**UNITED STATES DISTRICT COURT**

**FOR THE CENTRAL DISTRICT OF CALIFORNIA**

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| ENTROPIC COMMUNICATIONS, LLC,<br><br>Plaintiff,<br><br>v.<br>COX COMMUNICATIONS, INC., COXCOM, LLC, and COX COMMUNICATIONS CALIFORNIA, LLC,<br><br>Defendants. | Case No. 2:23-cv-01049-JWH-KESx (Lead Case)<br><br>Case No. 2:23-cv-01050-JWH-KESx (Related Case)<br><br>**[TENTATIVE] CLAIM CONSTRUCTION ORDER** |
| ENTROPIC COMMUNICATIONS, LLC,<br><br>Plaintiff,<br><br>v.<br>COMCAST CORPORATION, COMCAST CABLE COMMUNICATIONS, LLC, and COMCAST CABLE COMMUNICATIONS MANAGEMENT, LLC,<br><br>Defendants. | |



Comcast, Ex. 1234

## I. SUMMARY OF DECISION

In these actions, Plaintiff Entropic Communications, LLC asserts that the activities of Defendants Cox Communications, Inc.; CoxCom LLC; and Cox Communications California, LLC (collectively, the "Cox Defendants"); and Defendants Comcast Corporation; Comcast Cable Communications, LLC; and Comcast Cable Communications Management, LLC (collectively, the "Comcast Defendants")—in offering to sell and selling cable modem products and services—infringe 10 of Entropic's patents.[1] The parties dispute the meaning of certain limitation in three of those patents: U.S. Patent Nos. 8,223,775;[2] 8,284,690;[3] and 10,135,682[4] (collectively, the "Patents at Issue").

The parties present four limitations from the Patents at Issue for construction.[5] The Court conducted a claim construction hearing on July 23, 2024. After considering the parties' opening, responsive, and reply claim construction briefs,[6] as well as the argument of counsel at the hearing, the Court construes the disputed terms as follows:

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[1] *See generally* Compl. (the "Complaint") [ECF No. 1] (operative pleading against the Cox Defendants); Proposed Third Am. Compl. [ECF No. 170] (operative pleading against the Comcast Defendants).

[2] *See* Decl. of Vincent J. Galluzzo in Supp. of Entropic's Opening Claim Construction Brief (the "Galluzzo Declaration") [ECF No. 325-1], Ex. A (the "'775 Patent") [ECF No. 325-2].

[3] *See* Galluzzo Declaration, Ex. B (the "'690 Patent") [ECF No. 325-3].

[4] *See* Galluzzo Declaration, Ex. C (the "'682 Patent") [ECF No. 325-4].

[5] *See* Joint Claim Construction & Pre-Hr'g Statement (the "Joint Statement") [ECF No. 301], App. A.

[6] Entropic's Opening Claim Construction Brief ("Entropic's Opening Brief") [ECF No. 325]; Defs.' Joint Responsive Claim Construction Brief ("Defendants' Responsive Brief") [ECF No. 332]; Entropic's Reply Claim Construction Brief ("Entropic's Reply Brief") [ECF No. 333].

| Limitation | Construction |
|---|---|
| "wherein the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine" | "wherein the cable modem engine and the data networking engine are not necessarily physically separate but are functionally separate such that the cable modem functions are performed only by the cable modem engine and the home networking functions are performed only by the data networking engine" |
| "content payload" | "the content of a probe, which does not include the prefix, preamble, or overhead information" |
| "CMTS" | "hardware and accompanying software, with the hardware located at the point at which the cable modem's connection to the hybrid-fiber coaxial network terminates" |
| "SNR-related metric" | Not indefinite. |

## II. THE PATENTS AT ISSUE

The Patents at Issue generally relate to network communications in a cable modem system. The Patents at Issue are not part of the same patent family; they are directed to different solutions.

