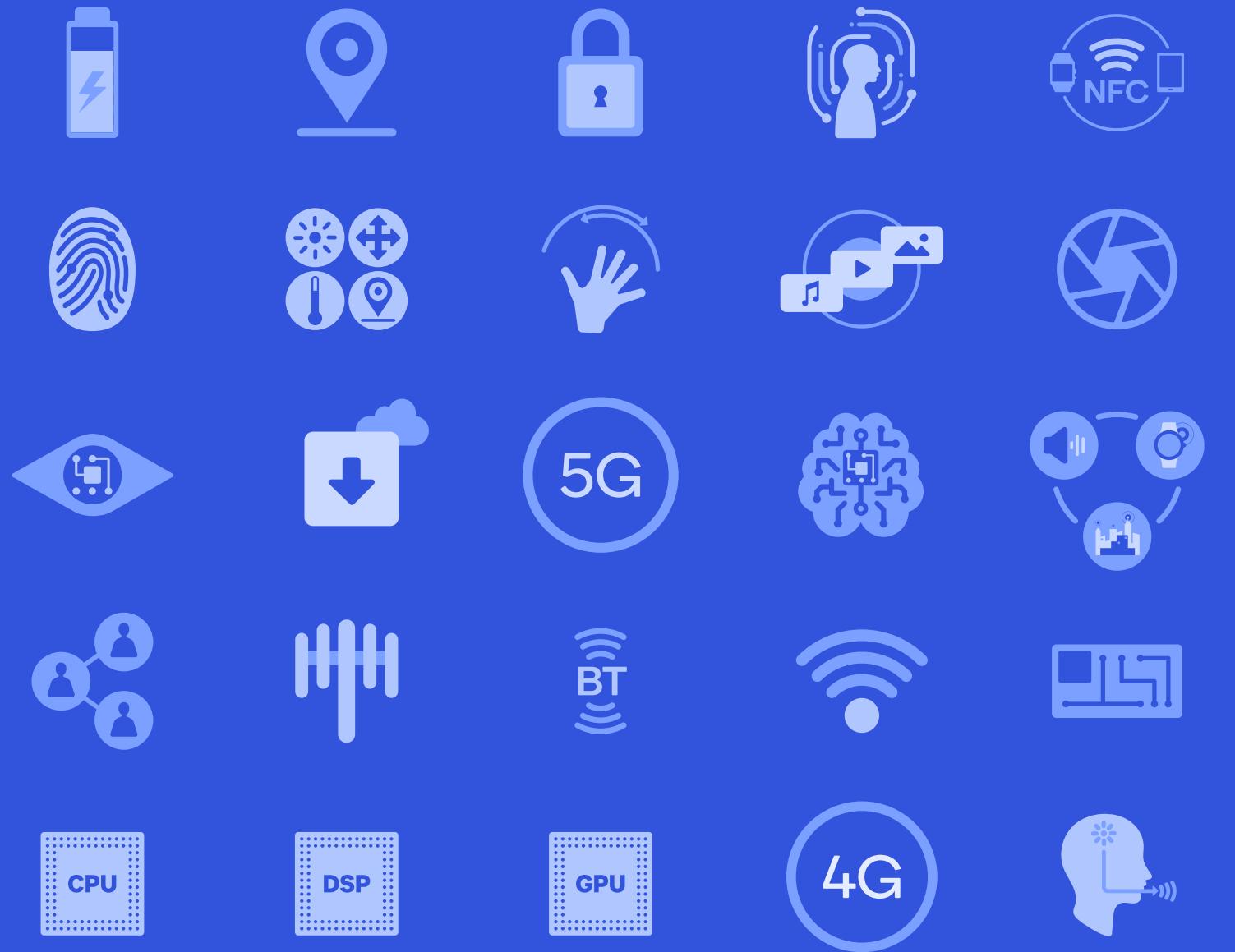


Open Source and Standards Collaboration

Craig Northway

Director, Engineering
Qualcomm Technologies, Inc.





