

SOAFEE.NEXT CI/CD with CC:

Integration Lab to test Blueprint

CI/CD/CCに対するBlueprintテスト

SOAFEE Integration Lab

Gen Shimada

Country Manager, Linaro

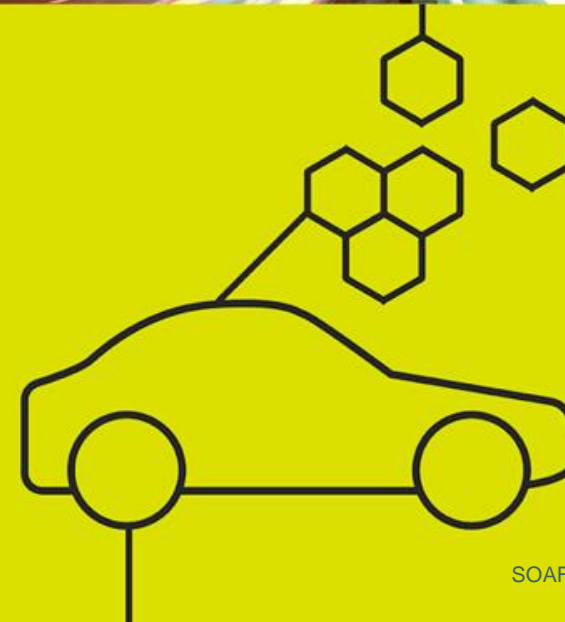
島田 源

Linaro

Gen.Shimada@linaro.org

May 15th 2025

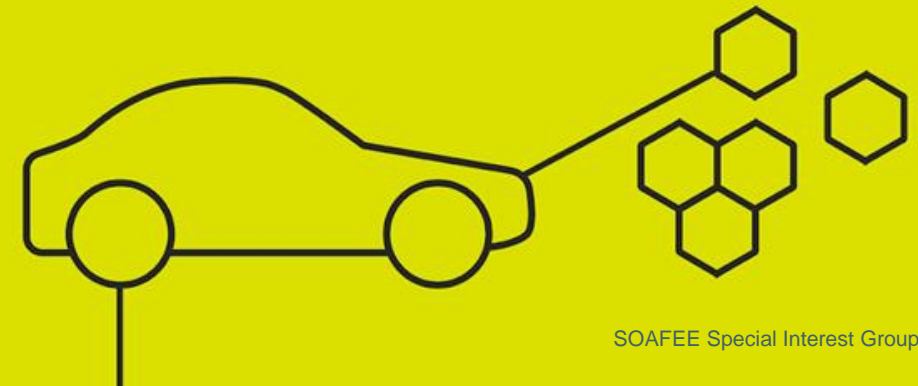
SOAFEE APAC Tokyo seminar



AGENDA

1. Who is Linaro

2. What is SOAFEE Integration Lab



Who am I?

Gen Shimada / 島田 源

For over 30 years, primarily worked on new businesses development, expanding multiple businesses from scratch.

Born/Residency:

- Tokyo and Silicon Valley

Technical area:

- Semiconductor (PC Graphics, LCD, Image Processing/MPEG, Storage, Wireless)
- Embedded (Java, etc.)

Business

- C-Cube Microsystems - Business Development (Silicon Valley)
- ATI (AMD) - Director, Consumer Electronics BU
- DiBcom - Country Manager
- Oracle - Senior Director, Java Embedded BU

Education:

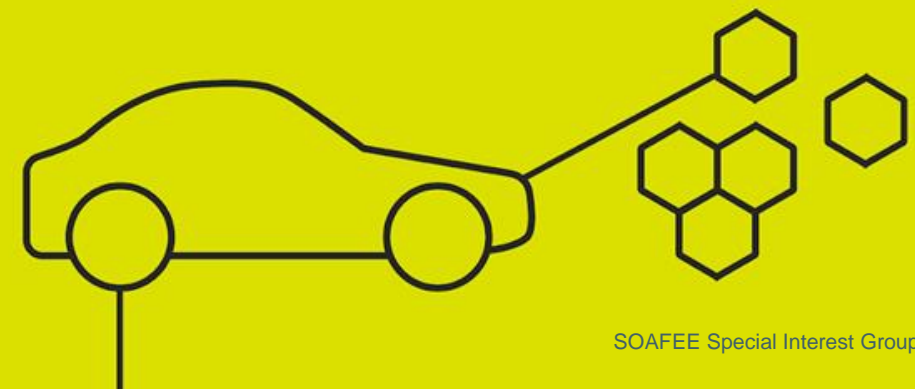
- University of California (computer engineering)
- Tokyo Institute of Technology (PhD)
- Waseda University Business School (MBA)

Hobbies:

- Music: 2ch pure Analog Audio (Marantz Amp + B&W Speakers), Jazz, Rock, Classic Vocal, Karaoke
- Sports: Gym, Zumba, Kickboxing, Baseball



Who is Linaro



Who is Linaro?

