Binary Blobs Attack!!!

Zach Pfeffer (pfefferz)
Linaro Android Platform Team

Embedded Linux Conference 2012

I'm working on a movie...

Here's the script...

Working Title: Binary Blobs Attack!!!

8 AM - San Jose

Philip

...stretches, pees, starts checking mail

9 AM

Philip

"okay, I need to write a message through this blob to the core"

11 AM

Philip

"Crap! What's wrong, why did you crash?"

1 PM San Jose
2:30 AM Bangalore

Philip

"Yeah, I'm not sure, I send the message and BOOM! The core just stops."

FAE of FaST

"I think that teams in India, I'll send a mail"

Philip

"Okay..."

10 AM Bangalore, the next day
8:30 PM San Jose
Vishal
"I got your mail..."
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11 PM San Jose
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calls Ngraphics' FAE...

A Word Problem

Father's Day is in 13 days. SuperCoolNotGoogle and FaST is working on the FathersDayChecksYourFridgeHasBeer phone. It estimates that it will need to solve 325 crashes. 2 engineers and 1 FAE can solve 1 crash per day. How many Engineers and FAEs does SuperCoolNotGoogle need to ship their product?

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12.5 engineers

Wow!!!

Having the source allowed SuperCoolNotGoogle and FaST to save 12.5 engineers and 25 FAEs.

Maybe they could get 2 phones out instead of 1 or...

Time spent on binary blob production, integration and debugging has eclipsed any other activity in the product cycle.

Engineer Rants

- “Binary blob scribbling is impossible to debug”
- “Kernel upgrades mean a recompile cycle with the SoC's 3rd party vendor”
- “Binary blobs are un-ethical”
- “OS independent code is always buggy, slow and will only be used on the OS its not meant for”
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Problems

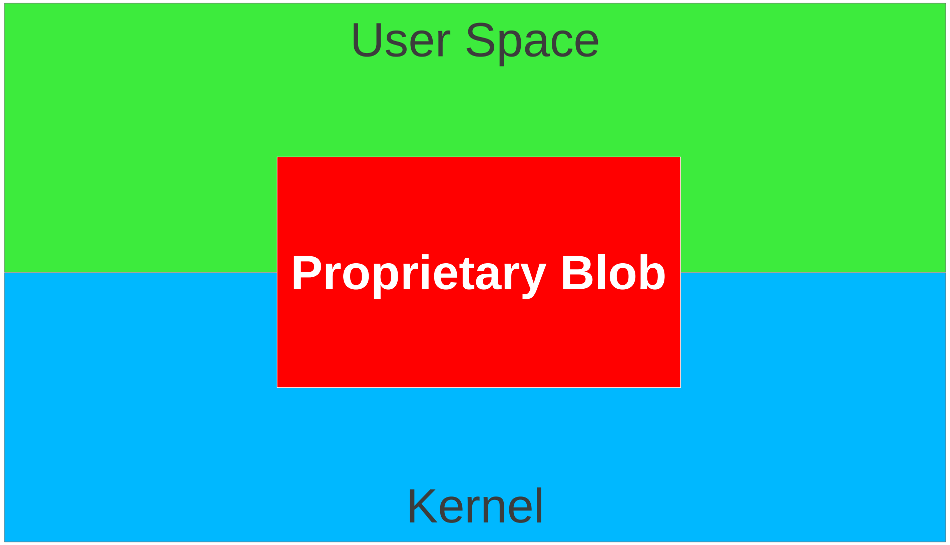
- The audio blob is locked to the 3.0 kernel the graphics blob is locked to 3.1
- hardfp and other toolchain improvements are lost
- The blob producers are impossible to track down
- Has brought back “batch” development

Binary blobs are responsible for the Linux ARM “problem.”

