Shared automated testing in GENIVI

on QEMU and automotive hardware

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Topic today

• Japanese proverb: さるもきからおちる (Saru mo ki kara ochiru)
• Even monkeys fall out of trees
• GENIVI exists for the industry to reduce costs and accelerate time to market by collaborating on non-differentiating technology
• Putting the two together
  - Shared testing to support development
    - Automated where possible and
    - on QEMU and automotive hardware
Industry Trends
Shared testing upstream

• Shared testing of important software
  - Successful example is Kernel CI
    - Community based, open source distributed test automation system focused on upstream Linux kernel development.
    - Goals
      - Build every configuration for each architecture.
      - Boot these configurations.
      - Execute tests on these configurations.

• Collaboration on test cases, interoperability and mechanisms
  - Automated Testing Summit
Automotive needs

- Companies have advanced internal testing setups
  - proprietary s/w which can’t be shared and
  - OSS s/w which is <-- here shared testing is possible

- OSS included in company-internal testing anyway so why share?
  - Pooling resources creates ability to test wider variation of versions and configuration than is normally done in a production or internal platform project (remember Kernel CI)
  - We use component Foo v4. Should we take v5?
    - v5 may not be tested internally (yet), but in wider community it might be
    - Investigating upstream components for integration

- Conclusion: ability to look upstream for test results is a stronger basis for development
GENIVI Contribution
What’s already in place

- Distributed CI of “systems” using [GENIVI GoCD instance](https://genivi.org/goCD)
  - Builds GDP and Baseline
  - Central server, with remote build agents
  - Ability for companies to contribute agents to expand capacity
- [GENIVI CI Policy](https://genivi.org/ci-policy) encourages use of GitHub-integrated tools such as Travis-CI where teams select their own tooling for components
- GENIVI source hosted in [GitHub](https://github.com)
  - Integrated with GoCD to sanity build test pull requests for GDP and baseline
- **GDP**
  - Sanity tests using ptest
- **Yocto Baseline (meta-ivi)**
  - Meta-ivi-test image contains component unit tests
- Components
  - Largely tested in individual companies seemingly
GENIVI s/w scope is expanding

- Multi-OS strategy
  - Domain Interaction evolving into Multi-OS
  - Android SiG, safety OSs
- Meaning multiple development environments
- Collective opportunity
  - Possibility to collaborate and integrate with existing testing infrastructures for supported development platforms such as Apertis, WebOS and Android.
  - Open dialog and flexibility
  - Favour working together towards greater combined solutions, than repetition
  - Example
    - Discussions about testing of Adaptive Autosar ARA::COM and Franca IDL tooling
      - Mix of internal models which can’t be shared and hopefully some that can.
New automated test initiative

• We would like your help
• Working mode: make a start, be flexible and open to collaboration with other orgs
• **LAVA** based test system to be connected to Genivi GoCD CI (and other CI as needed)
  - Distributed system in wide use.
  - Example, embedded industrial [Civil Infrastructure Platform (CiP)]
  - LAVA Master (control server)
  - LAVA Worker (execute tests on boards) for QEMU and automotive hardware
• Will use it for CIAT test of future GENIVI code emerging from Multi-OS
How can we all contribute?

• Renesas will contribute a LAVA Worker to provide an R-Car board farm.
• Renesas will also contribute to the setup of the LAVA Master (control server) and LAVA Worker for QEMU.

• Integrate your next GENIVI collaboration into the GENIVI CIAT
  - Easier done from the start, than later of course
• Propose to us other integration opportunities with your existing testing infrastructure
  - Internal (externalise test result, what can be shared upstream?)
  - Related alliances
• Contribute LAVA Worker board farm
• Contribute GoCD agents to increase build capacity
• Contribute test cases or help with integration
Thank you!

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