### A. The '775 Patent

The '775 Patent, entitled "Architecture for a Flexible and High-Performance Gateway Cable Modem," claims priority to an application filed in March 2005. The '775 Patent discloses a cable modem configuration to partition data networking operations from traditional cable modem operations.[7] That configuration provides a "highly flexible, high performance system capable

[7] '775 Patent 1:13-29 & 2:24-27.

of handling multiple cable modem voice, data and networking services."[8] The partitioning involves "localizing data networking functions in the data networking engine processor and localizing cable modem functions in the cable modem engine processor."[9]

Claim 18 discloses:

18. A cable modem system comprising:

a data networking engine implemented in a first circuit that includes at least one processor, the data networking engine programmed with software that when executed by the at least one processor of the first circuit causes the data networking engine to perform home networking functions including interfacing with customer provided equipment;

a cable modem engine implemented in a second circuit that includes at least one processor, the second circuit being separate from the first circuit, the cable modem engine programmed with software that when executed by the at least one processor of the second circuit causes the cable modem engine to perform cable modem functions other than the home networking functions performed by the data networking engine, the cable modem functions including interfacing with cable media, and the cable modem engine configured to enable upgrades to its software in a manner that is independent of upgrades to the software of the data networking engine, the cable modem engine including a DOCSIS controller and a DOCSIS MAC processor, the DOCSIS MAC processor configured to process downstream PDU packets and

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[8] *Id.* at 1:61–2:4.

[9] *Id.* at 4:16-19.

forward the processed packets directly to the data networking engine without the involvement of the DOCSIS controller in order to boost downstream throughput; and

a data bus that connects the data networking engine to the cable modem engine, ***wherein the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine***.[10]

**B. The '690 Patent**

The '690 Patent, entitled "Receiver Determined Probe," claims its earliest priority to two provisional patent applications filed in December 2008 and May 2009. The '690 Patent discloses a "received determined probe" that is used to "characterize the communication channel over which data is to be sent between nodes of the network."[11] The probe of the '690 Patent allows for flexibility in the characterization process compared to predetermined prior art probes.[12] "The receiving node may generate a probe request that specifies a plurality of parameters to be used in such a 'receiver determined' probe to generate a probe having the 'form' specified by these parameters."[13] The transmitting node then generates a probe "base[d] upon one of the parameters of the probe request or based upon information that previously existed within the transmitting node."[14] "By comparing the reference probe with the actual received probe, the receiver can determine some of the characteristics of the

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[10] '775 Patent, Claim 18 (emphasis added to show disputed limitation).

[11] '690 Patent 1:41-43 & 2:3-6.

[12] *See id*. at 1:52-59.

[13] *Id.* at 2:3-6.

[14] *Id.* at 6:43-45; *see also id*. at 2:3-6 & 2:17-19.

channel between the transmitting and receiving node."[15] The determined characteristics may be used for "OFDMA sub-channel assessment" or "for off-site network diagnosis," among other uses.[16]

Claim 1 discloses:

1. A method comprising:

a) receiving in a first node, a probe request specifying a first plurality of parameters associated with the generation and transmission of a probe, wherein the first plurality of parameters at least specify ***content payload*** of the probe and a second node,

b) determining a second plurality of parameters associated with generation and transmission of the probe;

c) generating the probe in accordance with the first plurality of parameters and the second plurality of parameters, wherein the probe has a form dictated by the first plurality of parameters; and

d) transmitting the probe from the first node to the second node.[17]

**C. The '682 Patent**

The '682 Patent, entitled "Method and System for Service Group Management in a Cable Network," claims priority to a provisional application filed in July 2013. It generally relates to organizing cable modems ("CMs") into service groups.[18] A cable modem termination system ("CMTS") connects to the CMs via a hybrid-fiber coaxial ("HFC") network.[19] The CMTS then assigns CMs to service groups based upon signal-to-noise ratio ("SNR") related

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[15] *Id.* at 1:54-57.

[16] *See id.* at 2:22–27 & 4:25–27.

[17] '690 Patent, Claim 1 (emphasis added to show disputed term).

[18] *See* '682 Patent, Claim 1.

[19] *Id.* at 3:47-50.

metrics.[20] SNR-related metrics may include "SNR at a particular frequency or SNR over a range of frequencies (an SNR profile), noise levels, strength of desired signals, and/or the like for any particular CM."[21] The group assignments can be used to configure "physical layer" parameters to optimize network reliability and other factors.[22]

Claim 1 discloses:

1. A method comprising:

determining, by a ***cable modem termination system (CMTS)***, for each cable modem served by said CMTS, a corresponding ***signal-to-noise ratio (SNR) related metric***;

assigning, by said ***CMTS***, each cable modem among a plurality of service groups based on a respective corresponding ***SNR-related metric***;

generating, by said ***CMTS*** for each one of said plurality of service groups, a composite ***SNR-related metric*** based at least in part on a worst-case SNR profile of said ***SNR-related metrics*** corresponding to said one of said plurality of service groups;

selecting, by said ***CMTS***, one or more physical layer communication parameter to be used for communicating with said one of said plurality of service groups based on said composite ***SNR-related metric***; and

communicating, by said ***CMTS***, with one or more cable modems corresponding to said one of said plurality of service groups using

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[20] *Id.*, Abstract & Claim 1.

