

Preserving the Royalty-Free Standards Ecosystem

Citation for published version (APA):

Contreras, J. L., Bekkers, R. N. A., Biddle, C. B., Bonadio, E., Carrier, M. A., Chao, B., Duan, C., Gilbert, R., Henkel, J., Hovenkamp, E., Husovec, M., Jakobs, K., Kim, D., Lemley, M. A., Love, B. J., McDonagh, L., Scott Morton, F., Schultz, J., Simcoe, T., ... Xiang, J. (2022). *Preserving the Royalty-Free Standards Ecosystem*. (22-40 ed.) University of Southern California. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4235647

Document license:

Unspecified

Document status and date:

Published: 30/09/2022

Document Version:

Publisher's PDF, also known as Version of Record (includes final page, issue and volume numbers)

Please check the document version of this publication:

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PRESERVING THE ROYALTY-FREE STANDARDS ECOSYSTEM

September 30, 2022

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It has long been recognized in Europe and elsewhere that standards-development organizations (SDOs) may adopt policies that require their participants to license patents essential to the SDO's standards (standards-essential patents or SEPs) to manufacturers of standardized products ("implementers") on a royalty-free (RF) basis.¹ This requirement contrasts with SDO policies that permit SEP holders to charge implementers monetary patent royalties, sometimes on terms that are specified as "fair, reasonable and nondiscriminatory" (FRAND). As demonstrated by two decades of intensive litigation around the world, FRAND royalties have given rise to intractable disputes regarding the manner in which such royalties should be calculated and adjudicated. In contrast, standards distributed on an RF basis are comparatively free from litigation and the attendant transaction costs.² Accordingly, numerous SDOs around the world have adopted RF licensing policies and many widely adopted standards, including Bluetooth, USB, IPv6, HTTP, HTML and XML, are distributed on an RF basis. This note briefly discusses the commercial considerations surrounding RF standards, the relationship between RF standards and open source software (OSS) and the SDO policy mechanisms – including "universal reciprocity" -- that enable RF licensing to succeed in the marketplace.

RF Standards

Though most of the recent case law and scholarly commentary on standards focuses on the vagaries of FRAND licensing commitments, only a small percentage of the standards actually in use around the world today require the payment of patent royalties. Even in the information and communications technology (ICT) sector, where SEPs are most prevalent, major SDOs such as the following have adopted policies requiring RF licensing with respect to some or all of their standards:

- Internet Engineering Task Force (IETF)³
- Worldwide Web Consortium (W3C)⁴
- Organization for the Advancement of Structured Information Standards (OASIS)⁵
- American Petroleum Institute (API)⁶

¹ See, e.g., Am. Bar Assn. Sec. of Antitrust Law, Handbook on Antitrust Aspects of Standard Setting 221 (2nd ed. 2011), Maurits Dolmans, *Standards For Standards*, 26 Fordham Intl. L.J. 163, 183 (2002).

² See notes 17-18, *infra*, and sources cited therein.

³ Internet Engineering Task Force, Intellectual Property Rights in IETF Technology, RFC 8179 § 7.E (May 2017) (strong RF preference for security-related standards).

⁴ Worldwide Web Consor., W3C Patent Policy, Sec. 3.1 (15 Sept. 2020), <https://www.w3.org/Consortium/Patent-Policy-20200915/>

⁵ OASIS Open, Intellectual Property Rights (IPR) Policy § 10.2, https://www.oasis-open.org/policies-guidelines/ipr/#licensing_req (RF policy for selected technical committees).

⁶ Am. Petroleum Inst., Procedures for Standards Development, § 7.3.2.1.b (7th ed., Apr. 2022), https://www.api.org/-/media/Files/Publications/2022_API_Procedures_for_Standards_Development.pdf?la=en&hash=127E785D52D3C4E880D64FEE364E53EF43D81035

- Bluetooth Special Interest Group⁷
- USB Implementers Forum⁸

Empirical studies have found that numerous ICT standards deployed in the field are distributed on an RF basis. One 2014 study of 44 standards embodied in a smartphone found that 18 of these (41%) were royalty-free.⁹ A study of patent disclosures made at IETF over a four-year period found that 59% were subject to RF licensing commitments.¹⁰ And a well-known study of 251 standards embodied in a typical laptop computer found that 22% of these were RF.¹¹

As these examples demonstrate, RF standards exist across a wide range of technologies and markets in the ICT sector, from the Internet and Worldwide Web, which are almost entirely RF, to wireless networking, computing and telecommunications, of which RF licensing is a significant component.

