IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

NETWORK SYSTEM TECHNOLOGIES, LLC,	)	
	)	
Plaintiff,	)	
	)	
v.	)	Civil Action No. 1:22-cv-1331
	)	
QUALCOMM INCORPORATED;	)	
QUALCOMM TECHNOLOGIES, INC.;	)	
ARTERIS, INC.,	)	
	)	
Defendants.	)	
	)	

DEFENDANTS' JOINT REPLY CLAIM CONSTRUCTION BRIEF

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I. INTRODUCTION

NST's claim constructions are not supported by the intrinsic record. Some of them attempt to divorce the claims from the invention disclosed in the specification. Others attempt to save indefinite claims that are not adequately defined in the specification. NST's attempt to remedy these problems through unsupported extrinsic evidence from its expert fails.

II. COMMON TERM – "CONNECTION" ('818, '449, '052, '9893, '800 PATENTS)

NST relegates its defense of its proposed "one or more communication channels" construction to a single footnote. Dkt. 81 ("NST Br.") at 7, n. 3. NST accuses Defendants of making a "strawman attack" on NST's proposed construction because "the 'communication channels' included in NST's construction [of 'connection'] require 'connection properties.'" *Id.* But NST's argument is hollow because its construction does not actually recite "connection properties." NST's argument is also a tacit admission that a "connection" requires more than just communication channel(s), and in fact requires "one or more channels, each having a set of connection properties, between a first module and at least one second module," as expressly recited in all five patents at issue. '818 patent at 6:34-38; '449 patent at 8:48-58; '052 patent at 4:50-55; '800 patent at 5:13-18; '9893 patent at 4:54-58.

In addition, of the five asserted patents that claim "connection," four explain that a connection "**must** be first created or established with the desired properties before being used" and "[a]fter usage, connections are closed, which leads to freeing the resources occupied by the connection." '818 Patent at 10:25-34; '449 Patent at 10:62-11:3; '9893 Patent at 10:34-42; *see also* '052 Patent at 5:44-49. NST fails to address this mandatory language. Instead, NST posits that the claims do not expressly recite the limitation. NST Br. at 6. Through this argument, NST seeks to capture claim scope to which it is not entitled. Nothing in the specification supports a construction of "connections" as broad as NST seeks. Indeed, NST's construction ignores the

legal effect of the specifications' teachings that a "connection" "must be" created before use and closed after use. *See* Dkt. 77 ("Opening Br.") at 6-8; *see also TiVo, Inc. v. Echostar Communs. Corp.*, 516 F.3d 1290, 1300-01 (Fed. Cir. 2008) (construing "separated" to require physical separation into different buffers based on specification statements that this physical separation "must" occur); *TAP Pharm. Prods, Inc. v. Owl Pharmaceuticals, L.L.C.*, 419 F.3d 1346, 1353 (Fed. Cir. 2005) (construing a term to include drug-retaining substances where the specification states that such substances "must be used"). For at least these four patents, the term must be construed to include this mandatory language.[1] And while the fifth patent does not contain this specific mandatory statement, it contains extensive discussion of "connections" consistent with this concept, including claiming that a remote buffer is "reserved for a connection." '800 patent at 5:15-29, 7:7-13, 7:62-65, 12:23-24.

Neither NST nor its expert disagree that the distinction between "connection based" systems and "connectionless" systems was included in the patents. Opening Br. at 8, 10; Dkt. 82-6 ("Chmelar") ¶¶ 54-55 ("While a POSITA would understand one or more distinctions between connection-oriented service and connectionless service . . ."). Dr. Chmelar argues that the construction of "connection" should exclude the distinctions because he believes that a system that "does not include the notion of connection" nevertheless communicates over "connections." Chmelar ¶ 55. But he never explains how this can be. Instead, he cites to a passage in the '818 patent stating that systems that "are not connection based" are "equivalent to a system with a single connection." *Id.* But the term "equivalent" is used to discuss similarity between two *different* things. Reply Declaration of Dr. Marwan Hassoun ("Hassoun Reply"), ¶ 4. Thus, by

[1] NST suggests the parties had an agreement that the term "should be afforded the same meaning across all five patents containing the term." NST Br. at 6. The parties had no such agreement.

stating that a non-connection based system is "equivalent to" a system with a single connection, the '818 patent is confirming that non-connection based systems do not employ connections. *Id.* Given the well understood distinction between connection based and connectionless systems, a POSA would recognize that when the patents refer to "connections," they are referring to the connections that are created in connection-based systems. Opening Br. at 8, 10.

NST accuses Defendants of improperly reading language from the specification into the claims. NST Br. at 7-8. However, claims must be read in light of the specification, particularly when the specification uses definitional language and consistently refers to the claim term using the same language. *See Phillips v. AWH Corp*., 415 F.3d 1303, 1315 (Fed. Cir. 2005) (en banc); Opening Br. at 7-10. NST also criticizes Defendants' construction for "import[ing] a functional limitation into a structural term." NST Br. at 8 (emphasis omitted). Even if true, the Federal Circuit has repeatedly construed structural claim limitations based on their function when supported by the intrinsic record. *See, e.g.*, *Exmark Mfg. Co. v. Briggs & Stratton Power Prods. Grp., LLC*, 879 F.3d 1332, 1346 (Fed. Cir. 2018) (looking to "function" in construing "substantially straight" to mean sufficiently straight to accomplish its intended function of "connect[ing] two arcuate portions of the baffle"); *Cordis Corp. v. Medtronic Ave, Inc.*, 511 F.3d 1157 (Fed. Cir. 2008) (construing "smooth" functionally "so that a stent would be considered 'smooth' if it was smooth enough to be capable of intraluminal delivery"); *Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319-20 (Fed. Cir. 2005). Here, "connection" implicates structure ***and*** function. Hassoun Reply ¶ 5. The specifications make clear that the channels in its connection-based system are structurally transitory, meaning they "must be" created before use (i.e., they exist during use), and are closed after use, and are structurally different from a permanent channel such as a wire. Opening Br. at 8-11. Thus, NST's cases are not applicable.

