

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)
)
Amendment of Part 0, 1, 2, 15 and 18 of the) ET Docket No. 15-170
Commission's Rules regarding Authorization of)
Radiofrequency Equipment)
)
Request for the Allowance of Optional) RM-11673
Electronic Labeling for Wireless Devices)
)

**COMMENTS OF
SOFTWARE FREEDOM LAW CENTER**

October 9, 2015

Background

On July 21, 2015, the Federal Communications Commission (Commission) released *Amendment of Parts 0, 1, 2, 15 and 18 of the Commission's Rules regarding Authorization of Radiofrequency Equipment; Request for the Allowance of Optional Electronic Labeling of Wireless Devices*, ET Docket No. 15-170, Notice of Proposed Rule Making, 30 FCC Rcd 7725 (NPRM), proposing to update the rules that govern the evaluation and approval of radiofrequency (RF) devices. Currently, the Commission ensures that RF equipment complies with the Commission's technical requirements by requiring authorization, under one of three separate procedures—certification, Declaration of Conformity (DoC), and verification. This NPRM proposes to modify the certification process, while replacing the DoC and verification processes with a single alternative. The proposed rules would also replace requirements that apply only to devices specifically classified as “software defined radios” (SDRs) with broadly applicable rules, while eliminating restrictions on hardware modifications of SDR devices. Software Freedom Law Center submits these comments in response to the NPRM.

About SFLC

The Software Freedom Law Center ("SFLC") is a 501(c)(3) not-for-profit legal services organization providing legal representation and related services in order to protect and advance “free software,” that is, software distributed under copyright licensing terms that give users freedom to copy, modify and redistribute the software. SFLC provides pro bono legal services to non-profit free software developers and distributors, serves for-profit entities where consistent with its mission, and also helps the general public better understand the legal aspects of free software.

Executive Summary

SFLC understands that the Commission can and should modernize its rules regarding the authorization

of RF devices. SFLC does not oppose the issuance of new rules requiring that manufacturers show as part of the authorization process how they design their devices to resist after-market modifications that would involve unauthorized RF transmissions in licensed frequencies or exceeding permitted transmission power. But the Commission has no statutory authority to regulate the software running in general purpose computers, or even the software running in RF transmitter modules that does not involve or define the RF transmission characteristics of the device. Our clients, and the larger community that produces free software, have no interest in interfering with the Commission's rule-making within the scope of its jurisdiction. But any effort by the Commission to regulate how software is licensed that performs all the other functions in, e.g. WiFi routers, access points, or client hardware threatens their freedom to invent.

Not only do our clients have reason to view with alarm any regulatory activity by the Commission that requires measures to prevent community produced software in WiFi and other unlicensed-spectrum devices, all the manufacturers of such devices have reason for concern as well. Free and Open Source Software (FOSS), is the standard building material for software in all such devices, with few and inconsiderable exceptions. From Android handsets and tablets interacting with WiFi networks, to laptops and desktop computers performing data processing tasks over wireless networks, to the network appliances themselves, manufacturers throughout the global industry rely on free software and community development. Without the freedom to invent software for sharing—by communities of individuals, university research teams, and the employees of manufacturers—inexpensive, ubiquitous networking hardware would not exist.

As other commentators have also pointed out at length, research into and the development of solutions for current network architecture failures, and prototypes for future Internet architectures, are only possible given the modifiability of software in networking devices. Only using community

development resources can manufacturers hope to stay abreast of the full range of challenges and opportunities in the technical environment. Over-regulation of software innovation threatens to hamper the ecosystem the Commission is seeking to foster.

SFLC believes that the Commission's regulatory initiative in this area, while welcome, is at risk of exceeding the statutory authority to regulate transmission devices. Any rule requiring manufacturers to show that the software in their devices *not* responsible for controlling RF transmission parameters is unmodifiable by users would not only surpass the Commission's authority, it would have a directly destructive effect on the spread, modernization, and security of the Internet in the United States.

In updating its authorization processes, the Commission should, in our view, take the opportunity to clarify decisively this aspect of its regulatory strategy. Either itself, or through staff action, the Commission should issue a policy statement, specifically supporting the use of community developed or free software in networking devices, including especially those containing RF transmitters in unlicensed spectrum ranges. The Commission should specifically recognize the benefits flowing to manufacturers and society as a whole from the availability of high-quality software produced by non-profit communities in the provision of networking to small businesses and consumers. The Commission should state that "security through obscurity," preferring proprietary software over software whose source code is publicly available, does not meaningfully enhance the security of software used to define the operating characteristics of software-defined radios. In this context, action by the Commission to require manufacturers to show adequate efforts to prevent illegal after-market modification of RF operating parameters is both appropriate and desirable.

