IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

HUAWEI TECHNOLOGIES CO. LTD, § § § *Plaintiff,* § § § v. § § T-MOBILE US, INC., ET AL., § § *Defendants,* § § § NOKIA SOLUTIONS AND NETWORKS § US LLC, NOKIA SOLUTIONS AND § NETWORKS OY, § TELEFONAKTIEBOLAGET LM § ERICSSON, and ERICSSON INC. § § *Intervenors*. §	Case No. 2:16-CV-00052-JRG-RSP

MEMORANDUM OPINION AND ORDER

On March 2, 2017, the Court held a hearing to determine the proper construction of the

disputed claim terms in United States Patent Nos. 8,069,365 ("the '365 Patent"), 8,719,617 ("the

'617 Patent"), and 8,867,339 ("the '339 Patent") (collectively "the Asserted Patents). The Court

has considered the arguments made by the parties at the hearing and in their claim construction

briefs. Docket Nos. 126, 130, 131, 141, & 143.[1] The Court has also considered the intrinsic

evidence and made subsidiary factual findings about the extrinsic evidence. *See Phillips v. AWH

Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005); *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct.

831, 841 (2015). The Court issues this Claim Construction Memorandum and Order in light of

these considerations.

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[1] Citations to the parties' filings are to the filing's number in the docket (Dkt. No.) and pin cites
are to the page numbers assigned through ECF.

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I.   BACKGROUND

A.   The '365 and '617 Patents

The '365 Patent was filed on April 23, 2009 and issued on November 29, 2011. The '617 Patent is a continuation of the '365 Patent, and was filed on October 31, 2011 and issued on May 6, 2014. The '365 and '617 Patents essentially share a common specification, and both are titled "Method and Device for Realizing IP Multimedia Subsystem Disaster Tolerance." The '365 and '617 Patents generally relate to backing up and acquiring "necessary data which is required when a user service processing is restored on an HSS." '617 Patent at 6:53–54.

The '365 and '617 Patents focus on the components of an IP Multimedia Subsystem ("IMS"). *Id.* at Abstract ("A method for realizing an Internet protocol (IP) multimedia subsystem (IMS) disaster tolerance includes the steps as follows."). The IMS components described in the specification include the Proxy Call Session Control Function ("P-CSCF"), Interrogating Call Session Control Function ("I-CSCF"), Serving Call Session Control Function ("S-CSCF"), and Home Subscriber Server ("HSS"). *See, e.g., id.* at 1:27–3:3 (describing IMS and the operation of the components). The specification describes "the present invention" as "a method for realizing an IMS disaster tolerance so as to improve the network reliability without increasing the system burden." *Id.* at 3:65–67.

The disclosed method includes the steps of "[a]n S-CSCF receive[ing] a user registration, and back[ing] up necessary data which is required when a user service processing is restored on a storage entity in a network." *Id.* at 4:8–10. The method further includes "[a]n I-CSCF of user's home domain receive[ing] a service request of a user, and assign[ing] a new S-CSCF to the user and forward[ing] the service request to the newly assigned S-CSCF, if it is found that the S-CSCF currently providing a service for the user fails." *Id.* at 4:11–15. The specification adds that "[t]he newly assigned S-CSCF interrogates and acquires subscription data of the user and the necessary

data backed up by the original S-CSCF from the storage entity, and then restores the user service processing according to the subscription data and the backup data." *Id.* at 4:16–20.

According to the specification, the prior art required the mobile device to re-register with IMS after expiration of a registration timer when the S-CSCF fails. *Id.* at 3:4–41. The specification notes that "[t]he longer the registration cycle, the longer the service interruption duration of the user." *Id.* at 3:49–50. To reduce service interruption, the disclosed method provides that "once the S-CSCF fails, the influenced user restores the service when a call is established without waiting for a re-registration timer of a user terminal to trigger a re-registration to restore the network service so as to improve the network reliability without increasing the system burden." *Id.* at 5:53–58

Claim 1 of the '617 Patent is an exemplary claim and recites the following elements (disputed term in italics):

> 1. In a serving call session control function (S-CSCF), a method for realizing an Internet protocol multimedia subsystem (IMS) disaster tolerance, the method comprising:
> receiving a service request of a user forwarded by an interrogating CSCF (I-CSCF) when it is determined that a previous S-CSCF failed in providing a service to the user;
> sending a request for subscription data of the user and *restoration data* stored in a storage entity and used for restoring the service that failed to the user, wherein the *restoration data* is stored by the previous S-CSCF;
> receiving the stored data that includes the subscription data of the user and the *restoration data*; and
> based on the received data, restoring the service to the user.