NST also provides specification cites purportedly showing that opening and closing connections is optional. NST Br. at 7, n.4. These cites describe situations in which there is no "connection," but none of them describe using a connection that is not first created and later closed. Hassoun Reply ¶ 6. For example, NST's first cite refers to a situation in which the communication manager "rejects establishing a connection." *See* '449 Patent at 7:56-65. But that passage is describing a circumstance where no data is transmitted over the NoC because no connection was established. That does not mean that data can be transmitted over a "connection" without it first being opened and later closed. The other passages NST selects are similar. Hassoun Reply ¶ 6. The construction proposed by Defendants should be adopted in its entirety.

III. SECTION 112(6) INDEFINITENESS TERMS

For the terms where Defendants assert indefiniteness due to failure to comply with 35 U.S.C. § 112(6), NST largely repeat the same arguments. To minimize duplication, Defendants group those three terms together in reply.

A. '818 Patent – "dropping means" / "first dropping means"

1. NST Has Not Overcome the Presumption That 112(6) Applies

NST does not dispute that "dropping means" and "first dropping means" are presumptively governed by § 112(6). NST also does not dispute that the limitations ***themselves*** do not recite any structure for performing the claimed functions. Instead, the gist of NST's response is that because claim 1 is directed to an "integrated circuit," and because everything on an integrated circuit is, by definition, a "circuit," the presumption that § 112(6) applies is overcome. NST Br. at 10-13. This is an extraordinary argument. NST is in effect asking this court to establish an exception to means-plus-function law and hold that integrated circuit claims are a special class to which § 112(6) simply does not apply.

NST cites no cases that support its breathtaking position that claiming an "integrated circuit" necessarily overcomes any 112(6) presumptions. Instead, NST cites cases where the claim term at issue was "circuit," not "means." NST Br. at 11-12, *citing Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 711 F.3d 1348, 1365 (Fed. Cir. 2013) (construing "soft start circuit"); *Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1319 (Fed. Cir. 2004) ("first circuit for monitoring a signal…"); *Apex Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364, 1368 (Fed. Cir. 2003) ("a first interface circuit"); *Mass. Inst. of Tech. v. Abacus Software*, 462 F.3d 1344, 1356 (Fed. Cir. 2006) ("aesthetic correction circuitry"). None of these cases apply because here, the claim term at issue is "dropping **means**," not "dropping circuit." And even assuming NST's cases are still good law,[2] they come nowhere close to supporting the capacious exception to § 112(6) law that NST asks the Court to create. *See Optimum Processing Solutions LLC v. Advanced Micro Devices, Inc.*, No. 1:09-cv-1098-TCB, 2012 U.S. Dist. LEXIS 203463, at *64-65 (N.D. Ga. July 10, 2012) (finding *Apex* "inapposite" to a claim reciting "means").

The handful of Federal Circuit cases where the presumption has been overcome are clearly different and highlight why NST's analysis is incorrect here. For example, in *Envirco Corp. v. Clestra Cleanroom, Inc.*, the claim recited "baffle means," and the presumption was overcome because "baffle" is a physical structure. 209 F.3d 1360, 1365 (Fed. Cir. 2000); *see also Skky, Inc. v. MindGeek s.a.r.l.*, 859 F.3d 1014, 1019-20 (Fed. Cir. 2017) (presumption overcome as to "wireless device means" because "wireless device" is a physical structure and no function

[2] All four cases were decided when the presumption arising from the absence of "means" in the claims was considered to be a "strong one" that was "not readily overcome" – an erroneously high standard that was overruled in *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348-49 (Fed. Cir. 2015) (*en banc*). Indeed, the fifth case cited by NST in footnote 8 did not involve a claim that recited "means" and was expressly overruled by *Williamson*. *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1359-60 (Fed. Cir. 2004) (construing "connector assembly"); *Williamson*, 792 F.3d at 1349.

was recited in the claim). In *Rodime PLC v. Seagate Tech., Inc.*, the claim recited "positioning means," and the presumption was overcome because the claim went on to expressly recite both the structure of the positioning means ("said positioning means including: two support arms…a pivot shaft…a positioning arm…a bearing assembly…a stepper motor…and a tensioned steel band"), as well as "the specific location and interconnection of each of these structural sub-elements." 174 F.3d 1294, 1303-04 (Fed. Cir. 1999).

Those cases do not apply here because no such structural language is present relative to the "dropping means" limitations. Unlike in *Envirco* and *Skky*, the word before "means" ("dropping") is purely functional, not structural, and neither NST nor its expert argue otherwise. Unlike in *Rodime*, there is no follow-on language stating what the structure of the dropping means is. In the absence of such structural language, the presumption arising from use of the word "means" is not overcome. *See, e.g.*, *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1375-76 (Fed. Cir. 2003) (affirming that presumption is not overcome as to "means for booting"; distinguishing *Envirco* and *Rodime*); *Biomedino, LLC v. Waters Techs. Corp.*, 490 F.3d 946, 950 (Fed. Cir. 2007) (affirming that presumption is not overcome as to "control means").

2. The Specification Does Not Identify Any Structure for Performing the Functions of the Dropping Means

NST does not dispute that, assuming §112(6) applies, the claims of the '818 patent are invalid as indefinite unless the specification clearly links the recited dropping functions to structure that performs that function. NST's response does not identify any such linking of structure to the dropping functions in the specification. Instead, NST and its expert argue that various general statements in the specification would lead a POSA to infer that the dropping means is "hardware" (and only "hardware"), and specifically is "an arrangement of microscopic

circuitry physically located within the NoC network interfaces." NST Br. at 10-11. NST's attempt to save the '818 claims from indefiniteness fails for several reasons.