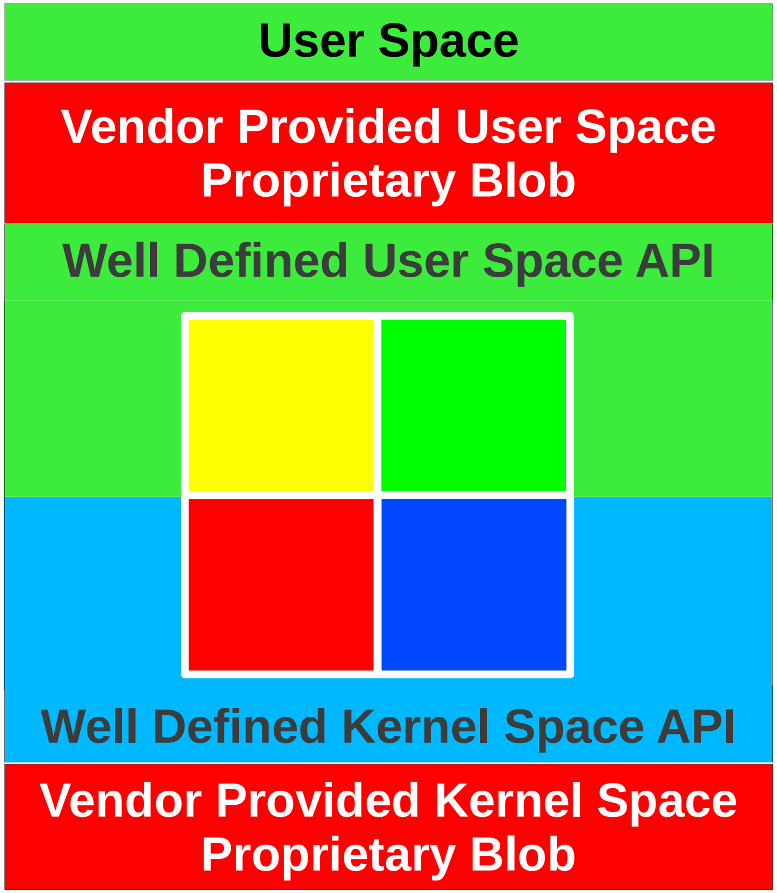
Binary blobs won't be going away.

How can we ensure an open, sustainable software eco-system with them?

Most problems happen when proprietary code crosses the userspace/kernel boundary



How Windows deals with this (so I've heard)



User Space

Vendor Provided User Space Proprietary Blob

Well Defined User Space API

Well Defined Kernel Space API

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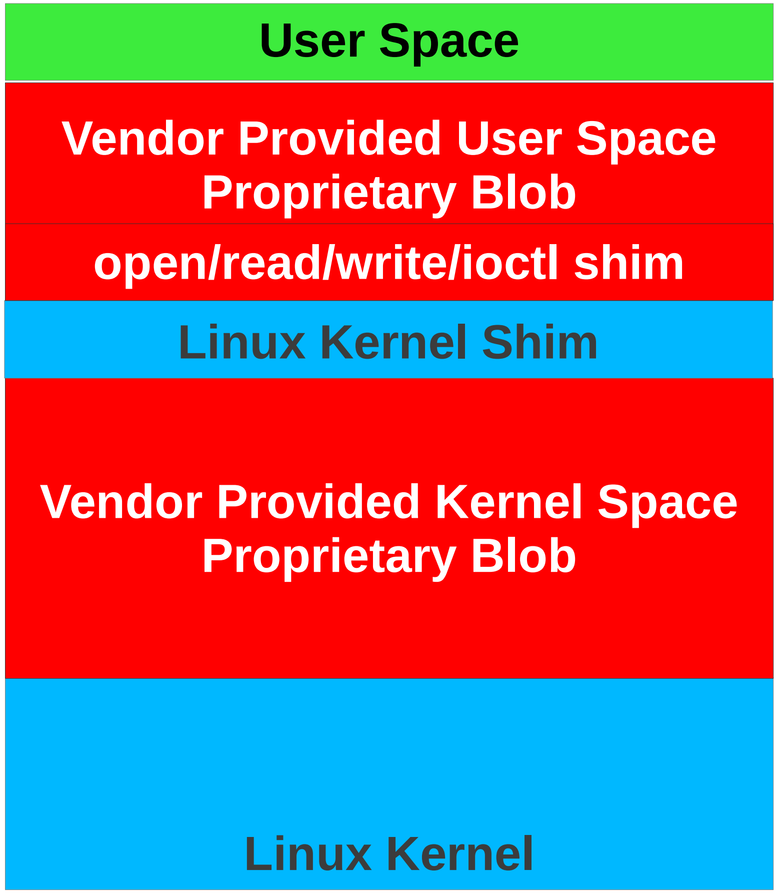
Typical Proprietary Stacks on Linux