Found : 2010

HQ : Cambridge, UK

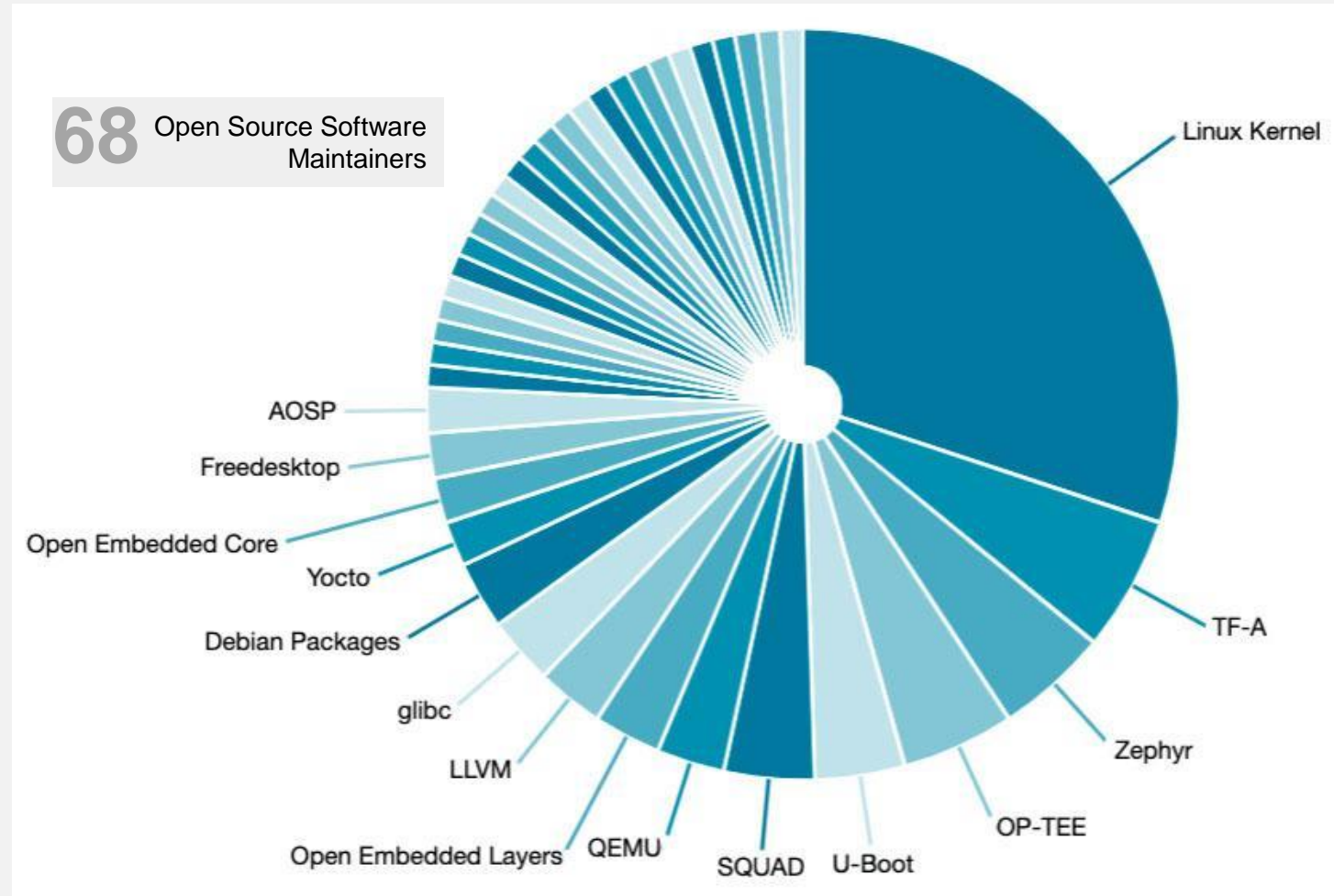
Employee : 200

Linaro has driven open source software development on Arm.

活動内容 : Linaroは企業やオープンソースコミュニティと協力して、Armベースのテクノロジー上でソフトウェアを開発してます。

エンジニアの多くは、Arm ソフトウェアエコシステムのオープンソースプロジェクトのメンテナーです。

これにより、オープンソースコミュニティと業界リーダーの間で必要な会話を推進し、問題を明らかにし、解決策を提案できる独自の立場にあります。



Many of our engineers are maintainers on open source projects in the Arm software ecosystem. This makes us uniquely positioned to drive the conversations needed between the open source community and industry leaders to identify opportunities, highlight problems and propose solutions.

Hi Quality

2010

Year Linaro formed to address fragmented code bases and consolidate & improve how OS is used

Patch submitted per Month

866

250

OSS Engineers worldwide

Always Top

3

Contribution to Linux kernel

1m

Test Linux kernel per week

4m

Android test per week

The active role we play in the Arm software ecosystem and the technical domain experts we employ also result in solutions being upstreamed quicker. Our automated testing capabilities and security expertise ensure products are more secure and of higher quality when they end up in the hands of end users.

Linuxへの貢献度：毎年常にTop 3内。

Linux Kernel：100万回のテスト/週（Androidは400万回/週）

毎月平均866個のパッチを実行。

Linaroの自動テスト機能とセキュリティの専門知識により製品がユーザーの手に渡る際の安全性と高品質が保証されます

Most active 6.3 employers

By changesets

Linaro	1752	12.1%
Intel	1416	9.8%
Red Hat	1013	7.0%
(Unknown)	957	6.6%
Google	840	5.8%
(None)	686	4.8%
AMD	601	4.2%
IBM	460	3.2%
NVIDIA	455	3.2%
Huawei Technologies	413	2.9%
Oracle	393	2.7%
Meta	363	2.5%
SUSE	320	2.2%
(Consultant)	300	2.1%
Pengutronix	265	1.8%
Renesas Electronics	224	1.6%
Qualcomm	210	1.5%
NXP Semiconductors	201	1.4%
Microchip Technology Inc.	166	1.2%
Linux Foundation	165	1.1%

By lines changed

Linaro	236941	24.2%
Qualcomm	80099	8.2%
(Unknown)	61511	6.3%
Intel	57448	5.9%
Linux Foundation	53935	5.5%
Red Hat	50334	5.1%
AMD	38130	3.9%
NVIDIA	35199	3.6%
Cisco	28249	2.9%
Google	24424	2.5%
IBM	21713	2.2%
Meta	21334	2.2%
(None)	18667	1.9%
Microchip Technology Inc.	17778	1.8%
MediaTek	17113	1.8%
Oracle	12501	1.3%
(Consultant)	11013	1.1%
Bootlin	8681	0.9%
SUSE	7865	0.8%
Renesas Electronics	6893	0.7%