The first is NST's acknowledgement that integrated circuits have "millions (even billions) of microscopic transistors, logic gates, flip-flops, multiplexers, and other circuitry elements." NST Br. 10. The Court can and should rule against NST based on this admission alone. As the Federal Circuit held when faced with a similar argument, "the mere mention of a complicated integrated circuit, comprised of hundreds if not thousands of circuits, is much too broad to sufficiently indicate the precise 'means for causing' structure to a [POSA.]" *Maurice Mitchell Innovations, L.P. v. Intel Corp.*, 249 Fed. Appx 184, 188 (Fed. Cir. 2007). Such a general disclosure is insufficient to save the claims from invalidity.

Second, the '818 patent does not state that the dropping means is purely hardware. In its brief, NST tries its best to recite the word "hardware" as often as it can. *See* NST Br. at 10-11. But NST's efforts do not make up for the fatal flaw in its own patent: the failure of the patent to link the "dropping means" to any specific hardware at all.[3]

Third, NST improperly attempts to rely on the knowledge of a POSA in lieu of disclosure in the specification. "The testimony of one of ordinary skill in the art cannot supplant the total absence of structure from the specification." *Williamson*, 792 F.3d at 1354. This caselaw is fatal to NST's position. NST's expert does not say that the specification discloses a circuit for

[3] NST appears to ask the Court to adopt a word-counting legal test, asserting that "'circuit' or 'integrated circuit' appear roughly 27 times in the patent." NST Br. 12. No cases support such a counting test; instead, the relevant question is whether the specification clearly links the claimed functions to specific structure. Of the 27 instances, 23 are "integrated circuit," i.e., the overall device made up of "millions (even billions)" of circuit elements. The four times that "circuit" alone appears in the patent is only in the "Background of the Invention" section and have nothing to do with the dropping functions. *See* '818 patent at 1:20-22; 3:28-33. Thus, these 27 instances do not help NST show the necessary linking to structure, which explains why NST failed to cite a single such instance as being linked to the dropping means.

performing the dropping means function. Instead, he says a POSA would "understand how to design and build" such circuitry." Chmelar at ¶ 69. This is just the sort of "gap filling" that is insufficient under § 112(6). *Williamson*, 792 F.3d at 1354 (citing cases); *WSOU Invs. LLC v. Google LLC*, No. 2022-1066, 2023 U.S. App. LEXIS 25255, at *17 (Fed. Cir. Sept. 25, 2023) (non-precedential); *Blackboard, Inc. v. Desire2Learn, Inc.*, 574 F.3d 1371, 1385 (Fed. Cir. 2009) ("A patentee cannot avoid providing specificity as to structure simply because someone of ordinary skill in the art would be able to devise a means to perform the claimed function.").

Fourth, NST's reliance on the alleged location of the dropping means "within the NoC network interfaces" (NST Br. at 11) is both wrong and irrelevant. It is wrong because claim 1 only requires that the "first dropping means" be in one of the interface means; the "at least one dropping means" is merely in "the integrated circuit." '818 patent at 12:16-17, 12:22-23. It is irrelevant because merely describing an element's location does not establish the structure necessary for claiming under §112(6). *WSOU*, 2023 U.S. App. LEXIS 25255, at *15 (rejecting patentee's reliance on "language [that] merely describes the location of the communication engine, rather than what it is or how it operates").[4]

Finally, NST's attempt to distinguish Defendants' case law as "non-chip cases" involving "software inventions" is also both wrong and irrelevant. *Maurice Mitchell* is unquestionably a "chip case"; the word "software" does not appear in the opinion. The same is true of *Fiber, LLC v.*

[4] For both this and the next term ("communication manager"), NST disingenuously tries to characterize the fact that Defendants' brief does not challenge the definiteness of other terms ("interface means" and "resource manager") as either an admission or an inconsistency that weakens Defendants' arguments. NST Br. 10-11, 14. As NST is well-aware, however, Defendants did assert indefiniteness of both of these other terms. Ex. 30 at 2. The fact that Defendants subsequently agreed to withdraw them in order to simplify the issues for the court and facilitate staying within the Court's page limits is neither an admission nor an inconsistency. *Id.* Defendants only need to show one indefinite claim term to prevail on a claim.

Ciena Corp., 792 Fed. Appx 789 (Fed. Cir. 2019). And while other cases refer to software, they also involve computer chips and ultimately hold the claims invalid due to failure to link the claimed function to a specific *structure*, not due to lack of an algorithm. *See WSOU*, 2023 U.S. App. LEXIS 25255 at *14-17; *Optimum Processing*, 2012 U.S. Dist LEXIS 203463 at *67-69. And, implicit in NST's argument is again the false assumption that "chips" (i.e., integrated circuits) are somehow a special class of invention that do not need to comply with §112(6)'s requirement that the specification disclose structure and clearly link it to the function of the claimed "means." Yet NST has cited no case that recognizes such an exception, which is flatly contrary to both *Maurice Mitchell* and *Fiber LLC*. Claim 1 is invalid as indefinite.

B. '449 Patent – "communication manager"

Regarding whether § 112(6) applies, NST argues that there is support "in the specification" to conclude that "communication manager" is sufficiently structural to avoid § 112(6). NST Br. at 18. This argument mis-states the law and misses the point. Section 112(6) can still apply to a claim term even if the word "means" is not used. *Williamson*, 792 F.3d at 1348-49. But the first step in that analysis requires focus on the claim term itself. *Id.* at 1349. NST skips that step. As set forth in Defendants' opening brief, "manager" is a generic term that imparts only ***function*** (*i.e.*, "something that manages") and fails to impart any structure (let alone a "circuit" structure). Opening Br. at 18-20. The modifier "communication" does no better. *Id.* Therefore, under governing Federal Circuit law, § 112(6) applies.

