

# Open Source and Samsung: Bits and Pieces – the why, what and how.

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# Samsung's Open Source Journey

**Getting a taste of Open Source**  
(Embedded Linux)



**Increased Adoption**



2002

2005

2008

2013

2014

2015

**Proliferation**

**Established the Open Source Group**



**TIZEN™**



**IoTivity**



# Samsung Open Source Group (OSG) – Est. 02/2013



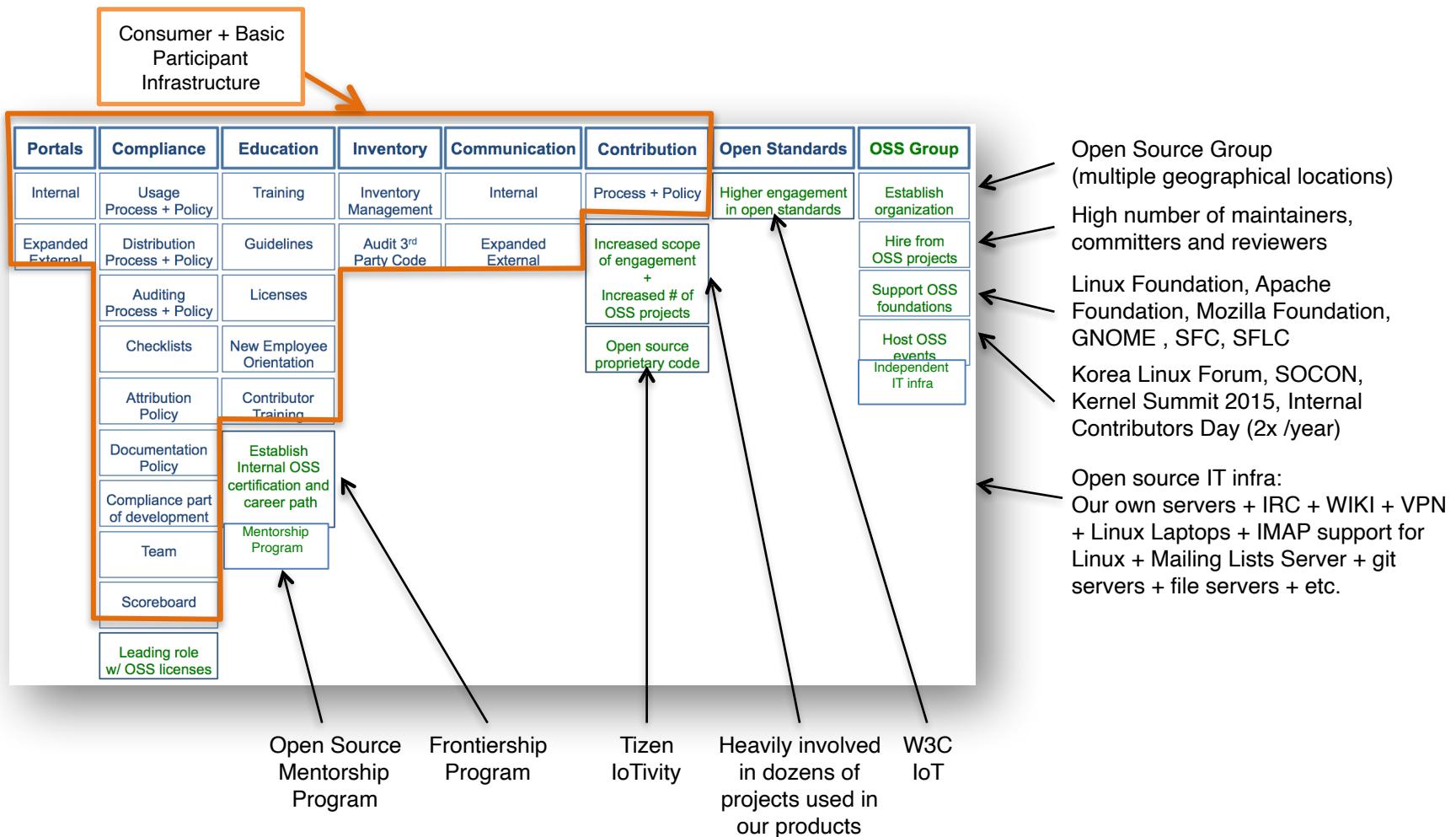
**Open source leadership can't be given.**

- You earn it by consistent participation and contribution.