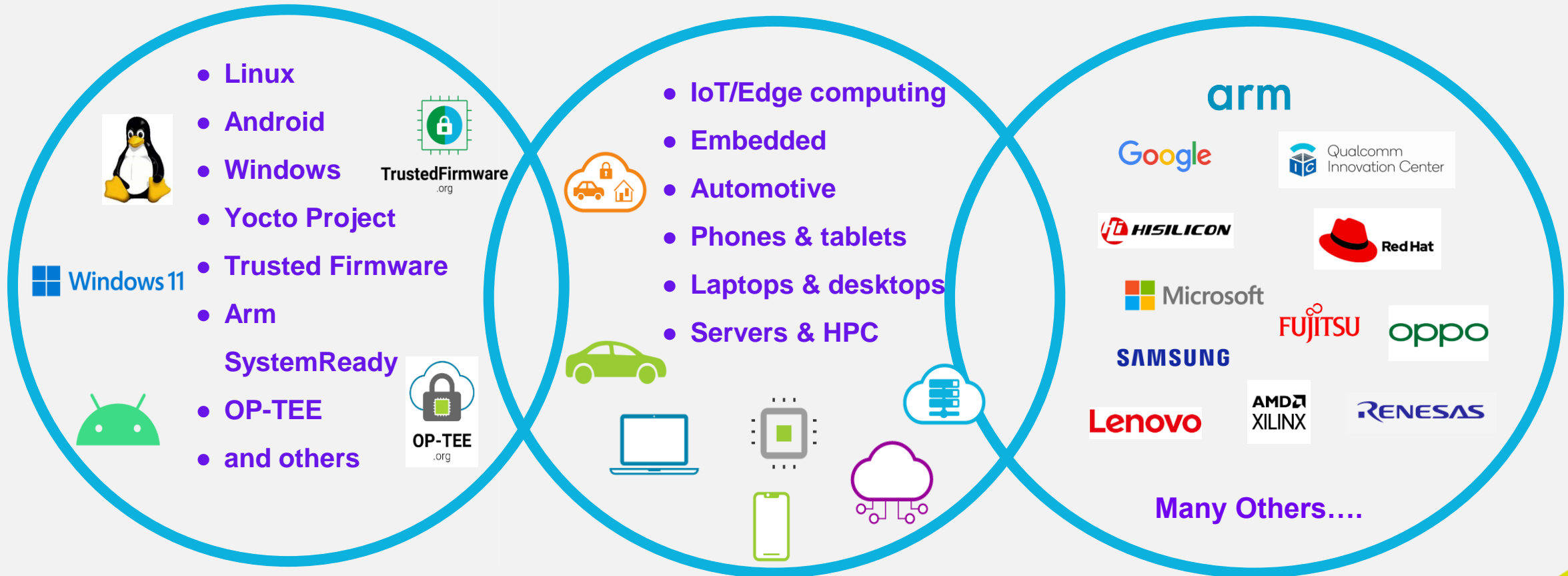
[LWN's development statistics from the 6.3 Kernel release](#) は、チェンジセットと変更されたラインの両方の点で、Linaroがリストのトップにあることを示しています。

Linaro Is Active Across All Major Platforms

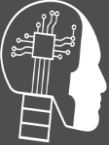




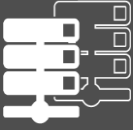
Platforms

Market

Customers includes



Technologies Linaro specialises in

 Artificial Intelligence	 Linux Kernel	 Security	 Testing & CI	 Toolchain	 Virtualization
<p><u>Machine Learning Inferencing</u> and AI to the Arm ecosystem.</p> <p>This involves <u>optimization</u> for Arm base hardware.</p>	<p><u>Upstream</u> and help facilitate of Linaro code into the Linux <u>mainline kernel</u>.</p> <p>Our goal is kernel consolidation - a single source tree with integrated support for multiple Arm based platforms.</p>	<p>Firmware Security solutions:</p> <ul style="list-style-type: none">*OP-TEE*SecureBoot*TrustedFirmware*CCA: Confidential Computing*Attestation	<p>Tools to detect build and functional-test <u>regressions</u> in Linux Android Zephyr, and other OS against a variety of emulated and hardware targets.</p>	<p>Working with <u>upstream</u> communities:</p> <ul style="list-style-type: none">*GCC*Glib*LLVM (Clang, Flang)*LLD, LLDB*QEMU*Binutils*GDB*Newlib*Valgrind*OpenOCD. <p>to improve and maintain.</p>	<p>*QEMU *Xen *VirtIO</p> <p>Linaro also drives Project Stratos to develop hypervisor agnostic Virtio interfaces and standards for Automotive and IoT.</p>

Recent hot Topics - examples

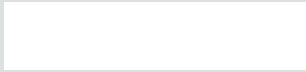
- Virtualization
 - virtio, QEMU, Hypervisor (Xen, etc.) Container (Docker, Kubernetes)
- SystemReady IR
 - Support to obtain certification
- Upstream
- Heterogeneous platform
 - Arm Cortex-A + Cortex-M/R (OpenAMP with HVAC / virtio-msg)
- OP-TEE
- CCA (Arm v9)
- TSN
- Performance Optimization
- Uboot
 - SecureBoot, MeasuredBoot, Quick Boot time
- SOAFEE Integration Lab

