



Growing Open Source Culture Inside Sony

Kazumi Sato, Hiroyuki Fukuchi
/ Sony Group Corporation

#ossummit #lfc #ospocon

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About Speakers

- **Kazumi SATO**

- Distinguished Engineer, Sony Group Corporation
- He works on Linux-based system software for various Sony products. He also works on OSS compliance and relationship with communities in Sony.
- Since 2002, when Sony started to use Linux, he has been leading system software development using Linux and introducing it to the products, complying with the OSS licenses.
- He is a member of the Software Strategy Committee at Sony.



- **Hiroyuki FUKUCHI**

- Senior Alliance Manager, Sony Group Corporation
- He works on OSS compliance and relationship with OSS communities.
- He is the leader of the planning subgroup of the OpenChain Japan workgroup.
- He is an English-Japanese translation volunteer for OSS community related documents, such as OpenChain and SPDX specification.



Agenda

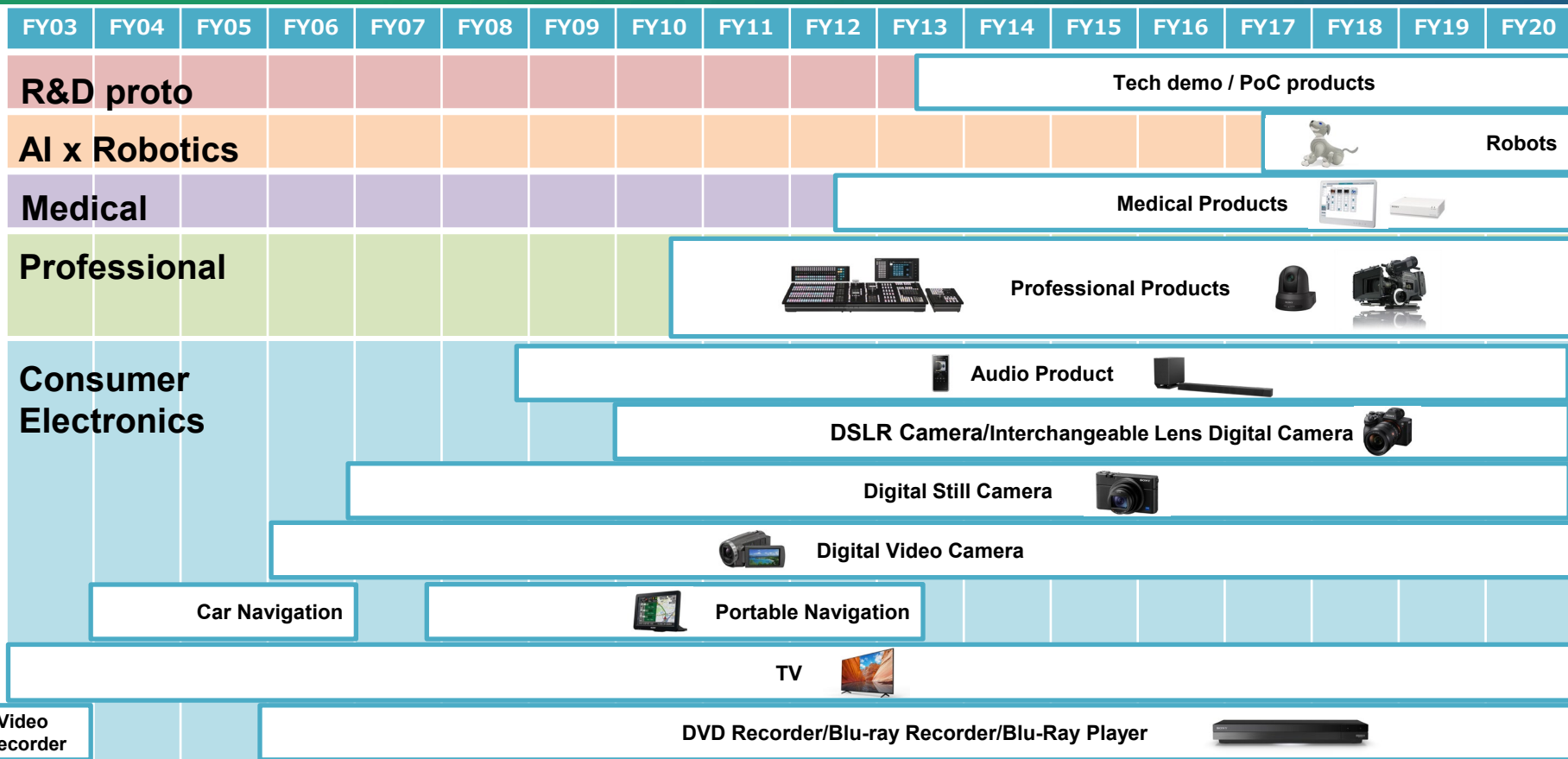
- Embedded Linux Products
- Challenges
- Development of Open Source Program
- OSPO and Internal Community
- Community Support
- Conclusion



