IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

INTERDIGITAL TECHNOLOGY CORPORATION, IPR LICENSING, INC., INTERDIGITAL COMMUNICATIONS, INC., INTERDIGITAL HOLDINGS, INC., and INTERDIGITAL, INC.,	:	
Plaintiffs,	:	
v.	:	C.A. No. 19-1590-LPS
LENOVO HOLDING COMPANY, INC., LENOVO (UNITED STATES) INC., and MOTOROLA MOBILITY LLC,	:	
Defendants.	:	

Neal C. Belgam, Eve H. Ormerod, SMITH, KATZENSTEIN & JENKINS LLP, Wilmington, Delaware

David S. Steuer, Michael B. Levin, Maura L. Rees, Ryan R. Smith, WILSON SONSINI GOODRICH & ROSATI, Palo Alto, California

Attorneys for Plaintiffs

Jack B. Blumenfeld, Rodger D. Smith II, Cameron P. Clark, MORRIS, NICHOLS, ARSHT & TUNNELL LLP, Wilmington, Delaware

Joseph A. Micallef, Scott Border, SIDLEY AUSTIN LLP, Washington, DC

Richard A. Cederoth, SIDLEY AUSTIN LLP, Chicago, Illinois

Melissa Colón-Bosolet, Ketan V. Patel, SIDLEY AUSTIN LLP, New York, New York

Attorneys for Defendants

MEMORANDUM OPINION

May 10, 2021
Wilmington, Delaware

STARK, U.S. District Judge:

Plaintiffs Interdigital Technology Corporation, IPR Licensing, Inc., Interdigital Communications, Inc., Interdigital Holdings, Inc., and Interdigital, Inc. (collectively, "Plaintiffs" or "Interdigital") filed suit against Defendants Lenovo Holding Company, Inc., Lenovo (United States) Inc., and Motorola Mobility LLC (collectively, "Defendants" or "Lenovo") on August 28, 2019, alleging infringement of U.S. Patent Nos. 8,427,954 (the "'954 Patent"); 8,085,665 (the "'665 Patent"); 8,199,726 (the "'726 Patent"); 9,456,449 (the "'449 Patent"); 8,675,612 (the "'612 Patent"); 8,797,873 (the "'873 Patent"); 8,619,747 (the "'747 Patent"); and 9,203,580 (the "'580 Patent"). (D.I. 1; *see also* D.I. 19 (amended complaint))[1]

Interdigital provides the following summary of the patents-in-suit:

> When the original patent application for the '954 and '665 Patents was filed back in 2000, cellular telephone networks "were intended to support voice communications, as compared to the digital communication protocols needed for Internet packet-oriented communications." ('665 patent at 1:33-36) "Voice communication requires a continuous duplex connection, that is, a user at one end of a connection expects to be able to transmit and receive to a user at the other end of a connection, while at the same [time] the user at the other end is also transmitting and receiving." (*Id.* at 1:45-49) In contrast, "access to Web pages over the Internet in general is burst-oriented. Typically, the user of a remote client computer first specifies the address of a Web page to a browser program. The browser program at the client computer then sends the request . . . . The Web server then responds with the content of the required Web page . . . ." (*Id.* at 1:51-59)
>
> Against this backdrop, the '665 and '954 patents explain that "[a] particular problem exists with efficiently adapting communication systems which use on-demand multiple access techniques in the physical layer to efficiently handle the TCP/IP message traffic which is prevalent in Internet communications." (*Id.* at 2:28-32) As a solution, the patents "make[] use of time slots to allocate specific channels on a demand basis. Thus, for example, a given

[1] Also proceeding in this Court are antitrust claims filed by Lenovo against Interdigital. (*See* C.A. No. 20-493-LPS)

forward link channel is allocated for only a predetermined time slot duration and only upon user request." (*Id.* at 2:52-55)

. . .

The '726 patent improves cellular handset operation by reducing the number of bits to transmit downlink channel quality information through generating a compact channel quality report based on a first channel quality measurement and differentials of channel quality for individual downlink resources. ('726 patent at 4:63-5:4) The related '449 patent improves cellular handset operation by allowing a wireless handset (or other receiver) the ability to use different downlink resources depending on a particular allocation from the base station. (*See, e.g.*, '449 patent at claim 1) The receiver then indicates to the base station a modulation and coding set (MCS) that it has determined based on the channel quality of the allocated downlink resources. (*Id.*) The related '612 patent improves cellular handset operation by transmitting to the base station derived channel qualities, which indicate a MCS, in a pattern of time intervals. ('662 patent at 2:37-54)

. . .

