

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of

Unlicensed Use of the 6 GHz Band

Expanding Flexible Use in Mid-Band
Spectrum between 3.7 and 24 GHz

ET Docket No. 18-295

GN Docket No. 17-183

REPLY COMMENTS OF APPLE INC.

The record in this proceeding confirms that the Commission can make the 6 GHz band available for innovative unlicensed uses while protecting incumbent operations.¹ But as the comments of network operators, technology companies, and public interest organizations illustrate, the FCC should not adopt rules that put users' privacy at risk.² The Commission

¹ See, e.g., Comments of Apple Inc., Broadcom Inc., Cisco Systems, Inc., Facebook, Inc. Google LLC, Hewlett Packard Enterprise, Intel Corporation, Marvell Semiconductor, Inc., Microsoft Corporation, Qualcomm Incorporated, and Ruckus Networks, an ARRIS Company ("RLAN Group Comments"); Comments of the Boeing Company; Comments of Broadcom Inc.; Comments of Dynamic Spectrum Alliance; Comments of GE Healthcare; Comments of Hewlett Packard Enterprise Company; Comments of Microsoft Corporation; Comments of Open Technology Institute at New America, American Library Association, Consumer Federation of America, COSN—Consortium for School Networking, Public Knowledge, Access Humboldt ("Public Interest Organizations Comments"). Unless otherwise noted, all comments were filed in ET Docket No. 18-295 and GN Docket No. 17-183 on Feb. 15, 2019.

² See, e.g., Comments of Broadcom Inc. ("Registering individual RLAN devices would require the collection, verification, protection, and synchronization of data on millions of individual consumers' devices . . . the collection and maintenance of such data would reduce the consumer appeal of RLAN devices by creating privacy concerns."); Comments of NCTA – The Internet and Television Association at 14 ("The Commission should in no event require *device-specific* identifiers, which would . . . implicate complicated user privacy concerns without corresponding benefits.") (emphasis in original); Public Interest Organizations Comments at 28 (a "device registration requirement . . . will deter use and invade privacy if applied to individuals purchasing what we hope will continue to be off-the-shelf and do-it-

should not require companies to conduct overbroad data collections or disclose consumer data as a condition of accessing the 6 GHz band. Fortunately, such inappropriate regulations are not needed to protect incumbents.

1. Device Identification and Tracking Requirements Threaten User Privacy.

Registration of access points and other 6 GHz devices in combination with a requirement for them to provide a unique identifier and their location creates substantive privacy risks.³ This effectively would create a permanent history of a device’s locations in a third party system that can be linked to individuals’ real-world identities.⁴ However, some commenters have asked that the Commission mandate these and even more extensive tracking requirements.

For example, Verizon argues that the FCC should require every 6 GHz access point—including every consumer’s home Wi-Fi router—to register a persistent identifier with Automated Frequency Control (“AFC”) systems to “enable[] the collection and tracking of user statistics,” including the “quantity of devices and how they are distributed in an area.”⁵ Comsearch would go further, urging the Commission to require “all unlicensed devices” to disclose information that includes (1) the device’s serial number, (2) its location information, and

yourself gear for indoor-only home and business use”); RLAN Group Comments at 64–66 (“The NPRM asks about the appropriateness of (1) requiring registration of AFC-controlled devices, (2) directing these devices to periodically transmit a unique identifier, and (3) mandating that AFC systems log the frequencies used by AFC-controlled RLAN devices. Such rules are unnecessary, would be ineffective in mitigating interference, would greatly reduce consumer use of the 6 GHz band, would limit AFC implementation choices to one or two existing models similar to the TV White Spaces database, and would present consumer privacy threats.”).

³ See Comments of Apple Inc. at 15.

⁴ *Id.* at 16.

⁵ Comments of Verizon at 6.

(3) the name and contact information of the person responsible for the device.⁶ Other commenters similarly maintain that the FCC’s rules should mandate collection and storage of identifiable information for devices that communicate with AFCs—and in some cases client devices as well.⁷

It is unclear what limitations, if any, are proposed to be placed on entities that would obtain such information under these proposals. Indeed, some commenters envision that AFCs would affirmatively disclose this information to third parties.⁸ Mandating the disclosure of such data, and creating databases of such information—which, again, could be an identifiable history of an individual’s location—creates risks not only based on the unlimited potential *permissible* uses of such information, but also security risks that such data could be accessed by unauthorized third parties.

A proposal by GCI Communications Corp. shows how 6 GHz device tracking and disclosure could work in practice. According to GCI, AFCs should implement “[a] method of

⁶ Comments of Comsearch at Attachment A, tbl.3 (emphasis added).

⁷ See, e.g., Comments of GCI Communication Corp. at 7–8 (“GCI Comments”) (stating that AFC must provide the ability to locate and contact interfering users); Joint Comments of the Government Wireless Technology & Communications Association, Los Angeles County, California, City and County of Denver, Colorado, San Bernardino County, California Ozaukee County, Wisconsin, The Regional Wireless Cooperative, and City of Kansas City, Missouri at 7 (“[M]erely having each unit transmit an occasional identification is insufficient . . . unit registration with the AFC must also include inputting information tying the unit to a party responsible for the unit’s operation.”); Comments of Motorola Solutions, Inc. at 5 (“Incumbents should be provided with a single point of contact to report interference issues.”); Comments of Sony Electronics Inc. at 6 (“[A]ccess points should report contact information for the device operator, and for the professional installer . . . to the AFC system.”). See also Comments of the National Public Safety Telecommunications Council at 11 (“NPSTC Comments”) (“The AFC should maintain a list of registered access points, accessible by unit ID and location, that can be accessed in the event an interference problem arises.”).