**Open source leadership can be taken away.**

- You lose it by lack of participation and contribution.

# We continue to build our open source infrastructure



# OSG current focus areas

Open Source Foundations

Legal Compliance

Evangelism  
Strategy  
Community

Media

Standards

Graphics

IoT

System

# What do our open source developers do?

- Upstream development.
- Helping R&D and product teams on open source software.
- Open source knowledge transfer internally.
- Special projects and new ideas.
- Internal and external thought leadership.

# Why do we have an open source team

# Why is open source important to Samsung?



# Why does this matter?

- Most product teams pay attention to what is happening downstream, starting when graphics are added to the product software stack. When things break, they must create workarounds.
- We pay attention to what is happening upstream, to prevent the breakages from reaching the product team in the first place.
- In general we review as much code as we write, helping to ensure stability in these strategic projects.
- Our status in the open source community helps ensure:
  - Functionality required by GBMs for products remains stable over time.
  - Features requested by GBMs are incorporated and tested upstream.
  - Samsung's committed code is not removed due to inaction.

# We influence via contributions the Linux kernel development because it is a critical component to our product

**Linux Foundation Kernel Report March 2012**

Company Name	Number of Changes	Percent of Total
None	46,982	17.9%
Red Hat	31,261	11.9%
Novell	16,738	6.4%
Intel	16,219	6.2%
IBM	16,073	6.1%
Unknown	13,342	5.1%
Consultant	7,986	3.0%
Oracle	5,542	2.1%
Academia	3,421	1.3%
Nokia	3,272	1.2%
Fujitsu	3,156	1.2%
Texas Instruments	2,982	1.1%
Broadcom	2,916	1.1%
Linux Foundation	2,890	1.1%
Google	2,620	1.0%
Analog Devices	2,595	1.0%
SGI	2,578	1.0%
AMD	2,510	1.0%
Parallels	2,419	0.9%
Freescale	2,265	0.9%
Cisco	2,259	0.9%
HP	2,158	0.8%
Renesas Technology	2,092	0.8%
MontaVista	2,019	0.8%
Atheros Communications	1,960	0.7%
Wolfson Microelectronics	1,952	0.7%
Marvell	1,752	0.7%
NetApp	1,746	0.7%
Univention	1,656	0.6%
Samsung	1,650	0.6%

**Linux Foundation Kernel Report Sept 2013**

Company	Changes	Total
None	12,550	13.6%
Red Hat	9,483	10.2%
Intel	8,108	8.8%
Texas Instruments	3,814	4.1%
Linaro	3,791	4.1%
SUSE	3,212	3.5%
Unknown	3,032	3.3%
IBM	2,858	3.1%
Samsung	2,415	2.6%
Google	2,255	2.4%
Vision Engraving Systems	2,107	2.3%
Consultants	1,529	1.7%
Wolfson Microelectronics	1,516	1.6%
Oracle	1,248	1.3%
Broadcom	1,205	1.3%

**Linux Foundation Kernel Report Feb 2015**

Company	Changes	Total
None	11,968	12.4%
Intel	10,108	10.5%
Red Hat	8,078	8.4%
Linaro	5,415	5.6%
Samsung	4,290	4.4%
Unknown	3,842	4.0%
IBM	3,081	3.2%
SUSE	2,890	3.0%
Consultants	2,451	2.5%
Texas Instruments	2,289	2.4%
Vision Engraving Systems	2,089	2.2%
Google	2,048	2.1%
Renesas Electronics	2,004	2.1%
Freescale	1,690	1.8%
Free Electrons	1,463	1.5%
FOSS Outreach Program for Women	1,418	1.5%
Oracle	1,166	1.2%
AMD	1,109	1.1%
Nvidia	1,078	1.1%
Broadcom	1,001	1.0%
Huawei Technologies	971	1.0%
ARM	788	0.8%
Pengutronix	763	0.8%
Cisco	723	0.7%
Qualcomm	679	0.7%
Fujitsu	672	0.7%
Linux Foundation	627	0.6%
Imagination Technologies	579	0.6%
QLogic	545	0.6%
Ingics Technology	526	0.5%