As the specification for the '873 patent explains, "[t]he Third Generation Partnership Project (3GPP) Release 6 defines fast control of wireless transmit/receive unit (WTRU) transmissions through Node-B based scheduling in HSUPA." ('873 patent at 1:26-29) The inventor identified a specific deficiency with the HSUPA design and focused his invention on improving handsets utilizing that standard. (*Id.* at 1:18-22) While HSUPA permitted sending data in packet data units (PDUs), it had no provision for sending fractions of PDUs. (*Id.* at 2:3-11) Consequently, HSUPA required a minimum instantaneous bit rate for the WTRU to transmit data. (*Id.*) The minimum bit rate, in turn, translated into a minimum power, below which the WTRU could not transmit data. (*Id.*) The inventor discovered situations in which transmission of scheduling requests could be "blocked" if the granted power ratio fell below the minimum needed. (*Id.* at 2:12-15) As a solution, the inventor proposed improving the cellular handset to trigger the transmission of scheduling information to a Node-B in response to the WTRU having a non-zero grant smaller than needed, thus preventing the WTRU from transmitting a PDU of any MAC-d flows. (*Id.* at 2:66-3:9)

. . .

> The related '747 and '580 patents improve latency and efficiency of channel usage for cellular networks having an evolved NodeB (eNB) base-station when there is varied traffic in the 16 system by providing for a non-contention based (NCB) uplink control channel. ('747 patent at 1:65- 2:7, 2:11-15) The NCB uplink control channel operates with multiple wireless transmit/receive units (WTRU), and is allocated for use by the WTRUs to transmit scheduling requests over the NCB uplink control channel. (*Id.* at 4:53-62) The presence of a "burst" indicates a scheduling request to the eNB. (*Id.* at 4:20-28) This approach minimizes overhead associated with sending uplink control information and scheduling requests for uplink resources and lowers the latency for the uplink transmissions.

(D.I. 76 at 2-3, 7, 12, 15-16)

The parties submitted a joint claim construction chart on January 14, 2021 (D.I. 71) and an amended joint claim construction chart on March 4, 2021 (D.I. 91). The parties filed claim construction briefs (D.I. 76-77, 79-80, 85-88) and submitted technology tutorials (D.I. 75, 78). The Court held a claim construction hearing on March 8, 2021. (D.I. 94) ("Tr.") Thereafter, the parties submitted additional materials requested by the Court. (*See* D.I. 93, 95, 97)

I. LEGAL STANDARDS

The ultimate question of the proper construction of a patent is a question of law. *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 321 (2015) (citing *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 388-91 (1996)). "It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (internal citation and quotation marks omitted). "[T]here is no magic formula or catechism for conducting claim construction." *Id.* at 1324. Where, as here, a prior opinion on claim construction has been issued, that opinion "may be consulted as persuasive authority." *Monec Holding AG v. Motorola Mobility, Inc.*, 2013 WL 12218320, at *4 (D. Del. June 11, 2013). However, the Court is free to attach the

appropriate weight to appropriate sources "in light of the statutes and policies that inform patent law." *Phillips*, 415 F.3d at 1324.

"[T]he words of a claim are generally given their ordinary and customary meaning. . . . [which is] the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Id.* at 1312-13 (internal citations and quotation marks omitted). "[T]he ordinary meaning of a claim term is its meaning to the ordinary artisan after reading the entire patent." *Id.* at 1321 (internal quotation marks omitted). The patent "specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996).

While "the claims themselves provide substantial guidance as to the meaning of particular claim terms," the context of the surrounding words of the claim also must be considered. *Phillips*, 415 F.3d at 1314. Furthermore, "[o]ther claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment . . . [b]ecause claim terms are normally used consistently throughout the patent." *Id.* (internal citation omitted).

It is likewise true that "[d]ifferences among claims can also be a useful guide. . . . For example, the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim." *Id.* at 1314-15 (internal citation omitted). This "presumption is especially strong when the limitation in dispute is the only meaningful difference between an independent and dependent claim, and one party is urging that the limitation in the dependent claim should be read into the independent claim." *SunRace Roots Enter. Co., Ltd. v. SRAM Corp.*, 336 F.3d 1298, 1303 (Fed. Cir. 2003).

It is also possible that "the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs." *Phillips*, 415 F.3d at 1316. It bears emphasis that "[e]ven when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction." *Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1372 (Fed. Cir. 2014) (internal quotation marks omitted).