[21] *Id.* at 3:55-59.

[22] *Id.* at 5:46-50.

said selected one or more physical layer communication parameter.[23]

## III. LEGAL STANDARD

The task of claim construction involves determining the meaning of a word or a group of words—which is known as a "limitation"—in a patent claim. Claim construction "'is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims.'" *Gart v. Logitech, Inc.*, 254 F.3d 1334, 1339 (Fed. Cir. 2001) (quoting *Embrex, Inc. v. Serv. Eng'g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000)). Construing the meaning of patent claims is an issue for the Court to decide as a matter of law. *Markman v. Westview Instr., Inc.*, 517 U.S. 370, 387-91 (1996). "When the parties present a fundamental dispute regarding the scope of a claim term, it is the court's duty to resolve it." *O2 Micro Intern. Ltd. v. Beyond Innovation Tech. Co., Ltd.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008).

"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) (*en banc*) (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). The task of claim construction always begins with the claim language. *See Innova*, 381 F.3d at 1116. Indeed, "the proper construction of any claim language must, among other things, 'stay[] true to the claim language.'" *Straight Path IP Group v. Sipnet EU S.R.O.*, 806 F.3d 1356, 1361 (Fed. Cir. 2015) (quoting *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998)). Claim terms "are generally given their ordinary and customary meaning," *Phillips*, 415 F.3d at 1312 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)), which is "the meaning that the term would

[23] '682 Patent, Claim 1 (emphasis added to show disputed terms).

have to a person of ordinary skill in the art," *id.* at 1313. The terms must be read in the context of the entire patent, however. *See id.* at 1314. In interpreting a limitation, the Court must focus primarily on the intrinsic evidence of record, including the claims themselves, the specification, and, if in evidence, the prosecution history. *See id.* at 1312-20; *see also Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319 (Fed. Cir. 2005).

Among the intrinsic evidence, the "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*, 90 F.3d at 1582. "The specification is, thus, the primary basis for construing the claims." *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985). It is "entirely appropriate for a court, when conducting claim construction, to rely heavily on the written description for guidance as to the meaning of the claims." *Phillips*, 415 F.3d at 1317. The Federal Circuit has recognized that an inventor may invoke a particular definition of a term in her specification, or otherwise use a term in the specification in a manner that differs from the term's ordinary usage. *See id.* at 1316. "In such cases, the inventor's lexicography governs." *Id.*

In addition to the specification, the Court should also consider the prosecution history (if it is in evidence), consisting of "the complete record" of the patent. *Id.* If, within the prosecution history, a patentee clearly and unmistakably disavowed a claim construction, then the patentee disclaimed that construction. *See SanDisk Corp. v. Memorex Prods., Inc.*, 415 F.3d 1278, 1287 (Fed. Cir. 2005); *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003). Because the prosecution history often lacks the clarity of the specification, however, it is less useful for claim interpretation purposes. *See Phillips*, 415 F.3d at 1317.

Although the Court may also consider extrinsic evidence, including expert testimony, dictionaries, and learned treatises, such evidence is generally viewed

as less reliable than intrinsic evidence. *See id.* at 1317-18. Therefore, the Court must use its discretion in admitting and weighing extrinsic evidence, keeping in mind the inherent flaws in that type of evidence. *See id.* at 1319.

## IV. AGREED-UPON CLAIM LIMITATIONS

The parties have agreed upon the following constructions:[24]

| Term | Agreed Construction |
|---|---|
| "network management messages" (U.S. Patent No. 9,825,826, Claim 1) | Plain and ordinary meaning. |
| "operable to" (U.S. Patent No. 8,792,008, Claim 1) | Plain and ordinary meaning. |
| "probe" ('690 Patent, Claim 1) | Plain and ordinary meaning. |
| "probe request" ('690 Patent, Claim 1, 7, & 8) | Plain and ordinary meaning. |
| [Order of the Steps] (U.S. Patent No. 9,210,362 (the "'362 Patent"), Claim 11) | In Claim 11 of the '362 Patent, the "digitizing . . ." step must be performed before the "selecting . . ." step, and the "selecting . . ." step must be performed before the "outputting . . ." step. No other order of steps is required. |

The Court adopts the parties' agreed-upon constructions. *See MyMail, Ltd. v. Am. Online, Inc.*, 476 F.3d 1372, 1377–78 (Fed. Cir. 2007) (rejecting a party's appellate challenge to claim construction agreed to by that party in the district court).