Embedded Linux Products



Embedded Linux products history of Sony



Challenges



Challenges

- Technology
 - Introduction of Linux to embedded products
- OSS license compliance
 - Embedded Linux products
- Culture
 - Growing an internal community and open source culture



Development of Open Source Program

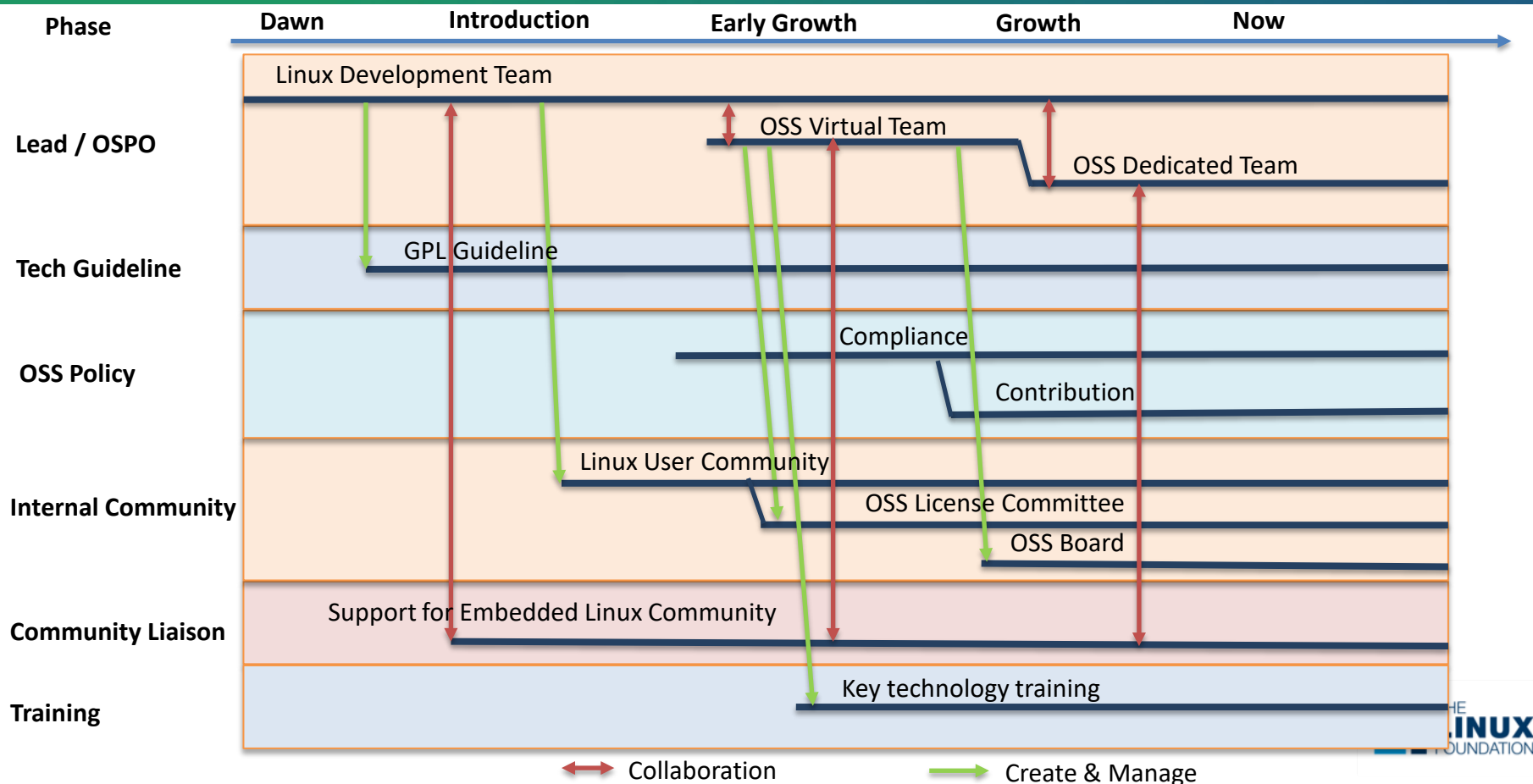


Open Source Program

- Lead (OSPO)
- Policy
- Internal Community
- Community Liaison
- Training