In addition to the specification, a court "should also consider the patent's prosecution history, if it is in evidence." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370 (1996). The prosecution history, which is "intrinsic evidence," "consists of the complete record of the proceedings before the [Patent and Trademark Office] and includes the prior art cited during the examination of the patent." *Phillips*, 415 F.3d at 1317. "[T]he prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be." *Id.*

"In some cases . . . the district court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period." *Teva*, 574 U.S. at 331. "Extrinsic evidence consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Markman*, 52 F.3d at 980. For instance, technical dictionaries can assist the court in determining the meaning of a term to those of skill in the relevant art because such dictionaries "endeavor to collect the accepted meanings of terms used in various fields of science and technology."

Phillips, 415 F.3d at 1318. In addition, expert testimony can be useful "to ensure that the court's understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field." *Id.* Nonetheless, courts must not lose sight of the fact that "expert reports and testimony [are] generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence." *Id.* Overall, while extrinsic evidence "may be useful to the court," it is "less reliable" than intrinsic evidence, and its consideration "is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence." *Id.* at 1318-19. Where the intrinsic record unambiguously describes the scope of the patented invention, reliance on any extrinsic evidence is improper. *See Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1308 (Fed. Cir. 1999) (citing *Vitronics*, 90 F.3d at 1583).

Finally, "[t]he construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998). It follows that "a claim interpretation that would exclude the inventor's device is rarely the correct interpretation." *Osram GmbH v. Int'l Trade Comm'n*, 505 F.3d 1351, 1358 (Fed. Cir. 2007) (quoting *Modine Mfg. Co. v. U.S. Int'l Trade Comm'n*, 75 F.3d 1545, 1550 (Fed. Cir. 1996)).

II. CONSTRUCTION OF DISPUTED TERMS

A. "wherein an explicit allocation of the second uplink channel is not received"[2] / "wherein . . . a specific allocation of the second time interval is not received by the CDMA subscriber unit"[3]

Interdigital "explicit allocation" refers to expressly allocating a channel to a subscriber unit. No further construction necessary
Lenovo wherein a control or signaling message assigning the second uplink channel to a particular subscriber unit is not received, and a process for allocating the second uplink channel that is separate from the process for allocating the recited downlink channel is not required
Court wherein a control or signaling message assigning the second uplink channel to a particular subscriber unit is not received and there is no separate process for allocating reverse link channels for the sending of acknowledgment messages in response to receipt of a forward link packet

The parties dispute: (1) what "allocation" refers to and (2) whether the phrase should be limited to specific processes encompassed by the invention.

With respect to the first issue, there is little material difference between the parties' positions. Indeed, at the hearing, Interdigital agreed that "there would have to be some sort of control or some sort of signalling message in terms of what the explicit allocation would be." (Tr. at 13)

With respect to whether the phrase should be further limited to require separate, non-simultaneous assignment or paired assignment, the Court sides with Lenovo. The patent suggests to a person of ordinary skill in the art ("POSA") that paired assignment is required:

> To minimize overhead in the allocation of channels, forward and reverse link time slots are automatically assigned in pairs. In particular, rather than requiring a separate process for allocating reverse link channels for the sending of acknowledgment messages in response to receipt of a forward link packet, a different scenario takes place. At the receiving end, . . . a reverse link time slot is

[2] This term appears in claims 1 and 4 of the '954 Patent.

[3] This term appears in claims 18 and 32 of the '665 Patent.

> automatically allocated in a time slot which depends upon the time slot allocation on the forward link.

('954 Patent at 2:60-3:2) Indeed, "the invention provides particular advantages in not explicitly allocating reverse link traffic channels for the anticipation of acknowledgment and other short messages." (*Id.* at 3:20-24) As Lenovo correctly concludes, "where the subscriber unit receives an uplink allocation by any process separate from the downlink allocation, the invention is not being practiced." (D.I. 85 at 3)

The prosecution history confirms this understanding. In distinguishing the Padovani prior art reference, which required a call set up followed by monitoring of a channel for paging messages, Interdigital represented that "Padovani requires that a channel be specifically allocated" and, therefore, did not disclose "that an explicit allocation of a time interval is not transmitted." (D.I. 71 Ex. 53 at 209-10) One of skill in the art would read this, and the patent as a whole, as disclosing an invention requiring paired, non-separate processes.