**#3 Contributor to Linux Kernel 4.2 LWN.net**

Intel	1665	12.3%
Red Hat	1639	12.1%
(Unknown)	884	6.5%
(None)	884	6.5%
Samsung	681	5.0%
Samsung	496	3.7%
Linaro	449	3.3%
(Consultant)	412	3.0%
Outreachy	391	2.9%
IBM	286	2.1%
Google	246	1.8%
Renesas Electronics	203	1.5%
Free Electrons	203	1.5%
Texas Instruments	191	1.4%
Facebook	176	1.3%
Oracle	163	1.2%
Freescale	156	1.2%
ARM	145	1.1%
Cisco	142	1.0%
Broadcom	138	1.0%

**#2 Contributor to Linux Kernel 4.4 LWN.net**

Intel	1660	12.9%
(Unknown)	1139	8.9%
(None)	684	5.3%
Samsung	670	5.2%
Red Hat	655	5.1%
Atmel	449	3.5%
Linaro	448	3.5%
(Consultant)	419	3.3%
Outreachy	400	3.1%
IBM	302	2.3%
Vision Engraving Systems	288	2.2%
Google	273	2.1%
SUSE	257	2.0%
ARM	226	1.8%
Texas Instruments	210	1.6%
Freescale	208	1.6%
Renesas Electronics	190	1.5%
AMD	177	1.4%
Oracle	173	1.3%
Broadcom	169	1.3%

## What does it mean to influence an upstream open source project?

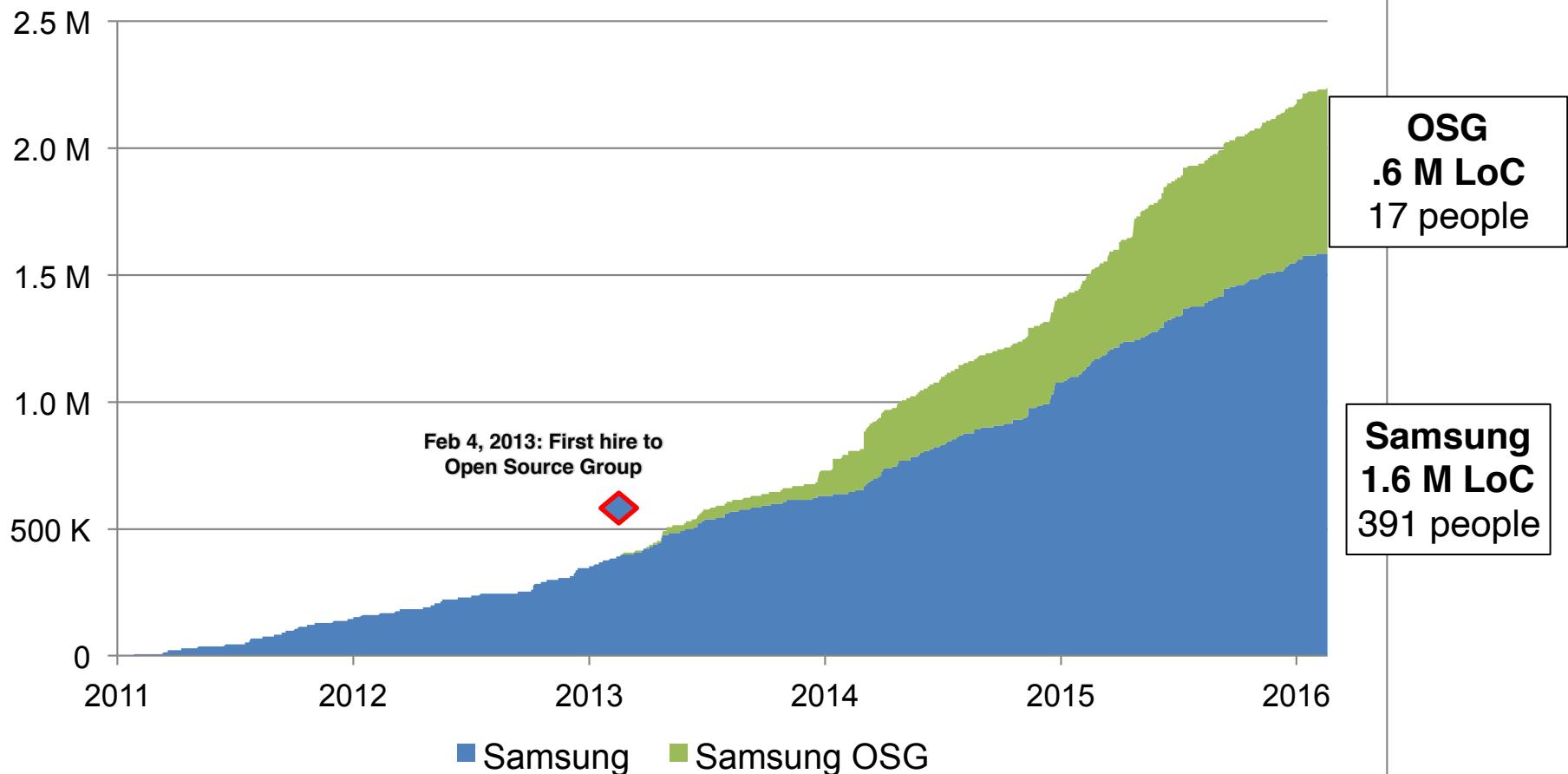
- Open source projects usually change considerably faster than products.
  - Major features may be added, changed, or removed with little notice, particularly in new projects.
  - Roadmaps (if they exist) and release dates may be changed.
  - Key decision-makers may change – or go to work for our competitors.
- It is impossible to negotiate directly with an open source project as we would with a business partner.
- Instead, we must influence these projects directly by gaining positions of leadership.