[24] Joint Statement 2:15-28.

## V. DISPUTED CLAIM LIMITATIONS

### A. Meaning of "Completely Partitioned"

| Limitation at Issue: "wherein the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine" ('775 Patent, Claim 18) | |
|---|---|
| **Entropic's Proposed Construction** | **Defendants' Proposed Construction** |
| "wherein the cable modem engine and the data networking engine are not necessarily physically separate but are functionally separate such that the cable modem functions are performed only by the cable modem engine and the home networking functions are performed only by the data networking engine" | Ordinary and customary meaning. |

The parties agree that plain and ordinary meaning applies,[25] but they dispute the scope of the phrase, "completely partitioned." Defendants argue that Entropic's proposed language is unnecessary and that the length of the clarification is "suspect."[26] Still, Defendants agree that the engines are functionally separate.[27] Defendants also agree that the engines can share circuitry.[28]

The Court first considers the claim language. Claim 18 of the '775 Patent discloses a data networking engine and a cable modem engine.[29] The data

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[25] *See* Entropic's Opening Brief 9:19-20.

[26] Defendants' Responsive Brief 3:27-28 & 4:2-4.

[27] *Id.* at 4:2-4.

[28] *See id.* at 5:4-10.

[29] '775 Patent, Claim 18.

networking engine is implemented in a first circuit, and it has software for home networking functions.[30] The cable modem engine is implemented in a second circuit, and it has software for cable modem functions "other than the home networking functions performed by the data networking engine."[31] The cable modem engine is configured to enable upgrades to its software independent of upgrades to the software of the data networking engine.[32] Finally, Claim 18 discloses "a data bus that connects the data networking engine to the cable modem engine, wherein the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine."[33]

The claim language itself clarifies three points. First, the engines are functionally separate because the cable modem software "causes the cable modem engine to perform cable modem functions other than the home networking functions performed by the data networking engine" and "the cable modem engine configured to enable upgrades to its software in a manner that is independent of upgrades to the software of the data networking engine."[34] Second, the engines may share connecting circuity, at least because "a data bus . . . connects the data networking engine to the cable modem engine."[35] Third, the engines use different circuits and accompanying processors because the "data networking engine [is] implemented in a first circuit" and the "cable

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30 *Id.*

31 *Id.*

32 *Id.*

33 *Id.*

34 '775 Patent, Claim 18.

35 *Id.*

modem engine [is] implemented in a second circuit."[36] Despite devoting much of their briefing to those points, the parties agree on each.[37]

The only remaining dispute appears to be whether those necessarily separate circuits and accompanying processors constitute a "functional" or "physical" separation.[38] The Eastern District of Texas already addressed that issue, albeit for purpose of resolving an indefiniteness challenge:

> Further, although the claim requires "the second circuit being separate from the first circuit," the "first circuit" and "second circuit" need not be physically separated, such as on separate chips, for example. *Cf. Linear Tech. Corp. v. Int'l Trade Comm'n*, 566 F.3d 1049, 1055 (Fed. Cir. 2009) ("We agree with the Commission's construction of 'second circuit' and 'third circuit,' defining the terms broadly to not require entirely separate and distinct circuits."). This is true even if the disclosed cable modem system 100 is implemented as a "System-on-a-Chip" ("SoC") because even if the SoC is considered to be a single "circuit" (*see* Dkt. No. 97, at 8; *see also* Dkt. No. 104, Ex. 2, May 4, 2023 Kramer dep. at 127:13–22 ("a System on a Chip can be considered an

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[36] *Id.*

[37] Defendants' Responsive Brief 4:2-3 ("The claim limitation uses readily understandable words that already establish that the cable modem engine and data networking engine are functionally separate."); *id.* at 4:4-5 ("Defendants do not contend that those engines cannot communicate with each other . . . ."); Entropic's Reply Brief at 4:11-13 ("Entropic does not dispute that the claimed cable-modem and data-networking engines must be implemented on 'separate' circuits, each having its own processor.").