From the
smartphone to 5G,
it all starts
with Qualcomm

\$50+ billion cumulative
investment in R&D

Qualcomm Standards Bodies and Industry Organizations

410

Standards and industry
memberships

2K

Employees participating in
standards and industry
memberships

- Cellular
- Automotive
- Wireless Connectivity
- IOT
- Multimedia
- Device Connectivity
- Security

Qualcomm Open Source Participation

2.5K

Projects vetted for use,
modification or contribution

2K

Employees trained to interact
closely with Open Source *

- Enablement Projects
- Business assistance projects
- Personal Projects

How are Open Source and Standards similar and different?

design commoditize document
community interoperable interface
contribute license efficient test
participate collaborate open
compromise share organization
implementations member industry
develop

“Open source software is commodity software. It's a level playing field in which anyone can participate.”

“It [a standard] is used to define an interface between two (or more) entities such that they can interact in some predictable fashion and to ensure certain minimum requirements are met. Standards exist to encourage and enable multiple implementations.”

Why do SDOs want to collaborate
with Open Source?





This repository Search Pull requests Issues Marketplace Explore

github / linguist Watch 196 Star 5,620 Fork 2,149

Code Issues 73 Pull requests 49 Projects 0 Insights

Language Savant. If your repository's language is being reported incorrectly, send us a pull request!

syntax-highlighting language-grammars language-statistics linguistic

5,718 commits 14 branches 127 releases 695 contributors MIT

Branch: master New pull request Create new file Upload files Find file Clone or download

		Latest commit 49593a6 3 days ago
lildude	Update Travis Config (#4081) ...	
.github	Add issue and pull request templates (#3972)	3 months ago
bin	Handle repo cleanup race more elegantly (#3930)	4 months ago
ext/linguist	drop max token len to 32 (#3925)	4 months ago
lib	Replace Kotlin language grammar (#4065)	3 days ago
samples	Support for PICO-8 as Lua variant (#4072)	3 days ago
script	Add script to alphabetise submodule list (#4054)	a month ago
test	Add script to alphabetise submodule list (#4054)	a month ago
tools/grammars	Whitelist 4 new TextMate grammar fields (#4039)	a month ago
vendor	Replace Kotlin language grammar (#4065)	3 days ago
.gitattributes	Merge branch 'master' into 1233-local	4 years ago
.gitignore	Replace the tokenizer with a flex-based scanner (#3846)	5 months ago



IEEE STANDARD

IEEE Std 802-2014 (Revision to IEEE Std 802-2001) - IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture

Description: This standard provides an overview to the family of IEEE 802® standards. It describes the reference models for the IEEE 802 standards and explains the relationship of these standards to the higher layer protocols; it provides a standard for the structure of IEEE 802 MAC addresses; it provides a standard for identification of public, private, prototype, and standard protocols; it specifies an object identifier hierarchy used within IEEE 802 for uniform allocation of object identifiers used in IEEE 802 standards; and it specifies a method for higher layer protocol identification. (The PDF of this standard is available at no charge compliments of the GETIEEE Program. Visit <http://standards.ieee.org/getieee802/> for more details.)

Working Group: [WG802.1 - Higher Layer LAN Protocols Working Group](#)

Oversight Committee: [C/LM - LAN/MAN Standards Committee](#)

Sponsor: [C - IEEE Computer Society](#)

STATUS:

Active Standard

RELATED MATERIALS[802c-2017](#)[802d-2017](#)**RELATED STANDARDS**[Wired and Wireless Communications Standards](#)[Smart Grid Standards](#)**ADDITIONAL RESOURCES**[Request Interpretation](#)[Related Products](#)[Standards Distributors & Resellers](#)**JOIN IEEE-SA & SAVE!**

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***Email Address:**

***Confirm Email Address:**

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-- Select One --

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Country/Province Code:
(if outside the U.S.)