## Influence is gained through code contributions and stewardship

- Our team members are major contributors, release managers, and maintainers of strategic projects.
- We provide stability within the projects, and can help ensure adoption of features that benefit our products.

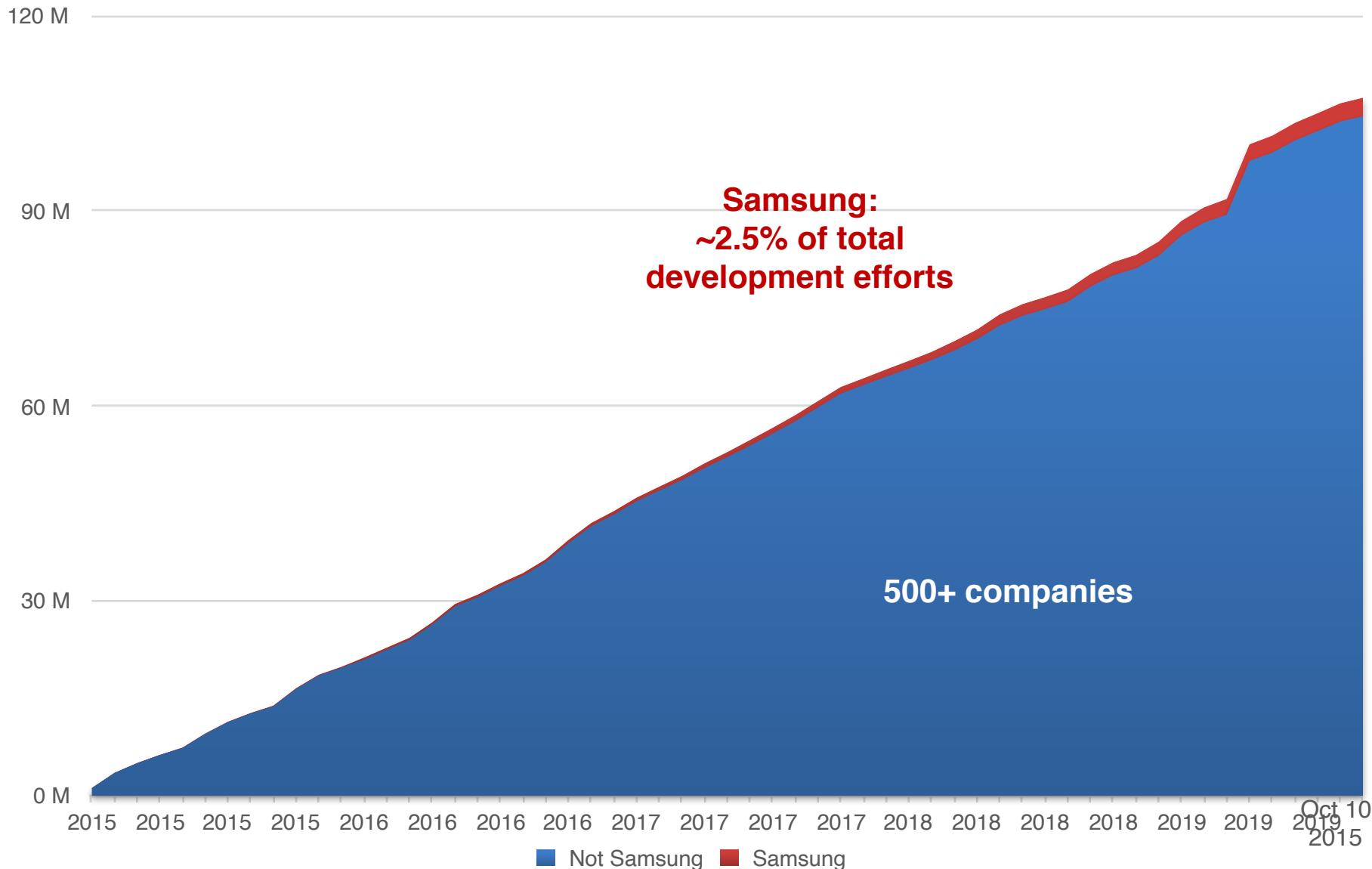
Samsung OSG's influence can be measured directly in lines of code

