Witekio

EMBEDDING SUCCESS

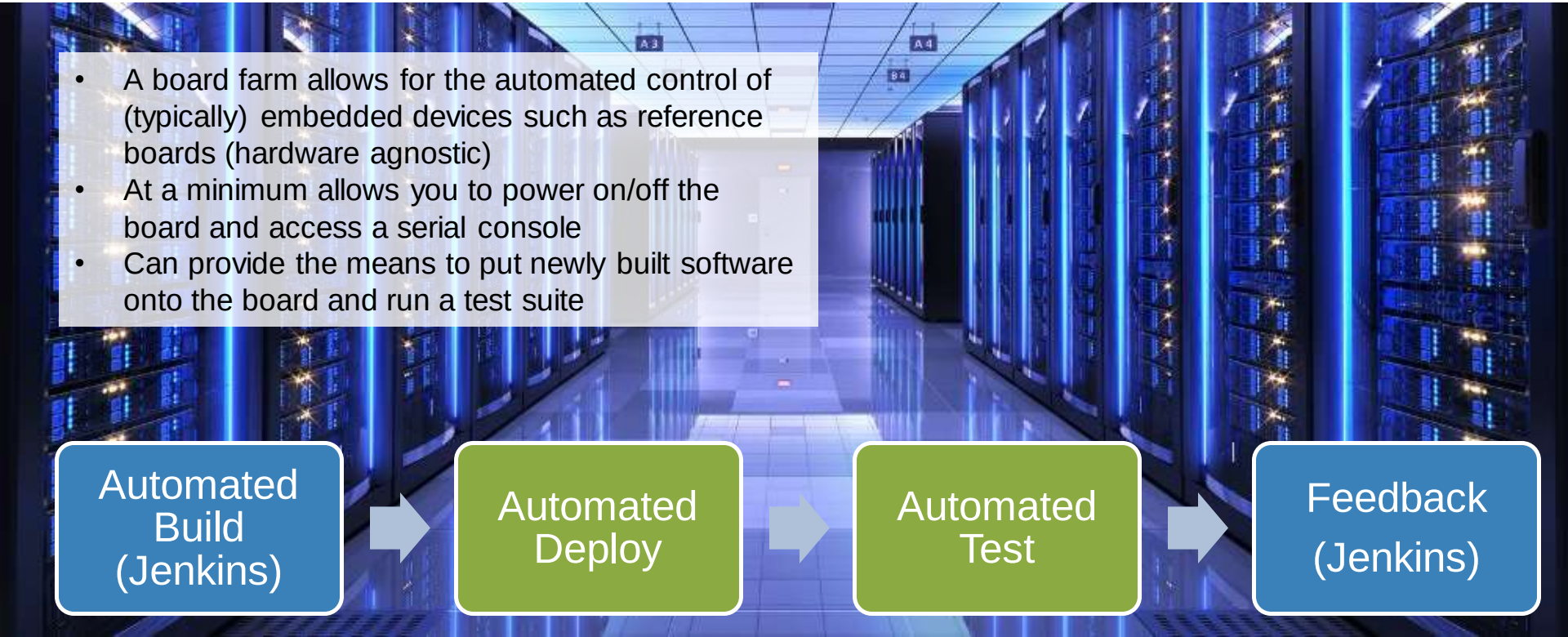
BoF – Farming Together

Andrew Murray

Embedded Linux Conference Europe 2017

What is a farm?

I'm guessing you wouldn't be here if you didn't already know.



- A board farm allows for the automated control of (typically) embedded devices such as reference boards (hardware agnostic)
- At a minimum allows you to power on/off the board and access a serial console
- Can provide the means to put newly built software onto the board and run a test suite

Automated Build (Jenkins) → Automated Deploy → Automated Test → Feedback (Jenkins)

What is a farm?