Benefits of RF Standards

RF licensing offers various benefits to SDOs, SDO participants, and markets that rely on RF standards.¹² RF licensing can accelerate the diffusion of standardized technology, facilitate decentralized follow-on innovation, and promote market entry and competition.¹³ One commentator has observed that, “[t]he effect of the Bluetooth SIG’s royalty-free licensing

⁷ Bluetooth Special Interest Group, Bluetooth Patent/Copyright License Agt., § 5 (Jul. 8, 2016), <https://www.bluetooth.com/wp-content/uploads/2019/03/PCLA-ESign-Version-Version-11.pdf>

⁸ USB Implementers Forum, USB 3.0 Adopters Agreement, § 2.1, https://www.usb.org/sites/default/files/USB%203_0%20Adopters%20Agreement%20PDF%20Submission%20Uupdate%2020210617.pdf.

⁹ Ann Armstrong, Joseph J. Mueller & Timothy D. Syrett, *The Smartphone Royalty Stack: Surveying Royalty Demands for the Components Within Modern Smartphones*, (2014), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2443848.

¹⁰ Jorge L. Contreras, *Technical Standards and Ex Ante Disclosure: Results and Analysis of an Empirical Study*, 53 *Jurimetrics* 163, 183 (2013).

¹¹ Brad Biddle, Andrew White & Sean Woods, *How Many Standards in a Laptop? (and Other Empirical Questions)*, in *Proceedings of the 2010 Int’l Telecom Union Section of Telecom. Standardization (ITU-T) Kaleidoscope Academic Conference* 123 at Fig. 2 (2010), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1619440.

¹² Parties with an interest in monetizing SEPs often argue that RF licensing requirements (and any other policy changes that could decrease the profitability of SEP licenses) will discourage participation in standardization activities. Several recent studies tend to refute this hypothesis. See Timothy S. Simcoe & Qing Zhang, *Does Patent Monetization Promote SSO Participation?* (Nov. 29, 2021), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3973585 (finding “little evidence” that SDO policy changes tending to reduce prospects for SEP monetization “caused a decline in participation by patent licensors or reduced innovation in patent-intensive parts of ... SDO”), Contreras, *Ex Ante*, *supra* note 10 (finding no evidence that changes to SDO policies requiring advance disclosure of SEP licensing terms caused measurable negative effects across a number of variables).

¹³ See Martin Husovec, *Standardization, Open Source and Innovation: Sketching the Effect of IPR Policies*, in *The Cambridge Handbook of Technical Standardization Law: Further Intersections of Public and Private Law* 177, 194-95 (Jorge L. Contreras ed., 2019), Jorge L. Contreras, *A Tale of Two Layers: Patents, Standardization and the Internet*, 93 *Denver L. Rev.* 855, 880 (2016), Laura Denardis, *The Global War for Internet Governance* 75-76 (2014).

provisions is to encourage sales growth, increased variety, and innovation in the Bluetooth space, to the benefit not only of makers of Bluetooth products but, also, to consumers of such products.”¹⁴ The benefits that consumers receive through lower prices enabled by RF licensing has been recognized in a recent report commissioned by the European Parliament.¹⁵

RF licensing is also seen in patent pools, including pools that cover standardized technologies. As one commentator observes, “royalty-free licenses (or royalties that are deliberately held below profit-maximizing levels) promote the adoption of technology covered by the pool’s patents.”¹⁶

From a pragmatic standpoint, the simplicity of the typical RF licensing framework dramatically reduces transaction costs associated with manufacturing standardized products over FRAND-based systems.¹⁷ And, as noted above, RF standards generate far fewer disputes and legal challenges than standards subject to FRAND licensing commitments,¹⁸ which have proven notoriously difficult to define with precision.

Finally, RF licensing promotes and supports the growth of innovative communities by inviting new participants, such as OSS developers, to participate in standards development.¹⁹ As one commentator notes, RF licensing can “encourage otherwise hesitant patentees to participate in a collaborative framework” and “reassure potential participants that their involvement in a standards process or open source development will not be abused by potential rivals.”²⁰ As such, RF licensing can be a feature that is “important to the architecture of a collaborative community”.²¹ Or, as Tim Berners-Lee, the principal creator of the Worldwide Web and founder of W3C explained, “By adopting this Patent Policy with its commitment to royalty-free standards

¹⁴ Robert G. Harris, *The Economics of Standard-Setting & Royalty-Free Licensing: The Case of Bluetooth 2* (Oct. 3, 2014).

