

Recycle Your Android Devices

Run real Linux
on them



mēr

Sailfish 

Sailfish 

mēr

jolla

David Greaves

lbt on #mer #sailfishos ...

Co-founder of the Mer Project

Who am I?

work at Jolla

systems and infrastructure
(OBS, QA, gitlab, bz ... VMs)

HA Documentation

Mer tools



**This is not a
Jolla pitch**

Sailfish 

m_er

jolla

**This is not a
Jolla pitch**

...

but

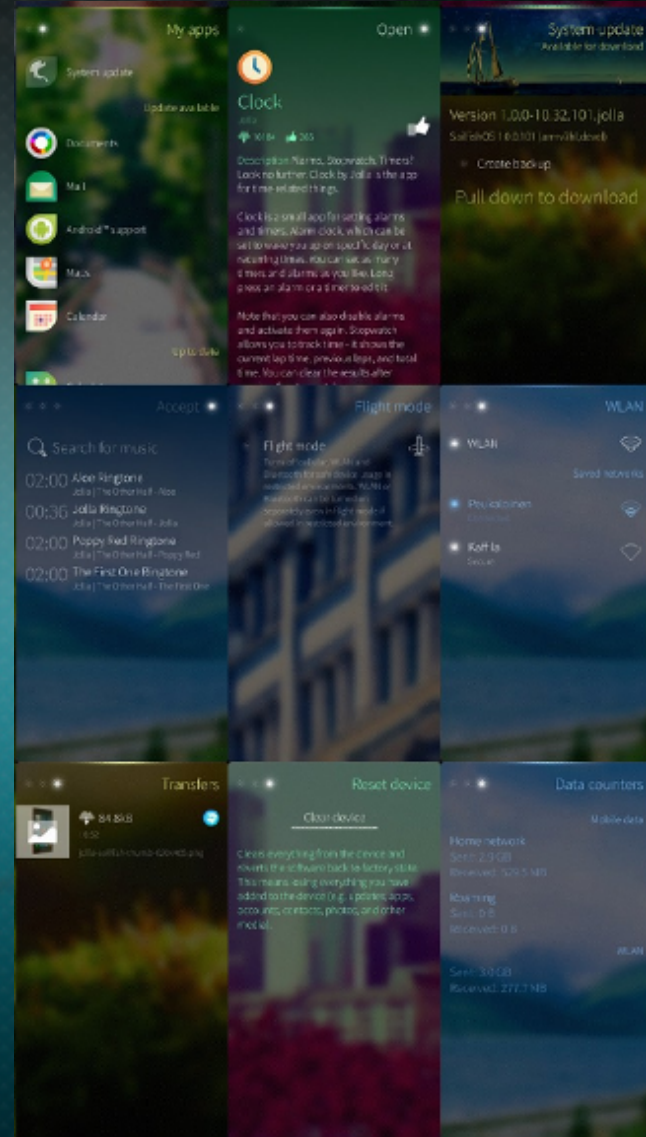
Sailfish 

m^{er}

jolla

This is not a Jolla pitch

...
but



Good case study

**This is not a
Jolla pitch
...
but**



Galaxy S3 &
Nexus 4 / 5 & more
Sailfish for Android

Sailfish 

mer 

jolla

This is not a Jolla pitch

...
but

HADK ToC:

- Prerequisites
- Preparing Your Device
- Setting up the SDKs
- Building the Android HAL
- Setting up Scratchbox2 Target
- Packaging Droid HAL
- Creating the Sailfish OS root fs
- Getting In
- Flashing the rootfs image
- Manual Installation
- List of Repositories
- Tweaks and Patches
- Building a new Device
- List of Supported Devices

Talk about Technology

Sailfish 

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**Talk about
Technology**

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JEOS

Just Enough OS

Sailfish 

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Talk about Technology

wayland
systemd
btrfs
connman
ofono/pulseaudio
git
dbus
rpm
blueZ
Gecko
libzypp
gstreamer
eglbc
glib
kcalcore
GeoClue
kernel



Talk about Technology

wayland
systemd ←
btrfs
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kernel