More likely than not it's a "pile of stuff" – [Collabora]

Witekio Farm

Also a sprawling mess

- Originally Built to support remote working and hardware sharing
- Rackmount with removable shelves that have common connectivity
- One single desktop PC that acts as the farm
- Access via SSH and a propriety set of ‘ebfarm’ scripts
- Now used as part of kernelci.org and to run automated tests for our customers
- Capabilities:
  - Control of power
  - USB relay for toggling DIP switches, pressing buttons
  - SDMux for SD card control
  - HDMI receiver for skype video access to boards [defunct]
  - Workspaces, and shared access control
  - Container isolation

Witekio Farm

A farm shelf and example of automated testing

- Automagically build deploy software via customer SD card update mechanism
- Allows testing upgrades work and is power failure tolerant
- Executes a set of manual tests including a soak test which provides CPU idle information to track performance regressions
- Automated emails with test results and graphs showing historical changes.

Our Challenges

It hasn't been easy

- USB issues (hubs disappearing, reappearing)
- Reliability and lack of notification when things go wrong
- Our SDMux is not perfect
- OpenVZ container has been an obstacle
- Maintaining the farm
- Scaling the farm – can we easily duplicate it to other sites? Probably not
- Automated testing with TCL/Expect – odd issues that only show up in test and difficult to debug
- Lack of support – not managed by IT managed by engineers.

Farms are a hot trend

Enabling the proliferation automated testing

- Loads of interest surrounding this topic, but why?
- Farms are enabling automated testing in a big way in the OSS community:
  - Kernelci.org
  - OSADL RT test lab (osadl.org)
  - Qualcomm ‘Boardfarm’ (OpenWRT) (github.com/qca/boardfarm)
  - Intel 0-day test bot (01.org/lkp)
  - Any others?
- Also used a lot in private
- Automated tests help prevent regression and maintain a level of quality
- Farms have other uses too – board sharing, remote development, etc
- We’re probably just touching the surface

kernelci.org

OSADL
Open Source Automation Development Lab eG

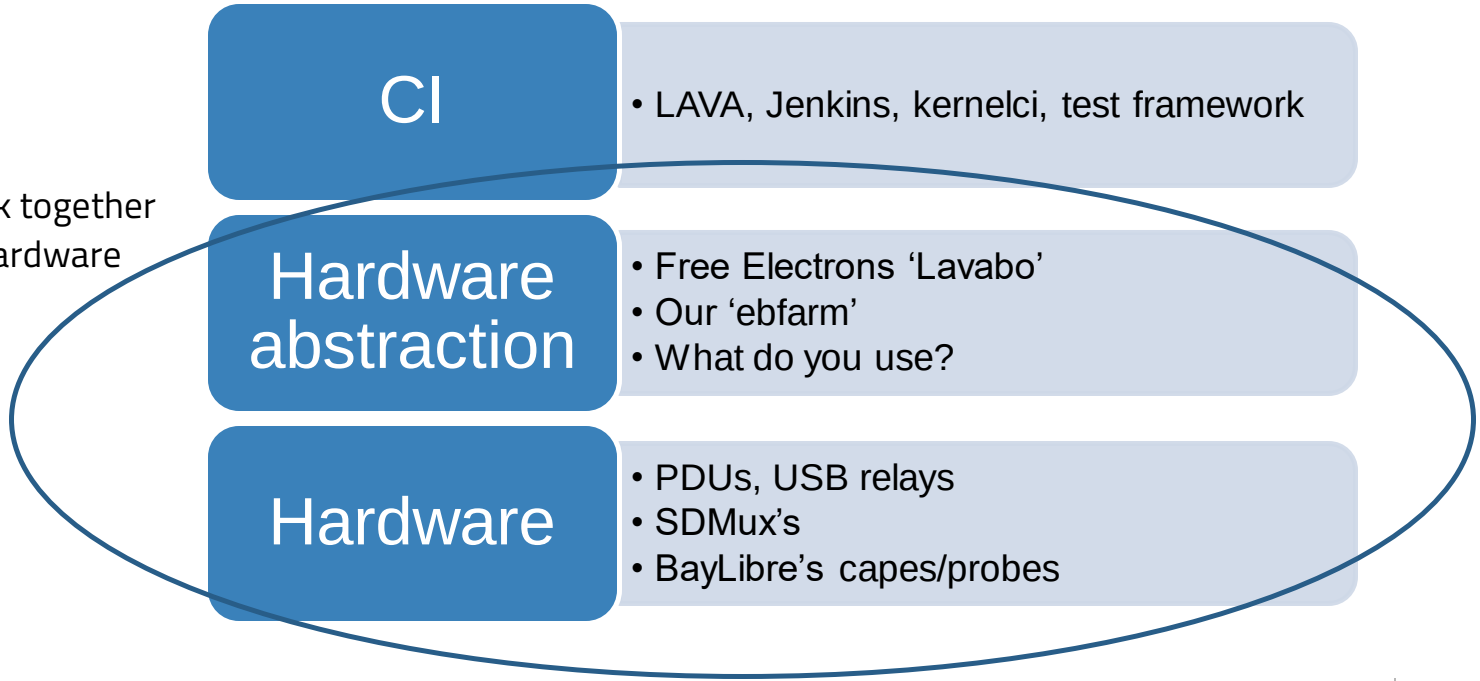
The problem?