LinaroはSOAFEEに大きく貢献してます！

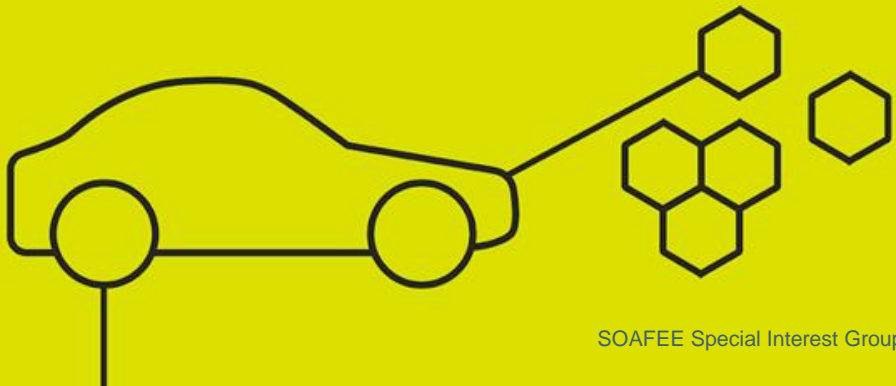
これらの分野で
受託開発のお手伝い

Linaro helps you

- アップストリーム
- 開発
- ビルド
- インプリ
- カスタマイズ
- 最適化
- 性能評価



What is SOAFEE Integration Lab



What is “SOAFEE Integration Lab”?

Why? - Background / Challenges:

- Various HW/SW diversity From multiple vendors
- Secure across diverse devices
- Software fragmentation
- Interoperability among various platforms
- Reuse of software on different hardware

**Reduce software fragmentation
adopting Standard Architectures**

Why ? - 背景と現状問題点 :

- 複数ベンダーからの様々なHW/SW
- 様々なデバイス間でセキュア
- ソフトウェア断片化
- 様々なプラットフォーム間での相互運用
- 異なるHW上でSW再利用

**標準アーキテクチャを採用し
ソフトウェアの断片化を削減**

What is “SOAFEE Integration Lab”?


Accelerate the transition from open source reference implementations to commercial solutions - safety certified where applicable - through full interoperability and compliance testing of any mix of open source and commercial components as SW licenses permit.

SOAFEE Integration LabはプラットフォームのSOAFEE準拠を保証する為の認証プログラムです。

また、あらゆるコンポーネントの組み合わせの相互運用性とコンプライアンス テスト(Test Suite)を通じ、リファレンス実装から商用への移行を加速します。

- Scale the pool of supported hardware and software platforms successfully passing the SOAFEE compliance test suite
- SOAFEE Test Suiteを通じて、サポートされるHWおよびSWを拡大していきます
 - Ensure SOAFEE compliance for EWAOL and non-EWAOL platforms
 - Test Xen and other hypervisors if present
 - SOAFEE Blueprints - E.g. Red Hat CentOS AutoSD, Digital Cockpit, OpenAD Kit
- Provide the needed CI to monitor and support
- 監視とサポートに必要なCIを提供します

<https://www.soafree.io/community/integration-lab>

 **SOAFEE**

AboutArchitectureInformationCalendar

SOAFEE integration lab at Linaro

The SOAFEE Reference Implementation WG develops and maintains a software reference implementation (EWAOL) that represents the SOAFEE architecture and ensure its compliance using the SOAFEE test suite which is run on several platforms in the SOAFEE Integration Lab. The lab also allows other SOAFEE software implementations to be validated against the specification and ensure their compliance.

In addition, the SOAFEE Integration lab validates SOAFEE compliant software implementations against SOAFEE blueprints to showcase the value of SOAFEE in future Software Defined Vehicle(SDV) architectures.

Daily test results

Build: 2023-09-19 Status: Finished

The results from the last daily run can be seen below. Click on the badge for detailed results. Builds can be downloaded from the links below.

Item	AVA	AVA (Xen)	QEMU - Arm64 (TRS)	RockPi4B	Synquacer
Build					
Boot					
Soafree test suite					

No results yet, tests are in progress:



Builds

- EWAOL - Arm 64bitewaol-baremetal-image-ava.rootfs.wic.bz2
- TRS - Arm 64bittrs-image-trs-qemuarm64.rootfs.wic.gz
- TRS - Arm 32bittrs-image-trs-qemuarm.rootfs.wic.gz

SOAFEE Test suites

- Tests used to verify software components interoperability and their adherence to the SOAFEE architecture standard.
- ソフトウェアの相互運用性と SOAFEE準拠を検証するために使用されるテスト。

<https://gitlab.com/soafee/soafee-test-suite>

List of tests/テスト項目

<https://gitlab.com/soafee/soafee-test-suite/-/tree/main/tests>

- Container engine integration
 - K3s integration tests
 - OpenAD kit integration tests
 - User accounts integration tests
 - Virtualization integration
- コンテナエンジン インテグレーション
 - Kubernetesインテグレーションテスト
 - OpenADKitインテグレーションテスト
 - ユーザーアカウント インテグレーションテスト
 - バーチャライゼーション インテグレーション

SOAFEE Test Suite

main soafee-test-suite Find file Code

container-test: Ping to localhost, no gateway Verified e023ffb0 History
Javier Tia authored 2 months ago

Name	Last commit	Last update
.gitlab/merge_request_templates	gitlab: Update merge request template	1 year ago
bin	soafee-test-suite-setup: ignore print fai...	3 months ago
docs	docs: Add SOAFEE Test Suite Test Plan ...	1 year ago
lib	Skip logging if empty BATS_TEST_NAME	1 year ago
tests	container-test: Ping to localhost, no gat...	2 months ago
.gitignore	Initial SOAFEE Test Suite documentation	1 year ago
.gitlab-ci.yml	Add SOAFEE Test Suite docs deployme...	1 year ago
LICENSE	Add missing Linaro copyright to LICENSE	2 years ago
Makefile	Makefile: add docs target	1 year ago
README.md	Amended the test suite to avoid compli...	1 year ago
soafee-test-suite	Make soafe-test-suite run without passi...	2 years ago
soafee-test-suite-setup	Rename to soafee-test-suite-setup	2 years ago

Project information
Tests used to verify components interoperability and adherence to the SOAFEE architecture standard.