[38] *See* Defendants' Responsive Brief 4:24-26 & 6:9-12; Entropic's Reply Brief 5:24-6:13.

> integrated circuit")), this circuit can itself be understood as being composed of multiple circuits.

*Entropic Commc'ns, LLC v. Charter Commc'ns, Inc.*, 2023 WL 4181266, at *6 (E.D. Tex. June 26, 2023) ("*Charter*"). Thus, according to that court, the separate circuits and processors may be functional in nature, and they do not necessarily require physical separation.

Although Defendants do not directly challenge the conclusion in *Charter*, they suggest that it is incorrect in view of the specification.[39] For instance, the specification discloses that complete partitioning "is accomplished by localizing data networking functions in the data networking engine processor and localizing cable modem functions in the cable modem engine processor."[40] Defendants argue that "localizing" those functions in different processors is disclosed throughout the specification.[41] Still, the header of the section that Defendants cite for support reads "***Functional*** Partitioning."[42] Thus, consistent with the decision in *Charter*, this Court does not conclude that "localizing" necessarily requires physical separation. Defendants' challenge to Entropic's proposed language, which quotes the claim construction adopted in *Charter*, is not persuasive.

For the foregoing reasons, the Court concludes that "wherein the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine" means "wherein the cable modem engine and the data networking engine are not necessarily physically separate but are functionally

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[39] Defendants' Responsive Brief 6:1-12.

[40] '775 Patent 4:16-19.

[41] Defendants' Responsive Brief 6:9-12.

[42] '775 Patent 4:13 (emphasis added).

separate such that the cable modem functions are performed only by the cable modem engine and the home networking functions are performed only by the data networking engine."

**B. Meaning of "Content Payload"**

| **Limitation at Issue:** "content payload" ('690 Patent, Claim 1) | |
|---|---|
| **Entropic's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning. | "data to be transmitted in the probe" |

The parties dispute the propriety and scope of the term "data," as used in Defendants' proposed construction. Entropic objects to the term "data" to the extent that it excludes "symbols."[43] Entropic also challenges Defendants' proposed construction of the content payload for a probe as supported only by disclosures concerning a packet.[44] Defendants argue that their construction appropriately clarifies that "content payload" refers to the data content of the probe, as opposed to any other information that might be transmitted with the probe, such as overhead information or a prefix.[45]

The parties' briefing reveals the absence of any fundamental claim construction dispute here. First, Defendants indicate that they read the term "data," as used in the '690 Patent, to include "symbols."[46] The specification does not expressly disclose that "data" includes "symbols." Nevertheless, it indicates that the content payload incudes both "data" and "symbols." For instance, it discloses that "[i]n one embodiment, the number of symbols and the

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[43] Entropic's Opening Brief 14:13-23.

[44] *Id.* at 13:24-28.

[45] Defendants' Responsive Brief 8:1-8.

[46] *Id.* at 9:16-20.

raw data sequence will be determined such that the serialized bit stream corresponding to the raw data sequence fully occupies the requested number of symbols using the requested bitloading profile."[47] It also states that "[i]n one embodiment, the parameters further include: the modulation profile for the probe; the payload content of the probe; the number of times to transmit the probe; the number of symbols for the payload of the probe; the preamble type for the probe; the cyclic-refix length for the payload of the probe; the transmit power for the probe; and the transmit power scaling factor for the payload of the probe."[48] Thus, the parties agree that the content payload includes both data and symbols, to the extent that the term data does not already encompass symbols—there is no dispute in that regard.

Next, Defendants acknowledge that a probe may be a packet, but it is not necessarily limited to a packet.[49] Still, the specification uses the term "data" primarily in embodiments in which the probe is a packet.[50] In some other embodiments, the specification discloses that the content payload includes a "raw data sequence," among other parameters.[51] Thus, the payload content certainly may include data, but it may also include symbols and other parameters that the '690 Patent does not expressly define as "data," even if Defendants understand that content to be "data." Accordingly, the Court declines to include the term "data" in its construction and instead opts for the term "content." That term is appropriate because the parties do not raise a

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[47] '690 Patent 8:8-12.

[48] *Id.* at 2:9-17.