### Samsung's contributions to strategic open source projects



12 key upstream projects: Linux Kernel, LLVM, FFmpeg, Gstreamer, Cairo, Wayland, EFL, Enlightenment, Servo, Skia, Caskbench, and Pixman.

# Measuring ROI



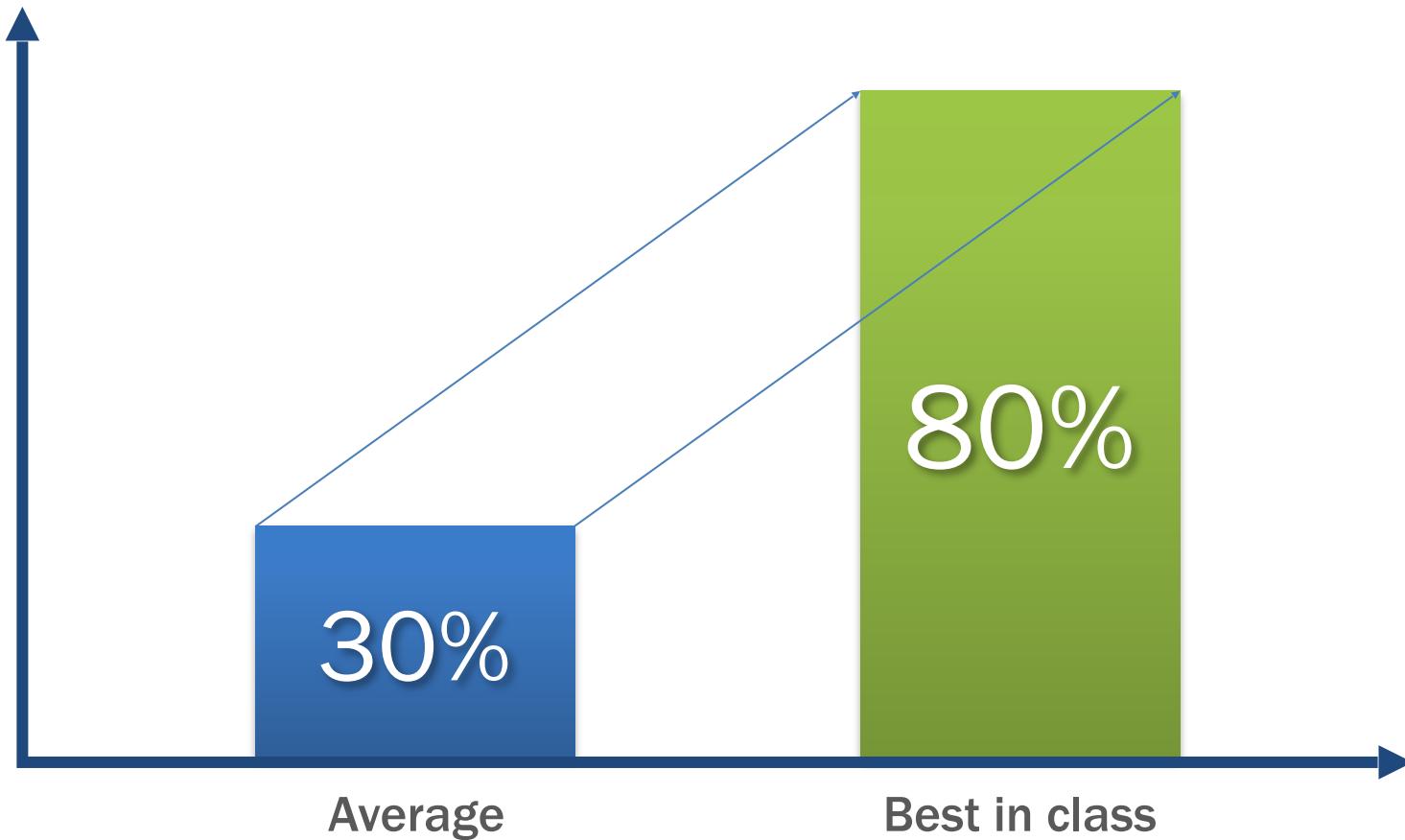
**Open Source is Collaborative, External R&D**