B. Steps of claim 4[4]

Interdigital no construction necessary
Lenovo all three steps of claim 4 must be carried out to satisfy the requirements of claim 4
Court steps two and three of claim 4 must be capable of being carried out to satisfy the requirements of claim 4

Claim 4 utilizes conditional claiming. Step two recites a ***condition*** in which an explicit allocation ***is*** received, followed by transmission of feedback information; step three recites the ***condition*** in which an explicit allocation ***is not*** received, followed by transmission of feedback

[4] Claim 4 of the '954 Patent.

information in a slightly different manner. ('954 Patent at claim 4) As Interdigital points out, these are "mutually exclusive alternatives." (Tr. at 35-36)

Even though the steps are conditional, Lenovo, citing *Lincoln National Life Insurance Co. v. Transamerica Life Insurance Co.*, 609 F.3d 1364 (Fed. Cir. 2010), and *Hytera Communications Co. Ltd. v. Motorola Solutions, Inc.*, 841 F. App'x 210 (Fed. Cir. 2021), argues that Federal Circuit precedent requires that each step be practiced in order for infringement to occur. Instead, in the Court's view, both *Lincoln* and *Hytera* (which are not claim construction opinions) make clear that each condition need not actually be ***practiced*** at the same time but only that patented embodiments be ***capable*** of doing so.

In *Lincoln*, 609 F.3d at 1366, the claim required "benefit payments, even if the account value is exhausted before all payments have been made." That "contingent limitation" yielded the same outcome: if the account was not exhausted, a "scheduled payment" would be made; and even if the account was exhausted, a "scheduled payment" would also be made. That is, the payment would be made in both instances. The claim step being addressed was "not a requirement that the account value be exhausted" but instead an explanation of "one of the circumstances in which the guaranteed payment must still be made." *Id.* at 1367. Thus, even though an account balance is necessarily either exhausted or non-exhausted – that is, the alternatives are mutually exclusive – a payment is still required under both conditions. *See id.* In *Lincoln*, because the plaintiff failed to show that the defendant's process would make a payment under both conditions, it failed to prove infringement. *See id.* at 1368.

In *Hytera*, 841 F. App'x at 215, the claim required "two alternative conditions and corresponding responses," based on whether a timeslot was currently desired. Prior art showed one of the alternative conditions was known. *See id.* The Court held that "unless the [prior art]

system ***is configured*** to perform each responsive action ***in response to each corresponding claimed prerequisite*** condition," the prior art does not disclose all elements (and, hence, invalidity is not proven). *Id.* at 216 (emphasis added). Even when it would be physically impossible to perform both conditions at the same time – that is, as in *Lincoln*, the alternatives are mutually exclusive – the prior art system must be capable of addressing both alternatives to constitute invalidating prior art. *See id.*

Here, then, Interdigital is correct that "[t]he claim language recites two alternative scenarios, only one of which is ***performed***." (D.I. 87 at 5) (emphasis added) It would be impossible for a system both to receive and not receive an explicit allocation at any given time. Therefore, the Court cannot, as Lenovo asks, construe the claim to "recite[] a process in which each of the three recited steps must be performed in order for the claim limitation to be met." (D.I. 79 at 4) However, as *Lincoln* and *Hytera* support, in order to infringe a system must be ***capable*** of addressing each alternative, regardless of which alternative occurs at any particular point.

C. "base station"[5]

Interdigital a communications station installed at a fixed location
Lenovo a centralized communications station installed at a fixed location that functions as a gateway between a CDMA network server and a plurality of mobile devices
Court a communications station installed at a fixed location that functions as a gateway between a network and a plurality of mobile devices

The disputes with respect to this term are whether the "base station" must be "centralized" and whether it "functions as a gateway between a CDMA network server and a plurality of mobile devices."

[5] This term appears in claims 39-41 of the '665 Patent.

With respect to centralization, it is true that the '665 Patent "repeatedly references" centralized equipment. ('665 Patent at 2:61-65; 3:52-55; 4:14-16; 5:34-37) That does not mean, however, that the "base station" ***must*** be centralized. Absent any evidence that the patentee either disclaimed non-centrally located "base stations" or intended to limit the claims to the centrally-located embodiments of the specification (and there is no such evidence), the Court cannot construe "base station" to require centralization.

A POSA would understand, however, that a "base station" must "function as a gateway." In addition to the extrinsic evidence provided by Lenovo (*see* D.I. 80 Exs. A-B), the record also contains Interdigital's acknowledgement that the "base station" "does act as a gateway between multiple networks." (Tr. at 28; *see also id.* at 33 (Interdigital stating "base station" "functions as a gateway between a network and plurality of mobile devices")) A POSA would have no basis, however, to view the claimed "base station" as limited to operating solely between a "***CDMA*** network server and a plurality of mobile devices." Even Lenovo concedes that "the defining purpose of a 'base station' is to act as a gateway into the network" (D.I. 85 at 5), a purpose which, of course, can be furthered in embodiments not involving CDMA network servers.

