



ARM SoCのOSS活動を共創する Linaroの活動紹介

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Linaro: トップ5のLinuxカーネル貢献企業



カーネル3.19から4.11において、Linaroは全体の4.7%の変更を行っています

The Linux kernel is one of the more than 70 open source projects that Linaro contributes to. Since 2013 and the release of Kernel 3.10, Linaro has been ranked number 3 of the named company contributors in 12 out of the 22 released kernel versions.

Linaro is member funded and delivers output to members, into open source projects, and into the community. Founded in 2010 with 6 members, Linaro now has over 30 with 140 staff and a total of over 300 OSS engineers distributed globally. With a track record of delivering high value collaboration, Linaro is consistently in the top five contributors to the Linux kernel and a major contributor to over 70 other open source projects, including many maintained by Linaro engineers.

	Company	4.11 Changesets	4.11 By percent
1	Intel	1,608	12.8%
2	Red Hat	955	7.6%
3	Linaro	624	5.0%
4	IBM	493	3.9%
5	SUSE	482	3.8%

Linuxにとどまらない活動領域



CentOS



ceph



devicetree
.org



EDGE X FOUNDRY™



LAVA
linaro.org/lava



OPEN
Compute Project



OpenJDK



OpenDataPlane
.org



openembedded



openstack™
CLOUD SOFTWARE



OPNFV



OP-TEE
.org



TensorFlow



yocto
PROJECT



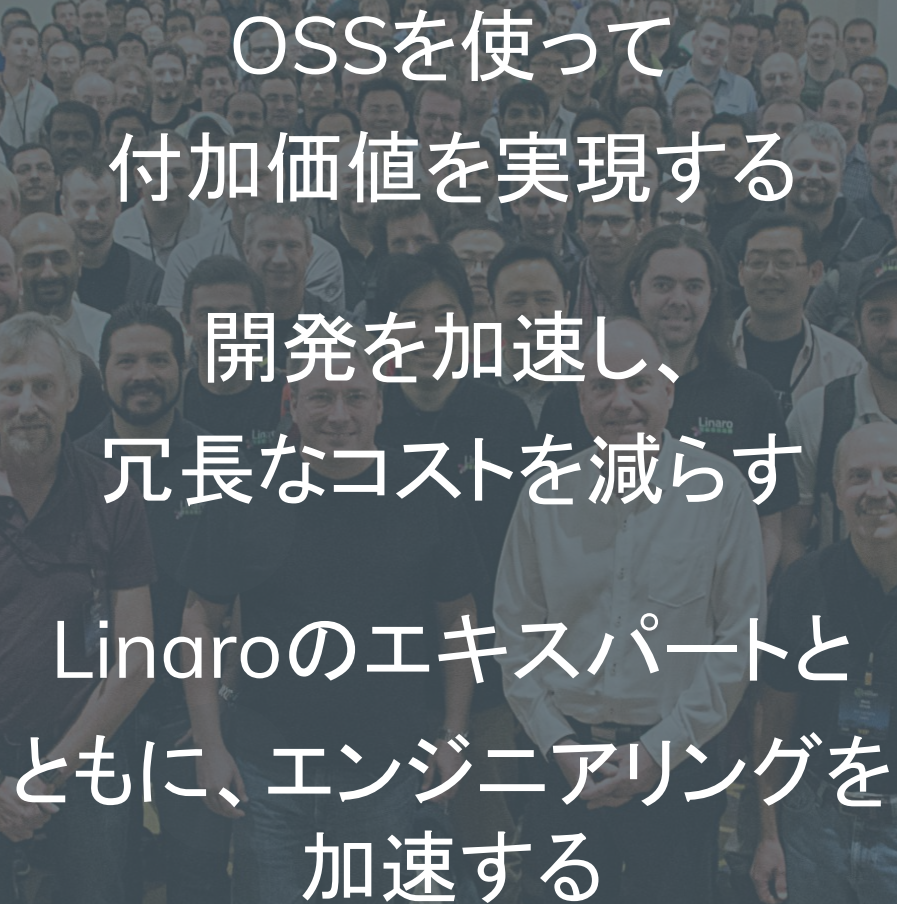
Zephyr™
Project

なぜLinaroが必要か

LinaroはArmエコシステムにおいて
コラボレーション開発をリード

Linaro helps you work with the latest open source technology, building support in upstream projects and ensuring smooth product roll outs and secure software updates. Instead of duplicating effort, competitors share development costs to accelerate innovation and time to market.