# Why are companies increasing open source R&D?

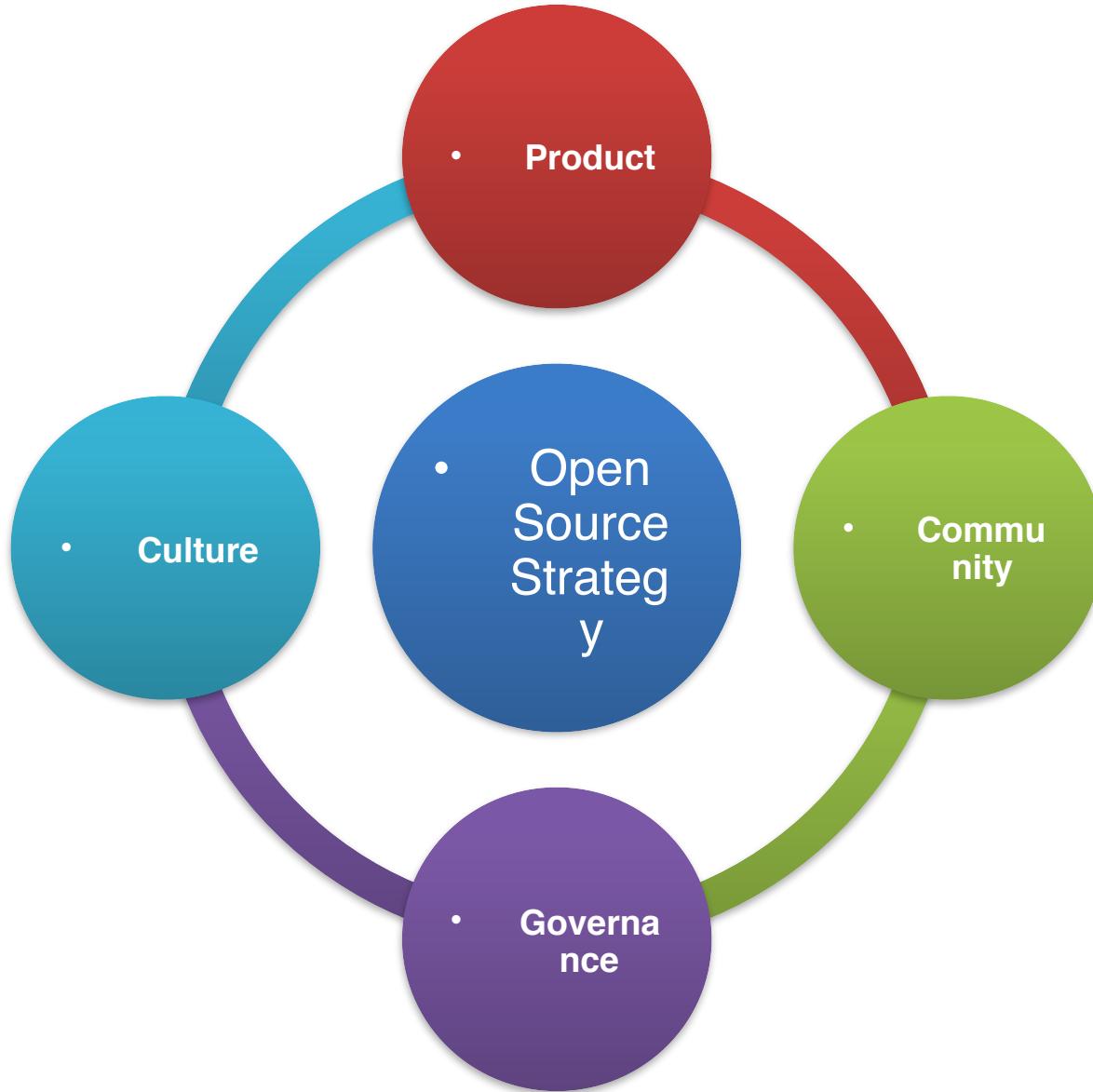
- Support Product Development
- Support Product Innovation
- Faster Time To Market
- Better Hiring