D. "first channel quality indication"[6]

Interdigital indication of channel quality for the plurality of downlink resources
Lenovo to encompass a channel quality indication providing quality information for the "plurality of downlink resources" as a whole and also encompass the use of a channel quality indication of one resource as a reference value related to the plurality
Court to encompass a channel quality indication providing quality information for the "plurality of downlink resources" as a whole and also encompass the use of a channel quality indication of one resource as a reference value related to the plurality

[6] This term appears in claims 1, 2, 4-7, 9-15, and 17-18 of the '726 Patent.

E. "a (first) channel quality of the plurality of downlink resources"[7]

Interdigital a channel quality value related to the "plurality of downlink resources" as a whole, such as a mean
Lenovo a channel quality value related to the "plurality of downlink resources" as a whole, such as a mean or reference value related to the plurality
Court a channel quality value related to the "plurality of downlink resources" as a whole, such as a mean or reference value related to the plurality

Although arising in different claim terms of different patents, the parties' disputes with respect to these two terms are essentially the same: whether the terms "may also cover the channel quality of one downlink resource used a reference value for the plurality of resources." (D.I. 79 at 8)

Interdigital says no. According to Interdigital, the patentee distinguished the '449 Patent from a prior art reference that used only "one downlink resource measured at multiple instances" and from another that "only measure[d] one input source." (D.I. 76 at 10) (citing D.I. 71 Ex. 11 at 236-38) Hence, to Interdigital, the term must "indicate channel quality for more than one downlink resource." (D.I. 87 at 7) Lenovo disagrees, pointing the Court to various alternative embodiments which can take values "as a reference," thereby "disclos[ing] an example in which the channel quality of one downlink resource . . . is used as a reference value." (D.I. 79 at 9) (citing '449 Patent at 6:12-15) Lenovo further argues that Interdigital's prior art distinguishes the claim term "differential value," not a "channel quality of the plurality of downlink resources." (D.I. 85 at 7-8-9)

The Court concludes that these terms can encompass both a mean value and a value related to the plurality, as Lenovo proposes. The embodiments disclosed in the patent make

[7] This term appears in claims 1, 6, 13, 16, 19, 21-22, 27, and 33 of the '449 Patent.

clear that so long as the value is ***related*** to the plurality of resources, it suffices. Interdigital's proposed construction would improperly read out embodiments (including Alternative 9) disclosed in the patent. *See Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1305 (Fed. Cir. 2007).

F. "Non-Zero Grant"[8]

Interdigital power ratio greater than zero
Lenovo information from a Node-B granting permission to the WTRU to engage in data transmission according to said information
Court power ratio greater than zero

The patent specifies that "transmission of scheduling of scheduling information (SI) is only allowed under certain conditions . . . such as if the user has a grant (power ratio) of zero." ('873 Patent at 2:42-49) Generally, "a parenthetical is the definition of the term which it follows," unless it "is merely an illustrative example." *Novacor Chems., Inc. v. United States*, 171 F.3d 1376, 1381 (Fed. Cir. 1999). Lenovo suggests the parenthetical reference to power ratio here is an "illustrative example," arguing that power ratios are just examples of scheduling information. (D.I. 85 at 12) In the Court's view, however, the '873 Patent uses the phrase "such as" to qualify examples of conditions for transmission of scheduling information, not as examples of what "grant" means. (*See* '873 Patent at 2:42-49) Thus, the patent links a grant with a power ratio. Additionally, because "a power ratio cannot take on a negative value, a 'non-zero grant' must mean a power ratio greater than zero." (D.I. 76 at 15)

[8] This term appears in claims 1 and 6 of the '873 Patent.

G. "scheduling request"[9]

Interdigital a request sent by the WTRU for an allocation of shared uplink resources on which it can transmit data
Lenovo a request to be allocated uplink transmission resources
Court a request sent by the WTRU for an allocation of uplink resources.

As Interdigital explains, the parties' dispute "centers on the purpose of the request in the context of LTE – whether the allocated resources must be for data transmission, and whether the allocated resources are shared uplink resources." (D.I. 76 at 16) The patents make clear that a "scheduling request" is a "request for uplink (UL) channel access" (*e.g.*, '747 Patent at Fig. 7), which "indicates whether or not a resource allocation is needed" ('747 Patent at 6:38-51). The 3GPP Standards are in accord. (D.I. 71 Ex. 1 § 5.4.4) ("The Scheduling Request (SR) is used for requesting UL-SCH resources for new transmission.") There is no mention in the patents that those resources must be shared (the Court's construction does not rule out the possibility of shared uplink resources) or that data necessarily need be transmitted (although it can be transmitted).