B.   The '339 Patent

The '339 Patent was filed on January 24, 2012, issued on October 21, 2014, and is titled "Method, System and Device for Recovering Invalid Downlink Data Tunnel between Networks." The '339 Patent generally relates to "a method for processing an invalidation of a downlink data tunnel between networks." '339 Patent at Abstract. Specifically, the specification introduces "One

Tunnel" network architecture and states that "to improve data transmission performance of the 3GPP system and reduce the costs of network investment by the operator, the 3GPP organization has researched a network architecture called One Tunnel, which is referred to as 'One Tunnel' or 'Direct Tunnel' network architecture in the specification." *Id.* at 1:31–36. The specification adds that "[i]n the One Tunnel architecture, the user plane has only one data tunnel established between the RNC and the GGSN." *Id.* at 2:4–5. The One Tunnel architecture is illustrated in Figure 1 (highlighted in yellow).
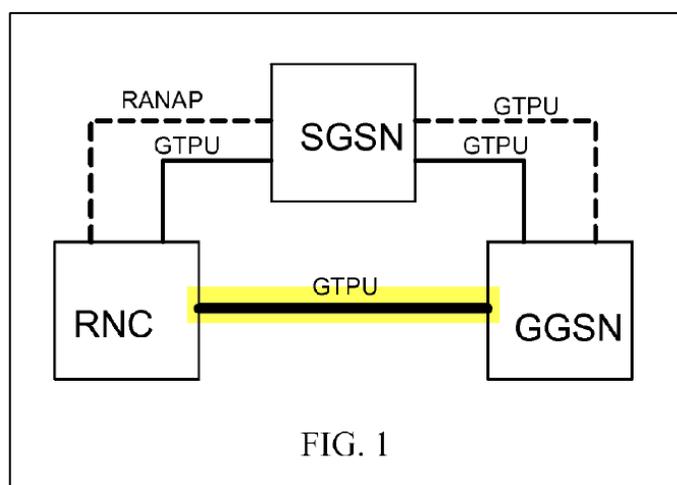
FIG. 1

Id. at Figure 1 (highlighting added). The specification states that in the One Tunnel arrangement "a large part of the user plane traffic is directly transmitted between an RNC and the GGSN via a tunnel . . . as indicated by the thick solid line in FIG. 1." *Id.* at 4:17-19.

The specification characterizes the problem with the prior art One Tunnel architecture as "[o]nce the RNC releases air interface resources and context of the user due to abnormal circumstances such as reset, a relevant downlink data tunnel between the relevant RNC and the GGSN becomes invalid." *Id.* at 2:6–9. The specification states that "[i]f the GGSN delivers a data to the RNC via the invalid downlink data tunnel, the GGSN inevitably receives an error indication message, i.e., an error indication, returned from the RNC." *Id.* at 2:9–12. "[I]n this case, the GGSN

deactivates a packet data protocol (PDP) context to release the entire IP bearer [resources]" *Id.* at 2:13–15. The specification further states that "[i]f a user wants to recover the data transmission later, the user must reactivate the PDP to establish the IP bearer [resources]" *Id.* at 2:15–16. The specification notes that "[s]uch reactivation operation inevitably affects the speed of the data transmission recovery and causes the affected users to appear offline, which is undesirable in the 3GPP systems." *Id.* at 2:20–23.

The specification describes "the technical solutions of . . . the present invention" as "the core network user plane anchor [GGSN] receiv[ing] the error indication of data tunnel from a access network device [RNC], and notif[ying] a relevant core network control plane [SGSN] to request recovering the downlink data tunnel after determining that the user plane corresponding to the error indication uses the One Tunnel technology." *Id.* at 3:15–21. The specification further states that "[t]he core network control plane [GGSN] recovers the downlink data tunnel and notifies the core network user plane anchor [SGSN] to update information of the user plane." *Id.* at 3:21–24. "Once the downlink data tunnel becomes invalid, the core network user plane anchor does not release the corresponding PDP context and notifies the core network control plane to reestablish the downlink data tunnel." *Id.* at 3:24–27. According to the specification, "[s]uch operation improves the speed of recovering data transmission after the downlink data tunnel becomes invalid and avoids negative influences on the data transmission recovery caused by reactivation of the PDP." *Id.* at 3:27–31.