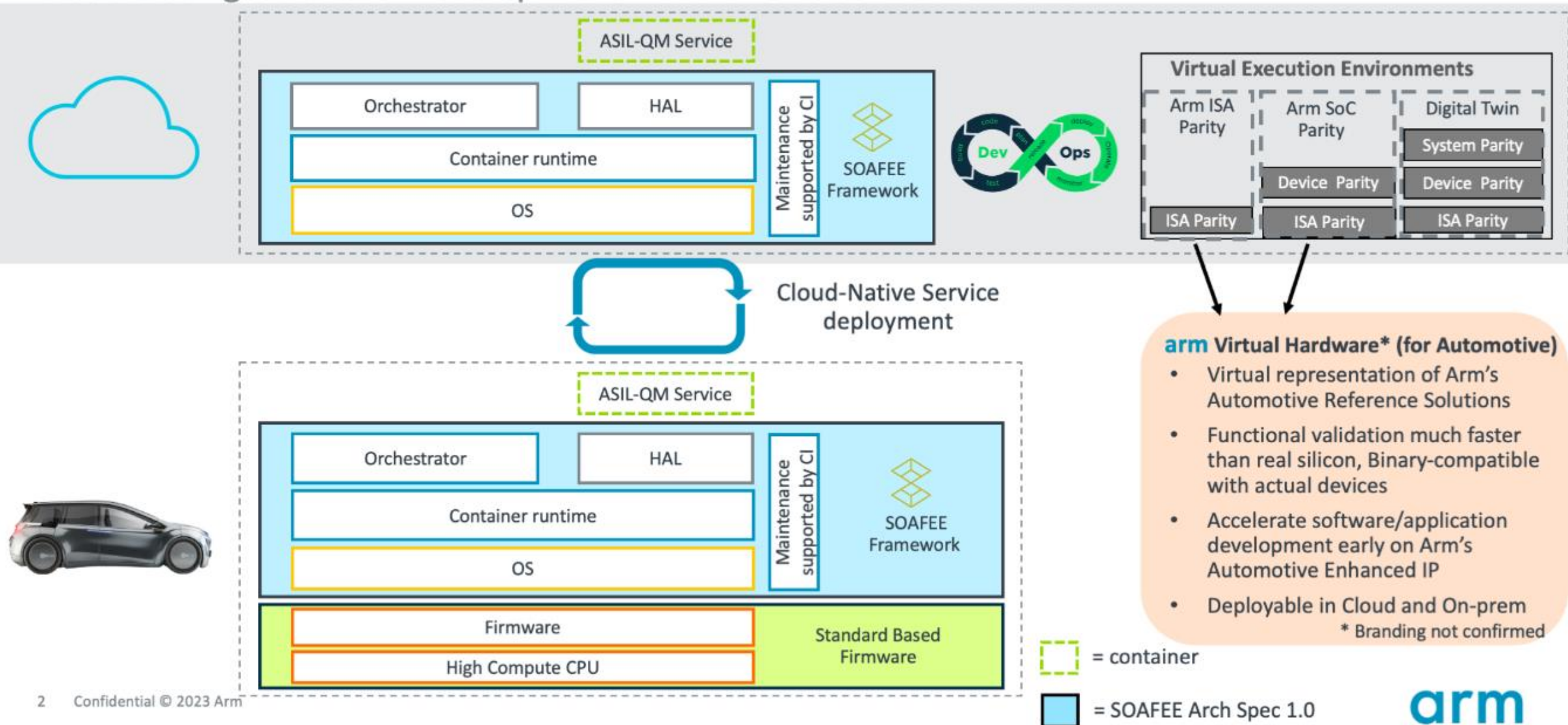
458 Commits
4 Branches
4 Tags

README
MIT License
GitLab Pages

Created on
November 07, 2022

Leveraging Arm's Virtual Hardware Initiative

Accelerating Software Development 'EARLY' to best work on Arm



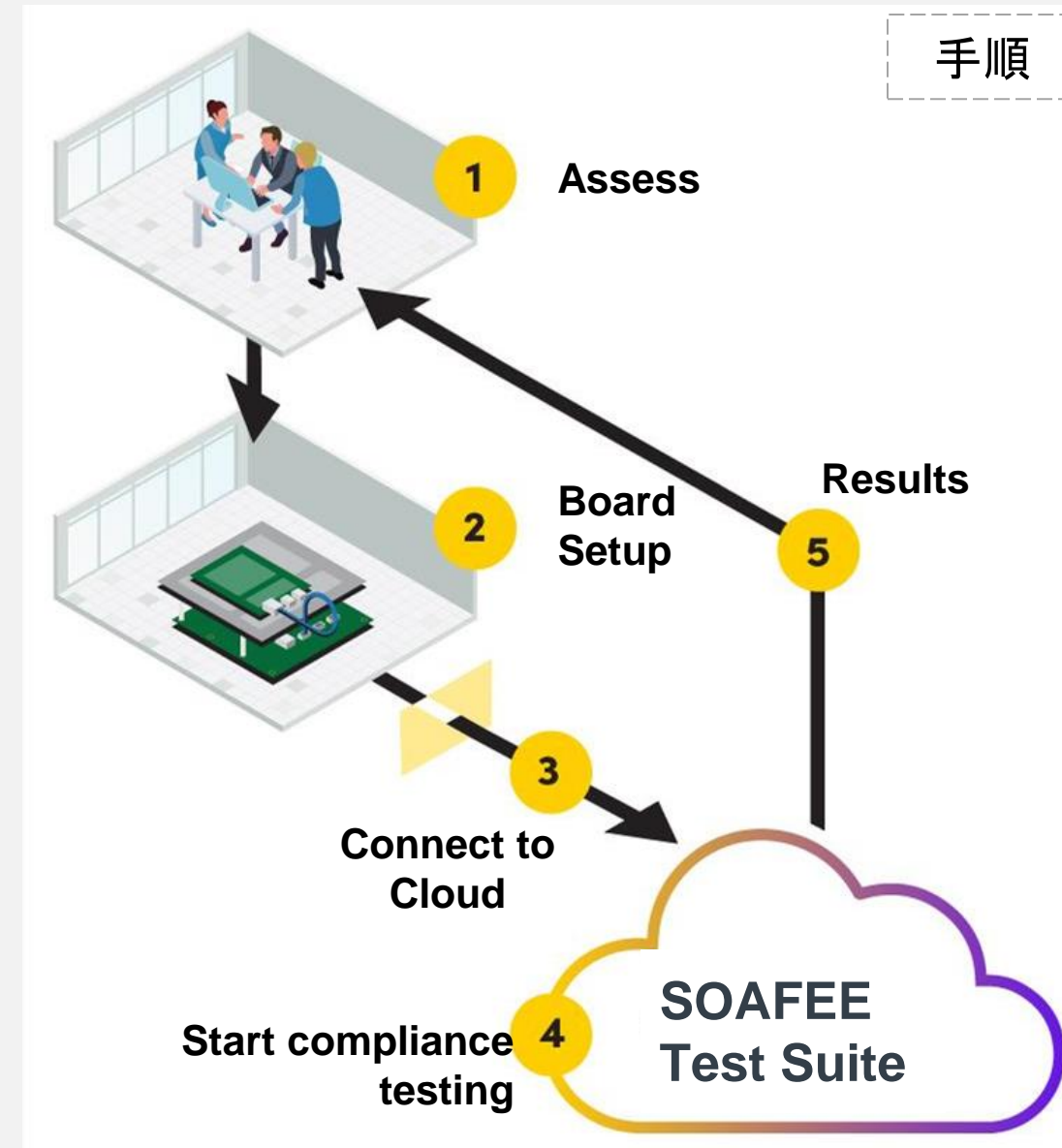
Process Flow

Initial Setup and Configuration

1. Access: Check Network environment
アクセス環境
2. Board Setup: Add DUT to LAA
セットアップ
3. Connect to Cloud: Upload configuration of DUT
Cloud接続

Running

4. Start compliance testing: - a few months
 - EWOAL image + customer SystemReady FW
対象イメージ
 - Update FW and OS
アップデート
5. Result: Monitor status / alert & Test log
結果モニター



LAA Board (Linaro Automated Appliance)

- The LAA board has I/O interfaces such as Ethernet, USB, UART, GPIO, and I2C.
- Each LAA board is assigned one IP address.
- Automates firmware and OS updates, and test execution on DUT