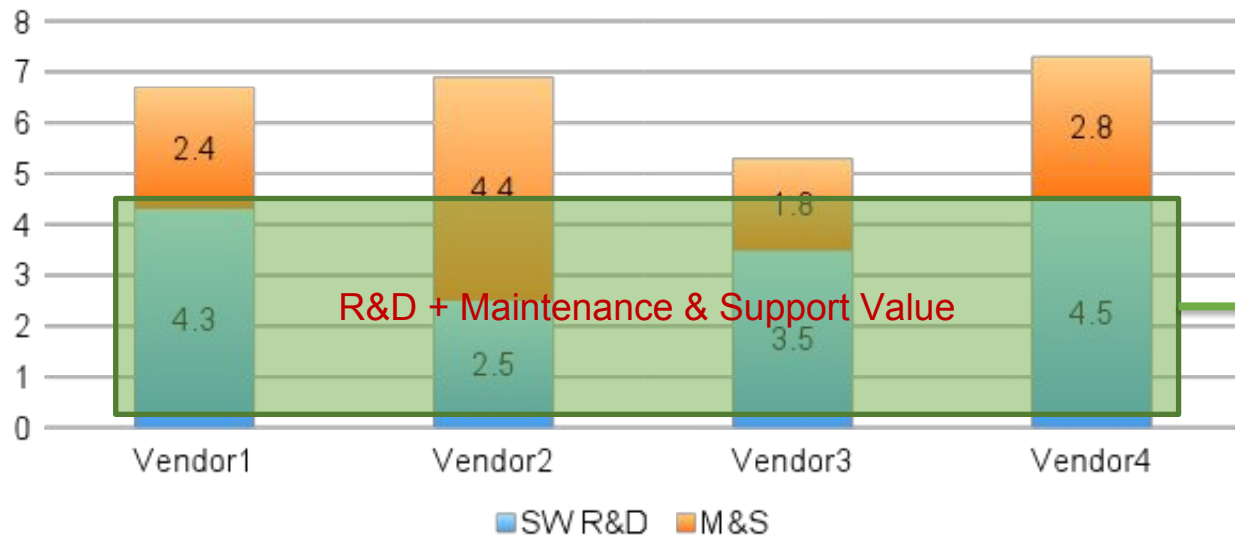
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A large group of Linaro engineers posing for a photo. The image is dark and serves as a background for the text on the right side of the slide.

OSSを使って
付加価値を実現する
開発を加速し、
冗長なコストを減らす
Linaroのエキスパートと
ともに、エンジニアリングを
加速する

Linaro = OSSによる共創の場

Collaboration = Win for All



arm



- Toolchains
- OS, Driver
- Security

CORE
level

CLUB
level

GROUP
level



96BOARDS

COMMUNITY

ARM

HISILICON

QUALCOMM
INNOVATION
CENTER, INC.
QulC

Google

socionext

SPREADTRUM

ST
life.augmented

TEXAS
INSTRUMENTS

ZTE

acer

Alibaba Group
阿里巴巴集团

CANONICAL

CAVIUM

CISCO

COMCAST

ENEA

ERICSSON

facebook

FUJITSU

Hewlett Packard
Enterprise

HXT 华芯通半导体

MEIZU

MEDIATEK
everyday genius

MontaVista

Mstar
semiconductor

NOKIA

NXP

QUALCOMM
QUALCOMM DATACENTER
TECHNOLOGIES, INC.

redhat

RDA

SAMSUNG

炬芯
Actions

ARCHERMIND

MTW

bpi

前海黑鲸
BLACK WHALE TECHNOLOGY

CANONICAL

FUJITSU

GLOBALSCALE

gumstix
dream, design, deliver

HOPERUN
Information Technology
潤和軟件

HUAQIN

LEMAKER

MEDIATEK
everyday genius

Mstar
semiconductor

NXP

Premier Farnell
element14

QUALCOMM
INNOVATION
CENTER, INC.
QulC

QWERTY
EMBEDDED DESIGN

ROHM
SEMICONDUCTOR

seeed

shapedmedia

socionext

SPREADTRUM

ST
life.augmented

TEXAS
INSTRUMENTS

TOCODING

ThunderSoft

威控博
eC Robotics

wrtnode

Xunlong

ZTE

IBM

THE
LINUX
FOUNDATION

Linaro Group Engineering



キーとなるセグメントでソフトウェアや
標準策定を共創します

LEG Enterprise

Software Defined Storage & Infrastructure (SDS/SDI), Big Data (Hadoop/Hive/Spark/Ambari), DPDK & SnabbSwitch, HPC, AI/ML, Developer Cloud