Claim 9 of the '339 Patent is an exemplary claim and recites the following elements (disputed term in italics):

> 9. A communication device, comprising:
> *a receiving unit* and *a sending unit*, wherein
> *the receiving unit is configured to receive an error indication of*
> *a data tunnel from an access network device*, and

> *the sending unit is configured to instruct a core network control plane to recover a downlink data tunnel* if a user plane corresponding to the error indication uses a One Tunnel technology, and
> wherein *the receiving unit is further configured to receive an update packet data protocol (PDP) context request from the core network control plane*, and wherein the device further comprises *a storage unit configured to update a corresponding PDP context according to the update PDP context request*.

II.   APPLICABLE LAW

A.   Claim Construction

"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)). To determine the meaning of the claims, courts start by considering the intrinsic evidence. *Id.* at 1313; *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). The intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *Phillips*, 415 F.3d at 1314; *C.R. Bard, Inc.*, 388 F.3d at 861. The general rule—subject to certain specific exceptions discussed *infra*—is that each claim term is construed according to its ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the patent. *Phillips*, 415 F.3d at 1312–13; *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003); *Azure Networks, LLC v. CSR PLC*, 771 F.3d 1336, 1347 (Fed. Cir. 2014) ("There is a heavy presumption that claim terms carry their accustomed meaning in the relevant community at the relevant time.") (vacated on other grounds).

"The claim construction inquiry. . . begins and ends in all cases with the actual words of the claim." *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998). "[I]n all aspects of claim construction, 'the name of the game is the claim.'" *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1298 (Fed. Cir. 2014) (quoting *In re Hiniker Co.*, 150 F.3d 1362, 1369 (Fed. Cir. 1998)). First, a term's context in the asserted claim can be instructive. *Phillips*, 415 F.3d at 1314. Other asserted or unasserted claims can also aid in determining the claim's meaning, because claim terms are typically used consistently throughout the patent. *Id.* Differences among the claim terms can also assist in understanding a term's meaning. *Id*. For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id*. at 1314–15.

"[C]laims 'must be read in view of the specification, of which they are a part.'" *Id*. (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc)). "[T]he 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.'" *Id*. (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). But, "'[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims.'" *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *see also Phillips*, 415 F.3d at 1323. "[I]t is improper to read limitations from a preferred embodiment described in the specification—even if it is the only embodiment—into the claims absent a clear indication in the intrinsic record that the

patentee intended the claims to be so limited." *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004).

The prosecution history is another tool to supply the proper context for claim construction because, like the specification, the prosecution history provides evidence of how the U.S. Patent and Trademark Office ("PTO") and the inventor understood the patent. *Phillips*, 415 F.3d at 1317. However, "because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes." *Id.* at 1318; *see also Athletic Alternatives, Inc. v. Prince Mfg.*, 73 F.3d 1573, 1580 (Fed. Cir. 1996) (ambiguous prosecution history may be "unhelpful as an interpretive resource").

Although extrinsic evidence can also be useful, it is "'less significant than the intrinsic record in determining the legally operative meaning of claim language.'" *Phillips*, 415 F.3d at 1317 (quoting *C.R. Bard, Inc.*, 388 F.3d at 862). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. *Id.* at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert's conclusory, unsupported assertions as to a term's definition are entirely unhelpful to a court. *Id.* Generally, extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id.* The Supreme Court recently explained the role of extrinsic evidence in claim construction:

> In some cases, however, the district court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for

example, the background science or the meaning of a term in the relevant art during the relevant time period. *See, e.g., Seymour v. Osborne*, 11 Wall. 516, 546 (1871) (a patent may be "so interspersed with technical terms and terms of art that the testimony of scientific witnesses is indispensable to a correct understanding of its meaning"). In cases where those subsidiary facts are in dispute, courts will need to make subsidiary factual findings about that extrinsic evidence. These are the "evidentiary underpinnings" of claim construction that we discussed in *Markman*, and this subsidiary factfinding must be reviewed for clear error on appeal.

Teva Pharm. USA, Inc. v. Sandoz, Inc., 135 S. Ct. 831, 841 (2015).

B. Functional Claiming and 35 U.S.C. § 112, ¶ 6 (pre-AIA) / § 112(f) (AIA)[2]

A patent claim may be expressed using functional language. *See* 35 U.S.C. § 112, ¶ 6; *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1347–49 & n.3 (Fed. Cir. 2015) (en banc in relevant portion). Section 112, Paragraph 6, provides that a structure may be claimed as a "means . . . for performing a specified function" and that an act may be claimed as a "step for performing a specified function." *Masco Corp. v. United States*, 303 F.3d 1316, 1326 (Fed. Cir. 2002).