Regarding function, NST argues that "Defendants impermissibly attempt to import functions not found in said claim language." NST Br. at 19. This is demonstrably false. The functions identified in Defendant's proposed construction for "communication manager" come directly from the language of claim 10. *See* '449 patent at 19:32-37, 20:1-3; Opening Br. at 20.

Regarding whether the specification discloses corresponding structure, NST simply incorporates its "integrated circuit" argument relative to "dropping means." NST Br. at 19. NST is wrong for the same reasons discussed immediately above relative to that term. Because alleged integrated circuit inventions are not immune from 112(6)'s requirement to disclose and clearly link structure to the claimed function, claim 10 of the '449 patent is invalid as indefinite.

C. '800 Patent – "first determination unit" / "second determination unit"

Regarding whether § 112(6) applies, Defendants overcame the presumption arising from absence of the word "means" by pointing out that "determination" is purely functional, and "unit" is well-recognized nonce word that is devoid of structure. Opening Br. 41. NST's only argument to the contrary is that the cases cited by Defendants relate to systems and software "that are not inherently structural, like integrated circuits." NST Br. at 41. NST's argument is both wrong and irrelevant. The "alerting unit" in *WSOU Investments* involved structure (an alarm clock facility in a mobile communication terminal, and the disclosed structures were "implemented on a common chip"). *WSOU*, 2023 U.S. App. LEXIS 25255, at *12-13. Similarly, the "cheque standby unit" in *Diebold* involved a mechanism that physically stored a check by holding it in position on a belt. *Diebold Nixdorf, Inc. v. Int'l Trade Comm'n*, 899 F.3d 1291, 1303 (Fed. Cir. 2018). Regardless, as discussed above, there is no exception to the § 112(6) rules when the claims otherwise recite an "integrated circuit." *Supra*, § II(A).

Regarding whether the specification discloses corresponding structure, NST largely makes the same arguments as it does for "dropping means," and those arguments are wrong for the same reasons discussed above. NST also makes two additional arguments, but both of those arguments fail. NST first points to a statement in the specification indicating that the determination units store data, which NST asserts a POSA would know requires "storage circuitry, such as latches, flip-flops, registers, or memory cells." NST Br. at 39. This fails for at

least two reasons. One, NST is again trying to improperly gap-fill with the alleged knowledge of a POSA rather than disclosure in the patents. *Supra*, § II(A)(2). The words "storage circuitry," "latches," "flip-flops," "registers," and "memory cells" do not appear anywhere in the '800 patent, and thus are not clearly linked in the patent to the recited functions. Two, the law requires that the specification disclose "adequate corresponding structure to perform ***all*** of the claimed functions." *Williamson*, 792 F.3d at 1351-52. Claim 12 does not state that the determination units perform the function of storing data; rather, the functions recited in the claims are **making *determinations*** regarding optimal amounts of data to buffer and an optimal moment to send data. '800 patent at 11:65-12:1, 12:5-7,12:16-19. NST does not argue that the claimed determination functions are performed by storage circuitry, nor could it reasonably do so.

Second, NST argues that the '800 patent describes an alternative embodiment in which the determination unit is the network interface. NST Br. at 40. This argument also fails. The '800 patent does not disclose such an embodiment; the passage cited by NST is merely a general statement that the same item of hardware can contain multiple means. '800 patent at 8:34-36. And regardless, claim 12 could not read on such an embodiment, since claim 12 separately claims the network interface as a separate element (which it calls an "interconnect module") and states that the interconnect modules "include[e]" the determination units. And, the Federal Circuit has held that describing the location of a unit, "rather than what it is or how it operates," is insufficient to comply with § 112(6). *WSOU*, 2023 U.S. App. LEXIS 25255, at *15.

IV. OTHER TERMS FOR CONSTRUCTION

A. '449 Patent – "resource manager determining whether a target connection with the desired connection properties is available"

The issue here is very similar to the one faced by the Federal Circuit in *BASF Agro B.V. v. Makhteshim Agan of N. Am., Inc.*, 519 Fed. Appx 1008, 1017 (Fed. Cir. Mar. 20, 2013). In that

case, the applicant stated that prior art references were "designed to provide a 'barrier' around the building to be protected," while the patent claims included "both 'treated and untreated locations.'" *Id.* The Federal Circuit determined that this was "a clear disclaimer of barrier treatments." *Id.* Similarly here, during prosecution of the '449 patent, the applicants characterized a prior art reference as containing an "arbiter" for "prioritizing which port of the module is to be utilized," and stated that this arbiter does not disclose the features of the claim including "resource manager determining whether a target connection with the desired connection properties is available." Ex. 11 at 6-7 (emphasis in original). Just as in *BASF*, this is a clear and unmistakable disclaimer of an "arbiter that prioritizes which port should be utilized."

NST's cases are easily distinguishable. *Thorner* did not address disclaimer during prosecution. *Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1365-67 (Fed. Cir. 2012). In *MIT*, each of the applicant statements related to claim terms that were not present in any of the asserted claims. *Mass. Inst. of Tech. v. Shire Pharms., Inc.*, 839 F.3d 1111, 1119-22 (Fed. Cir. 2016). Finally, in *Avid Tech*., the Federal Circuit found that the applicant was making a different distinction from the prior art than the one suggested by the defendant. *Avid Tech., Inc. v. Harmonic, Inc.*, 812 F.3d 1040, 1046-47 (Fed. Cir. 2016).[5] Here, NST's statements during prosecution distinguishing clearly identified prior art components involved the specific claim term at issue here, and those statements were clear and unmistakable.

[5] Specifically, the defendant argued that two statements in the prosecution history disclaimed a "central controller that identifies the storage unit." *Id.* at 1045. After reviewing the relevant statements, however, the Federal Circuit determined that the first statement only disclaimed a central controller that both identified storage unit and issued requests to storage units. *Id.* at 1046. Similarly, the Federal Circuit determined that the second statement distinguished the prior art because each client application is only connected to one single storage unit. *Id.* at 1046-47.