Extension (optional):

**How did you hear about IEEE
(optional):**

-- select one --

IEEE

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Before you start

Prior to completing the membership application form we recommend that you:

1. Verify if your organization is already a member of IEEE-SA. Please check your entity status by reviewing IEEE-SA's online [member directory](#).
2. Review the following policies that will provide you with information on IEEE-SA and the privileges, rights and obligations of its member entities.

[IEEE Code of Ethics](#)

[IEEE Intellectual Property Rules](#)

[Policies and Procedures for Corporate Standardization](#)

After you have submitted the Membership Application Form

1. You will receive an electronic receipt confirming that the application form has been submitted.
2. The membership team will review the completed application form within 48 hours of receipt. An invoice will be sent to the primary contact via email.
3. Full membership is granted upon payment of required appropriate membership dues to IEEE.
4. A welcome letter will be sent to the primary contact when full membership is granted.
5. At any time during the process, the IEEE-SA Membership team is available to answer any questions. Please feel free to contact +1 732 562 6381, corp-mem@ieee.org.

Paper Application Information

You may obtain a hard-copy application by sending an email to corp-mem@ieee.org

Complete the membership application

New Applicants: Enter your preferred email address in the box below to proceed with this application. By providing your email address, you agree to receive emails from IEEE Standards Association - Corporate Membership.

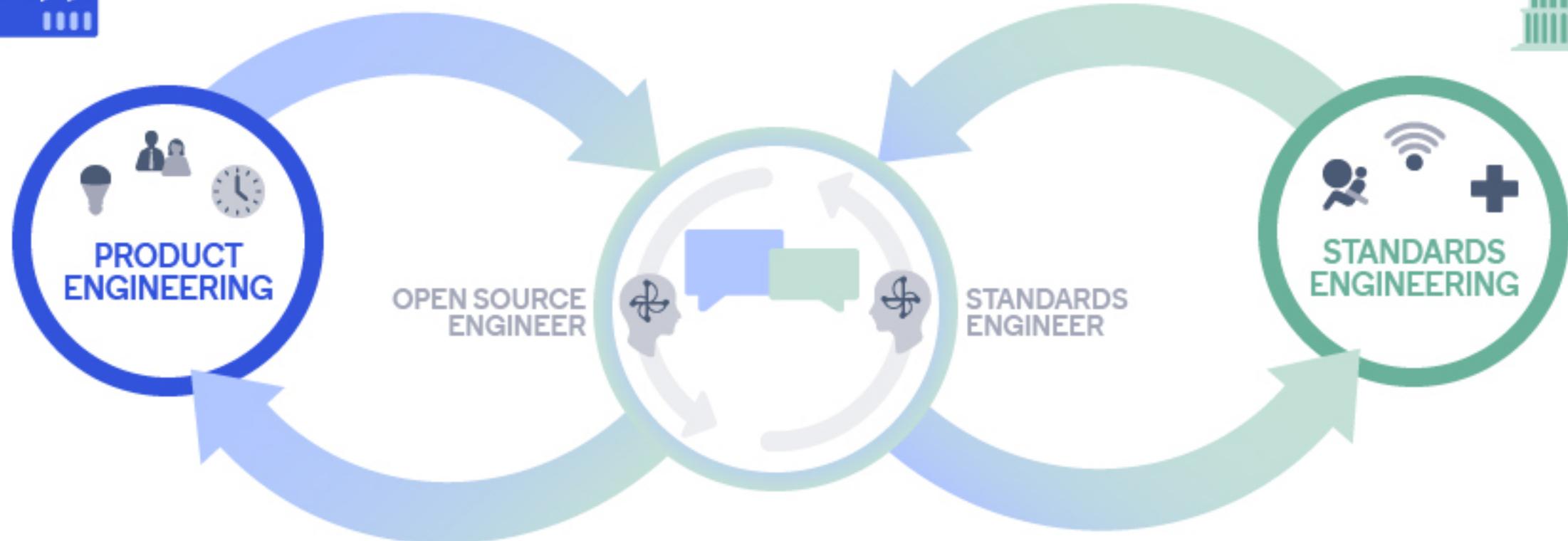
Email:

How should SDOs collaborate using Open Source?