Development of Open Source Program

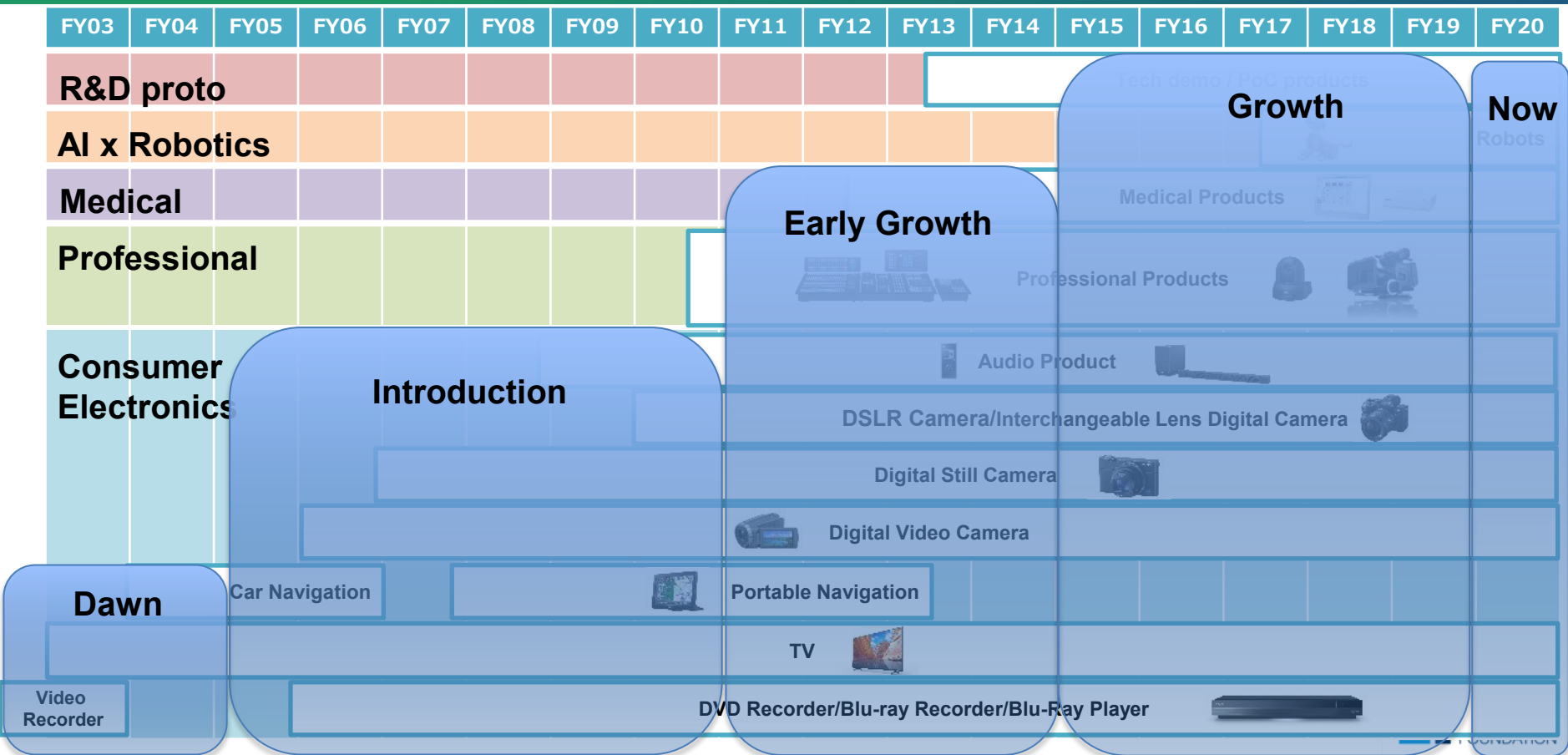


Background

- Latest technology through embedded Linux
- Support for various architecture processors (x86, ARM, MIPS)
- Use case of unexpected power down
- Small memory & small storage
- Long term support (10 years)

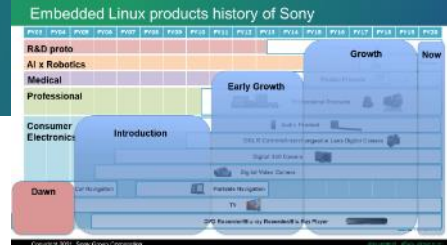


Embedded Linux products history of Sony



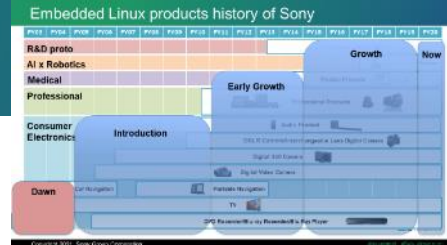
Dawn Phase #1 Learned from early failure