H. "dedicated physical resources allocated to the WTRU"[10]

Interdigital no construction necessary
Lenovo a set of one or more physical resources exclusively allocated to a particular WTRU
Court a set of one or more physical resources exclusively allocated to a particular WTRU during a particular time

[9] This term appears in claims 1, 12, 16, 21, 23, 27, 32, and 37 of the '747 Patent and claims 1, 11, and 17-20 of the '580 Patent.

[10] This term appears in claims 1, 16, 27, and 32 of the '747 Patent.

The '747 Patent explains that channels "are dedicated to a particular WTRU for use during a particular time." ('747 Patent at 3:8-17) Indeed, resources "may be configured for use by more than one WTRU at various times without being contended for by those WTRUs." (*Id.* at 4:53-62) As each WTRU is utilized, it has exclusive domain over the resources allocated to it – even if another WTRU may later use the same resources. (*Id.* at 2:15-19) The Court does not agree with Interdigital that this understanding of the patent "reads out the embodiment where there is moment-to-moment reallocation of physical resources between the various WTRUs." (D.I. 87 at 17) Reallocation results in an exclusive allocation of resources to a different WTRU at a different time.

I. "resources dedicated to the WTRU by the first allocation"/"resources dedicated to the WTRU"[11]

Interdigital no construction necessary
Lenovo the exclusive resources allocated to the particular WTRU
Court the exclusive resources allocated to the particular WTRU

The Court agrees with the parties that the proper construction of these terms turns on the Court's determination as to the proper construction of the "dedicated physical resources" term in the prior section. (D.I. 79 at 18; D.I. 85 at 19; D.I. 87 at 18) Accordingly, the Court here adopts Lenovo's construction.

[11] These terms appear in claims 1, 16, 27, and 32 of the '747 Patent.

J. "evolved Node B (eNB)" / "eNodeB" / "eNB"[12]

Interdigital a base station in a 4G/LTE network as opposed to the "Node Bs" of 3G/UMTS networks or the "BTS" of 2G/GSM networks
Lenovo a base station capable of implementing the disclosed noncontention based (NCD) channel allocation technique
Court a base station in a 4G/LTE network as opposed to the "Node Bs" of 3G/UMTS networks or the "BTS" of 2G/GSM networks

"The parties have two disputes with respect to this term: (1) whether the term refers to a base station generally or to a base station in the context of LTE, and (2) whether the term should be limited to include Lenovo's added limitation – 'capable of implementing the disclosed noncontention based (NCB) channel allocation technique.'" (D.I. 87 at 14)

On the first dispute, a POSA would understand that the patents refer to LTE-based base stations. The incorporated 3GPP standards (published in November 2006) provide that an "Evolved NodeB (eNodeB) is the base station for LTE radio." (D.I. 77 Ex. 4) Extrinsic evidence demonstrates that a POSA would understand the term "eNodeB" to be related to "a term that had recently been coined for LTE, to distinguish 4G base stations from 2G/3G base stations" and a POSA "would therefore understand that the invention was intended for use in forthcoming LTE/4G networks." (D.I. 93 Ex. 1 at 250)

Lenovo's argument to the contrary is based on concepts of enablement that are unpersuasive in the context of claim construction. Lenovo contends that at the priority date of the patent the term eNodeB "was not yet a defined term of art" but instead an "inconsistently-employed idiom for a next generation base station," so a skilled artisan with the patent in hand "could not have made or used an LTE eNodeB with undue experimentation." (D.I. 79 at 15) In

[12] These terms appear in claims 6, 16, 19, and 27-31 of the '747 Patent, and claims 1, 12, 17, and 19 of the '580 Patent.

a hearing in the United Kingdom in a related action between these parties, an Interdigital expert, Dr. Moss, agreed with Lenovo that "as at January 2006 it was not possible to build a fully functioning LTE eNodeB" but only "a demonstrator eNodeB, which could, for example, demonstrate the OFDMA interface and the capability of the speeds that were possible." (D.I. 93 Ex. 1 at 212-13) Dr. Moss further acknowledged that "no one knew the final list of components that were going to be in it [i.e., an eNodeB] at the time." (*Id.* at 251) While all of this evidence may support a meritorious nonenablement defense, it does not help Lenovo at this stage, as it does nothing to undermine the Court's conclusion that a POSA would understand "eNodeB" to mean "next-generation" (LTE) technology.[13]