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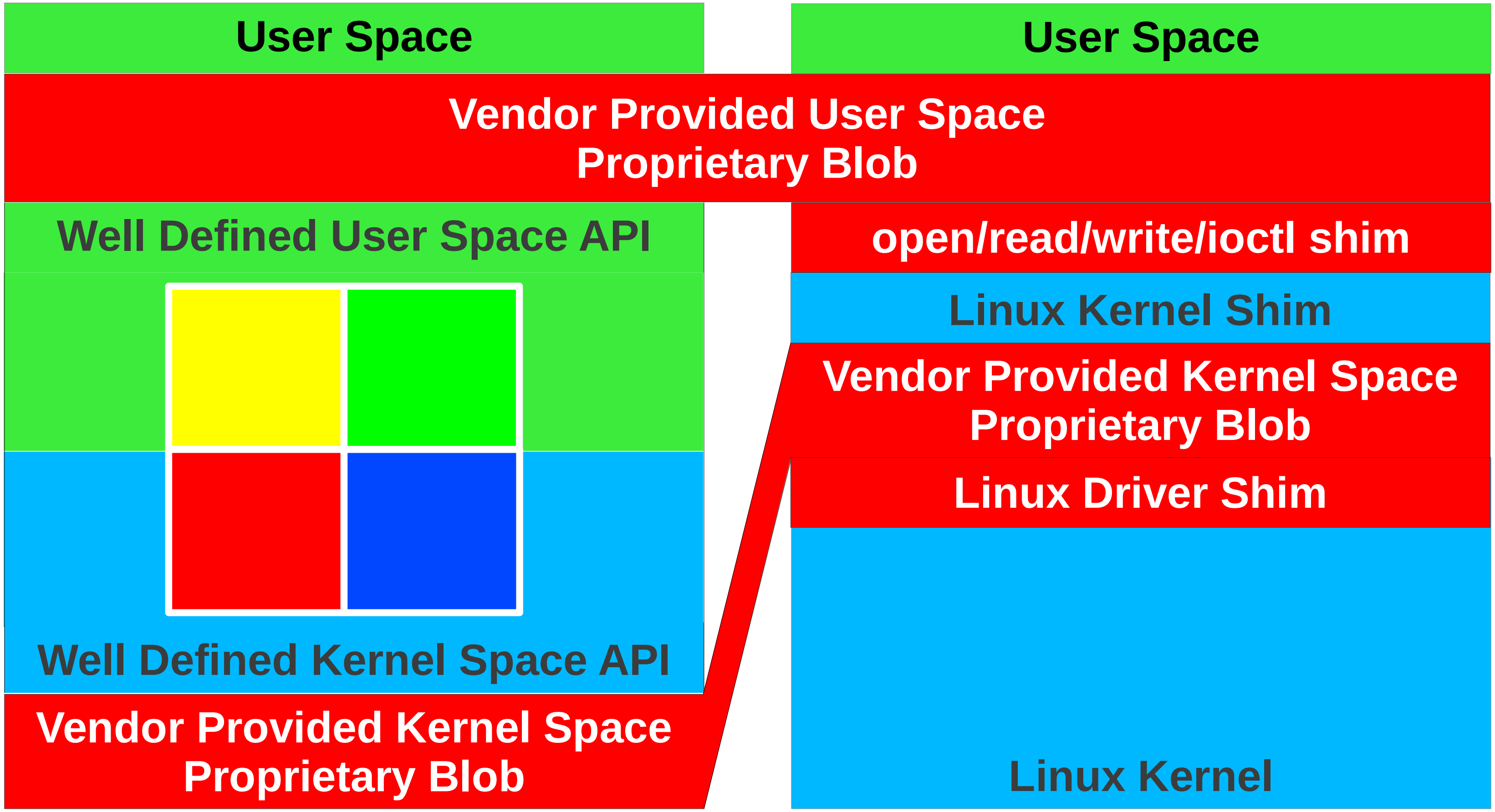
SoC vendors want to write code once and protect IP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Things we can do

- Examine what crosses the OS barrier and see what we can do to decouple things, such as:
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  - Create official binary box interfaces
  - Split devices from the kernel completely
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Things we can do

- OEMs and ODMs can work with SoC manufactures to ensure the source flows
- Reverse engineer

Thanks!