# Open source is a strategic asset

Shift from smaller part to majority of code being open source across industries: Embedded, Supercomputing, Telecom, Banking, Healthcare, Automotive, etc.



# Key dimensions to enterprise open source strategy



# Executing the strategy: Enterprise open source infrastructure

Portals	Compliance	Education	Inventory	Communication	Contribution	Open Standards	OSS Group
Internal	Usage Process + Policy	Training	SW Inventory Management	Internal	Process + Policy	High engagement in open standards	Establish organization  Hire from OSS projects  Support OSS foundations  Host OSS events  Independent IT Infra
External	Distribution Process + Policy	Guidelines	Audit 3 <sup>rd</sup> Party Code	External	Open source proprietary code	Oss reference implementation	
	Auditing Process + Policy	Licenses			Increased scope of engagement		
	Checklists	New Employee Orientation			Increased work with # of projects		
	Attribution Policy	Contributor Training					
	Documentation Policy	Establish Internal OSS certification and career path					
	Compliance part of development						
	Compliance Team	Mentorship Program					
	Scoreboard						
	Involvement w/ OSS licensing						

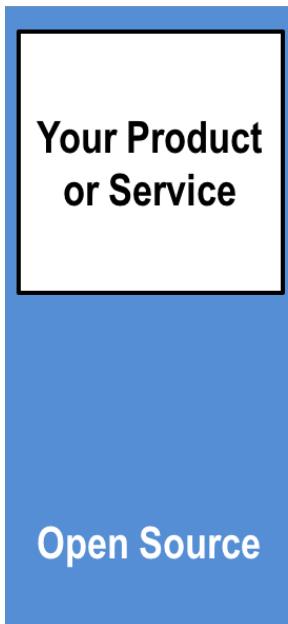
# Why aim for open source leadership?

# 1/ Product dependency on open source software

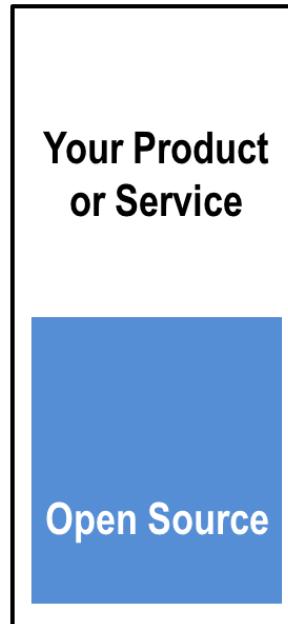
Let's ask ourselves this one question:

**Can we build a product without using open source software?**

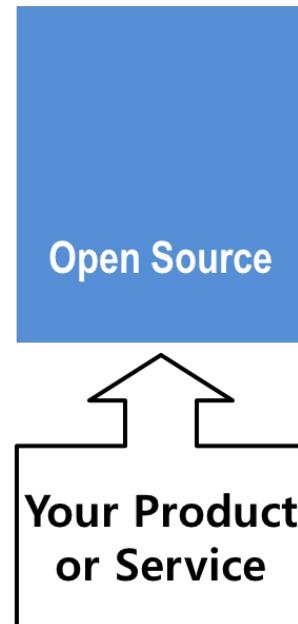
Building OSS



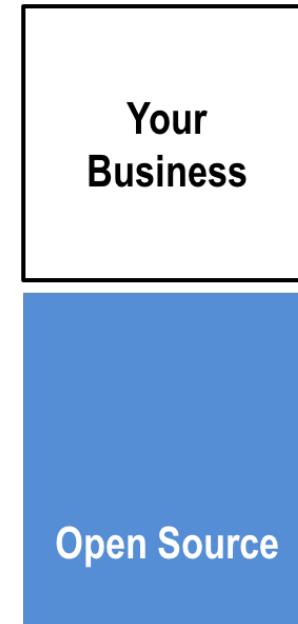
Building with OSS



Building for OSS



Building on OSS



## 2/ Faster Path to Innovation

- **Commoditizing and freely sharing lower-level components of the platform proved to be a better way of building products.**
- **When you do this, you are focused differentiating at higher levels of the stack, focusing your resources to innovate on your unique value add.**

⇒ **This is a fundamental business advantage that Linux and open source enable.**

### 3/ Open Source is Eating the Software World

2011  
THE WALL STREET JOURNAL.  
**WSJ**



ESSAY

#### Why Software Is Eating The World

By MARC ANDREESSEN

August 20, 2011

May 5, 2014, 5:51 PM ET

### Open Source ‘Eating’ Software World: Samsung

Article

Comments

By RACHAEL KING

Reporter



THE WALL STREET JOURNAL.  
**WSJ**

Samsung Electronics is ramping up its contributions to various open source projects as the company depends more on open source software in its products. The company sees open source software as a faster path to innovation.

2014

Open Source is Eating the Software World.

**SAMSUNG**

## Needed skills to accelerate software innovation

- More open collaboration
- Better programming and development skills
- Better architectural skills
- Better software and system design skills
- Better integration skills
- Modular and scalable designs
- Software re-use
- Continuous integration cycles
- e

Open Source Dev Skills

# What's our impact? (Thought Leadership)

**2013**

**10 publications**

**30 conference talks**

**Numerous conferences sponsorships**

**Established social media presence**

**2014**

**7 technical publications**

**58 conference talks**

**22 media mentions (incl. 2x in WSJ)**

**Numerous conferences sponsorships**

**Sponsored Outreachy Program**

**2015**

**Established: <http://blogs.s-osg.org/>**

**76 blogs at 81K views**

**46 conference talks**

**44 media mentions**

**56 talks on Slideshare at 32K views**

**Creating own demos at events**

Samsung Talks About Its Aggressive Linux Talent Recruitment Strategy

Wednesday, 22 May 2013 06:41 | Jennifer Cloer |  Exclusive

APRIL 16, 2013

**Samsung flexes its open source muscles where you might not expect**

**Open source goes corporate at Samsung**

Posted 01 Oct 2014 by [Ben Lloyd Pearson](#) 

Rating: ★★★★★ (7 votes)

How Samsung is Bringing Open Source Culture Inside the Firewall

Thursday, 27 March 2014 14:27 | Libby Clark |  Exclusive

May 5, 2014, 5:51 PM ET  
**Open Source 'Eating' Software World: Samsung**

 LINUX.COM

HOW  
SAMSUNG  
IS EVOLVING  
INTO AN  
OPEN SOURCE  
COMPANY

# Guiding principles

## 1. We can't hire all the smart people in the world.

We need to find a way to tap into their knowledge and influence favorable outcomes in external collaborative and R&D projects.

## 2. Open source R&D creates significant value.

Internal R&D uses the results of open source R&D and claims portion of that value.

## 3. We don't need to originate the research to use it or benefit from it.

## 4. We practice what we preach internally: openness and collaboration.

# Closing Thoughts

# Why Focus on Open Source?

Open Source is a very important and a strategic innovation tool.

- Share development on non differentiating software
- Lower R&D cost
- Accelerate product development
- Influence on technologies used in products
- Access to talent pool

# Companies need to adapt to collaborative development (internally and externally)

## Culture

- Development model
- Collaboration
- Transparency
- Meritocracy
- Team formation
- Hiring practices

## Processes

- Contribution
- Governance
- Organizational
- Approvals
- Operational model

## Tools

- IT infrastructure
- Development tools
- Metrics
- Knowledge sharing
- Code reuse

*We're on the right path; it will take time and perseverance.*

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