As to the second dispute, the Court finds Lenovo's additional limitation to be superfluous. As Interdigital points out, "the claims recite that the WTRU receives an allocation of a non-contention based (NCB) uplink control channel from the eNodeB." (D.I. 87 at 16) The patent is otherwise silent about an eNodeB's capabilities. (D.I. 79 at 15-16)

K. "resource blocks"[14]

Interdigital sub-channels allocated for a specific time duration
Lenovo a channel for the duration of one time slot
Court channels, sub-channels, or sub-carriers allocated for a specific time duration

The parties' dispute is whether the patent encompasses sub-channels or is limited just to channels. (D.I. 76 at 19; D.I. 85 at 18) The patent encompasses both. Sub-channels are depicted in Figure 9 of the '580 Patent ('580 Patent at 8:24-27), and channels are equated with resource

[13] Issues of priority date and written description may also lay ahead. (*See, e.g.*, D.I. 87 at 15, D.I. 85 at 17)

[14] This term appears in claims 5-6 of the '580 Patent.

blocks (*id.* at 7:31-33) (pointing out "allocated channels or resource blocks"). Also included are "subcarriers," used interchangeably with "sub-channels" and in reference to "resource blocks." (Tr. at 122-23 ("resources block could include plurality of subcarriers" but are not limited to them); *see also* '580 Patent claim 6 (claiming "resource blocks" that "comprise a plurality of subcarriers"))

Also in dispute is whether allocation is for a "time duration," as Interdigital contends, or limited to a "time slot," as Lenovo proposed. At the claim construction hearing, Lenovo admitted that "the patent said fractions," which are "fractions of time." (Tr. at 121) The Court concludes that a POSA would read the claims as covering resource blocks (or fractions thereof) existing for a time duration, not (more specifically) for a time slot. (*E.g.*, '580 Patent at Fig. 9)

III. CONCLUSION

The Court will construe the disputed terms as explained above. The Court will also adopt the parties agreed-upon constructions. An appropriate Order follows.

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

INTERDIGITAL TECHNOLOGY CORPORATION, IPR LICENSING, INC., INTERDIGITAL COMMUNICATIONS, INC., INTERDIGITAL HOLDINGS, INC., and INTERDIGITAL, INC.,	:	
Plaintiffs,	:	
v.	:	C.A. No. 19-1590-LPS
LENOVO HOLDING COMPANY, INC., LENOVO (UNITED STATES) INC., and MOTOROLA MOBILITY LLC,	:	
Defendants.	:	

ORDER

At Wilmington this **10th** day of **May, 2021**:

For the reasons set forth in the Memorandum Opinion issued this date,

IT IS HEREBY ORDERED that the following claim terms of U.S. Patent Nos. 8,427,954 (the "'954 Patent"); 8,085,665 (the "'665 Patent"); 8,199,726 (the "'726 Patent"); 9,456,449 (the "'449 Patent"); 8,675,612 (the "'612 Patent"); 8,797,873 (the "'873 Patent"); 8,619,747 (the "'747 Patent"); and 9,203,580 (the "'580 Patent") are construed as follows:

Claim Term	Patent Number	Court's Construction
"timeslot" [Claims 2, 13, and 24 of the '612 Patent]	'612	The parties agree that the term means "time allocation."
"downlink resource"	'726 '612 '449	The parties agree that the term means "any radio signal, or portion thereof, used to transmit in the

[Claims 1, 6, 11, and 14 of the '726 Patent; Claims 1, 3, 8, 12, 14, 19, 23, 25, and 30 of the '612 Patent; Claims 1-2, 6, 9, 11-13, 16-17, 19, 21-22, 25-27, 30, 33, and 36 of the ' 449 Patent]		downlink direction, including but not limited to a downlink pilot signal."
"channel quality"/"channel qualities" [Claims 1-2, 4-7, 9-15, and 17-18 of the '726 Patent; Claims 1, 3, 7-10, 12, 14, 18-21, 23, 25, and 29-31 of the '612 Patent; Claims 1, 6, 13, 16, 19, 21-22, 25, 27, and 33 of the '449 Patent]	'726 '612 '449	The parties agree that the term means "a value/values quantifying how efficiently downlink resources of a channel can communication information."
"code channel" [Claims 19, 20, 22, 33, 34, and 36 of the '665 Patent]	'665	The parties agree that the term means "a CDMA channel using a particular spreading code."
"configured to" [Claim 1 of the '954 Patent; Claims 18-22 and 39-41 of the '665 Patent; Claims 1, 2, 6-7, and 11 of the '726 Patent; Claims 12, 14, 19-21, 23, 25, and 30-31 of the '612 Patent; Claims 1, 11-12, 21-22, 25, 27, and 30 of the '449 Patent; Claims 6 and 8-9 of the '873	'954 '665 '726 '612 '449 '873 '747 '580	The parties agree that the term means "set up for operation."