5.2

Talk about Technology

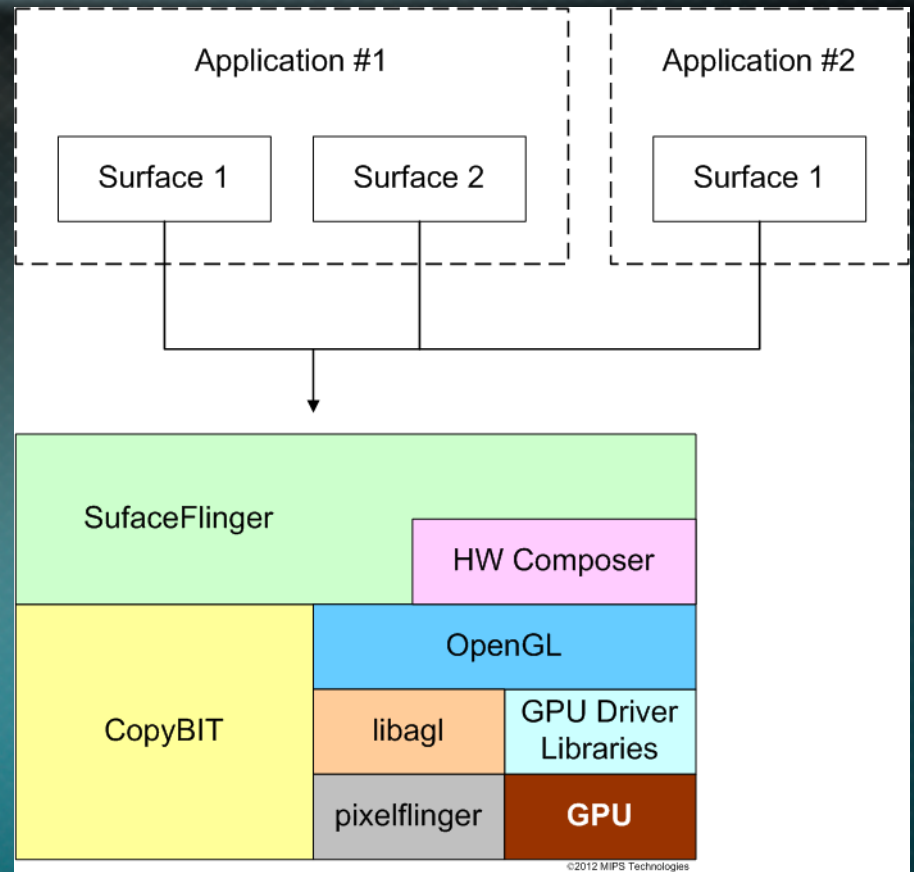
Qt 5.2-ish

Why?

