

Open Source Implementation for IEEE Standards

IEEE-SA Corporate Advisory Group
Ad Hoc on Open Source

Agenda

- Background
- Effort
- Open Source License Offerings
- Open Source and IPR
- Next Steps

Background

- IEEE members have had an interest in open source (OS) code implementation guidance, and have already participated in, or are currently participating in OS projects
 - IEEE Humanitarian Group
 - IEEE Technical Activities
 - IEEE Standards
- Through discussion among various IEEE OUs and IEEE Legal and Compliance, it was realized that there was a need to formalize IEEE OS development and provide a platform for this work where IEEE groups can voluntarily engage

Background

- Research by IEEE-SA identified open source to be evolving as a necessary industry market development mechanism complementary to open standards
 - Next generation infrastructures and vertical industry and consumer deployments are expected to be dependent upon open source, across all market sectors
 - Open source provided the potential for expanded integration of previously discrete technology eco-systems (e.g. 5G, IoT, Analytics, Big Data, Virtual and Augmented Reality, Artificial Reality, Vertical platforms: Smart Energy, Smart Cities, Automotive, etc.)
 - Industry feedback indicated open source solutions could provide improved time to market solutions and potentially provide economic benefits to both suppliers and consumers
 - Research indicated standards / open source community initiations were expanding, where open source was being considered more frequently as an option to address industry requirements

Background

- IEEE-SA Board of Governors (BoG) Corporate Advisory Group (CAG) chartered an Ad Hoc to work with other entities within the IEEE, including IEEE Legal and Compliance, to determine for the entire IEEE appropriate
 - Use cases around OS development
 - IPR options
 - Pilots for OS work
 - Marketing and Communication for stakeholders

Effort

- Since 2015, the CAG Ad Hoc has
 - Reviewed various support structures needed to support OS development in IEEE
 - Josh Gay was brought on as the new IEEE-SA OS Community Manager
 - Analyzed various OS platforms (GitLab, GitHub, other Git options)
 - Considered several OS licensing options
 - Invited IEEE groups currently developing OS code to participate in pilot projects
 - Consulted with other OS communities about IEEE's effort and the best way to engage OS collaboration
- OS Streams were created to advance the efforts for use cases, pilots, IPR, and marketing
 - Approximately forty (40) participants who expressed interest
 - Seven (7) use cases were identified
 - Three (3) open source licenses were evaluated
 - Several IEEE groups have expressed interest in being pilots

Effort

- Use cases
 - Test & Tools Framework
 - Reference Example Implementation
 - Informative Portion of a Standard
 - Normative Portion of a Standard (exception rather than norm)
 - IEEE (but not IEEE-SA) OS Project
 - Non-IEEE OS Project
 - IEEE-SA Non-Standard Open Source Project
- IEEE Projects Expressing Interest as Pilots
 - IEEE 802[®] YANG
 - IEEE P1076[™] VHSIC Hardware Definition Language (VHDL)
 - IEEE P21451-1-4[™] Standard for a Smart Transducer Interface for Sensors, Actuators, and Devices - eXtensible Messaging and Presence Protocol (XMPP) for Networked Device Communication
 - IEEE P1451-99[™] Standard for Harmonization of Internet of Things (IoT) Devices and Systems
 - IEEE P370[™] Electrical Characterization of Printed Circuit Board and Related Interconnects at Frequencies up to 50 GHz

Effort

- IEEE Open Source Environments
 - GitLab (pilots)
 - GitHub

- IEEE Staff and Legal Support
 - Josh Gay, IEEE Standards Open Source Community Manager
 - External counsel with expertise in open source

- Outreach
 - Leading Open Source organizations
 - Open Source conferences

Open Source Pilots

- IEEE invited groups interested in developing open source material to participate as pilots
 - Intent of pilots is to work with IEEE-SA as it develops protocols, processes, learning collateral, and other information to help inform the direction taken in establishing an open source platform for IEEE
 - Pilots will allow IEEE to understand current and possible future open source development within IEEE
 - Participants in pilots will be able to help IEEE-SA frame the volunteer and staff support, as well as tools that will be needed
- Steps for volunteering as a pilot
 - Complete the Open Source Information Request Form
 - Form can be obtained by contacting m.aranzamendez@ieee.org
 - Once accepted as a pilot
 - All contributors (for any material submitted wrt the open source development) shall submit an appropriate Contribution License Agreement (CLA)
 - A GitLab area will be established where all relevant material can be uploaded for initial review (including IPR review) by the Community Manager

Open Source Licensing Offerings

■ OS Licenses

- Three licenses evaluated
 - Apache 2.0 (open source software)
 - BSD 3-Clause (open source software)
 - CERN 1.2 (open hardware)
- Apache and BSD are recommended for possible use in standards development context
 - Well established and accepted in open source community
 - Recognized by many organizations involved in open source development
- CERN is being evaluated for use in IEEE Humanitarian projects

Open Source and IPR

- Apache 2.0
 - License available at the following URL:
 - <https://www.apache.org/licenses/LICENSE-2.0>

- BSD 3-Clause
 - License available at the following URL:
 - <https://opensource.org/licenses/BSD-3-Clause>

NOTE: Participants are advised that they may wish to seek their own legal advice on the terms of the licenses or their choice of license as it may have implications on intellectual property rights.

Open Source and IPR

- Contributor License Agreements (CLAs) developed for both individual and entity contributions
 - Similar concept to IEEE Standards Permission Letters
 - If a participant is submitting contributions owned by employer/affiliation, an entity CLA is required
 - A change in employer/affiliation requires a new CLA
 - If a participant is submitting contributions owned by the participant, an individual CLA is required
- Based on Apache Software Foundation's CLAs
- Required for any open source contribution
 - Through CLAs, contributors grant to IEEE all rights needed so that IEEE can provide the code or hardware documentation under an open source license
 - Grants to users (licensees) the rights to use the code or documentation as permitted in the open source license
- Additional licenses may be considered, but must go through IEEE Legal evaluation prior to use

Open Source and IPR

- Choice is provided in how contributions can be made:
 - **ALL IEEE Open Source Projects under that license**
 - CLA is submitted once for each type of license
 - This license cannot be retracted for another type of license
 - **SPECIFIC Open Source Project**
 - CLA is submitted once for each Open Source Project
 - **SPECIFIC CONTRIBUTION to a SPECIFIC Open Source Project**
 - CLA is submitted for each contribution

NOTE: Participants are advised that they may wish to seek their own legal advice on the terms and scope of the CLA as it may have implications on intellectual property rights.

Next Steps

- Pilots initiated for the various use cases
 - IEEE 1076 an active pilot
 - Additional pilots will be accepted
- Define Open Source development processes/protocols for pilots
 - Can be used in review by IEEE and SASB
- Handoff to IEEE-SASB for consideration of implications to IEEE standards development process and associated policies and procedures
- Discussion on IEEE level with respect to governance of IEEE open source initiatives
 - Will need to take under consideration IEEE Standards as one source of IEEE OS activity

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