B. '052 Patent – "interconnect means"

Regarding whether § 112(6) applies, NST again argues that the presumption is overcome because claim 6 is directed to a method of mapping in an "integrated circuit." NST Br. at 21. As discussed above, however, integrated circuit claims are not an exception to the rule that the presumption arising from "means" is only overcome if the limitation itself (here, "interconnect means") recites sufficient structure. *Supra*, § II.A.1. NST has neither argued nor presented evidence that "interconnect" is a known structure in the art that is limited to "multi-hop interconnections." Therefore, § 112(6) applies to "interconnect means."

Regarding the corresponding structure in the specification, Defendants' identification of corresponding structure linked to the recited function (bus, switch, point-to-point wire, or network) comes directly from the '052 patent specification. '052 patent at 1:25-27; 1:50-54; 2:31-38; 4:46-50. NST does not dispute that busses, switches, point-to-point wires, and networks are all "interconnects" that perform the claimed coupling function. Rather, NST argues that if § 112(6) applies, the structure should simply be "circuit" because the specification allegedly distinguishes buses, switches or point-to-point wires from what NST calls "the patented Network on Chip technology." NST Br. at 21. This argument fails. **First**, the patentee could have more narrowly claimed a "network," but instead chose to claim an "interconnect means." NST cannot now re-write the claims to exclude certain structures clearly linked in the specification to the recited function simply because other structures perform better. **Second**, NST's argument that "the patented Network on Chip technology" was distinguished from buses, switches, or point-to-point wires is directly contradicted by the '052 patent, which states "[t]he network on chip may include wires, bus, time-division multiplexing, switches, and/or routers within a network." '052 patent at 4:48-50. Therefore, the structures identified in Defendants' construction are expressly identified as structures in what NST refers to as "the patented Network on Chip technology."

Finally, NST's proposed construction ("multi-hop interconnection between modules separated by one or more network nodes," a/k/a, "network") should be rejected. NST argues that the '052 patent uses "interconnect means" and "network" interchangeably, and that claim 6 recites the interconnect means is connected to a network interface. NST Br. at 20. These arguments ignore the patent's disclosure that "[t]he network on chip may include wires, bus, time-division multiplexing, switches, and/or routers within a network." '052 patent at 4:48-50. NST's construction reads out structure that the patent clearly links to the recited function.

C. '9893 Patent – "arranging . . . the first and second information comprising said issued message as a single address"

The claim language at issue recites in relevant part "the first and second information comprising said issued message." Dr. Chmelar admits that a POSA would recognize the "incongruity" to the literal words of the claim as chosen by the patentee because the claim also recites the reverse, *i.e.*, that the message is the one comprising the first and second information. Chmelar ¶¶ 149-151. According to Dr. Chmelar, the claim erroneously used the "incorrect verb form" of "comprising," when it should instead have recited "comprised in." *Id.* at ¶ 151.

With these statements, NST all but concedes that the claim as written is indefinite. With the dispute postured by NST in this way, the claim as written cannot be left alone. It must be found indefinite or re-written. But in this instance, a finding of indefiniteness is warranted. Re-writing claims is only allowed in cases where there is a clerical or typographical error that is clear from the intrinsic record. *See* Opening Br. at 24. There is no evidence that is the case here. The patentee knew how to draft the claims to read as Dr. Chmelar proposes – it did so in claim 1. '2893 Patent at 12:19-22. That suggests that the language of claim 4 was a conscious drafting choice, not a mistake. The Federal Circuit rejected a similar attempt at rewriting a claim with an incorrect usage of "comprising" in *Synchronoss Technologies, Inc. v. Dropbox, Inc.*, 987 F. 3d

1364, 1366-67 (Fed. Cir. 2021) (noting that "it is not our function to rewrite claims to preserve their validity"). NST's argument here is no different and should be rejected.

Moreover, even if the Court were to rewrite the claim as proposed by NST, the claim would remain indefinite. Opening Br. at 24-25. NST's expert opines that a POSA would readily understand the rewritten claim language, and provides purported examples of "arranging" such as "concatenation, addition, subtraction, integer multiplication, XOR, indexing a look-up table, and so on." Chmelar ¶ 154. This list of mathematical operations is not disclosed anywhere in the patent, and Dr. Chmelar's suggestion that "arranging" would encompass all of them (and more) illustrates why the term is indefinite. Hassoun Reply ¶¶ 24-25. Moreover, Dr. Chmelar sidesteps the central indefiniteness problem by parsing out individual terms in the phrase, rather than addressing the claim phrase. Dr. Chmelar offers no insight for how any of the exemplary "arranging" operations (like integer multiplication) can take the claimed first and second information and turn it into a <u>single</u> address. Dr. Chmelar suggests the metes and bounds of a "single address" would be known simply by recognizing "what would fit within the address field of the message." Chmelar ¶ 155. This argument fails to account for what is claimed as the first and second information. The (redrafted) claim requires not just arranging in a vacuum but arranging the claimed first and second information into a single address, where the first information includes a connection identifier identifying **two or more** message receiving modules, and the second information includes a particular location such as a register address. '9893 patent at 12:45-53 (claim 4). Dr. Chmelar offers no insight on how information about two or more different modules can be arranged with an existing address as a "single" address. Even if redrafted as NST proposes, the claim remains indefinite.

D. '2893 Patent Terms

1. "each data package comprising N data elements"

NST's arguments for this term are inconsistent with the fact that claim 10 is directed to a "method of designing" an integrated circuit, not the integrated circuit itself. Defendants' opening brief pointed out that the plain language of claim 10 indicates that this is one of the instances where "each" means "every." Opening Br. at 26 (citing cases). NST's response is to allege that interpreting "each" to mean "every" would improperly mean that "all possible" data packages that could ever go through an integrated circuit would need to comprise N data elements. NST Br. at 25. But that ignores that claim 10 is a method of "designing" an integrated circuit. As set forth in the claim language, the data packages that are at issue are those that will go through the portion of the integrated circuit alleged to be infringingly "designed." '2893 patent at 12:22-27.