Analysis

I. THE COMMISSION'S JURISDICTION DOES NOT EXTEND TO SOFTWARE IN DEVICES THAT DOES NOT AFFECT THE OPERATION OF RF TRANSMITTERS OR CREATE INTERFERENCE

The Commission is a statutory body with a grant of jurisdiction strictly defined by Congress. It has the power to regulate “interstate and foreign commerce in communication by wire or radio.”¹ Commission also has “ancillary jurisdiction”, to make rules and regulations necessary for the execution of its primary functions.² The commission has the power to make “reasonable regulations ... governing the interference potential of devices which in their operation are capable of emitting radio frequency energy....”³ These regulations must be consistent with public interest, convenience and necessity. Although courts recognize that Commission has been afforded “wide latitude”, in its supervision over communication by wire, it was not delegated unrestrained authority.⁴ Thus, while the Commission’s jurisdiction reasonably extends to regulating the marketing and sale of devices that create active radio interference, it does not extend to such activities as the construction of buildings that might interfere with radio signals.⁵

Let us imagine a point-of-sale device with IEEE 802.11 “WiFi” communications capabilities. The software in that device that performs sales, inventory control, pricing and customer relations functions is not subject to the Commission's regulatory jurisdiction. The Commission cannot require manufacturers to show that only they can modify the software in the device performing these functions, or that it denies the businesses that buy these devices the right to repair or modify the software in them, or to have that work done for them by third parties. The boot-loader, operating system, and application

1 47 U.S.C. § 151

2 47 U.S.C. § 154(i)

3 47 U.S.C. § 302(a)

4 *Commission v. Midwest Video Corp.*, 440 U.S. 689 (U.S. 1979)

5 *Ill. Citizens Comm. for Broad. v. FCC*, 467 F.2d 1397 (7th Cir. 1972)

program stack installed on a handset, laptop or tablet sold to a consumer lie similarly outside the range of the Commission's power to regulate, except insofar as the precise software component involved either controls the RF transmission parameters of a transmitter-module in the device, or so operates as to cause RF interference. “FCC *never* has possessed ancillary jurisdiction ... to regulate [software] that can be used for receipt [or transmission] of radio communication when that [software] is not engaged in the process of radio or wire transmission.”⁶

II. OVERREGULATION OF SOFTWARE IN WIRELESS DEVICES WILL STALL INNOVATION AND ENDANGER THE OPERATION AND SECURITY OF THE INTERNET

Even when regulating within the scope of its jurisdiction, the Commission must be careful of the unintended consequences of over-regulation. The Internet we know today is largely the outgrowth of “user innovation” by parties at the edge of the network empowered to institute new services, modify the provision of existing services, and change the way network communication and routing occurs. Innovations in data and network security, for example, from PGP to SSH to SSL and OpenVPN have emerged from the free software communities, rather than the equipment manufacturers.

The Commission wishes, as the NPRM makes clear, to increase manufacturers' flexibility to modify the hardware in software-defined radios more easily than the preexisting authorization procedures allowed. But by removing the designation of “SDRs,” and applying controls over software modifiability broadly, across a larger range of devices and to the limits of its statutory jurisdiction, the Commission is reducing flexibility far more important to the health of the Internet than the flexibility it is creating for manufacturers to modify hardware after authorization.

After-market modification of software in wireless devices (routers, access points, and terminal equipment) is the route to increased security and functionality for enterprise and individual users alike. Network congestion problems, like the “Bufferbloat” issue referred to by other commentators, may

⁶ American Library Association v. FCC, 406 F.3d 689, 705 (D.C. Cir. 2005)

result from errors in the TCP/IP protocol stack implementation in router firmware. The ability to alter encryption algorithms, hash functions, or other security-related code inside routers may be necessary in order to respond to security challenges posed, for example, by progress in establishing the vulnerabilities in existing algorithms.

Research in future Internet architectures has been and will be conducted through, among other means, the modification of router firmware. Manufacturers, as the Commission itself noted in 2007,

may wish to use open source (for example GNU/Linux) in developing software-defined radios. The use of such software may have advantages for manufacturers such as lower cost, and decreased product development time.⁷

For these manufacturers (whose use of GNU/Linux and other free software has increased substantially in the last ten years), regulation preventing tinkering by individual developers and non-profit development communities would kill the goose that has laid these golden eggs. If the purpose of this NPRM is “set[ting] the stage to prevent [the Commission's] rules from becoming a hindrance to innovation and creativity” as declared by Commissioner Michael O’Rielly⁸, then the Commission must recognize that, even within the scope of its jurisdiction to regulate the software that directly controls the operating parameters of RF transmission, it must tread carefully to avoid cutting off the sources of innovation and of low-cost high-quality software on which manufacturers depend.

Conclusion

SFLC applauds the Commission for efforts to increase manufacturers' flexibility and access to innovative software for the further expansion of wireless Internet services. We urge the Commission to weigh carefully the risks and benefits to the Net of regulations on user innovation and after-market

7 Memorandum Opinion and Order at page 3, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-07-66A1.pdf (quoting Cognitive Radio Report and Order at 5504; 47 C.F.R. §2.1).

8 *Amendment of Parts 0, 1, 2, 15 and 18 of the Commission’s Rules regarding Authorization of Radiofrequency Equipment; Request for the Allowance of Optional Electronic Labeling of Wireless Devices*, Notice of Proposed Rulemaking, 30 FCC Rcd 7725, 7813 (2015) (Statement of Commissioner Michael O’Rielly)

software modification. We look forward to working with manufacturers and the Commission to provide the most secure and robust Net possible, based on software that respects both regulatory standards and users' rights.

Respectfully submitted,

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