LAAボード : Ethernet、USB、UART、GPIO、I2Cなど

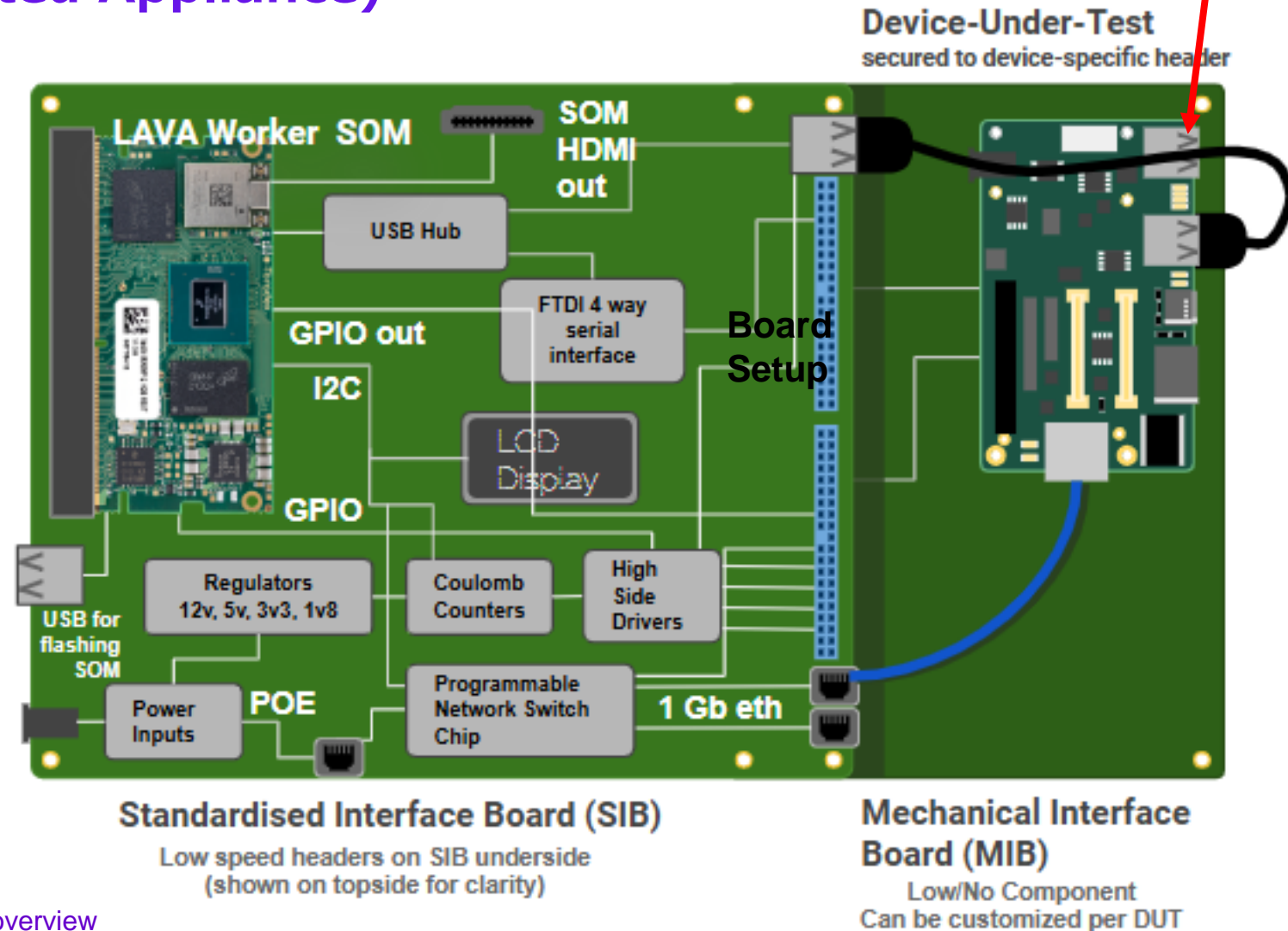
各LAAボードはIPアドレスをもってます

LAAボードをユーザーのラボにてDUTと接続→Cloudに接続

自動Firmware/OS アップデートとテストをCloud上で実行

LAA User's Guide:

https://linaro-linaro-automation-appliance-users-guide.readthedocs-hosted.com/en/latest/laa_overview.html#linaro-automation-appliance-overview



Nightly Build

- The test keeps running overnights.
- You can see the update of the test log.
- 夜通し連続してテスト継続
- 常にテストログ表示

blueprints » nightly » Build 2025-05-03 » 1 tests 1 pass

Summary Tests Metrics Metadata Test jobs 1

Metadata

build_url	r8a779f4-s4sk https://gillab.com/renesas-rcar/ci/-/jobs/9916528803
build_artifacts	r8a779f4-s4sk https://storage.tuxsuite.com/public/community/canh.lam/oebuilds/2wb1HONiuZjHdR4vfqjDa03fDD5/
build_log	r8a779f4-s4sk https://storage.tuxsuite.com/public/community/canh.lam/oebuilds/2wb1HONiuZjHdR4vfqjDa03fDD5//build.log

Test jobs progress 0 / 1 (0%)

see progress for each environment

Compare builds

Build version to compare:

Comparison type: ☒ compare by tests ☐ compare by metrics

Test results by suites ☒ failures only

Filter results ...

Collapse/expand all

Metrics

Filter metrics ...

blueprints » nightly » Builds					
Project Summary Builds Metrics Known Issues					
1 2 3 4 5 6 ... 35					
Compare builds <input type="radio"/> compare by metrics <input checked="" type="radio"/> compare by tests					
<input type="radio"/>	2025-04-28	1 test runs 1 completed	<input checked="" type="checkbox"/> 1 tests 1 pass	12 hours ago April 28, 2025	
<input type="radio"/>	2025-04-27	1 test runs 1 completed	<input checked="" type="checkbox"/> 1 tests 1 pass	1 day, 12 hours ago April 27, 2025	
<input type="radio"/>	2025-04-26	1 test runs 1 completed	<input checked="" type="checkbox"/> 1 tests 1 pass	2 days, 12 hours ago April 26, 2025	
<input type="radio"/>	2025-04-25	1 test runs 1 completed	<input checked="" type="checkbox"/> 1 tests 1 pass	3 days, 12 hours ago April 25, 2025	
<input type="radio"/>	2025-04-24	1 test runs 1 completed	<input checked="" type="checkbox"/> 1 tests 1 pass	4 days, 12 hours ago April 24, 2025	
<input type="radio"/>	2025-04-23	1 test runs 1 completed	<input checked="" type="checkbox"/> 1 tests 1 pass	5 days, 12 hours ago April 23, 2025	
<input type="radio"/>	2025-04-22	1 test runs 1 completed	<input checked="" type="checkbox"/> 1 tests 1 pass	6 days, 12 hours ago April 22, 2025	
<input type="radio"/>	2025-04-21	1 test runs 1 completed	<input checked="" type="checkbox"/> 1 tests 1 pass	1 week ago April 21, 2025	
<input type="radio"/>	2025-04-20	1 test runs 1 completed	<input checked="" type="checkbox"/> 1 tests 1 pass	1 week, 1 day ago April 20, 2025	
<input type="radio"/>	2025-04-19	1 test runs 1 completed	<input checked="" type="checkbox"/> 1 tests 1 pass	1 week, 2 days ago April 19, 2025	
<input type="radio"/>	2025-04-18	1 test runs 1 completed	<input checked="" type="checkbox"/> 1 tests 1 pass	1 week, 3 days ago April 18, 2025	
<input type="radio"/>	2025-04-17	1 test runs 1 completed	<input checked="" type="checkbox"/> 1 tests 1 pass	1 week, 4 days ago April 17, 2025	
<input type="radio"/>	2025-04-16	1 test runs 1 completed	<input checked="" type="checkbox"/> 1 tests 1 pass	1 week, 5 days ago	


<https://qa-reports.linaro.org/blueprints/nightly/builds/>

Details of one example build

- The result from the last daily run can be seen below on the SOAFEE Integration Lab site.
- And the details of each can be shown by clicking the item.
- And you can download the Builds.