Similarly, NST argues that N can be variable, i.e., that "the number of data elements can vary between one data package and the next." NST Br. at 25. But one of the claimed designing steps is "inserting M*N data storage elements into the data communication network," where "N [is] an integer of at least two." '2893 patent at 12:29-39. In the context of designing an integrated circuit, N being "an integer" means that the number of storage elements is selected once at design time. Hassoun Reply ¶¶ 8-10. If N could be variable and changing, a designer could not know how many storage elements to insert to meet the "M*N" calculation. *Id.* Based on the claim language, it is non-sensical to suggest "N" can change on a packet-by-packet basis.

NST's proposed construction is also divorced from the specification. The '2893 patent teaches that the problem being solved requires the number of N data elements in the network be fixed so that headers can be synchronized. *See* Opening Br. at 27-29. The disclosed invention

would not work under NST's construction. *Id.* NST cites ***no disclosure*** in the specification that supports the idea that the packages can have varying sizes, and for good reason: there is none.[6] Finally, while not in NST's brief, NST's expert Dr. Chmelar (who is a lawyer) makes the legal argument that N is not fixed because "comprising" is open-ended. Chmelar ¶ 164. This argument is directly contrary to ¶ 179 of his declaration, where Dr. Chmelar acknowledges that "[t]he specification of the '2893 Patent states that N corresponds to the size of the data package." And while "comprising" is often open ended, that is not the case when the surrounding claim language and the specification indicate otherwise. *In re Suitco Surface, Inc.*, 603 F.3d 1255, 1260 (Fed. Cir. 2010); *Raytheon Co. v. Sony Corp.*, 727 Fed. Appx. 662, 673 (Fed. Cir. 2018) ("'comprising' does not displace, or otherwise allow one to disregard, the patent specification"). Here, if the applicants had intended that a data package could have "N or more" data elements, they would have said that each data package comprises "a plurality of data elements," not "N data elements" where N is "an integer of at least two," which has a plainly different, narrower meaning. Moreover, Dr. Chmelar's legal argument is not just unsupported by the specification, it is ***contrary*** to the specification, which states that M*N data storage elements are added "to introduce a delay of M*N cycles onto the communication channel, with N corresponding to the size of a data package." '2893 patent at 5:54-58 (emphasis added); *see also* 7:7-8 ("with N corresponding to the number of data elements in a data package"); Hassoun Reply ¶ 12; *On*

[6] While not in its brief, NST's expert attempts to explain why packages need not be the same size. Chmelar ¶ 169. But there is no disclosure in the specification supporting Dr. Chmelar's example. Hassoun Reply ¶ 11. And, this attempt only serves to prove why Defendants are right as it shows why a host of other examples where packages are not the same size would be inoperable. *Id.*; *AIA Eng'g Ltd. v. Magotteaux Int'l S/A*, 657 F.3d 1264, 1278 (Fed. Cir. 2011) (stating that "a construction that renders the claimed invention inoperable should be viewed with extreme skepticism" and construing claim "to avoid an inoperable claim construction").

Demand Mach. Corp. v. Ingram Indus., Inc., 442 F.3d 1331, 1340 (Fed. Cir. 2006) ("claims cannot be of broader scope than the invention that is set forth in the specification").

2. "data package"

This claim term should not be construed in isolation, as its meaning is easily understood in the context of the asserted claim and the specification. The claim language is clear that a "data package" is made of "data elements." '2893 patent at 12:26-27. The specification teaches the same thing. *Id.* at 7:7-8 ("with N corresponding to the number of data elements in a data package"); *see also* 5:54-58. Further, the specification indisputably teaches that the "data packages <u>have a fixed size</u> of N data elements." *Id.*, 2:17-18. Instead of reading this term in the context of the claim language and specification, NST attempts to usurp the "fixed size" language from the specification and use it in a way that is contrary to the specification's teaching.

Further, neither the claim nor the specification use "arrangement." All NST points to in support of adding "arrangement" to the construction is that the specification shows figures where a data package has the header data element first, followed by two payload data elements. NST Br. at 27; '2893 patent at Figs. 2 and 4. The fact that the specification shows the order of "header, d0, d1" could support saying the header has to come first, but that is not NST's construction. NST's proposal merely adds the vague term "arrangement" to the construction. Indeed, NST's expert does not give any guidance on what "arrangement" means. *See* Chmelar ¶¶ 174-179.

3. "data storage elements"

Defendants' construction is premised on the fact that in the '2893 patent, a "data element" is the amount of data that is transmitted in a clock cycle, and a "data storage element" is a structure that stores that amount of data. Opening Br. at 31; '2893 patent at 6:60-7:2, 7:67-8:18, Figs. 1-4; Hassoun Reply ¶ 14. NST tries to refute this by quoting a portion of the specification (NST Br. at 27-28), but that portion says nothing about "data <u>storage</u> elements." The quotation is:

> The routing information, e.g. destination and required service type (e.g. best effort or guaranteed band width) has a fixed position in the data package, e.g. the first data element (i.e. a header), although other data elements may (also) contain such information.

'2893 patent at 2:22-26. This passage, in fact, *supports* Defendants' construction. It teaches that routing information has a "fixed position" in the data package, such as in the "first data element, (i.e., a header.)" *Id.* It also clarifies that the routing information may be located in other data elements, for example if the routing path is too long to fit in a single data element. *Id.* The fact that routing information may be spread over multiple data elements *confirms* that a data element is the amount of data that is transmitted in a clock cycle.