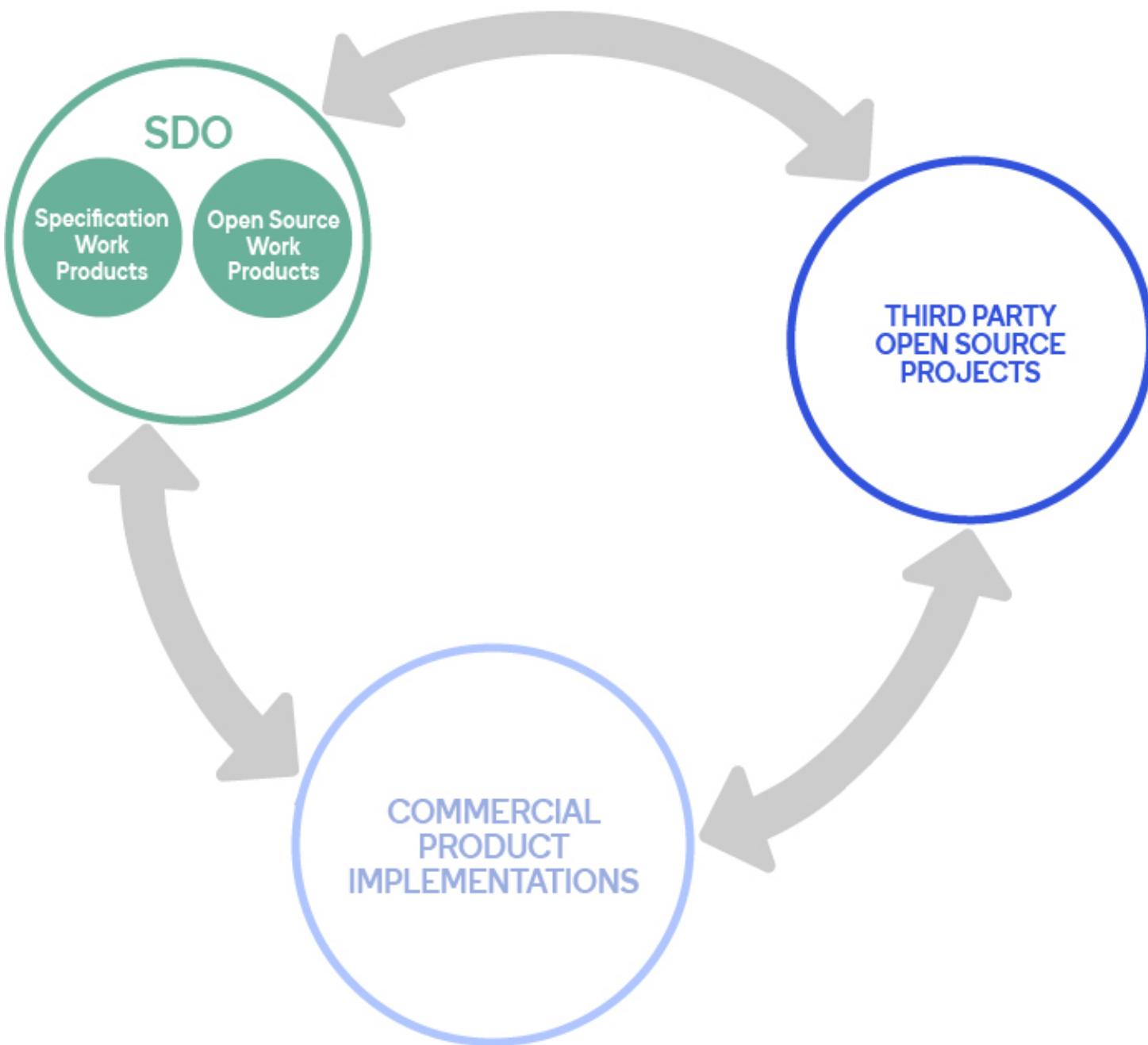
COMPANY



SDO



Open Source participation enables feedback loops across the board

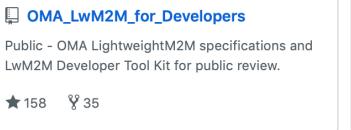


 Search or jump to... / Pull requests Issues Marketplace Explore

 **Open Mobile Alliance**
Delivering Standards for Global Connectivity
<http://openmobilealliance.org/> github@omaorg.org

 **Repositories** 15  **People** 4  **Projects** 0

Pinned repositories

-  **OMA_LwM2M_for_Developers**
Public - OMA LightweightM2M specifications and Lwm2M Developer Tool Kit for public review.
★ 158 ⚡ 35
-  **OMA-LWM2M-DevKit**
Public - OMA Lightweight M2M repository for developing a LWM2M Client/Server tutorial
JavaScript ★ 101 ⚡ 41
-  **lwm2m-registry**
This is a public repository dedicated to store and register new LwM2M Objects
★ 2 ⚡ 13

Find a repository... Type: All Language: All

lwm2m-registry
This is a public repository dedicated to store and register new LwM2M Objects

[iot](#) [objects](#) [lwm2m](#) [oma](#) [leshan](#) [wakaama](#)
★ 2 ⚡ 13 2 issues need help Updated an hour ago

openmobilealliance.github.io
Publication. Contains OMA Technical pages.

HTML ★ 5 ⚡ 8 Updated 2 days ago

Top languages: JavaScript, HTML

Most used topics: iot, lwm2m, oma

People: 4 

 Search or jump to... / Pull requests Issues Marketplace Explore

 **Internet Engineering Task Force**
<http://www.ietf.org/>

 **Repositories** 11  **People** 1  **Projects** 0

Find a repository... Type: All Language: All

perc-wg
PERC Working Group
Makefile ★ 4 ⚡ 7 Updated 3 days ago


ietfsched
Java ★ 1 ⚡ 5 Apache-2.0 Updated on Feb 28