[49] Defendants' Responsive Brief 9 n.3. The disputed "content payload" is the content payload of the probe. *See* '690 Patent, Claim 1.

[50] '690 Patent 3:57-58 ("A PHY payload is used to transmit the data content of the packet.").

[51] *See, e.g.*, *id.* at 8:8-9.

fundamental claim construction dispute concerning the type of content that the probe may include.

Finally, to resolve Defendants' concern regarding distinguishing "content payload" from other information, including overhead and prefix information, Entropic agrees to construe "content payload" as "the content of a probe, which does not include the prefix, preamble, or overhead information."[52] That proposed construction is appropriate because the specification consistently distinguishes "preambles and payloads."[53]

For the foregoing reasons, the Court construes "content payload" as "the content of a probe, which does not include the prefix, preamble, or overhead information."

### C. Meaning of "Cable Mode Termination System (CMTS)"

| **Limitation at Issue:** "CMTS" ('682 Patent, Claims 1, 3-5, & 9) | |
|---|---|
| **Entropic's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning, wherein the CMTS may be realized in hardware, software, or a combination of hardware and software, and may be realized in a centralized or distributed fashion. | "equipment at which the cable modem's connection to the hybrid-fiber coaxial network terminates" |

Here, the claim explains what the CMTS does, but it does not explain what the CMTS is or where it is located. The Court primarily considers the specification to resolve the parties' dispute.

[52] Entropic's Reply Brief 6:15-21.

[53] '690 Patent 2:9-17, 3:40-44, & 9:7-8.

The specification discloses that "[t]he CMTS 102 may comprise circuitry operable to manage connections to the [cable modems] CMs 1121-1125."[54] The specification previously defined "circuits" and "circuitry" to mean "physical electronic components (i.e. hardware) and any software and/or firmware ('code') which may configure the hardware, be executed by the hardware, and or otherwise be associated with that hardware."[55] Thus, per the specification, the CMTS may include hardware and any software associated with the hardware. To the extent that the CMTS comprises circuity, it may not include software alone because the '682 Patent defines circuity to include both hardware and software.

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[54] '682 Patent 2:61-62.

[55] *Id.* at 2:32-36.

Next, the specification shows that the network connects the CMTS and the cable modems. For instance, Figure 1 shows the CMTS (102) in connection with the cable modems (112):[56]