¹⁵ Luke McDonagh & Enrico Bonadio, *Standard Essential Patents and the Internet of Things*, Policy Dept. for Citizens' Rights and Constitutional Affairs, Directorate Gen. for Internal Policies of the Union, PE 608.854 at 27-28 (Jan. 2019), https://www.europarl.europa.eu/thinktank/en/document/IPOL_IDA.

¹⁶ Richard J. Gilbert, *Ties That Bind: Policies to Promote (Good) Patent Pools*, 77 *Antitrust L.J.* 1, 25 (2010).

¹⁷ Björn Lundell, Jonas Gamalielsson & Andrew Katz, *On Implementation of Open Standards in Software: To What Extent Can ISO Standards be Implemented in Open Source Software?*, 13 *Intl. J. Standardization Res.* 47, 60-63 (2015), Greg R. Vetter, *Open Source Licensing and Scattering Opportunity in Software Standards*, 48 *BOSTON COLL. L. REV.* 225, 247-48 (2007).

¹⁸ See Rudi Bekkers, Christian Catalini, Arianna Martinelli, Cesare Righi, & Timothy Simcoe, *Disclosure Rules and Declared Essential Patents*, 52 *Research Policy* 8 (2023) (finding that patents subject to FRAND commitments have a litigation probability three times larger than a matched non-SEP control group whereas patents subject to RF commitments have lower probability of litigation than matched controls), Mark A. Lemley & Timothy Simcoe, *How Essential Are Standard-Essential Patents?*, 104 *CORNELL L. REV.* 607, 619 (2019) (95% of litigated patents studied were subject to a FRAND commitment, compared to only two RF patents), Contreras, *Two Layers*, *supra* note 13, at 861-64 (comparing litigation rates of Internet and telecommunication/network standards), Jorge L. Contreras, *When a Stranger Calls: Standards Outsiders and Unencumbered Patents*, 12 *J. Comp. L. & Econ.* 507, 530-33 (2016) (finding significantly higher litigation rates among 5 FRAND standards than 2 RF standards).

¹⁹ See Husovec, *supra* note 13, at 195.

²⁰ Eli Greenbaum, *Puzzles of the Zero-Rate Royalty*, 27 *FORDHAM INTELL. PROP. MEDIA & ENT. L.J.* 1, 26 (2016).

²¹ *Id.* at 28.

for the future, we are laying the foundation for another decade of technical innovation, economic growth, and social advancement.”²²

RF Standards and Open Source Software

A major benefit that has emerged from the use of RF licensing for technical standards is the ease with which such standards may be implemented in open source software (OSS). While there is some debate whether FRAND licensing is *technically* incompatible with OSS (particularly OSS projects that utilize a “copyleft” license such as the GNU General Public License),²³ studies have found that, from a practical standpoint, it is sometimes difficult for software developers to obtain FRAND licenses to incorporate standards into OSS projects.²⁴ As a result, OSS developers are often hesitant to incorporate FRAND-based standards into OSS projects.²⁵ By the same token, RF standards are viewed as more amenable to implementation in OSS projects,²⁶ particularly if they utilize recognized OSS licenses.²⁷ It is for this reason that the European Telecommunications Standards Institute (ETSI), which generally permits FRAND licensing for its standards, requires RF licensing of patents under the OSS Apache license in its MANO Open Source project.²⁸

Reciprocity and RF Licensing

A common feature of SEP licenses is a “reciprocity” requirement, whereby the SEP holder agrees to license an implementer only if the implementer grants the SEP holder a comparable license under its own SEPs covering the same standard.²⁹ As explained by the U.S. Department of Justice

²² Jeffrey V. Nickerson & Michael zur Muehlen, *The Ecology of Standards Processes: Insights from Internet Standard Making*, 30 MIS Q. (Special Issue) 467, 469 (2006).

²³ See Husovec, *supra* note 13, at 190-91 (discussing debate), David J. Kappos, *OSS and SDO: Symbiotic Functions in the Innovation Equation*, in *The Cambridge Handbook of Technical Standardization Law: Further Intersections of Public and Private Law* 198, 200-01 (Jorge L. Contreras ed., 2019) (FRAND is compatible with OSS except with respect to GPL-type OSS licenses), Catharina Maracke, *Free and Open Source Software and FRAND-based patent licenses How to mediate between Standard Essential Patent and Free and Open Source Software*, 2019 J. World Intell. Prop. 1, 8-13 (2019) (finding no inconsistency).