repo-files
★ 2 ⚡ 1 Updated on Feb 14


nomcom-vol
Python GPL-3.0 Updated on Jul 16, 2018


draft-rfc5011-security-considerations
Makefile ⚡ 2 Updated on Jul 16, 2018


Top languages: Python, Makefile, Java, Tcl

People: 1 >
 **hardaker** Wes Hardaker

IETF Hackathons

IETF Hackathons encourage developers to collaborate and develop utilities, ideas, sample code and solutions that show practical implementations of IETF standards.

In this section ▾

The IETF Hackathons aim to:

- Advance the pace and relevance of IETF standards activities by bringing the speed and collaborative spirit of open source development into the IETF
- Bring developers and young people into IETF and get them exposed to and interested in IETF

IETF Hackathons are free to attend and open to everyone. They are collaborative events, not competitions. Past IETF Hackathons have covered a range of topics including; DNS, HTTP 2.0, NETVC, OpenDaylight, ONOS, VPP/FD.io, RiOT, SFC, TLS 1.3, WebRTC, YANG/NETCONF/RESTCONF. New technologies are always encouraged.

The [next IETF Hackathon](#) will be held in Montreal, Quebec, Canada July 20-21, 2019.

Can Open Source improve
collaboration with lessons from
Standards development processes?

“Foster an open ecosystem by establishing interoperable APIs, ensuring interoperable implementations with vendor commitments and open source tools.”







<https://pixabay.com/en/abstract-blur-britain-british-1239439/>

“The fast pace of updates to these projects has created some unexpected problems for the people who deploy and use them.”