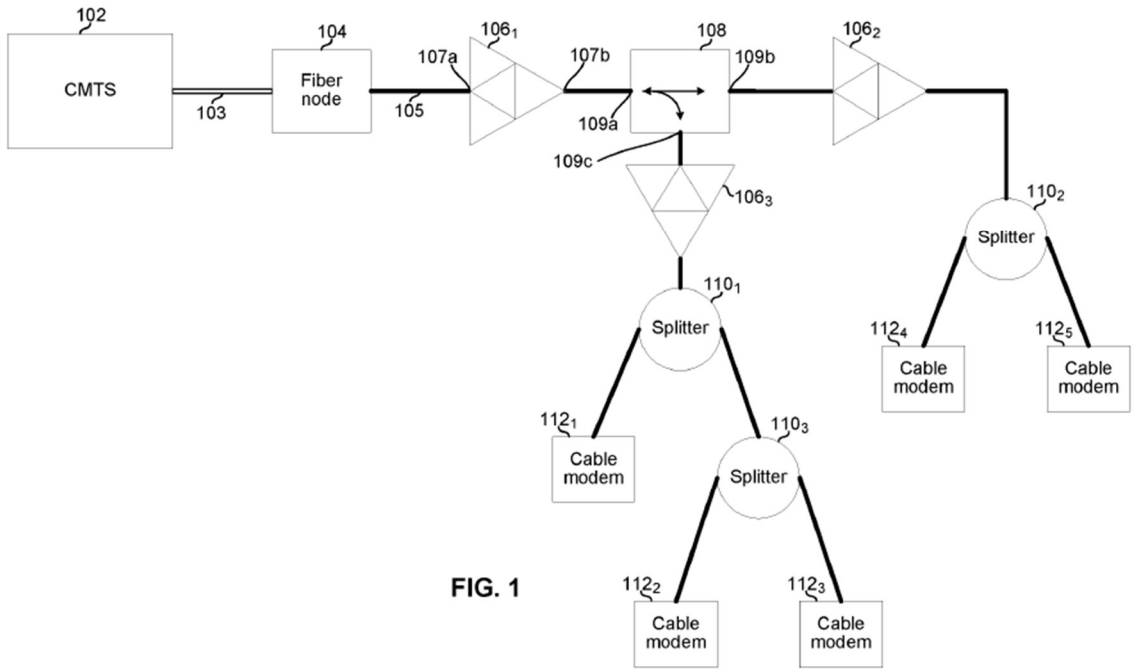


FIG. 1

"The components (including, fiber optic cables, coaxial cables, amplifiers, directional couplers, splitters, and/or other devices) between the CMTS and the CMs may be referred to as a hybrid fiber coaxial (HFC) network."[57] Thus, Defendants' construction appears to be correct.

But the parties disagree regarding Entropic's proposal that the CMTS may be "realized in a centralized or distributed fashion."[58] The specification discloses generally that "[t]he present invention may be realized in a centralized fashion in at least one computing system, or in a distributed fashion where different elements are spread across several interconnected computing

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56 *Id.*, Fig. 1; *id.* at 2:56-62.

57 *Id.* at 3:47-50.

58 Entropic's Reply Brief 6 n.1.

systems."[59] Other portions of the specification describe the CMTS as occupying a specific physical location. For instance, the specification discloses that "[l]ocation of a CM 112x may be characterized in a variety of ways including, for example[] total distance of fiber and/or coaxial cable between the CMTS 102 and the CM 112x . . . ."[60] Similarly, during prosecution, the applicant argued the following to overcome a rejection under 35 U.S.C. § 101:

> [A] CMTS is certainly not a "generic computer." It is a specific set of hardware and software configured for the very specific purpose of managing and communicating with cable moderns over a hybrid fiber coaxial (HFC) network. Thus, each of claims 1 and 12 does not attempt the [*sic*] preempt every possible use of generating a composite SNR related metric, but instead only claims the use of such a metric by the very particular machine of a CMTS for the specific purpose of assigning cable moderns among service groups.[61]

The Court considers the intrinsic record and concludes that the physical, hardware portion of the CMTS must be located at the point at which the cable modem's connection to the hybrid-fiber coaxial network terminates. But the CMTS may also include software "otherwise [] associated with" that hardware.[62] That software does not necessarily have a physical location. However, the specification does not disclose that the CMTS may be decentralized, at least because the CMTS necessarily includes hardware. The CMTS comprises hardware at a specific physical location and accompanying

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[59] '682 Patent 7:33-36.

[60] *Id.* at 6:14-17; *see also id.*, Claim 7.

[61] Decl. of Kathryn Bi in Supp. of Defendants' Responsive Brief, Ex. 4 [ECF No. 332-5] (quoting Applicant's response to final office action) 12.

[62] '682 Patent 2:35-36.

software, which does not necessarily have a physical location. The software, only, could potentially be decentralized in that software at different locations could control the CMTS. Thus, the Court declines to adopt Entropic's proposed construction because it does not accurately describe the hardware portion of the CMTS.

Because an examination of the intrinsic record adequately clarifies the parties' dispute, the Court concludes that it is unnecessary to consider extrinsic evidence here.

In view of the foregoing discussion, the Court construes "CMTS" as "hardware and accompanying software, with the hardware located at the point at which the cable modem's connection to the hybrid-fiber coaxial network terminates."

**D. Meaning of "SNR-Related Metric"**

| **Limitation at Issue:** "SNR-related metric" ('682 Patent, Claims 1 & 9) | |
|---|---|
| **Entropic's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning. | Indefinite. |

Defendants argue that "SNR-related metric" is indefinite because the patent does not explain how a metric may be related to a signal-to-noise ratio.[63] Entropic asserts that several examples throughout the specification and a related application adequately disclose the scope of "SNR-related metric."[64]

[63] Defendants' Responsive Brief 17:13-16. Here, "SNR" means "signal-to-noise ratio." '682 Patent 8:5.

[64] Entropic's Opening Brief 20:8-16.

A patent must conclude "with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention." 35 U.S.C. § 112(b). "[A] patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). Section 112(b) allows for "[s]ome modicum of uncertainty," but it requires that patents "afford clear notice of what is claimed." *Nautilus*, 572 U.S. at 909. "Because a patent is presumed to be valid, the evidentiary burden . . . is one of clear and convincing evidence." *Young v. Lumenis, Inc.*, 492 F.3d 1336, 1345 (Fed. Cir. 2007).