LITE IoT/Embedded

IoT client, Smart sensors, Embedded devices, Gateways



LNG Networking

Networking, OpenDataPlane (ODP), SmartNIC



LHG Digital Home

Secure media frameworks, TV, STB/Cable boxes, media devices



LMG Mobile

Mobile phone, Tablet/Clam, Android optimization



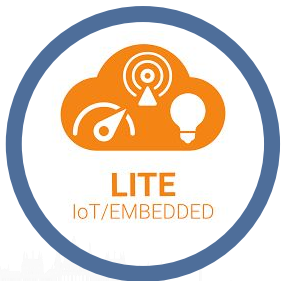
最近のハイライト - a few of many



17.08 ERP



Linaro
Downloads
linaro.org/downloads





Linaro Enterprise Groupの 活動



エンタープライズArmにおけるイノベーション

Upstream貢献

- Linaro is consistently a top 5 company contributor to the Linux kernel
- Linaro contributes to over 50 other open source projects, many to build the ERP

ビルドサービス

- Linaro builder and repo for RPK, Firmware, Cloud and Big Data

ベアメタル及びクラウド

- Build and QA/CI LAB (established in Cambridge)
 - User and API driven
 - Full control of servers by developers and engineers

テストスイート

- Linaro Enterprise test suite
 - <https://git.linaro.org/qa/erp-test-automation.git/>
 - Automated CI based on member, partner and upstream project requirements

Enterprise Reference Platform (ERP)

- ファームウェアからアプリまで一貫してOSSで実装され、ドキュメント化された、データセンタ向けのArmサーバ
 - 標準参照実装となる
 - 市場への展開時間を減らし開発コストを減らせる
- OSSのセキュアファームウェア、カーネル、Distro、及びデータセンタ向けのOSSプロジェクトを含む
- Linaroメンバのハードウェア上でテストされ、Linaro Developer Cloudの基本OSとなっている



DeveloperCloud
www.linaro.cloud

ERPのビルディングブロック

Tools & Libraries



OpenJDK



RPK

linux-next及びメンバのハードウェアサポートを元にした単一の共通カーネル



オープンソースのワークロード

オープンソースのコンポーネント

ユーザ空間

Reference Platform Kernel

UEFI

Datacenter Workloads



Apache Ambari



ceph



hadoop



APACHE Spark™



openstack™
CLOUD SOFTWARE



openHPC

Userspace Community Distros



CentOS

Tianocore





Linaro Developer Cloud

データセンタへのArmサーバのデプロイを加速: www.linaro.cloud

OSS開発者及び商用ISVが
Armサーバ上で
クラウドソフトウェアを
評価出来るようにします。



Linaroメンバから提供された
最新のArmv8サーバで構成
中国・US・ヨーロッパに60台以
上のサーバを展開
→2017年度中に拡大予定



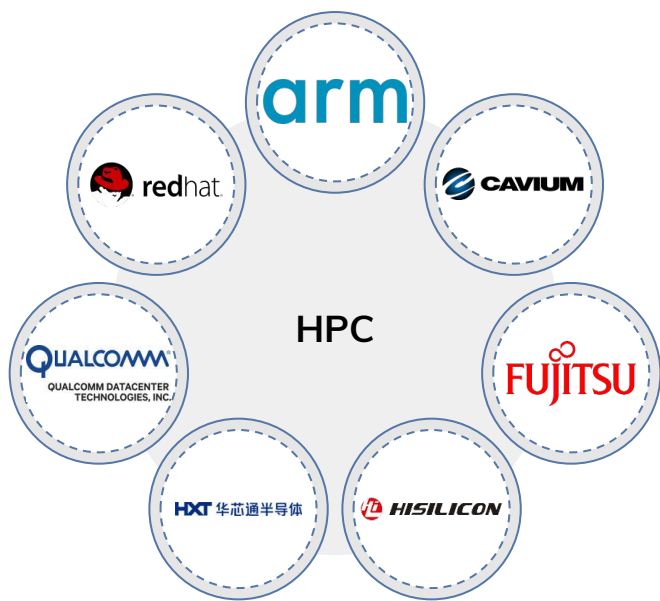
Linaro Enterprise Reference
Platformを使い、Openstack,
OpenJDK, Hadoop, Spark
etc. on Armを提供



HPC Special Interest Group (HPC-SIG)



スパコン向けOSSプロジェクトを対象とした共同プロジェクト



エンタープライズクラスのHPCオープンソース開発をArm上で推進

Identify and adopt standards to make HPC deployment on Arm a commercial imperative. Develop real-world use cases that reap the benefits of Arm while ensuring interoperability, modularization, orchestration



Armを使う上での、デプロイ及び管理の障壁をなくす

Leverage the Linaro Developer Cloud and other services to develop cost-effective Cloud-based HPC development frameworks and generate reference implementations to accelerate



Arm上でのビッグデータ処理の最適化を推進

Machine learning and Deep learning are both critical to the future of HPC, specifically as the path toward exascale computing. Driving engineering in HPDA and Machine learning algorithms will aid the success of organizations to fully capitalize on these technologies



グループはLinaroメンバとアドバイザーで構成

Members determine work to be completed by engineering resources while the advisory board provides subject matter expertise on HPC requirements and guidance on the ongoing HPC SIG strategic direction and roadmap