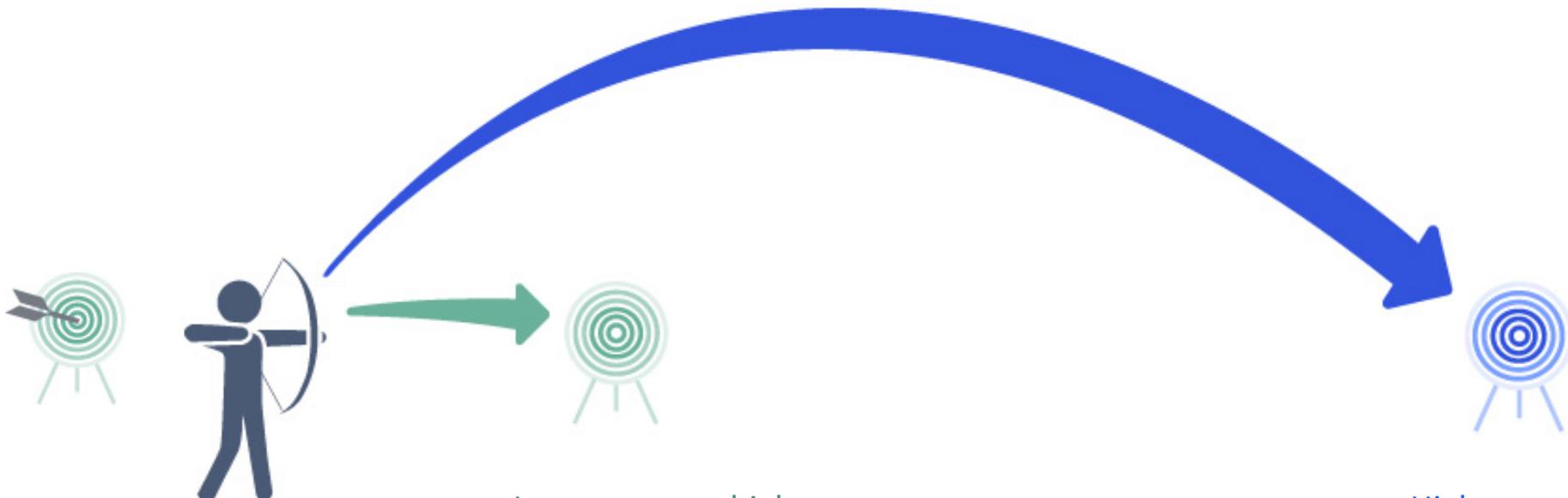




But what about IP Policy?

IP Policy

- Consider 2 broad categories of SDO IP policy
 - Royalty Free
 - FRAND - Fair, Reasonable and Non-Discriminatory



- Lower energy, higher accuracy
 - Lower risk
 - Invest in product development
 - Roadmap (clarity)
- Higher energy, lower accuracy
 - Higher risk
 - Invest in R&D
 - Science (might fail)

IP Policy

Royalty Free

- Using only RF Open Source licenses may:
 - Make unclear what is “standards essential”
 - Only apply RF terms to the specific implementation
 - May not grant all contributions from everyone
- Need an IP policy/agreement for the standard that clearly stipulates terms for **ANY** implementation of the standard and **all** essential IP

IP Policy

FRAND

- Many SDOs have FRAND or disclosure-only IP policies
 - Have worked very well
- Consider 2 aspects of licensing:
 - Copyright
 - Patents
- Enable Open Source Copyright and FRAND Patent policy:
 - Make source code license copyright-only (suggest Clear BSD, 3-Clause BSD or MIT)
 - Add an explicit pointer to the SDO IP policy to cover patent commitments

Call to Action

What can we do?

Educate!

- OSPO - Open Source Program Office
- ISPO - Industry Standards Program Office

Robert Burns: Oh would some power the gift give us, To see ourselves
as others see us.