Too much diversity, not enough collaboration

- Very little collaboration:
  - no de-facto blueprint for creating a farm
  - no knowledge resource available
  - Limited collaboration on software
- Perhaps this is why every farm is completely unique in hardware and software
- We're probably all facing the same challenges:
  - Making a scalable and reliable platform
  - Adding new capabilities
- We're all in our own silos working on the basics

A missing piece?

- Do we need to work together on hardware and hardware abstraction?



The vision

A better solution

- We can achieve more if we do it together
- We can move on from the basics and focus on the stuff that generates value – often testing
- Reduce the friction when integrating with existing higher layers.
- At a minimum bring farmers together

Open Discussion

Let’s discuss

Open Discussion 1

- Who are we? What are we doing with farms? What problem are we trying to solve?
  - Do we have a common goal?
  - Learn from each other
- What challenges do you face?
  - Bad/cheap hardware? Lack of hardware skills? Scalability?
- What solutions already exist?
  - Are there technologies that we didn’t know were out there?
  - Lavabo, Tizen SD Mux, BayLibre power probes, LAVA, etc
- How can we collaborate?
  - Would a wiki be useful? A mailing list?
  - Leave your business card on the way out and we can create a list

Let’s discuss

Open Discussion 2

- What needs to be done?
  - Some open source farm framework? (apt-get install farm)
  - Collaborate on software support for relays, capes, sd-muxs, PDUs, etc?
  - Collaborate on hardware to create new capabilities (e.g. USB removal)
  - Produce a pool of knowledge on available hardware, where to buy it, how to wire up tricky boards?
  - Produce a blueprint/standard for a farm? From Linux distribution through to higher level interfaces?
  - Exclusive access? Board sharing? Documentation?
  - Self describing farm shelves (via USB sticks describing layout?)
  - Configuration files for existing boards?
  - Improve reliability? Infrastructure issues.
- What needs to happen next?
- Anything else?

Accountability & Commitment

Cutting Edge expertise

Agility & Scalability Reliability

Local Teams Worldwide presence

Global Actions

Compliance with customers teams

Thank you

Witekio France
4, chemin du ruisseau
69134, Ecully France
Phone : + 33(0) 4 26 49 25 39
sales.emea@witekio.com

Witekio USA
3150 Richards Roads Suite 210 Bellevue,
WA, 98005, USA
Phone : + 1 425 749 4335
sales.amer@witekio.com

Witekio Germany
Am Wartfeld- 61169
Friedberg, Germany
Phone : + 49 6031 693 7070
sales.dach@witekio.com

Witekio UK/EmbeddedBits
Hollywood Mansion, Hollywood Lane,
Bristol BS10 7TW, UK
Phone : + 44(0) 117 369 0930
sales.uk@witekio.com

Witekio Asia
C/O 14F-3, No. 57, Fuxing Nth Rd,
Songshan District, Taipei, 10595, Taiwan
Phone : +886 2 2740 0394
sales.asia@witekio.com

©2017 Witekio & Subsidiaries. All Rights Reserved.
This document and the information it contains is confidential and remains the property of our company. It may not be copied or communicated to a third party or used for any purpose other than that for which it is supplied without the prior written consent of our company.