But § 112, ¶ 6 does not apply to all functional claim language. There is a rebuttable presumption that § 112, ¶ 6 applies when the claim language includes "means" or "step for" terms, and that it does not apply in the absence of those terms. *Masco Corp.*, 303 F.3d at 1326; *Williamson*, 792 F.3d at 1348. The presumption stands or falls according to whether one of ordinary skill in the art would understand the claim with the functional language, in the context of the entire specification, to denote sufficiently definite structure or acts for performing the function. *See Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1372 (Fed. Cir. 2015) (§ 112, ¶ 6 does not apply when "the claim language, read in light of the specification, recites

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[2] Because the applications resulting in the Asserted Patents were filed before September 16, 2012, the effective date of the America Invents Act ("AIA"), the Court refers to the pre-AIA version of § 112.

sufficiently definite structure" (quotation marks omitted) (citing *Williamson*, 792 F.3d at 1349;

Robert Bosch, LLC v. Snap-On Inc., 769 F.3d 1094, 1099 (Fed. Cir. 2014))); *Williamson*, 792 F.3d

at 1349 (§ 112, ¶ 6 does not apply when "the words of the claim are understood by persons of

ordinary skill in the art to have sufficiently definite meaning as the name for structure"); *Masco*

Corp., 303 F.3d at 1326 (§ 112, ¶ 6 does not apply when the claim includes an "act" corresponding

to "how the function is performed"); *Personalized Media Communications, L.L.C. v. International*

Trade Commission, 161 F.3d 696, 704 (Fed. Cir. 1998) (§ 112, ¶ 6 does not apply when the claim

includes "sufficient structure, material, or acts within the claim itself to perform entirely the recited

function . . . even if the claim uses the term 'means.'" (quotation marks and citation omitted)).

When it applies, § 112, ¶ 6 limits the scope of the functional term "to only the structure,

materials, or acts described in the specification as corresponding to the claimed function and

equivalents thereof." *Williamson*, 792 F.3d at 1347. Construing a means-plus-function limitation

involves multiple steps. "The first step . . . is a determination of the function of the means-plus-

function limitation." *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 1311

(Fed. Cir. 2001). "[T]he next step is to determine the corresponding structure disclosed in the

specification and equivalents thereof." *Id.* A "structure disclosed in the specification is

'corresponding' structure only if the specification or prosecution history clearly links or associates

that structure to the function recited in the claim." *Id.* The focus of the "corresponding structure"

inquiry is not merely whether a structure is capable of performing the recited function, but rather

whether the corresponding structure is "clearly linked or associated with the [recited] function."

Id. The corresponding structure "must include all structure that actually performs the recited

function." *Default Proof Credit Card Sys. v. Home Depot U.S.A., Inc.*, 412 F.3d 1291, 1298 (Fed.

Cir. 2005). However, § 112 does not permit "incorporation of structure from the written

description beyond that necessary to perform the claimed function." *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999).

For § 112, ¶ 6 limitations implemented by a programmed general purpose computer or microprocessor, the corresponding structure described in the patent specification must include an algorithm for performing the function. *WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999). The corresponding structure is not a general purpose computer but rather the special purpose computer programmed to perform the disclosed algorithm. *Aristocrat Techs. Austl. Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008).

III. CONSTRUCTION OF AGREED TERMS

The parties agreed to the construction of the following phrase:

Claim Term/Phrase	Agreed Construction
"S-CSCF currently providing a service for the user fails" ('356 Patent, claim 1)	"S-CSCF currently assigned to provide a service for the user has failed"

Docket No. 149-1 at 2. In view of the parties' agreement on the proper construction of the identified terms, the Court hereby **ADOPTS** the parties' agreed constructions.

During the claim construction hearing, the parties agreed to the construction of the following terms:

Claim Term/Phrase	Agreed Construction
"restoration data" ('617 Patent, claims 1, 4, 5, 7)	Plain and ordinary meaning.
"restoring data" ('617 Patent, claim 5)	Plain and ordinary meaning.

"notifying, by the core network user plane anchor, a core network control plane to recover a downlink data tunnel" ('339 Patent, claims 1, 3)	"sending a request by the core network user plane anchor to a core network control plane to recover a downlink data tunnel"
"notification from a core network user plane anchor to recover a downlink data tunnel" ('339 Patent, claim 11)	"request from a core network user plane anchor to recover a downlink data tunnel"
"notify a core network control plane to recover a downlink data tunnel" ('339 Patent, claim 14)	"request a core network control plane to recover a downlink data tunnel"
"notification" ('339 Patent, claim 14)	"request to recover the downlink data tunnel"

Regarding the terms "restoration data" and "restoring data," the Court agrees that the terms should be given their plain and ordinary meaning. The terms appear in the claims of the '617 Patent. Claim 1 of the '617 Patent recites storing restoration data and then "sending a request for subscription data of the user and restoration data" to restore the user's service. The specification also states that the "restoring data" must be acquired before the S-CSCF can restore service data to the user. '617 Patent at 12:5–8 ("After acquiring the restoring data of the disaster tolerance restoring user through any of the above manners, the S-CSCF restores the service data of the user, and restores a session processing of the user.").