Feel free to send questions, comments and rants to zach.pfeffer@linaro.org

or

pfefferz at #linaro-android on irc.freenode.net

or

Zach Pfeffer (not the soccer player) on G+

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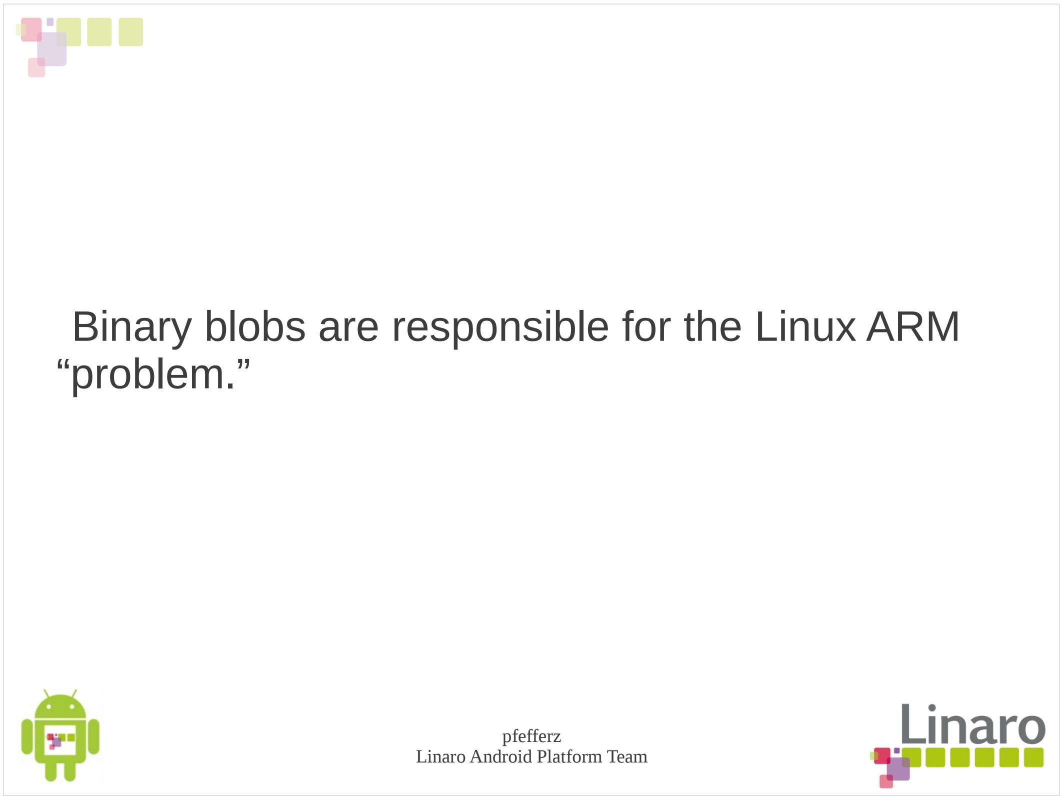

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Linaro Android Platform Team

Linaro

Upstream won't look at shim's, pass throughs or other kernel or userspace blob frontends.

This also leads to an inability to refactor ARM support into common kernel code, further marginalizing ARM

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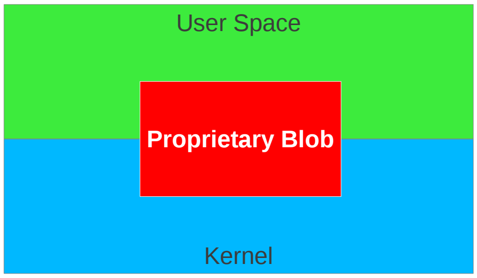

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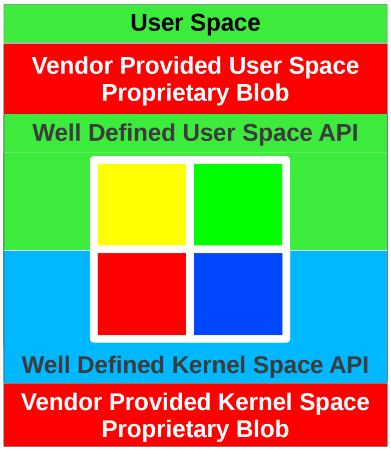

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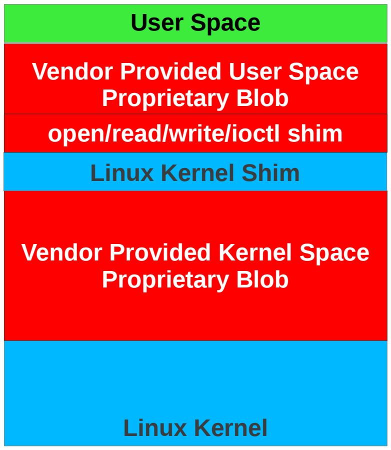