- Commercial Embedded Linux Distribution
 - TV, Video recorder
 - Learned: Necessity of deep knowledge of Linux
- CE Linux Forum
 - Building an embedded Linux group
 - Failed because of misunderstanding as a trade group
 - Learned: Necessity of following the ways of open source



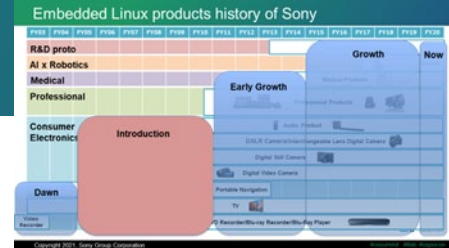
Dawn Phase #2 prepared for the next phase

- GPL guideline
 - Internal technical document
 - Best practices of GPL usage from engineering perspective
 - Written by Linux development team
 - Reviewed by Legal & IP department
- EULA for products
 - Careful consideration of OSS licenses
 - (EULA: End User License Agreement)
- Source Code Distribution sites
 - <https://oss.sony.net/>



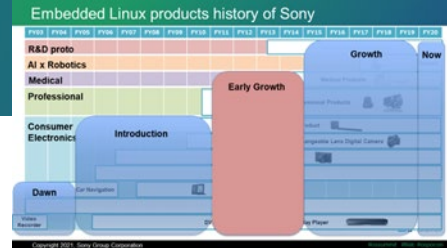
Introduction Phase (2005-)

- **Environment:**
 - Internal Linux Distribution
 - #1 TV, Video recorder
 - #2 Digital Camera, Digital Camcorder
- **Lead:**
 - Linux development team
- **Policy:**
 - Technical guideline (GPL guideline)
- **Internal community:**
 - Linux user community
- **Community Relationship**
 - Community Liaison
 - Changed the activity of CE Linux Forum to adopt open source way
 - Hired community expert engineers
 - Contributed through community expert engineers



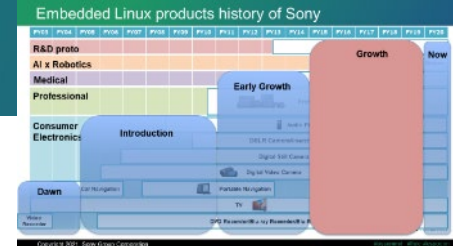
Early Growth Phase (2011-)

- Environment:
 - **OSS expanded over all electronics categories**
- Lead:
 - **Virtual OSS team & Linux development team**
- Policy:
 - **OSS Policy as an official tech manual**
 - **Focused on OSS license compliance**
- Internal Community:
 - **OSS license committee**
 - **Focused on OSS license compliance**
 - **Virtual group**
 - **Cooperation with Legal and IP Department**
- Community Relationship
 - **Community Liaison**
- Training
 - **Key technology training (1 day course)**



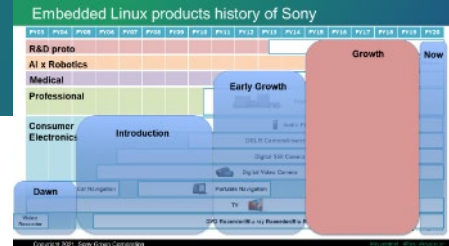
Growth Phase (2015-) #1

- Environment:
 - Continue to grow OSS usage in many products/services
- Lead:
 - Dedicated OSS team(OSPO) & Linux development team
 - Management(Software Strategy Committee) recognized OSS promotion
- Policy:
 - Updated for OSS contribution and disclosure
 - Approval process for disclosure as OSS
 - Prepared GitHub site: <http://github.com/sony>



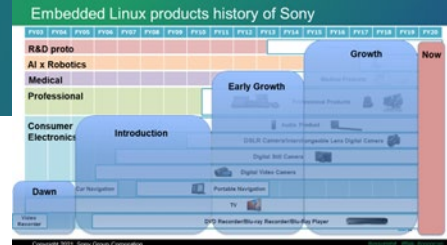
Growth Phase (2015-) #2

- Internal Community:
 - OSS license committee
 - **OSS board for contribution**
- Community relationship
 - Community Liaison
 - **Each engineer started contributing code and participating in OSS communities**
 - **OSS community support**
- Training:
 - Key technology training
 - **Added e-learning**