- QML
- Performant
- Open
- Not Java
- Huge developer base

Talk about Technology

Qt 5.2-ish

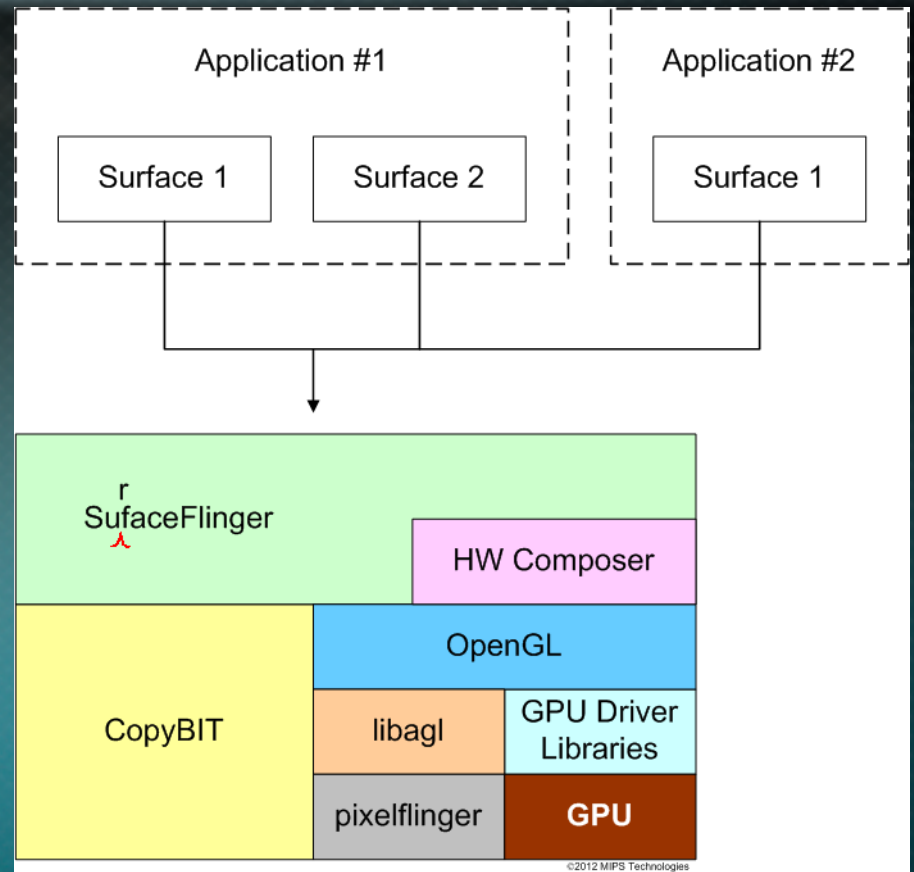


QtWayland replaces SurfaceFlinger

More to come using hwcomposer.

