sun6i / sun8i
SoC's

- Various generations now
- Open source drivers for most components
- Theoretically FSF endorsable
- But PowerVR → No A31(s), A80 support
A23 status

- Only 1 dev with a tablet
- SDK without bootloader source
- No memory init
- Mali (Lima)
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Closed blobs
Closed blobs

- Mali (GPU, 3D)
Limare
Closed blobs

- Mali (GPU, 3D)
  - Lima: Luc, Graphics dev room H.1301; 15:00 – 15:50
  - Shadercompiler: Connor, \( \Lambda \), 16:00 – 16:50
  - sunxi-KMS: Luc, \( \Lambda \), 17:00 – 17:20
Closed blobs

- Mali (GPU, 3D)
  - Lima: Luc, Graphics dev room H.1301; 15:00 – 15:50
  - Shadercompiler: Connor, Λ, 16:00 – 16:50
  - sunxi-KMS: Luc, Λ, 17:00 – 17:20
- GPS (but debugging symbols in the KO)
- Not the touchscreen! Resistive internal one is mainlined
- Boot ROM (BROM)
- CedarX (APU/VPU)
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Demonstration Time!
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How to contribute

- Documentation! (Wiki mostly)
- New Device How to
- (Help) porting OS's and bring it to the community
  - AOSP
  - Cyanogen / Replicant
  - Firefox OS
  - Ubuntu Touch
- Kernel patches! 3.4, 3.10 and mainline!
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Questions