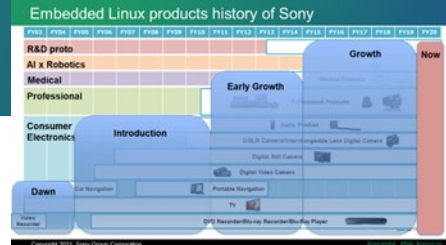
Now (2020-) #1

- Environment:
 - Expanding from electronics to other sectors
 - Game, Film
 - OSS community participation
 - Each engineer participates in OSS communities
 - Disclosure of software as OSS via GitHub site
- Lead:
 - Dedicated OSS team & Linux development team
- Policy:
 - Updated to accelerate contribution



Now (2020-) #2

- Internal Community:
 - **Global networking of internal community**
 - OSS license committee
 - OSS board
- Community Relationship
 - Community Liaison
 - Each engineer contributes code and participate in OSS communities
 - OSS community support
- Training:
 - **Global OSS training**
 - **Creating a new e-learning library for remote workers**



History of OSS Policy

Phase	Dawn (2002-)	Introduction (2005-)	Early Growth (2011-)	Growth (2015-)	Now (2020-)
Name	GPL Guideline	GPL Guideline	OSS technical manual	OSS technical manual (revised)	OSS technical manual (revised)
Category	Technical guideline	Technical guideline	OSS policy (Official)	OSS policy (Official)	OSS policy (Official)
Scope	Usage	Usage	Usage	Usage Contribution Publishing as OSS	Usage Contribution Publishing as OSS
Lead	Linux development team	Linux development team	OSS license committee	OSS license committee	OSS license committee
Background	Preparing OSS activity		Making official policy	Expanding contribution and publishing	Accelerating contribution



OSPO and Internal Community



OSPO and Internal communities

- OSPO
 - Dedicated OSS team
 - Collaboration with Linux development team
- Linux Development team
 - Internal distro
 - Advice for technology and OSS licenses
- OSS License Committee
 - Advice for OSS usage
 - Technical manual (OSS Policy)
 - Member Legal, IP department, R&D, Representative of Business
- OSS board
 - Advice for OSS contribution
 - Member IP department, Legal, Repository maintainer, R&D, community experts
- Global networking of internal communities
 - Japan, China, India, US, EU
- Linux User Community
 - User community of internal distro
- Other OSS communities



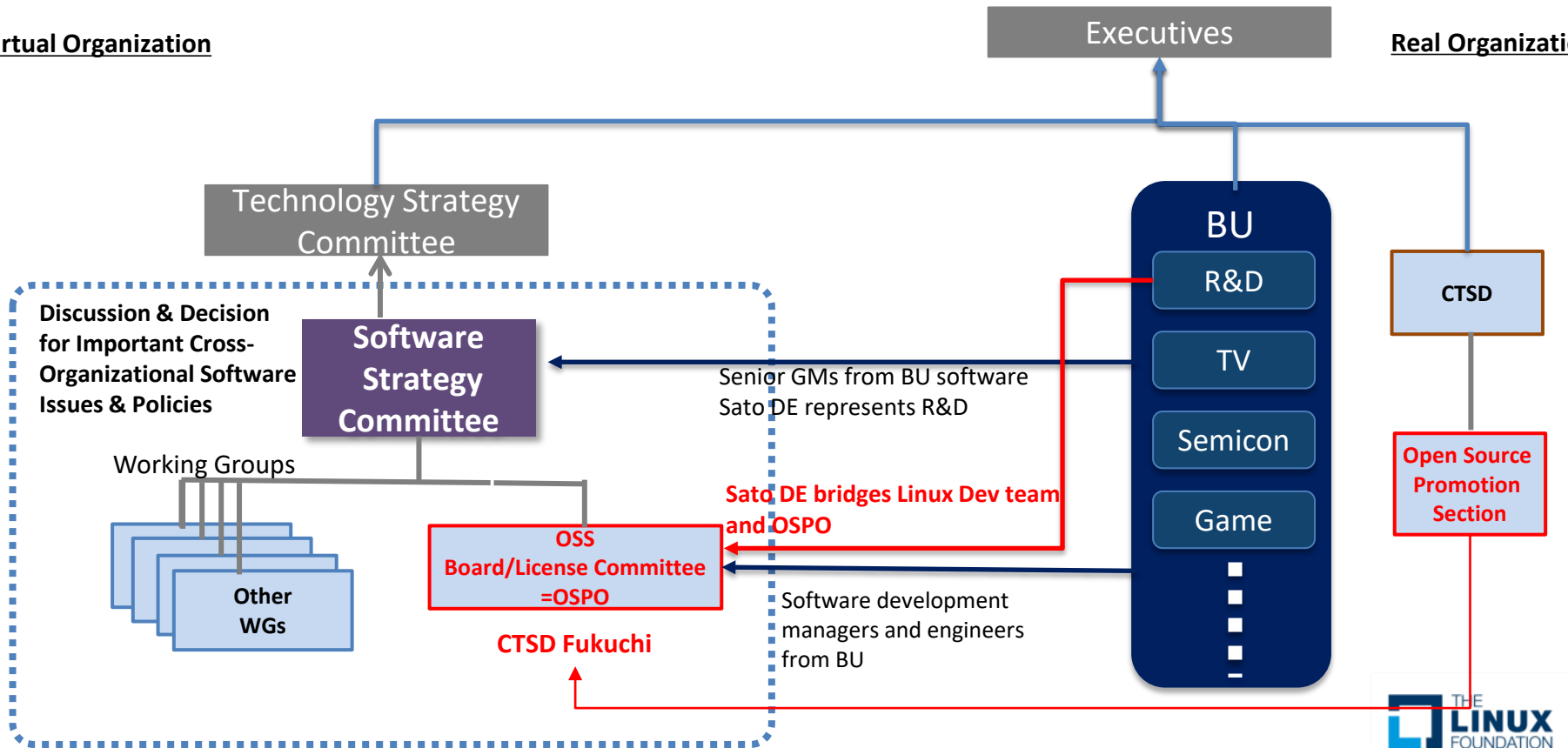
“Software Strategy Committee”