その結果もこのようにSOAFEE Integration Labサイトに公開されます。
それぞれのアイテムのビルドもそこからダウンロードできます。

<https://www.soaftee.io/community/integration-lab>



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Build	<div><div>100.00%</div></div>	<div><div></div></div>	<div><div>100.00%</div></div>	<div><div>100.00%</div></div>	<div><div>100.00%</div></div>
Boot	<div><div>100.00%</div></div>	<div><div>100.00%</div></div>	<div><div>100.00%</div></div>	<div><div></div></div>	<div><div>100.00%</div></div>
Soaftee test suite	<div><div>100.00%</div></div>	<div><div>100.00%</div></div>	<div><div>100.00%</div></div>	<div><div></div></div>	<div><div>100.00%</div></div>

No results yet, tests are in progress:

Builds

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- TRS - Arm 64bittrs-image-trs-qemuarm64.rootfs.wic.gz
- TRS - Arm 64bittrs-image-trs-qemuarm64.rootfs.wic.gz

Item	AVA	AVA (Xen)	QEMU - Arm64 (TRS)	RockPi4B	Synquacer
Build	<div><div>100.00%</div></div>	<div><div></div></div>	<div><div>100.00%</div></div>	<div><div>100.00%</div></div>	<div><div>100.00%</div></div>
Boot	<div><div>100.00%</div></div>	<div><div>100.00%</div></div>	<div><div>100.00%</div></div>	<div><div></div></div>	<div><div>100.00%</div></div>
Soaftee test suite	<div><div>100.00%</div></div>	<div><div>100.00%</div></div>	<div><div>100.00%</div></div>	<div><div></div></div>	<div><div>100.00%</div></div>

Reference

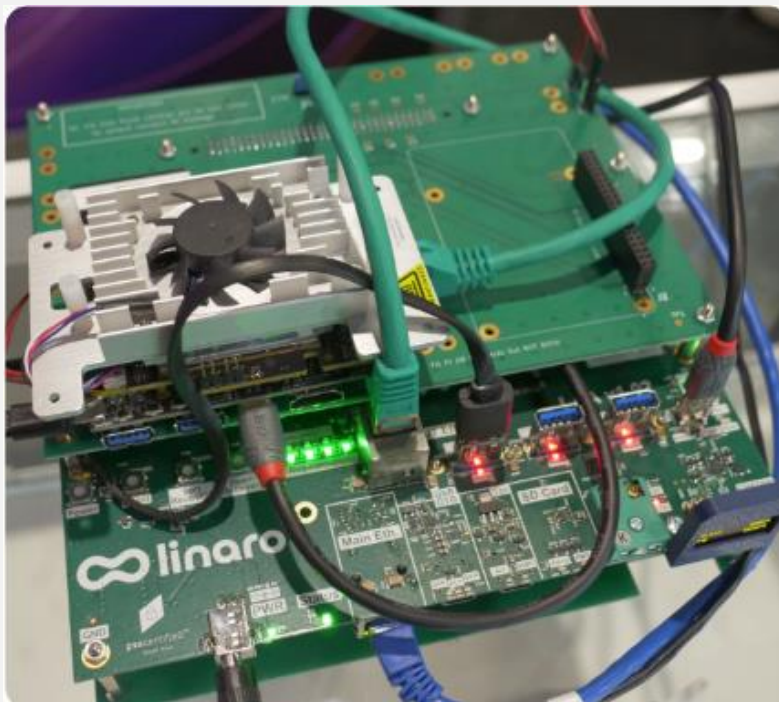
参考情報です

GitLab site for meta-ewaol

<https://gitlab.com/soafec/ewaol/meta-ewaol>

Picture of actual LAA board

LAAボードの実際の写真



GitLab interface showing the project page for **meta-ewaol** under the **SOAFEE / EWAOL** namespace.

Project information: Edge Workload Abstraction and Orchestration Layer (EWAOL) is a SOAFEE architecture reference implementation. It provides a standards-based framework for containers.

Commits:

Name	Last commit	Last update
classes-recipe	classes-recipe: Introduce ewaol-...	9 months ago
classes	Add bluechi	6 months ago
conf	Add bluechi	6 months ago
kas	Add bluechi	6 months ago
recipes-core/packagegroups	Add bluechi	6 months ago
recipes-tests/soafec-test-suite	Add soafec-test-suite recipe	3 weeks ago
tools	build.sh: fix typo	8 months ago
LICENSE.rst	Introduce LICENSE.rst	9 months ago
README.md	README.md: reference the Gene...	9 months ago

Project information details:

- 13 Commits
- 12 Branches
- 9 Tags
- 1 Release
- README
- feh License
- Created on: October 21, 2022

SOAFEE Integration Lab Deliverables

- EWAOL build CI targeting a generic SystemReady platform
- Provides **early detection of regressions** before they reach production
- SOAFEE test suite for the generic EWAOL image and customer SystemReady firmware
- Results available on the SOAFEE integration lab dashboard
- It can also be used as a promotional tool to appeal to your customers with its "high reliability."

成果

- 汎用 SystemReady プラットフォームをターゲットとしたEWAOLビルドのCIテストティング
- 量産前にリグレッションテストにより早期に問題検出します
- 汎用 EWAOL イメージと顧客の SystemReady ファームウェア用の SOAFEE テストスイート
- 結果は SOAFEE Integration Lab のダッシュボードにて公開・利用可能
- 皆さんのお客様に対しても「高信頼性」をアピールでき、促進ツールとして使える。

Join SOAFEE Integration Lab!

- Become a leading SOAFEE compliant maker
 - with Updated & Tested EWAOL and Firmware
- SOAFEE準拠のリーディングメーカーに
 - 常に最新でテストされたEWAOLとファームウェアで

Get involved and engage with us!

[Project Orko](#), [OP-TEE](#), [Linaro Trusted Substrate](#), [Linaro Linux Kernel Functional Testing](#), [Tux Suite](#)

懇親会で
名刺交換しましょう！
(お気軽にお声がけ下さい)

島田 源
Gen Shimada
Gen.Shimada@Linaro.Org

www.Linaro.org

Thank You



APPENDIX

SOAFEE Stack from Linaro

- **STRS:** Trusted Reference Stack