96Boards



96Boardsオープンプラットフォーム規格

全ての開発者へ最新のArmSoC/マイコンを。



IoT, コンシューマ/モバイル, デジタルホーム, ネットワーク/サーバ

96Boards specifications define development platforms specific to each segment, with shared expansion headers to enable maximum compatibility of aftermarket add-on mezzanine boards, perfect for prototyping, digital signage, robotics, makers, AI/VR developers and many more use cases



標準拡張I/Oとワイヤレスの接続環境を提供

The specifications define a minimum set of required functions to ensure the smooth introduction of new hardware and software features - these are platforms using the latest SoC/MCUs for future product development



全レイヤのソフトウェアとディストリビューションサポートが可能

AOSP, Open Embedded, Debian, CentOS with required drivers available through the 96Boards website - some as Linaro supplied builds, others offered by the silicon vendors or operating system providers including Red Hat, Canonical and SUSE



\$10-\$400の様々な価格帯で、全世界に提供

The latest Arm SoCs are traditionally only available in expensive finished products - mobile phones, laptops or fully fledged servers. 96Boards provides the core technology in a cost-effective platform designed for developers

最近のボード例

Consumer Edition



HiKey 960

4x Cortex-A73
4x Cortex-A53
Mali-G71 MP8
3GB LPDDR4 RAM
32GB UFS 2.0 flash
USB 3.0, HDMI, mini-PCIe,
WiFi, BT

IoT Edition



Orange Pi i96

RDA Cortex-A5
256MB RAM
512MB Flash
WiFi, BT
CSI Camera
\$9



Uranus

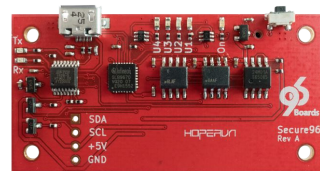
TI CC3220 M4
256KB RAM
1MB Flash
WiFi

メザニンカード



NeonKey

STM Cortex-M4
128KB SRAM
512KB Flash
SensorHub & LEDs

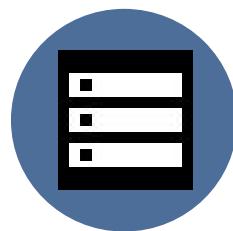


Secure96

1Mbit Flash
Crypto ECC/SHA
TCG 2.0 TPM

詳細はwww.96boards.orgへ

開発者向けArmプラットフォーム



Foundation
Base
System Guidance



DeveloperCloud
www.linaro.cloud



GIGABYTE™
socionext™



24x A53 1GHz cores @ 5W
LPDDR4, PCIe G2
microATX 96Boards EE
Upstream software support

その他のLinaroの活動

- Linaro Developer Service
- Linaro Connect

Linaro Developer Services

Expert software engineers to build your products on Arm



Developer Services

Efficiently support the latest technology features upstream

Reduce burden of post-release software updates and support

Available to both Linaro Member and non-Member companies



Boot architecture & kernels

We can help you with your boot architecture, kernel configuration optimization and support.



Upstreaming services

Helping companies upstream their code reducing their cost and effort to maintain their product



BSPs & board bring-up

Create, maintain and optimize board support package. Help with initial board bring up.



Power management

Helped major companies implement and optimize power management in their products



Long-term support builds

Provide long term custom kernel and build support. Backport key patches and maintain builds



Landing teams

Landing Teams are Linaro's unique services approach to help build your team expertise.



Security

Deep hands-on expertise with Arm security and Trusted Execution Environments (TEE)



Developer training

Linaro has a wide range of hands-on developer training in key Arm and open source areas



Other services

Linaro has helped many companies with a wide range of unique services.

Linaro Connect



Face-to-face Engineering Discussion and Collaboration

500人以上の開発者

Linaro Connect is all about engineering - about 500 engineers from 60-80 companies get together for a week to discuss the latest challenges and work together on the solutions. Mornings are filled with sessions, with the engineering collaboration happening in the afternoons

5日間で100セッション以上

A keynote starts each day, which then splits into four tracks. Segment sessions are held on theme days, with other sessions arranged to encourage as much cross-pollination between different groups as possible. Afternoon engineering work is split into focused group rooms.

つながりを作る1週間

In addition to keynotes, sessions and engineering collaboration, Linaro Connect provides ample opportunities to network and meet engineers from Linaro and other companies. Steering committees also meet - the technical architects and strategists can work with all levels of engineer.



Linaro エコシステムに参加しよう

Open to OEMs/ODMs/Service Providers/Universities

Participate and provide input to Linaro

Email: victor.duan@linaro.org

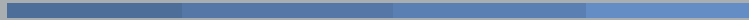


Engage with the leaders of the Arm ecosystem !

Visit www.linaro.org for more information



Questions?



Thank you,