Real organizations are virtually integrated by working groups under Software Strategy committee.

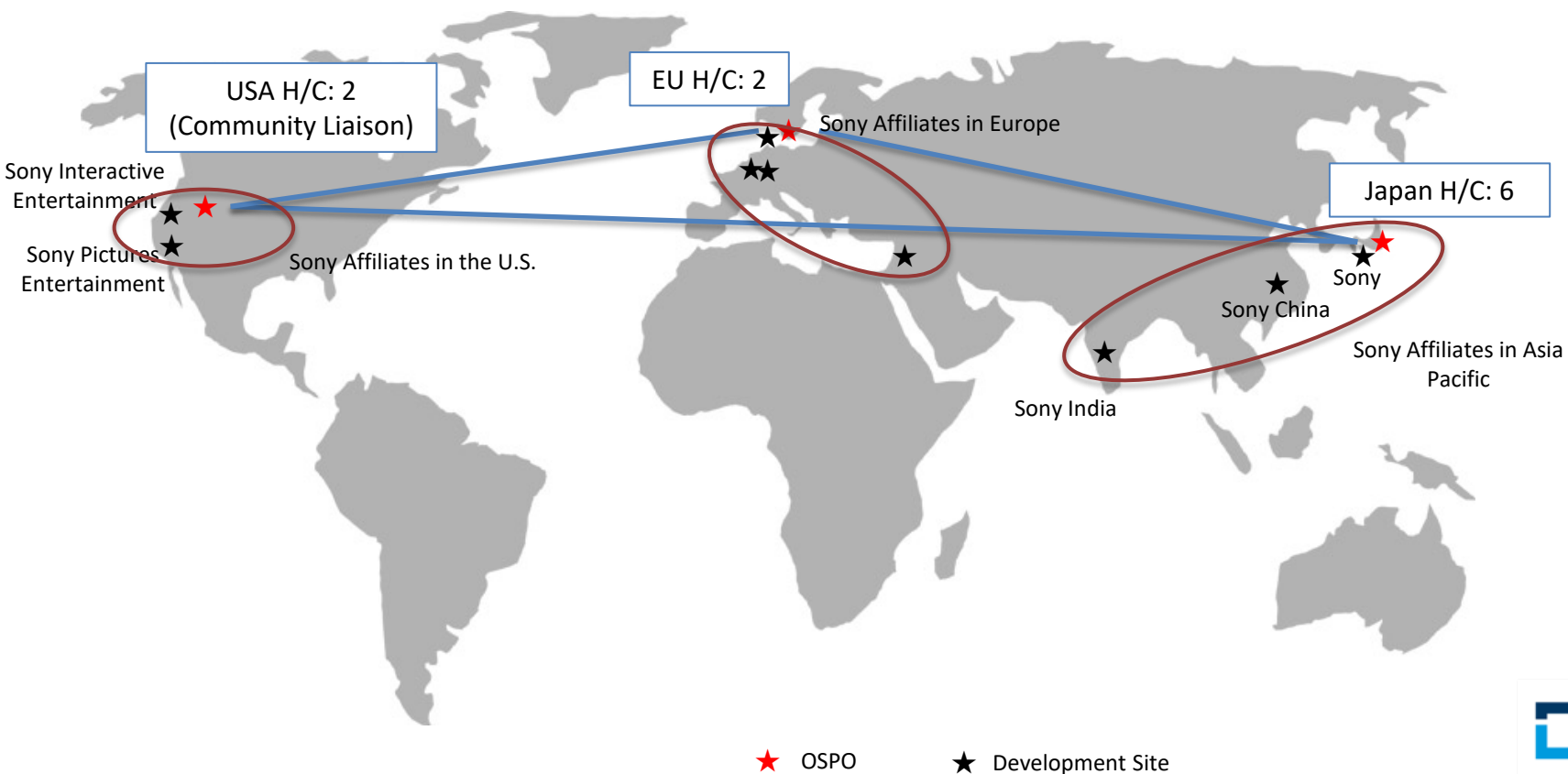
Ver. 2017/06/01

Virtual Organization

Real Organization



OSPO Network



Technical Guideline

- GPL guideline
 - Sprits of OSS
 - Respect for OSS communities
 - Sharing best practices of the Linux kernel
 - Dynamic/Static Linking
 - License Text
 - Disclosure of the Source Code
 - Contribution to OSS communities



- Official Technical Manual for OSS
 - OSS Policy
 - Promoting OSS usage and contribution(strategic use)
 - Guideline for OSS usage
 - Process for Product Development
 - Procurement & OEM/ODM
 - Guideline for Contribution
 - Process for an internal approval
 - Contribution (Submission)
 - Publishing software as OSS
 - Presentation at Event

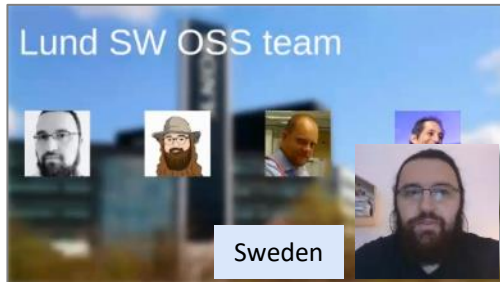
Training

- Key Technology Training Course