Patent; Claims 16-17, 21, 27-29, and 31-32 of the '747 Patent; Claims 1, 2, 7, 10-11, 15-16, and 19 of the '580 Patent]		
"Medium Access Control-d (MAC-d) flows" [Claims 1, 5-6, and 10 of the '873 Patent]	'873	The parties agree that the term means "flows of MAC-d data units"
"differential channel quality" [Claims 1, 9, 13, 19, 21, 25, 27, and 33 of the '449 Patent]	'449	The parties agree that the term means "'a channel quality expressed as a difference relative to some other channel quality'" where the 'difference' can be measured or recognized in ways other than subtraction."
"periodicity" [Claims 1, 12, 16, 23, 27, 31-32, and 37 of the '747 Patent; Claims 1, 11, 17, and 19 of the '580 Patent]	'747 '580	The parties agree that the term means "recurring time intervals."
"scheduling information (SI)" [Claims 1-4 and 6-9 of the '873 Patent]	'873	The parties agree that the term means "information concerning the resources the WTRU requires to transmit data to the Node-B."
"wherein an explicit allocation of the second uplink channel is not received" [Claims 1 and 4 of the '954]	'954	"wherein a control or signaling message assigning the second uplink channel to a particular subscriber unit is not received and there is no separate process for allocating reverse link channels for the sending of acknowledgment messages in response to receipt of a forward link packet"
"wherein . . . a specific allocation of the second time interval is not received by the CDMA subscriber unit"	'665	"wherein a control or signaling message assigning the second uplink channel to a particular subscriber unit is not received and there is no separate process for allocating reverse link channels for the sending of acknowledgment messages in response to receipt of a forward link packet"

[Claims 18 and 32 of the '665 Patent]		
Steps of claim 4 [Claim 4 of the '954 Patent]	'954	Steps two and three of claim 4 must be capable of being carried out to satisfy the requirements of claim 4
"base station" [Claims 39-41 of the '665 Patent]	'665	"a communications station installed at a fixed location that functions as a gateway between a network and plurality of mobile devices"
"first channel quality indication" [Claims 1, 2, 4-7, 9-15, and 17-18 of the '726 Patent]	'726	"to encompass a channel quality indication providing quality information for the 'plurality of downlink resources' as a whole and also encompass the use of a channel quality indication of one resource as a reference value related to the plurality"
"a (first) channel quality of the plurality of downlink resources" [Claims 1, 6, 13, 16, 19, 21-22, 27, and 33 of the '449 Patent]	'449	"a channel quality value related to the 'plurality of downlink resources' as a whole, such as a mean or reference value related to the plurality"
"Non-Zero Grant" [Claims 1 and 6 of the '873 Patent]	'873	"power ratio greater than zero"
"scheduling request" [Claims 1, 12, 16, 21, 23, 27, 32, and 37 of the '747 Patent; Claims 1, 11, and 17-20 of the '580 Patent]	'747 '580	"a request sent by the WTRU for an allocation of uplink resources"
"dedicated physical resources allocated to the WTRU" [Claims 1, 16, 27, and 32 of the '747 Patent]	'747	"a set of one or more physical resources exclusively allocated to a particular WTRU during a particular time"
"resources dedicated to the WTRU by the first allocation"/"resources	'747	"the exclusive resources allocated to the particular WTRU"

dedicated to the WTRU" [Claims 1, 16, and 32/Claim 27 of the '747 Patent]		
"evolved Node B (eNB)" / "eNodeB" / "eNB" [Claims 16 and 27/Claims 6 and 19/ Claims 28-31 of the '747 Patent; Claims 1, 17, 19 / Claim 12 of the '580 Patent]	'747 '580	"a base station in a 4G/LTE network as opposed to the 'Node Bs' of 3G/UMTS networks or the 'BTS' of 2G/GSM networks"
"resource blocks" [Claims 5-6 of the '580 Patent]	'580	"channels, sub-channels, or sub-carriers allocated for a specific time duration."

UNITED STATES DISTRICT JUDGE