What your ISPO & SDO needs to learn about Open Source

- Open Source Compliance and effect of non-compliance
 - Review of the software products and contributions
 - Inbound & Outbound processes and policy
- Open Source Development practices
 - CI/Testing
 - Community parity
 - Security
- Open Source Community best practices
 - Issues/Bug tracking, Documentation, Chat
 - Fair and efficient review and responses
 - Monitoring and metrics for project health

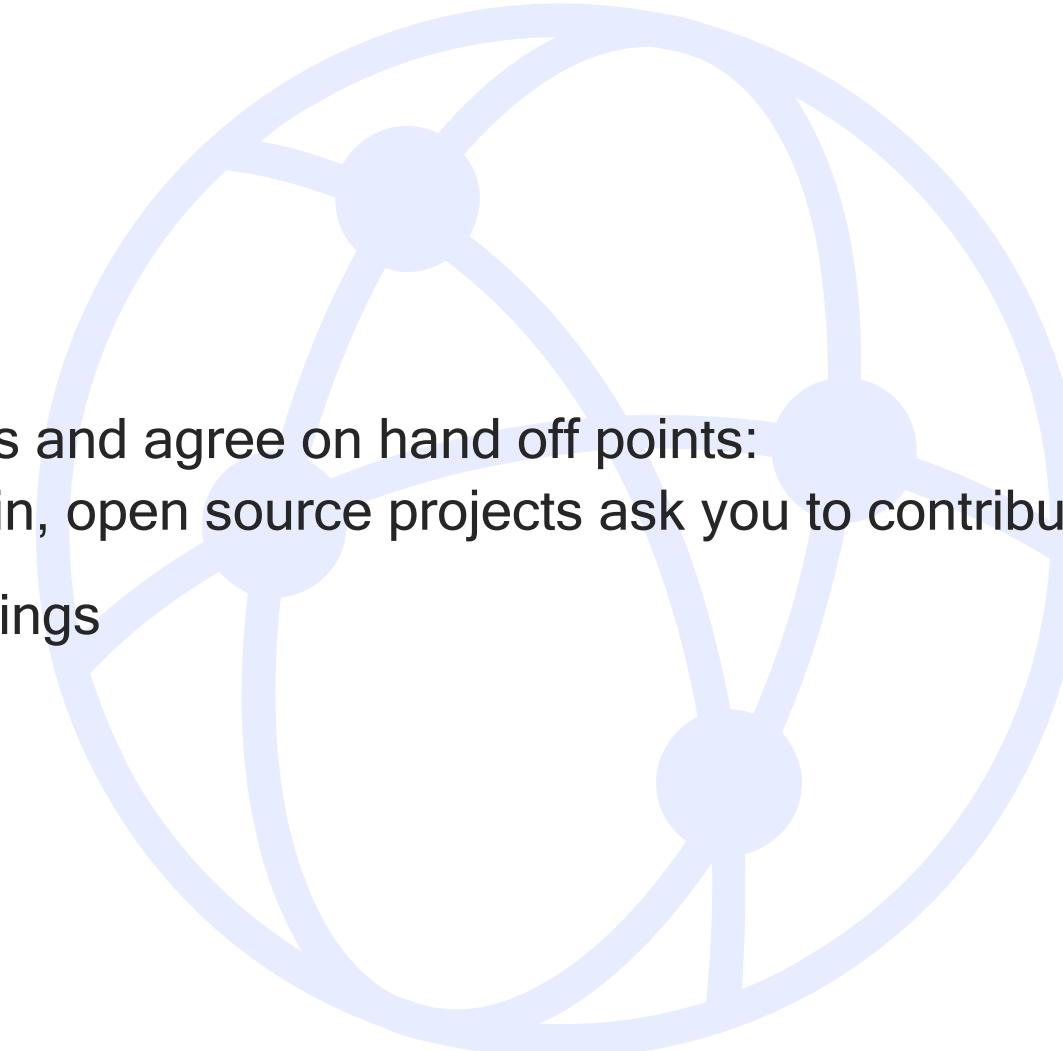


What OSPO & Open Source can learn from ISPOs & SDOs

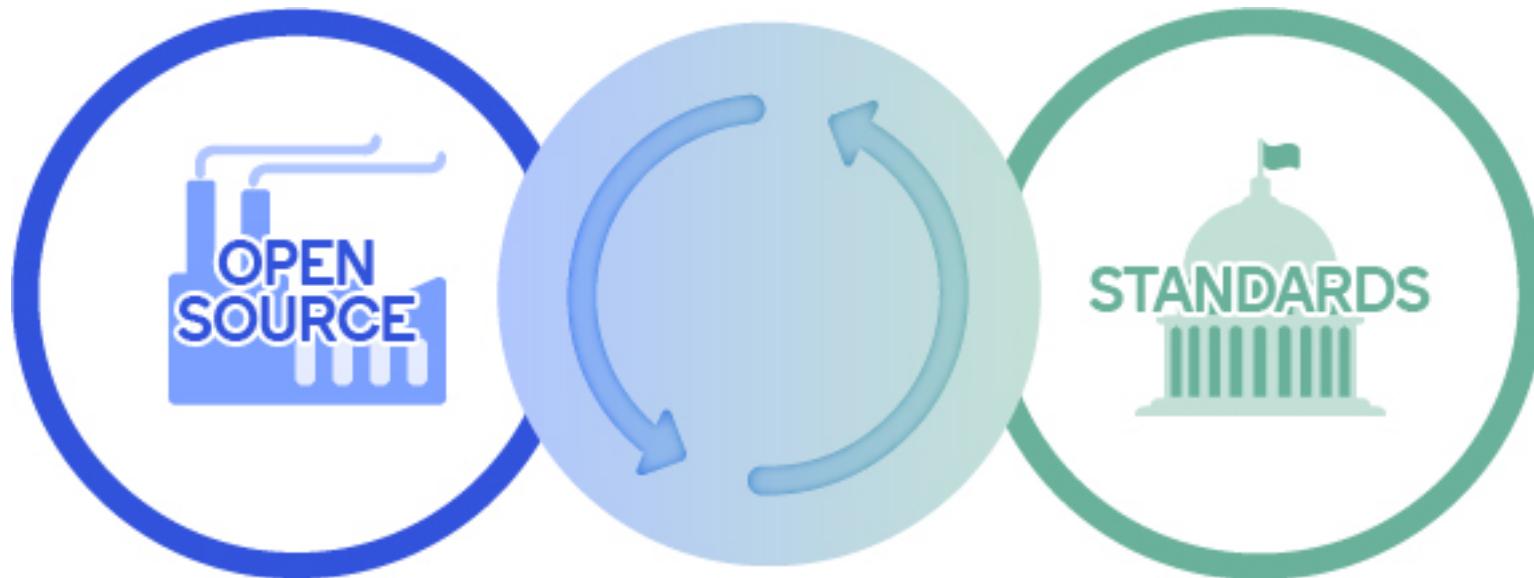
- Expectation of complete releases and high quality standards
- Governance and Antitrust compliance
- Interoperability and backwards compatibility
 - “There are numerous examples I can cite where open source projects are updated so frequently that new versions will, usually unintentionally, break backwards compatibility.” - Kevin Fleming
- Long term strategy, roadmaps, and planning
- Clear rules for contributors, participation and IP declaration

Our internal collaboration between OSPO & ISPO

- Collaborate on:
 - Training/Awareness
 - Compliance
 - Outreach
- Align review processes and agree on hand off points:
 - “SDO’s ask you to join, open source projects ask you to contribute.”
- Regular strategy meetings



Standards and Open Source will blend further over time



Thank you!

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