 - Open Source Software (Japanese)
 - Japanese/English slide
 - e-Learning version is being prepared for remote workers
 - OSS community #1
 - community basics (English)
 - OSS community #2
 - git training (English)
- e-Learning
 - OSS basics (Japanese)
- New Employees Training
 - OSS basics (Japanese)



Internal Events: Open Source Day & Webinar

Lund SW OSS team



Sweden

WebKit on PlayStation



- First introduced during PS3 era
- Primary use cases:
 - PlayStation Network applications (e.g. store, social features, account mgmt)
 - In-game web browser dialogs
 - Internet Browser app

USA

STEF 2020 Webinar

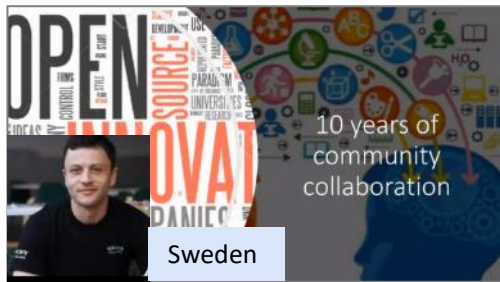
Introduction of OSS Board and OSSL Committee

CTSD Group 3
Open Source Promotion Section
Mitsuhiko Kubota

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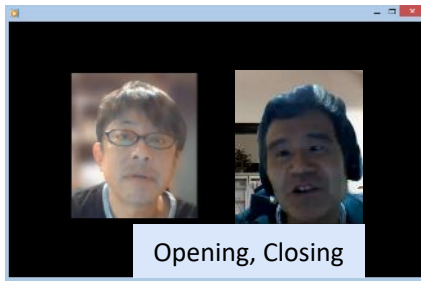