²⁴ See Björn Lundell, Jonas Gamalielsson & Andrew Katz, *Implementing IT Standards in Software: Challenges and Recommendations for Organisations Planning Software Development Covering IT Standards*, 10 EUR. J. L. & TECH. (2019), Lundell et al., *ISO Standards*, *supra* note 17.

²⁵ See Husovec, *supra* note 13, at 196.

²⁶ See Lundell et al., *ISO Standards*, *supra* note 17, at 64.

²⁷ See *id.*

²⁸ See Eur. Telecom. Standards. Inst., Open Source Group MEMBER AGREEMENT relating to Open Source Mano, (9 Feb. 2016), attached ETSI OSG OSM CORPORATE Contributor License Agreement (CCLA) at § 3 https://etsisign.eu1.echosign.com/public/agreements/view/CBJCHBCAABAAPINmiMMGu5KKOBd-W_29RUAiB57DxQ6B?readerMode=true&type=widget (“Grant of Patent License” – “You hereby grant to the Project Manager and to recipients of software distributed by the Project Manager a perpetual, worldwide, non-exclusive, no-charge, royalty free ... patent license ...”). See also Husovec, *supra* note 13, at 188; Maracke, *supra* note 23, at 15.

²⁹ See Greenbaum, *supra* note 20, at 27; Intellectual Property Challenges for Standard-Setting in the Global Economy 46 (Keith Maskus & Stephen A. Merrill eds., 2013) [hereinafter NAS Report]; Am. Bar Assn. Comm. on Tech. Standardization, Section Sci. & Tech. L., Standards Development Patent Policy Manual 61 (2007) [hereinafter ABA Patent Policy Manual]. Though, in theory, reciprocity or grantback requirements could extend

Antitrust Division, “[t]his provision mitigates the concern that a firm taking advantage of the commitments others made to the standard can then engage in hold up of the same standard by asserting essential claims it has refused to license on RAND terms.”³⁰ This form of bilateral reciprocity or “grantback” clause is expressly permitted by the policies of numerous SDOs including ITU/ISO/IEC, ETSI, HDMI Forum, NFC Forum and IEEE.³¹

In addition, SDOs such as W3C and OASIS permit SEP holders to require that their licensees grant reciprocal RF licenses not only to the SEP holder, but to *all* implementers of a standard. This form of “universal reciprocity” is intended to “avoid the perceived unfairness of a licensee granting rights to a third party who might assert patents against the [original SEP holder].”³² More importantly, universal RF reciprocity establishes a level playing field across the marketplace, ensuring that no implementer of a standard can obtain an unfair commercial advantage by refusing to make its SEPs available to other implementers while it benefits from the RF licenses of others. The W3C universal RF reciprocity clause has been in effect since the adoption of W3C’s patent policy in 2002.

Universal Reciprocity and Copyleft

In many ways, universal reciprocity resembles the “copyleft” requirement of OSS licenses such as the GPL.³³ These requirements provide that, subject to a few exceptions, a licensee that incorporates OSS code into another software program must redistribute the entire combined program under the same OSS terms.³⁴ The result is an OSS ecosystem in which no participant may turn the OSS code developed by others into proprietary software. Many widely distributed software programs including the Linux and Android operating systems and the WordPress website platform are distributed under GPL licenses.

While litigants have occasionally claimed that copyleft OSS licenses run afoul of the antitrust laws, these challenges have not been successful in the courts. This issue came squarely before the U.S. Court of Appeals for the Seventh Circuit in *Wallace v. IBM*,³⁵ in which the plaintiff, the developer of a software operating system that hoped to compete with Linux, accused the GPL of being “a joint undertaking among users and creators of derivative works to undercut the price of any

beyond the standard as to which the initial license was granted, this brief is concerned only with reciprocity requirements that are limited to that single standard.

³⁰ Letter from Renata B. Hesse, Acting Assistant Att’y Gen., U.S. Dep’t of Justice, Antitrust Div., to Michael A. Lindsay, at 15 (Feb. 2, 2015) [hereinafter DOJ 2015 IEEE BRL].