NST argues that the specification contradicts the Defendants' construction. NST Br. at 28. But every instance cited by NST shows that the number of "data storage elements" is a multiple of the number of "data elements" in a data package, i.e., N is the number of data elements and M*N is the number of data storage elements. '2893 patent at 6:1-2; 5:63-64; 6:60-61. NST also cites an example provided by Dr. Chmelar. NST Br. at 28. But Dr. Chmelar's example is inconsistent with the patent. In his example, Dr. Chmelar concludes without any explanation that two sets of 5 data storage elements not only have a delay other than 5 clock cycles (the number of data storage elements), but different from each other.[7] Chmelar ¶ 189. Dr. Chmelar provides no explanation of how this is possible. The '2893 patent only discloses that the number of data storage elements is equal to the number of cycles of delay introduced, and nowhere in the patent is there a single suggestion of variable delays for each data element. *E.g.*, '2893 patent at 1:41-61, 2:11-14, 6:60-7:2, 7:67-8:18; Figs. 1-4; Hassoun Reply ¶¶ 15-16. This is because data storage

[7] In ¶ 189, Dr. Chmelar argues that the aggregate delay is equal to the number of data storage elements. However, the '2893 patent makes clear that each data storage element causes a delay of one cycle on the network. '2893 patent at 1:41-61, 6:60-7:2, 7:67-8:18; Figs. 1-4.

elements as taught by the ’2893 patent each store one data element for one clock cycle and then pass it on during the next clock cycle. *Id*.

NST’s proposed construction fails to add any clarity for the term “data storage element” and is not supported by the specification. The word “array” does not appear in the ’2893 patent. NST provides no argument supporting this language. NST Br. at 27-28. NST’s only discussion of its construction is to provide a definition of “array,” and say that it is not “‘ambiguous’ or ‘potentially overbroad.’” *Id.* However, inserting the definition of array proposed by NST in its construction shows just how ambiguous and broad NST’s construction is: “Array [(a group of elements forming a complete unit)] of one or more elements that store data.”

E. ’800 Patent Terms

1. “optimal amount of data”

“Optimal amount of data” is purely subjective and a POSA would not know with reasonable certainty what the “optimal amount of data” is. Opening Br. at 32-35. NST concedes that “optimal amount of data is not a fixed quantifier,” but argues that a POSA would understand that the “optimal amount of data” is the amount of data that would result in optimal “interconnect utilization.” NST Br. at 28-32. NST’s argument fails for two reasons.

First, neither the claims nor the specification indicate that the “optimal amount of data” should be the amount that optimizes “interconnect utilization.” Indeed, the specification does not include any discussion of “optimizing” interconnect utilization.[8] Instead, the specification reflects that interconnect design requires a weighing of many different costs and benefits. Hassoun Reply ¶ 18; ’800 patent at 1:37 (electrical problems), 1:39-40 (number of wires), 1:41 (energy efficiency, reliability, and scalability); 1:55-56 (out-of-order transactions, latency, and

[8] The ’800 patent only refers to improving interconnect utilization, never optimizing it. ’800 patent at 1:40, 2:57, 2:62, 3:37, 4:27-28, 6:6, 7:22-23.

end-to-end flow control); 2:1 (cost of memory); 3:29-30 (deadlock); 3:50-52 (number of packet headers); 4:50-54 (overhead, efficiency); 5:27-35 (throughput, lossiness, transaction termination, transaction completion, data correctness, priority, and data delivery). Many of these properties would be affected by the amount of data that is buffered; a POSA would not ignore them to focus solely on interconnect utilization. Hassoun Reply ¶ 18.

NST suggests that at least some of these properties would be fixed at interconnect design time. NST Br. at 30. NST only explains that argument for "latency" and does not explain how the many other factors that are relevant to interconnect design would be "baked" into the integrated circuit. Most of them would not be. Hassoun Reply ¶ 19. To take just one example, the optimal amount of data could depend on how much the POSA valued latency as compared to throughput. *Id*. The specification never discloses how to weigh these various conditions to determine the optimal amount of data. *Id.*

Second, even if "optimal amount of data" could be construed to mean "optimal amount of data to optimize interconnect utilization," it would still be indefinite because "interconnect utilization" is itself a subjective term that is not well-known or readily calculated. Hassoun Reply ¶ 20. Neither the patent nor Dr. Chmelar explain what "interconnect utilization" means, much less explain how an "optimal amount" of utilization could be determined. To the extent that phrase is even somewhat understandable, the level of "interconnect utilization" could be determined in multiple different ways that might conflict. *Id.* NST's brief characterizes interconnect utilization as "send[ing] as much data in the fewest number of transmissions as possible." NST Br. at 30. NST has no support for this characterization. Its own expert does not support it. Chmelar ¶¶ 195-97. To the extent "interconnect utilization" can be understood, a POSA would expect that "sending as much data in the fewest number of transmissions as

possible" could conflict with maximizing interconnect utilization. Hassoun Reply ¶ 20. A POSA would expect that waiting to send as much data in the fewest number of transmissions could result in the interconnect being left empty (not utilized) while data is built up. *Id.*

Patents claiming "optimal" or similar terms are often held indefinite. Opening Br. at 32, 35; *In re TR Labs Patent Litig.*, No. 09-3883, 2014 U.S. Dist. LEXIS 95185, at *14-20 (D.N.J. Jul. 14, 2014) (finding "optimize demand served" indefinite). NST's attempts to distinguish these cases by arguing that "optimal amount" is "an objective value that can be calculated based on objective attributes that are baked into an integrated circuit during fabrication." NST Br. at 31. As discussed above, that is not true. One statement NST makes as part of these distinctions illustrates the problem with its argument. NST characterizes dicta from *Optimum Processing Solutions* as suggesting the result would have been different if "optimized" meant "maximize or minimize a performance index." NST Br. at 31, n.13. NST states that this is "exactly how 'optimal' is used in the '800 patent." *Id.* But "optimal amount of data" in the '800 patent does not mean "maximize or minimize" any single, calculable, parameter. This is fatal to NST's argument.