Talk about Technology

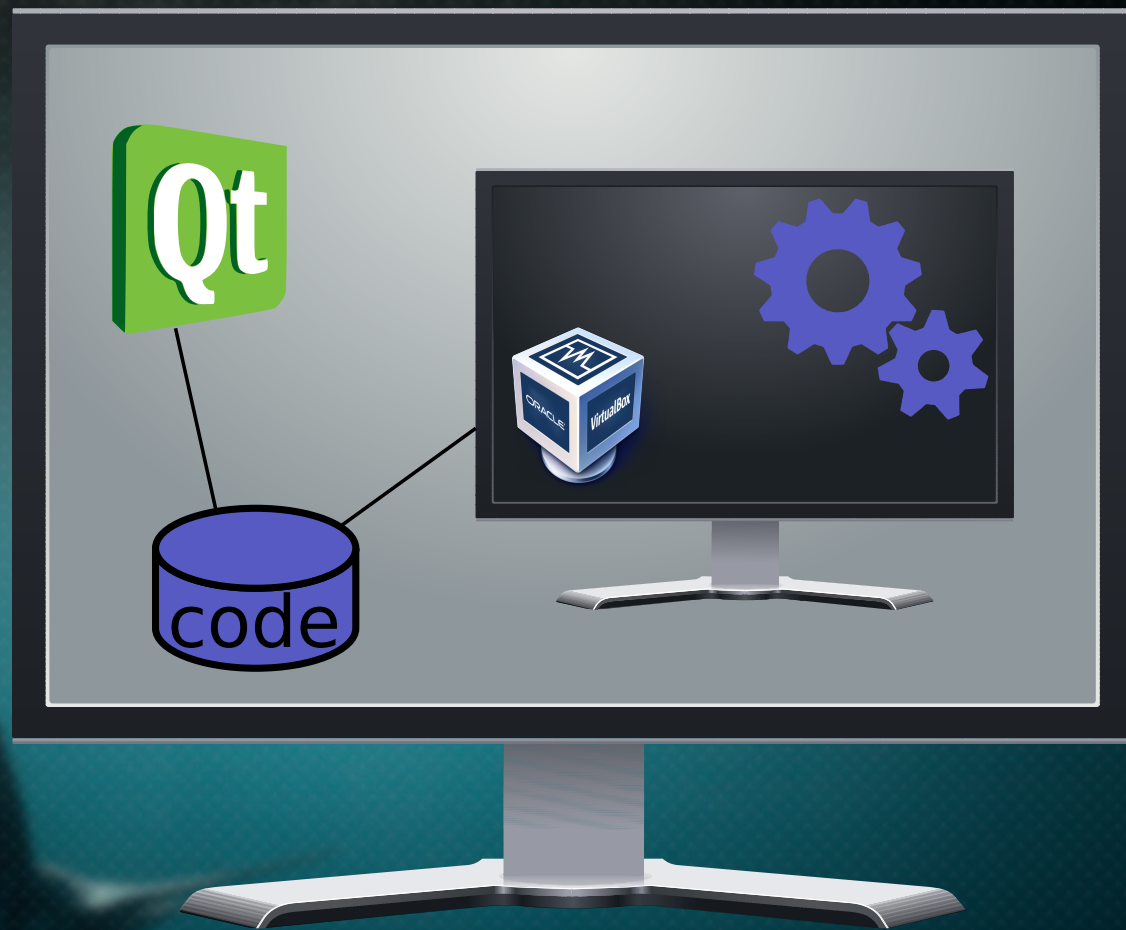
Qt 5.2-ish



QtWayland replaces SurfaceFlinger

More to come using hwcomposer.

Talk about Technology



Routing around the breakage of closed binary blobs



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Talk about Technology

libhybris

Shim between GNU
libc and bionic libc

Enables use of glibc
stack on top of
Android BSP

Talk about Technology

libhybris

Android linker code

dlopen

dlsym

dlclose

become

android_dlopen

android_dlsym

android_dlclose

Talk about Technology

libhybris

Patches to bionic -
relatively few:

- Thread local storage
- pthreads
- errno
- hard vs softfp float-abi
- /dev/log

Talk about Technology

libhybris

```
android_dlopen("libEGL.so");  
  
myeglCreateWindowSurfaceFP =  
android_dlsym("eglCreateWindowSurface");  
  
*myeglCreateWindowSurface(...)
```

Gets you

- `libEGL.so`

or

- `libGLv2.so`

as wrappers which
present to glibc space

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libhybris

Rinse and repeat for:

- Gralloc
- OpenGL ES 1.1/2.0
- NFC
- Hardware HAL
- OpenCL
- SurfaceFlinger
- OpenMAX
- Camera
- Hwcomposer
- and so on ...

HA DK

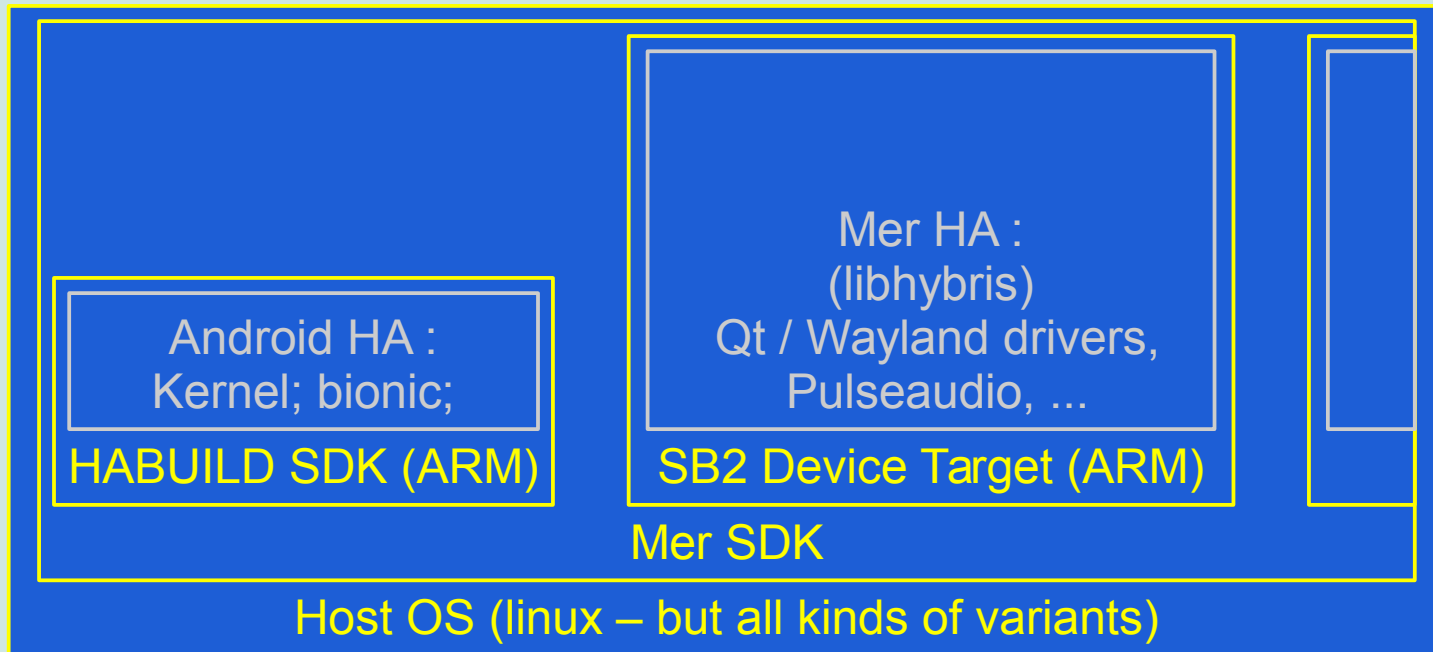
- Mer SDK
- Scratchbox2
 - Device target
- Minimal Ubuntu
(for Android build)

