PUBLIC NOTICE

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THE OFFICE OF ENGINEERING & TECHNOLOGY SEEKS ADDITIONAL INFORMATION REGARDING CLIENT-TO-CLIENT DEVICE COMMUNICATIONS IN THE 6 GHZ BAND

ET Docket No. 18-295; GN Docket No. 17-183

Comment Date: [30 days after date of publication in the Federal Register]
Reply Comment Date: [60 days after date of publications in the Federal Register]

In this Public Notice, the Office of Engineering and Technology seeks additional information to supplement the record on whether the Commission should permit direct communications between client devices. In the *6 GHz Notice*, the Commission broadly proposed to allow low-power indoor devices in the 6 GHz band.[1] In its *6 GHz Order* adopted in April 2020, the Commission authorized two types of Unlicensed National Information Infrastructure (U-NII) devices—standard-power and low-power indoor device operations—in the 5.925-7.125 GHz (6 GHz) band.[2] Standard-power access points can operate in the U-NII-5 and U-NII-7 bands and require use of an automated frequency coordination (AFC) system for providing access to spectrum in the band (including the enforcement of exclusion zones where these devices cannot operate). Low-power indoor access points can operate across the entire 6 GHz band but at lower power levels than standard power operations. Client devices operate under the control of either a standard-power or low-power indoor access point and communicate using power levels that depend on the type of access point to which they are connected.[3] To ensure that client devices not associated with standard power access points transmit indoors, the Commission required that these devices operate under the control of an indoor access point and prohibited 6 GHz U-NII client devices from directly communicating with one another.[4]

In the *6 GHz Further Notice*, the Commission sought comment on additional actions that it should take to further expand unlicensed operations in the band through revisions to the existing rules for standard-power or low-power indoor operations or by authorizing a third type of operation, very low power operations.[5] Among the comments filed, unlicensed proponents requested that the Commission modify its low-power indoor device rules to permit client-to-client device communications, which they

[1] *Unlicensed Use of the 6 GHz Band*, Notice of Proposed Rulemaking, 33 FCC Rcd 10496, 10518, para. 59 (2018) (*6 GHz Notice*).

[2] *Unlicensed Use of the 6 GHz Band*, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 3852 (2020) (*6 GHz Order* and *6 GHz Further Notice*, respectively).

[3] *6 GHz Order*, 35 FCC Rcd at 3860, paras. 17-18.

[4] *6 GHz Order*, 35 FCC Rcd at 3926, para. 199; 47 CFR § 15.407(d)(5).

[5] *6 GHz Further Notice*, 35 FCC Rcd at 3938-45, paras. 231-55.

assert would enable additional types of innovative unlicensed operations in the band.[6] The Fixed Wireless Communications Coalition opposes any such revisions and asserts that there is no record support for permitting client-to-client communications in this band.[7]

In the *6 GHz Order*, the Commission prohibited unlicensed client devices from acting as "mobile hotspots" because "[p]ermitting a client device operating under the control of an access point to authorize the operation of additional client devices could potentially increase the distance between these additional client devices and the access point and increase the potential for harmful interference to fixed service receivers or electronic news gathering operations."[8] To avoid this situation, the Commission's rules prohibit 6 GHz U-NII client devices from directly communicating with one another.[9] The Commission did not, however, examine whether a more limited approach to indoor client-to-client communications within the ambit of the *6 GHz Notice* should be permissible—e.g., when a client is *not* acting as a mobile hotspot. Accordingly, Apple, Broadcom et al. suggest that client devices be permitted to directly communicate with each other if they can decode an enabling signal transmitted by a low-power indoor access point within the last four seconds.[10] They suggest that the Commission could further constrain client-to-client communications by requiring that the enabling signal be received at a signal strength of at least -99 dBm/MHz. According to Apple, Broadcom et al., as a client device could communicate at this signal level with a low-power indoor access point in a traditional access-point-to-client topology under the existing rules, this would ensure each individual client participating in client-to-client communications is safely inside the area where a client device is authorized to communicate with an access point.[11]

We take this opportunity to invite interested parties to supplement the record, for the Commission's consideration, on whether and under what circumstances client devices could be permitted to directly communicate with each other in a limited manner consistent with the rationale underlying the Commission's decisions in the *6 GHz Order* that were targeted at protecting incumbent licensed services.. More specifically, we invite comment on whether the Commission should permit 6 GHz U-NII client devices to directly communicate when they are under the control of or have received an enabling signal from a low-power indoor access point. As an initial matter, commenters should explain how they define an enabling signal, what characteristics it must have, how it is similar or different from signals, such as beacons, that access points already use to connect with client devices, and the degree to which an enabling signal would tether a client device not under the direct control of an access point to that access point. Commenters should also provide information on the types of applications that direct client-to-client communications would enable that cannot be accomplished by communications through an access point. In addition, commenters advocating for rule changes should address whether direct client-to-client communications should be under the current power limits or restricted to lower power limits to reduce the potential for harmful interference to incumbent operations. In this connection, we note that client devices

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[6] *See, e.g.*, Apple, Broadcom, Google, and Microsoft Comments at 13-14; Wi-Fi Alliance Comments at 19-20; Qualcomm Comments at 7; Dynamic Spectrum Alliance Comments at 19-20; Broadcom, Microsoft Reply at 3-4; Apple, Intel, and Microsoft Oct. 22, 2020 *Ex Parte* at 1-2; Apple, Broadcom et al. Nov. 6, 2020 *Ex Parte* at 1-2.

