Recycle Your Android Devices
Run real Linux on them
Who am I?

David Greaves

Ibt on #mer #sailfishos ...

Co-founder of the Mer Project

work at Jolla

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

HA Documentation

Mer tools
This is not a Jolla pitch
This is not a Jolla pitch ... but
This is not a Jolla pitch...

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

Galaxy S3 &
Nexus 4 / 5 & more

Sailfish for Android
This is not a Jolla pitch

... but
Talk about Technology
Talk about Technology

JEOS
Just Enough OS
Talk about Technology

wayland
systemd
btrfs
connman
ofono/pulseaudio
git
dbus
rpm
blueZ
Gecko
libzypp
gstreamer
eglibc
glib
kcalc
GeoClue
kernel
Talk about Technology

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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
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

libhybris
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

Gets you

• libEGL.so
or

• libGLESv2.so

as wrappers which present to glibc space

android_dlopen("libEGL.so");

myeglCreateWindowSurfaceFP =
android_dlsym("eglCreateWindowSurface");

*myeglCreateWindowSurface(....)
Talk about Technology

libhybris

Rinse and repeat for:

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

HA DK
- Mer SDK
- Scratchbox2
  - Device target
- Minimal Ubuntu
  (for Android build)
Building it

- Explaining the layout
- Bridge Android / Linux

HA DK

- Android HA:
  - Kernel; bionic;
  - HABUILD SDK (ARM)

- Mer HA:
  - (libhybris)
  - Qt / Wayland drivers,
  - Pulseaudio, ...

- SB2 Device Target (ARM)

- Mer SDK

- Host OS (linux – but all kinds of variants)
Building it

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

Mer DK

- Package up the HABUILD built:
  - binaries
  - headers
  - kernel
  - boot & recovery .img

- Create a local rpm repository (headers)

- Make an SB2 'Target'
Mer SDK

• Build hybris

• Build drivers:
  • Qt hwcomposer
  • Audio
  • Haptic
  • Sensors

Building it
Building it

Mer SDK
• Build SailfishOS rootfs
• Build <insert your system here> rootfs
Running it

- 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
- ...

Sailfish

mer

jolla
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
Where are we?

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/mer-hybris
- SailfishOs meetups, London, Berlin, Finland
- Regular IRC meeting where developers drive the agenda
Open Source

Open Working

Mer @ merproject.org

- Core & some MW
- Systems
- Community

Code is not enough
Unlike freenode:
  #mer
  #sailfishos

Not that hard

90 people made this:

github/mer-hybris

merproject.org
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