Building it

HA DK

Building it

- Explaining the layout
- Bridge Android / Linux



Mer SDK

- Minimal install
- Some tools
- SB2 ready

Building it

HABUILD SDK

- Grab a tarball
- Install 'repo'

Building it

HABUILD DK

- Device specific XML manifest
- Sync the git repos
- Mix of CM & Mer
- Run 'make'
- Fix problems :)

Building it

Building it

Mer DK

- Package up the HABUILD built:
 - binaries
 - headers
 - kernel
 - boot & recovery .img
- Create a local rpm repository (headers)
- Make an SB2 'Target'

Building it

Mer SDK

- Build hybrid
- Build drivers:
 - Qt hwcomposer
 - Audio
 - Haptic
 - Sensors

Mer SDK

- Build SailfishOS rootfs

Building it

- Build <insert your system here> rootfs

Flashing

- Use adb or equiv

Running it

Booting

What happens?

- Bootloader
- Kernel
- Initrd and /init
- Systemd
- Android 'init'

Running it

Running it

Running

- ssh
- nodejs
- ruby/python
- webserver
- ...

SailfishOS Porters

- Currently around 25 active developers
- Working on 22 devices
 - Galaxy Nexus/Note/Tab2/S3/S4
 - Nexus One/4/5/7's
 - OnePlus, Photon Q, HTC Desire HD
 - Ascend P6, G525-u00, Xperia Z1
 - HP Touchpad
 - N900, N9(50)
- N4, N5, Galaxy Nexus, are most mature and images are available

Status:

<http://bit.ly/port-devices-status>

Where are we?

Legend: **Y** - Working (y=hack), **Y** - HAL works, not hooked up to UVMW/init yet, **N** - Not working, **?** - Untested, **N/A** - N/A on device.