Here, Claim 1 of the '682 Patent explains that the "SNR-related metric" corresponds "to said one of said plurality of service groups."[65] Thus, the metric provides information about some characteristic or property of a service group. To determine what kind of information the metric provides, the Court first considers the specification. The specification does not outright define "SNR-related metric," but it does provide several examples. It discloses:

> As shown in FIG. 2A, to determine one or more measured performance metric(s) (e.g., an SNR-related metric such as SNR at a particular frequency or SNR over a range of frequencies (an SNR profile), noise levels, strength of desired signals, and/or the like) for any particular CM 112x, the CMTS 102 may transmit, at time 1, a message 202 that is destined (unicast, multicast, or broadcast) for the CM 112x and that functions as a probe to enable determination of the metric(s) for the CM 112x.[66]

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[65] '682 Patent, Claim 1.

[66] *Id.* at 3:54-63.

Thus, an SNR-related metric may be the SNR at a particular frequency, the SNR over a range of frequencies, the noise levels, the strength of desired signals, and "the like." The '682 Patent also incorporates U.S. Patent Appl. No. 13/948,401 (the "'401 Application") by reference.[67] The '401 Application lists the foregoing examples and also adds "bit error rate" and "symbol error rate."[68]

Defendants argue that those examples do not sufficiently clarify the scope of "SNR-related metric" because "the specification offers no explanation or principle for determining what makes any other metric sufficiently 'like' the listed metrics to make it 'SNR-related' or (conversely) sufficiently unlike the listed metrics to make it a different type of measured performance metric."[69]

Here, the Court regards Defendants' concern as misplaced. Each of the listed examples relates to the signal, the noise, or both. For instance, the first two examples—SNR at a particular frequency or over a range of frequencies—both relate to the signal and the noise (the ratio). The next example is the noise level, and, thus, it relates to the noise. The next example is the strength of the signal, which relates to the signal. The next example is the bit error rate. The Court understands that noise or other factors may affect the amount of received bits. Defendants' expert, Dr. Sandeep Chatterjee, confirms that understanding.[70] While it is true that other factors could affect the bit error rate, the context here adequately clarifies that noise is important. In that way, the

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[67] *Id.* at 1:38-40.

[68] '401 Application ¶ [0030].

[69] Defendants' Responsive Brief 19:3-8.

[70] Decl. of Dr. Sandeep Chatterjee re Claim Construction [ECF No. 332-7] ¶ 88 ("There are several characteristics of transmission systems which degrade the quality of signals. Among these are noise, loss, amplitude/frequency distortion, crosstalk, echo, and delay distortion.").

Court finds this example sufficiently related to the others. The final example is the symbol error rate. The Court understands the symbol error rate relates to the bit error rate, and, thus, it also relates to noise.

In sum, although the examples of the "SNR-related metric" leave the scope of this claim term broad, they are not so unrelated that a person having ordinary skill in the art could not understand the scope of "and the like." Accordingly, the Court declines to find this limitation indefinite. *See Niazi Licensing Corp. v. St. Jude Med. S.C., Inc.*, 30 F.4th 1339, 1347 (Fed. Cir. 2022) ("[A] claim is not indefinite just because it is broad.").

Because an examination of the intrinsic record adequately clarifies the parties' dispute (with some reference to Dr. Chatterjee's testimony), the Court concludes that a consideration of the remaining extrinsic evidence is unnecessary.

For the foregoing reasons, "SNR-related metric" is not indefinite.

## VI. DISPOSITION

As explained above, the Court construes the disputed limitations as follows:

| Limitation | Construction |
|---|---|
| "wherein the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine" | "wherein the cable modem engine and the data networking engine are not necessarily physically separate but are functionally separate such that the cable modem functions are performed only by the cable modem engine and the home networking functions are performed only by the data networking engine" |
| "content payload" | "the content of a probe, which does not include the prefix, preamble, or overhead information" |

| Limitation | Construction |
| --- | --- |
| "CMTS" | "hardware and accompanying software, with the hardware located at the point at which the cable modem's connection to the hybrid-fiber coaxial network terminates" |
| "SNR-related metric" | Not indefinite. |

**IT IS SO ORDERED.**

Dated:_____

_____
John W. Holcomb
UNITED STATES DISTRICT JUDGE