³¹ See NAS Report, *supra* note 29, at 46; Rudi Bekkers & Andrew Updegrove, *IPR Policies and Practices of a Representative Group of Standards-Setting Organizations Worldwide* at 105-06, Table 11 and 120-22, Commissioned by the Committee on Intellectual Property Management in Standard-Setting Processes. National Research Council, Washington, D.C. (May 2013); DOJ 2015 IEEE BRL, *supra* note 30, at 15.

³² ABA Patent Policy Manual, *supra* note 29, at 62.

³³ This resemblance is not coincidental. The founder of W3C, Tim Berners-Lee, was heavily influenced by the OSS movement when creating W3C. See Andrew L. Russell, *Constructing Legitimacy: The W3C’s Patent Policy*, in *OPENING STANDARDS* 159, 162–64 (Laura DeNardis ed., 2011).

³⁴ See Jorge L. Contreras, *Intellectual Property Licensing and Transactions: Theory and Practice* 609-10 (2022).

³⁵ *Wallace v. IBM*, 467 F.3d 1104 (7th Cir. 2006).

potential rival.” Judge Frank Easterbrook, writing for the court, rejected the plaintiff’s antitrust claims, reasoning that the GPL does not restrain trade, but instead “is a cooperative agreement that facilitates production of new derivative works, and agreements that yield new products that would not arise through unilateral action are lawful.” That is, the open development environment promoted by the GPL, rather than seeking to disadvantage competitors, instead enables the creation of new products that thus promote competition. In response to the plaintiff’s allegation that the GPL was no more than a thinly veiled horizontal price fixing arrangement (i.e., fixing prices at zero), Judge Easterbrook responded that “[c]opyright and patent laws give authors a right to charge more, so that they can recover their fixed costs (and thus promote innovation), but they do not require authors to charge more... Linux and other open-source projects have been able to cover their fixed costs through donations of time; as long as that remains true, it would reduce efficiency and consumers’ welfare to force the authors to levy a charge on each new user.” He concludes that “[t]he GPL and open-source software have nothing to fear from the antitrust laws.”

Judge Easterbrook’s reasoning applies with equal force to universal RF reciprocity requirements in standard-setting. These requirements exist in order to encourage collaborative technology development and broad adoption of standards without the fear of patent litigation or the need to undertake lengthy and costly FRAND negotiations. Like joint ventures in which each participant contributes time, resources and IP to a collaborative project for the benefit of all, the participants in joint standards development are entitled to collaborate without the exchange of monetary compensation and to require that others using the products of their cooperation do the same. So while SDOs like W3C *could* permit their members to charge more for their SEPs (e.g., FRAND royalty rates), nothing in the law requires that they do so.

Finally, while some IP grantback arrangements can reduce licensees’ incentives to engage in further research and development, universal RF reciprocity requirements can offer offsetting procompetitive benefits of promoting the dissemination of the licensees’ patented improvements, increasing incentives to disseminate the licensed standard, increasing competition in and output of standardized products, and creating opportunity for SEP holders to earn profits from the sale of standardized products, all of which may increase SEP holders’ incentives to innovate in the first place.³⁶

Conclusion: Preserving the RF Ecosystem

The European Commission has been asked to consider whether universal RF reciprocity requirements are compliant with EU competition law. As noted above, a large number of standards that are used on a daily basis by billions of consumers depend on the universal RF reciprocity requirements of W3C and other SDOs. RF reciprocity requirements have been shown to yield procompetitive benefits. Calling these requirements into question two decades after they were introduced threatens to disrupt a stable and efficient system that benefits the entire world.

³⁶ U.S. Dept. Justice & U.S. Federal Trade Comm’n, Antitrust Guidelines for the Licensing of Intellectual Property 33-34 (2017) (applying “rule of reason” analysis to grantback requirements).

Moreover, questioning the legality of universal RF reciprocity provisions in SDO policies necessarily implicates the GPL and other copyleft OSS licenses, which have been in use for more than three decades, govern software that is both pervasive and critical to the global technology infrastructure, have been identified as having a significant impact on the European economy,³⁷ and have been reviewed and found to comply with the antitrust laws when challenged in the U.S. Undermining these well-established legal structures could have a potentially serious impact on global standardization, markets for standardized products, and the OSS ecosystem.

³⁷ Knut Blind et al., The impact of Open Source Software and Hardware on technological independence, competitiveness and innovation in the EU economy, Final Study Report, Eur. Comm. Directorate-Gen. for Communications Networks, Content and Technology (2021).