Downloadable Image	Linux Kernel	Display	Touch	LED	Audio	NFC	Bluetooth	GSM			WLAN	GPS	Camera	Sensors				Keys		Vibra	Haptics	Power Mgmt.	RTC alarms	USB			
								SMS	Voice	Data				ALS	PS	Accel.	Gyro.	Magne.	Vol+/-					Home	Net.	Charge	
Find5 X909 (find5)	3.4.0	N	?	?	?	?	?	?	?	?	?	N	?	?	?	?	?	?	?	Y	?	?	?	?	Y	Y	
Galaxy Nexus (maguro)	3.0.31	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N/A	Y	Y	Y	Y	Y	Y	
Galaxy Note (n7000)	3.0.64	Y	Y	?	Y	N/A	N	?	?	?	Y	?	?	N	?	?	N	?	Y	N	N	Y	Y	?	Y	Y	
Galaxy Tab 2 Wifi (p3110)	3.0.31	Y	Y	?	N	N/A	N	N/A	N/A	N/A	N	?	?	N	?	Y	N	?	Y	N/A	N	N/A	Y	?	Y	Y	
Huawei Ascend P6 (hwp6_u06)	3.0.8	Y	Y	N	N	N/A	N	N	N	N	Y	?	?	N	?	Y	N	?	Y	N/A	?	N/A	Y	?	Y	Y	
Nexus One (passion)	2.6.38	Y	Y	?	?	N/A	?	?	?	?	?	?	?	?	?	?	?	?	?	?	N	N	N	N	Y	Y	
Nexus 4 (mako) rQ	3.4.0	Y	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N/A	Y	Y	Y	N	Y	Y	
Nexus 5 (hammerhead)	3.4.0	Y	Y	Y	Y	?	Y	Y	Y	Y	Y	Y	N	?	?	?	?	?	Y	N/A	Y	Y	Y	N	Y	Y	
Nexus 7 WiFi 2012 (grouper)	3.1.10	Y	Y	?	Y	Y	Y	N/A	N/A	N/A	Y	Y	N	Y	?	Y	Y	Y	Y	N/A	N/A	N/A	Y	N	Y	Y	
Nexus 7 GSM 2012 (tilapia)								Y	?	Y																	?
Nexus 7 2013 (flo)	3.4.0	Y	Y	?	N	?	Y	N/A	N/A	N/A	N	?	N	?	?	?	?	?	?	Y	N/A	N/A	N/A	?	N	Y	Y
Nexus 7 2013 (deb)								?	?	?																	
SGSIII Intl (i9300) rQ	3.0.64	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	N	Y	?	Y	?	?	?	Y	N	Y	Y	N	Y	Y	
SGSIII 4G (i9305)	3.0.64	Y	Y	?	Y	N	N	Y	Y	?	Y	N	N	?	?	Y	?	?	?	Y	N	N	Y	Y	N	Y	Y
Motorola Photon Q (xt897)	3.0.93	N	Y	Y	N	N	Y	N	N	N	Y	Y	N	Y	?	N	Y	?	Y	QWERTY	N	N	Y	N	Y	Y	
HTC Desire HD (ace)	3.0.101	Y	Y	N	N	N	N	N	N	N	Y	Y	N	N	?	N	N	?	N	N	Y	Y	N	N	Y	N	
Sony Xperia L C2105	3.4.0	Y	Y	N	Y	N	N	Y	Y	Y	N	N	N	Y	Y	Y	N/A	?	Y	N/A	Y	Y	Y	N	Y	Y	
Sony Xperia Z1 Compact (amami)	3.4.0	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N/A	Y	N	N	N	Y	Y
Huawei C8813Q / G525	3.4.98	Y	Y	Y	Y	?	?	?	?	?	?	N	?	Y	Y	Y	N/A	N/A	Y	?	Y	?	Y	?	Y	Y	



Working Together

- Multirom

Worked with tassadar to add multirom support for sailfishOs images

- Upstreaming bugfixes code back to CM

During N5 port we contributed bugfix back to the upstream CM

<http://review.cyanogenmod.org/#/c/67489/>



Talk to us

- Xdadev sailfish section and also individual device forums have SailfishOs threads
- IRC channel #sailfishos-porters
- All source at <https://github.com/merhybris>
- SailfishOs meetups , London, Berlin, Finland
- Regular IRC meeting where developers drive the agenda

Mer @
merproject.org

**Open
Source**

- Core & some MW
- Systems
- Community

**Open
Working**

Code is not enough

Unlike

Not that hard

freenode:

#mer

#sailfishos

90 people made this:

**github/
mer-hybris**

**merproject.
org**



Sailfish 

mer

jolla

**Jolla's
FOSDEM
Discount
Code**

Code:
"FOSDEM2015"

€50 discount (€199)

31 Jan - 8 Feb

(One per person)

EU / Switzerland /
Norway

Tablet : See us on
Indiegogo