The only case NST identifies where a claim reciting "optimal" was not found to be indefinite is *Bitmicro LLC v. Kioxia America, Inc., et al.*, No. 6:22-cv-00331, Dkt. 54 at *30 (W.D. Tex. Feb. 16, 2023) (Albright, J.). In that case, the claim recited an optimal "device profile" for a given data type, and the specification identified only two data types. *Id.* at *44. The specification provided detailed information regarding which device profile would be optimal for both types. *Id.* This case is different. There are innumerable amounts of data that could be buffered, and the specification merely provides a long list of potential criteria to consider.

2. "optimal moment"

"Optimal moment for sending the data" also fails the reasonable certainty test because it is subjective. Opening Br. at 35-38. NST argues that "optimal moment" is the "transmission

moment" disclosed in the specification. NST Br. at 33. But the patent does not say that – indeed, "optimal moment" does not appear in the specification. Neither NST nor its expert explain how an optimal moment can be determined based on the ten communication properties identified in the claim. Instead, NST's expert again suggests that the "optimal moment" is the moment that is optimal for "interconnect utilization." Chmelar ¶ 206. This argument fails for the same reasons as it fails for "optimal amount of data." Again, the disconnect between NST's expert and its brief highlights the issue. NST's brief argues that the transmission moment "is simply the next possible moment when network resources become physically available so that its [sic] physically possible to transmit the data." NST Br. at 33; *see also* 34, 35. NST's expert does not support this statement, and neither NST nor its expert explain why this would result in optimal "interconnect utilization." Chmelar ¶ 205. There is no reason to believe simply choosing the first available moment would be "optimal" for any given property, particularly given that interconnects frequently used shared resources to manage communications between multiple different IP blocks. Hassoun Reply ¶ 21.

Defendants also explained that the "optimal moment" may conflict with the "optimal amount." Opening Br. at 37. NST responds that because data is buffered before it is transmitted the "optimal amount" controls over "optimal moment." NST Br. at 34. This argument misses the point. Even if data is buffered before it is transmitted, the determination unit could decide the "optimal moment" has arrived before the "optimal amount of data" has been buffered under the various arguments advanced by NST. Hassoun Reply ¶ 22. In that case, the NoC would have the option of sending the data even if it was less than an "optimal amount," or waiting and sending the data at a time after the "optimal moment." *Id.* The patent fails to describe what the NoC would do in that instance. *Id.* The claim is indefinite for this additional reason.

3. "according to communication properties of the communication between the master and the slave, wherein the communication properties include ordering of data transport . . . , and data delivery"

During the claim construction meet and confer, NST took the position that only ***some*** of the communication properties listed after "include" need to be used to determine the optimal moment. Ex. 30 at 7-10. Defendants disagree because the plain language of the claim states otherwise. Therefore, the parties have a fundamental dispute regarding the scope of this claim that the Court must resolve during claim construction. *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008).

The plain language of the claim is clear: it states that the optimal moment should be determined "according to communication properties" (plural) that "include" a list of different properties that are connected using the conjunctive word "and." This is straightforward. If something should be determined "according to communication properties including X and Y", it cannot be determined according to only X; it needs to be determined according to both X and Y. NST does not provide any reason for the Court to construe "and" to mean "or." NST does not respond to the portions of the specification identified in Defendants' brief, and its argument about the file history fails. NST argues that "incorporating the claimed list" somehow means something less than the claimed list. NST Br. at 37. The Examiner's reference to "using all of the listed conditions/requirements" and "incorporating the claimed list" clearly indicate the Examiner's interpretation of this claim term is consistent with Defendant's construction. Ex. 18 at 20; Ex. 20 at Notice of Allowability, p. 2.

4. "said first wrapper" / "said second wrapper"

NST does not dispute that "said first wrapper" and "said second wrapper" lack antecedent basis in claim 12, and also does not dispute that this renders claim 12 indefinite unless a POSA can discern the appropriate correction with reasonable certainty. Defendants' opening brief

pointed out that this cannot be done because there are at least three reasonable ways to correct the lack of antecedent basis. Opening Br. at 44-45. In response, NST latches onto the first one (that "wrapper" should have been "memory") as the only reasonable correction. However, NST fails to persuasively explain why the other two corrections are unreasonable. The second possible correction (replacing "wrapper" with "interconnect module") would be reasonable because the specification teaches that the wrapper, like the interconnect module, may transfer data. '800 patent at 3:59-60; 3:64-4:2; 4:41-46; 6:22-25. The third possible correction (replacing "said wrapper" with "a wrapper") would be reasonable because the specification's most salient description of "wrappers" equates them with "interconnect interfaces." *Id.* at 8:13-18.

Instead, NST tries to distract attention away from these other reasonable corrections by alleging an inconsistency between Defendants' position on this term and their proposed construction of "determination unit." NST Br. at 44. There is no inconsistency. Defendants' proposed recitation of the function for "determination unit" refers to "first/second memory" because that is what is stated in the relevant parts of claim 12. *See* '800 patent at 11:66-12:1 and 12:5-7. However, the lack of antecedent basis arises in a ***different*** part of claim 12. *Id.* at 12:16-19. Defendant's proposed function relevant to that part of claim 12 does not refer to "memory" because that part of the claim does not say "memory." *See id.*; Opening Br. at 40-41. Because a POSA would not have reasonable certainty regarding what "said first wrapper" and "said second wrapper" refer to, claim 12 is invalid as indefinite. *Bushnell Hawthorne, LLC v. Cisco Sys.*, 813 Fed. Appx 522, 525-27 (Fed. Cir. 2020) (finding reference to "said different IP address" indefinite where it was not clear what IP address the claim was referring to).

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CERTIFICATE OF SERVICE

I hereby certify that all counsel of record who are deemed to have consented to electronic service are being served this 30th day of November, 2023, with a copy of this document via the Court's CM/ECF system per Local Rule CV-5(a).

s/ *J. Derek Vandenburgh*