⁸ See *supra* note 7.

locating and tracking secondary, unlicensed users automatically.” “All users of the 6 GHz band” would then be eligible to obtain this information.⁹ This is necessary, GCI asserts, because “equipment in the field needs to be able to query the AFC database to look for nearby users,” and “[t]o resolve interference, the users need to be able to contact an interfering user.”¹⁰ Although GCI’s proposal represents an expansive information disclosure requirement, attempts to limit such disclosure—e.g. to incumbents—would still result in sensitive data being available to numerous third parties, and any breach or other disclosure of the databases containing this information could affect large numbers of individuals.

In short, these incumbents envision a set of rules in which unlicensed users of the 6 GHz band must surrender information about their current and historic location as well as information associated with their real-world identity as a condition of spectrum access. The Commission should reject their proposals, which are fundamentally inconsistent with users’ privacy rights.

Finally, the City of Los Angeles suggests that pervasive information collection and disclosure requirements are consistent with protecting user privacy if such collection involves only the “data necessary to identify and contact Access Point operators, not necessarily their individual users or client devices.”¹¹ However, the Commission cannot negate privacy risks by confining collection of sensitive information to access points that must interface directly with AFCs. Although access points would likely include devices such as enterprise routers, they would also include other devices—including devices operated by consumers—that create networks rather than joining another party’s already-established network. Indeed, the City of

⁹ GCI Comments at 7–8.

¹⁰ *Id.* at 8.

¹¹ *See* Comments of the City of Los Angeles at 14.

Los Angeles argues that “*all* access points operating in the 6 GHz band”—“even lower-power access points”—should be tracked.¹² In these cases, the access point will likely be serving a small number of users—if not a single user—and the owner of the access point and devices using it will often be one and the same (e.g. in the case of a residence’s access point). Registration of such devices and information logging requirements therefore will likely involve data directly associated with individual end users.

2. FCC Rules Can Protect Incumbents Without Sacrificing User Privacy.

Unfounded assertions that 6 GHz device operations would interfere with incumbents should not justify the pervasive collection, tracking, and disclosure of identifying information for 6 GHz devices. The Commission, as the expert agency, will select appropriate operating parameters for unlicensed devices that provide sufficient protection for incumbents, just as it has for other frequency bands. In the U-NII-5 and U-NII-7 bands, this will include using AFCs to identify permissible operating frequencies.

Even if this were not the case, data collection proponents fail to explain how logging information would establish that a device is the source of harmful interference. As set forth in greater detail in the RLAN Group Reply Comments, in urban areas, there are likely to be numerous RLAN devices under AFC control.¹³ Investigation could reveal the source of interference using conventional direction-finding and other techniques, but these methods do not

¹² See *id.* at 14–15 (emphasis added).

¹³ Reply Comments of Apple Inc., Broadcom Inc., Cisco Systems, Inc., Facebook, Inc. Google LLC, Hewlett Packard Enterprise, Intel Corporation, Marvell Semiconductor, Inc., Microsoft Corporation, Qualcomm Incorporated, and Ruckus Networks, an ARRIS Company at 34-35 (filed Mar. 18, 2019) (“RLAN Group Reply Comments”).

require a separate database of potential interferers.¹⁴ A database also would not be able to definitively associate a device in the database with an interference event that took place in the past.¹⁵

Several commenters also suggest that users could illegally modify their devices, citing FCC enforcement action related to Terminal Doppler Weather Radar (“TDWR”) interference in the 5 GHz band in which modified unlicensed devices transmitted in a non-compliant manner that caused interference to those systems.¹⁶ It is true that the Enforcement Bureau took swift action against AT&T, Motorola, and others related to TDWR interference concerns.¹⁷ But the Bureau’s successful efforts in that band illustrate why it would be unnecessary for incumbents to attempt to engage in self-help using sensitive information about 6 GHz device users—and certainly do not argue for violating consumer privacy with unprecedented rules that Wi-Fi users must disclose personal information to use a band.

Significantly, moreover, subsequent adjustments to the Commission’s U-NII regulatory framework also demonstrate that technical rules can effectively address incumbents’ concerns without compromising user privacy. In its First Report and Order revising the U-NII rules, the Commission implemented a requirement that devices include security features that would prevent end users from modifying the device to operate in a non-compliant manner.¹⁸ As the

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ *See, e.g.,* Comments of CTIA at 17–18; Comments of EIBASS at 6; NPSTC Comments at 5.

¹⁷ *See, e.g., AT&T Inc., San Juan PR*, Forfeiture Order, 27 FCC Rcd. 10803 (EB 2012); *Motorola Inc.*, Order, 25 FCC Rcd. 3601 (EB 2010).

¹⁸ *See generally* *Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, First Report and Order, 29 FCC Rcd. 4127 (2014); 47 C.F.R. § 15.407(i).

Commission explained, the changes it made to the U-NII technical rules—including the device security requirement—“would have prevented most of the harmful interference cases that we have observed to date, and . . . will prevent future interference cases.”¹⁹ This is exactly what has transpired in the 5 GHz band, where millions of compliant U-NII devices utilizing the updated security features co-exist with TDWR operations without compromising privacy.

* * * *

The Commission should move forward with rules for the 6 GHz band that will protect incumbents while enabling a wide range of innovative unlicensed uses. But the 6 GHz band will only be a success if these rules do not create substantial privacy risks. The Commission should therefore reject calls to force users to make an unnecessary choice between protecting their privacy and accessing the 6 GHz band.

Respectfully submitted,

/s/ Maria Kirby

Maria Kirby
Senior Policy Counsel

Mark Neumann
Senior Manager
Regulatory Engineering

APPLE INC.
801 Pennsylvania Ave NW
Suite 915
Washington DC 20004
202-772-9500

March 18, 2019

¹⁹ *Id.* ¶ 70.