10 years of community collaboration



Sweden

Opening, Closing

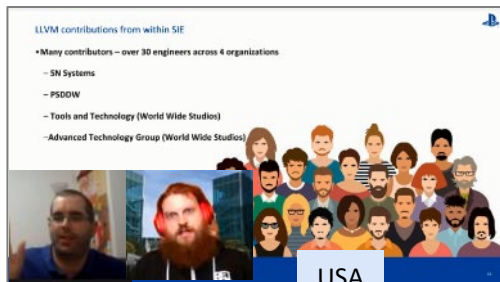


Opening, Closing



LLVM contributions from within SIE

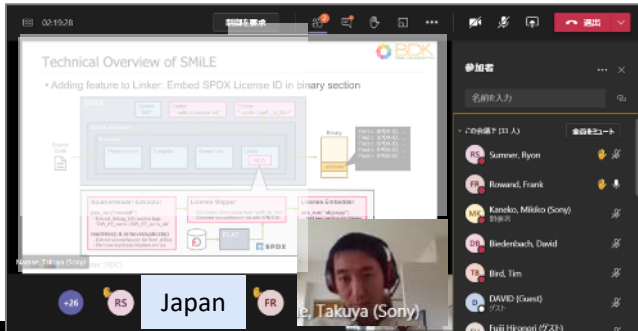
- Many contributors – over 30 engineers across 4 organizations
- SN Systems
- PSDDW
- Tools and Technology (World Wide Studios)
- Advanced Technology Group (World Wide Studios)



USA

Technical Overview of SMILE

Adding feature to Linker: Embed SPOX License ID in binary section



Japan

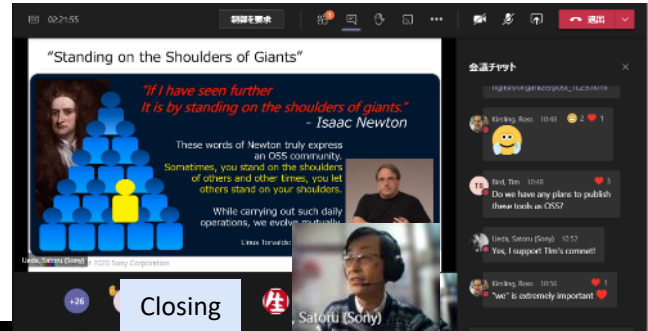
Takuya (Sony)

"Standing on the Shoulders of Giants"

"If I have seen further It is by standing on the shoulders of giants" - Isaac Newton

These words of Newton truly express an OSS community. Sometimes, you stand on the shoulders of others and other times, you let others stand on your shoulders.

While carrying out such daily operations, we evolve ourselves.



Closing

Satoru (Sony)

Community Support



Community Support

- Membership
 - Linux Foundation (Gold)
 - Board director
 - OpenChain project (Platinum)
 - Board member
 - SODA Foundation (General)
 - Core Embedded Linux Project (member)
 - Board member
- Project Maintainer:
 - Linux kernel
 - Apache NuttX (RTOS)
 - Fuego test framework
 - ROS2
- Event Sponsorship & Host
 - ELC-Europe 2019 (Gold)
 - ROScon Japan 2018(Platinum), 2019(Platinum), 2021(Silver)
 - NuttX meetup Europe, NuttX meetup Tokyo
- Event Program Chair/Member
 - ELC
 - Japan Technical Jamboree



Contribution

- Published as OSS
 - NNabla neural network libraries <https://github.com/sony/nnabla>
 - Flutter for embedded Linux <https://github.com/sony/flutter-embedded-linux>
 - Mapray.js <https://github.com/sony/mapray-js>
 - NMOS <https://github.com/sony/nmos-cpp>
 - OpenColorIO <https://github.com/AcademySoftwareFoundation/OpenColorIO>
 - OpenCue <https://github.com/AcademySoftwareFoundation/OpenCue>
 - Spresense SDK <https://github.com/sonydevworld/spresense>
- Contribution
 - Linux kernel
 - Webkit
 - LLVM
 - ROS2
 - Apache NuttX
 - Fuego
 - OpenChain
 - SPDX



Community Liaison & Embedded Linux Conference

Thank You to the Embedded Linux Conference 2021 Program Chairs



Tim Bird
Principal Software
Engineer, Sony



Frank Rowand
Senior Software
Engineer, Sony

Additionally, Thank You to Our 2021 Program Committee!



**Marta
Rybczynska**
Independent



**Jeffrey Osier-
Mixon**
Sr. Principal Community
Architect, Red Hat



Helen Koike
Sr. Software Engineer,
Collabora



**Yoshitake
Kobayashi**
Sr. Manager of The
Open Source
Technology
Department, Toshiba



Kate Stewart
Vice President,
Dependable
Embedded Systems,
The Linux
Foundation



**Thomas
Petazzoni**
Co-owner & CEO,
Bootlin



Conclusion



Lessons learned

- Core competence and collaboration
 - Deep knowledge of technology
 - Open source way
- Open Source Culture
 - Internal community
 - OSPO, OSS license committee, developer community, global networking
 - Community Liaison
- OSS policy and operation
 - Adapting to business environment
- Cooperation between engineering and license compliance



Thank you!



Thank you!



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