[7] Fixed Wireless Communications Coalition Dec. 3, 2020 *Ex Parte* at 1-2. We note that the Fixed Wireless Communications Coalition also contends that the Commission has not provided adequate notice for revising the existing rules regarding low-power indoor client-to-client device communications. *Id.*

[8] *6 GHz Order*, 35 FCC Rcd at 3927, para. 202.

[9] 47 CFR § 15.407(d)(5) (stating that "[c]lient devices are prohibited from connecting directly to another client device").

[10] Apple, Broadcom et al. Nov. 6, 2020 *Ex Parte* at 1-2. Other submissions by unlicensed proponents also support permitting client-to-client communications. *See, e.g.*, Apple, Broadcom, Google, and Microsoft Comments at 13-14; Wi-Fi Alliance Comments at 19-20; Qualcomm Comments at 7; Dynamic Spectrum Alliance Comments at 19-20; Broadcom, Microsoft Reply at 3-4; Apple, Intel, and Microsoft Oct. 22, 2020 *Ex Parte* at 1-2.

[11] *Id*. at 2.

under the control of a low-power indoor access point are permitted to operate up to 24 dBm EIRP over 320-megahertz channels (or -1 dBm/MHz).

As the *6 GHz Order* explained, the requirement that 6 GHz U-NII client devices operate under the control of either a standard-power or low-power indoor access point is designed to prevent client devices from causing harmful interference by limiting their operation either to outdoors in areas where the AFC system has determined that interference will not occur or to indoor locations where other factors such as building entry loss prevent harmful interference.[12] In particular, operations under the control of a low-power indoor access point is aimed at restricting operation of the client devices to indoor locations. It may be possible for a client device to receive an enabling signal from an access point even when the enabling signal is too weak to enable the client device to conduct communications with the access point. In such situations, the weak received signal level makes it more likely that the client device could be outdoors. By requiring the enabling signal have a specific signal strength, this problem could be potentially avoided. If the Commission were to adopt rules permitting client-to-client communications, should it require the enabling signal from the low-power indoor access point to be received by the client device with a particular signal level? Apple, Broadcom et al. suggested -99 dBm/MHz: is this level appropriate? If not, what signal level would be appropriate for this purpose? How can a specific signal level be correlated with the current requirement that the client device be under the control of an access point? For example, under such an approach, should the enabling signal level be of such a strength to effectively require that the signal levels between the access point and client device be sufficiently strong to permit bi-directional communications between the client devices and the access point, thereby ensuring that both client devices are sufficiently close to the access point? How frequently should a client device be required to receive an enabling signal to continue transmitting to another client device?

If permitted, should the client devices be limited to receiving an enabling signal from the same access point or could client-to-client communications be permitted so long as each client device receives an enabling signal from any authorized access point? Apple, Broadcom et al.'s suggestion would potentially permit two client devices to communicate even if they receive enabling signals from two different access points. For example, client devices in two different buildings receiving enabling signals from different low-power indoor access points could attempt to communicate with each other. Would permitting this to occur increase the potential for the client devices to cause harmful interference to licensed services? How would a requirement for both devices to receive an enabling signal from the same access point be implemented? Or should other configurations be permitted? For example, could a client device controlled by a standard power access point be permitted to communicate with a client device controlled by a low-power indoor access point? Could client-to-client communications be permitted between devices when both clients are controlled by a standard power access point? If so, are any changes needed to the AFC systems? Must the enabling signal be received on the same channel for each device under any of the scenarios contemplated? Under any envisioned client-to-client communication scenario, commenters should provide detailed descriptions of how such communications can be enabled including how such communications fit under the current rules that limit client devices to operating only under the control of a standard power access point or a low-power indoor access point or whether, and which, rules would need to be modified. Commenters should provide detailed analysis of how any client-to-client communication configurations they prefer would protect incumbent operations from harmful interference. Finally, commenters should provide any other information they believe relevant to evaluating whether direct client-to-client communications consistent with the rationale of the Commission in the *6 GHz Order* should be permitted, including any alternative methods or necessary rule changes not directly noted above.

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[12] *6 GHz Order*, 35 FCC Rcd 3926, para. 199.

Interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS). *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: http://www.fcc.gov/ecfs/.
- Paper Filers: Parties who choose to file by paper must file an original and one copy of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

  Filings can be sent by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

  - Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9050 Junction Drive, Annapolis Junction, MD 20701.
  - U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington, DC 20554.
  - Effective March 19, 2020, and until further notice, the Commission no longer accepts any hand or messenger delivered filings. This is a temporary measure taken to help protect the health and safety of individuals, and to mitigate the transmission of COVID-19. See FCC Announces Closure of FCC Headquarters Open Window and Change in Hand-Delivery Policy, Public Notice, DA 20-304 (March 19, 2020), https://www.fcc.gov/document/fcc-closes-headquarters-open-window-and-changes-hand-delivery-policy.

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Ex Parte Rules. The Commission has treated this proceeding as a "permit-but-disclose" proceeding in accordance with the Commission's *ex parte* rules.[13] Persons making *ex parte* presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must: (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made; and (2) summarize all data presented and arguments made during the presentation.

If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter's written comments, memoranda, or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with section 1.1206(b) of the Commission's rules.[14] In proceedings governed by section 1.49(f) of the rules or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and

[13] *See id.* §§ 1.1200 *et seq*.

[14] *Id.* § 1.1206(b).

must be filed in their native format (e.g., .doc, .xml, .ppt, searchable .pdf).[15] Participants in this proceeding should familiarize themselves with the Commission's *ex parte* rules.

Additional Information. For further information, contact Nicolas Oros of the Office of Engineering & Technology, at (202) 418-0636, or Nicholas.Oros@fcc.gov.

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[15] *Id.* § 1.49(f).