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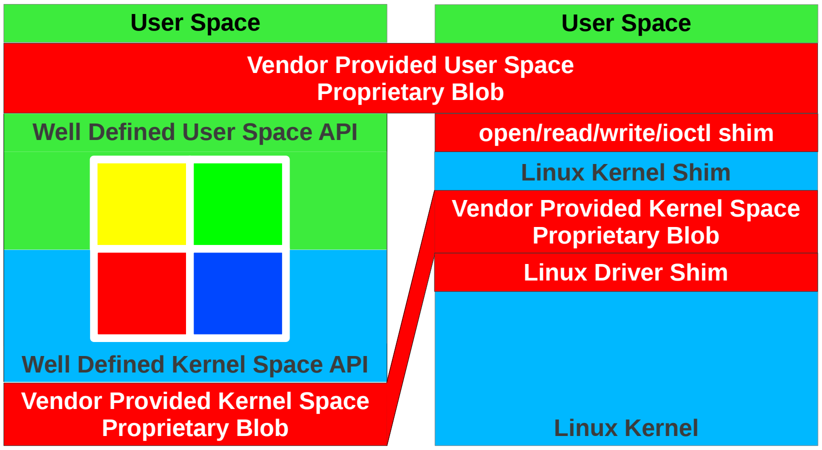

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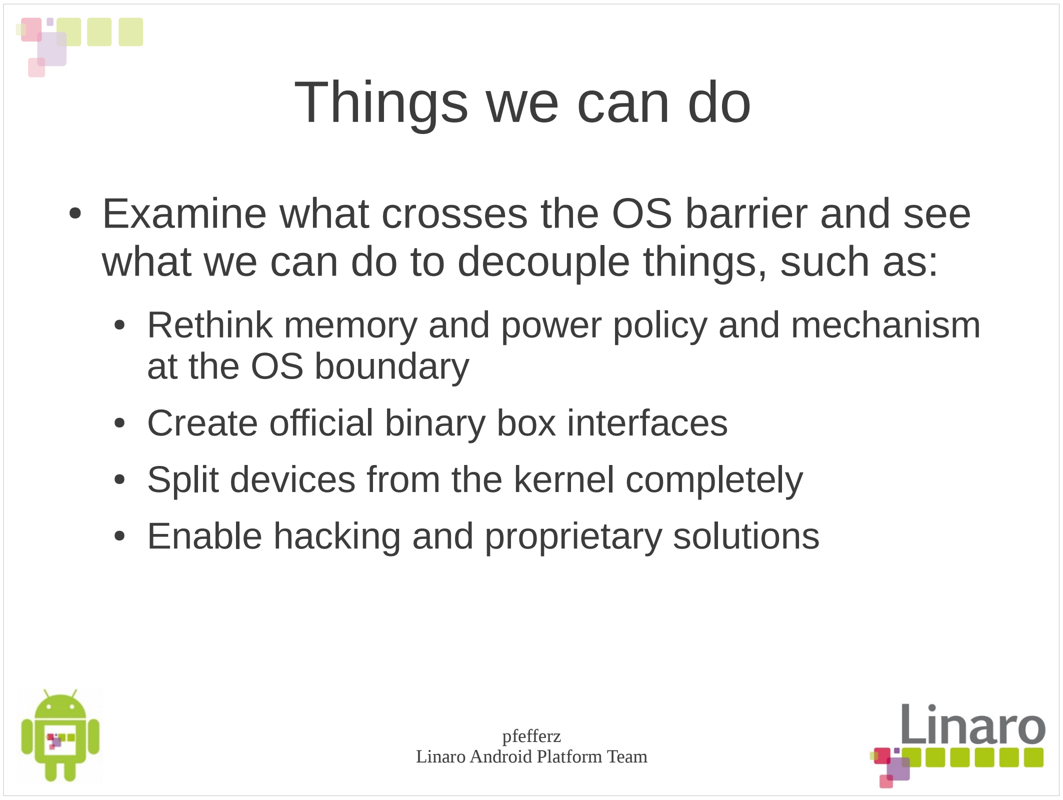

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