Plaintiff originally argued that the terms "restoration data" and "restoring data" in the '617 Patent should have the same construction as the term "necessary data" in the '365 Patent. (Dkt. No. 126 at 16). According to Plaintiff, a comparison of the claims of the '365 Patent and the '617 Patent highlights the identical nature of the term "necessary data" to the term "restoration data."

(*Id.* at 16). Plaintiff also argued that the '617 Patent includes the identical definition of the data that must be backed up in the HSS for the system to restore a user's session. (*Id.* at 17) (citing '617 Patent at 7:29–40).

Defendants argue that the specification does not provide an explicit definition of the term "restoration data." (Dkt. No. 130 at 10). Defendants further argue that the specification describes Figure 5 as "an embodiment of the present invention," and merely states that User-Backup-Data "at least includes" the imported data limitations in this example. (*Id.* at 10) (citing '617 Patent at 7:24–25, 7:33–40). Defendants also contend that there is no effort to explain what else may be included in the data, much less any expression of intent to redefine the claim. (Dkt. No. 130 at 10). The Court agrees with Defendants that the claims should not be limited as Plaintiff originally proposed.

In the prior art, the originally-assigned S-CSCF would gather information about the registering user device (*i.e.*, subscription data) from the HSS during initial registration. '617 Patent at 2:44–3:3. If the S-CSCF failed or restarted, the I-CSCF would have to wait for the registration timer cycle to complete before retrying registration, and at that point, the system would once again retrieve the subscription data from the HSS while restoring connectivity through the refreshed S-CSCF or a new S-CSCF. *Id.* at 3:4–50.

Given this context, the specification states that if specific additional data were backed up at the HSS during initial registration, then in the event of a failure or restart, the I-CSCF could immediately assign a new S-CSCF to the user device, and the HSS could provide the information necessary to restore the user session without interruption. *Id.* at 6:55–61. In one embodiment, the specification defines "necessary data" as information including at least the P-CSCF address and the contact address of the user device. *Id.* at 7:29–40 ("In order to back up the *necessary data*

which is required when the user service processing is restored on the HSS, an AVP with an extended definition needs to be added in the SAR message, that is, AVP User-Backup-Data, and the AVP at least includes the following information: . . .") (emphasis added).

As indicated below, the Court finds that this provides an explicit definition for the term "necessary data." However, the agreed term is "restoration data" and "restoring data," not "necessary data." Therefore, the Court is not persuaded that this provides an explicit definition for the terms "restoration data" and "restoring data." Likewise, the Court is not persuaded that a comparison of the claims of the '365 Patent and the '617 Patent indicates that the terms "necessary data" and "restoration data" should be construed the same. In fact, the claims indicates otherwise because Plaintiff's original construction would violate the doctrine of claim differentiation. Dependent claims 4 and 10 both require that "the restoration data includes a session initiation protocol (SIP) URL of a proxy CSCF (P-CSCF) assigned for the user to enter the IMS subsystem and a contact address of the user." The inclusion of these limitations in dependent claims indicates that the terms should not be limited in the independent claim as Plaintiff originally proposed.

To the extent that Plaintiff argues that the terms "restoration data" and "restoring data" are limited to "information necessary for the S-CSCF to handle traffic for a registered user, which includes at least a SIP URL of a P-CSCF assigned for a user device and a contact address of the user device," the Court rejects this argument. Accordingly, in view of the intrinsic evidence and the parties' agreement on the proper construction of the terms "restoration data" and "restoring data," the Court hereby **ADOPTS** the parties' agreed constructions.

Regarding the "notifying" and "notification" terms/phrases, the Court finds that the terms/phrases mean sending a "request" from the core network user plane anchor to the core network control plane to recover a downlink data tunnel. The specification states that "[a]ccording

the technical solutions of the embodiments of the present invention, the core network user plane anchor receives the error indication of data tunnel from an access network device, and *notifies a relevant core network control plane to request recovering the downlink data tunnel* after determining that the user plane corresponding to the error indication uses the One Tunnel technology." '339 Patent at 3:15–21 (emphasis added). Specifically, Figure 6 illustrates "a flow chart of processing an invalidation of a downlink data tunnel of a user plane." *Id.* at 8:61–63.

FIG. 6
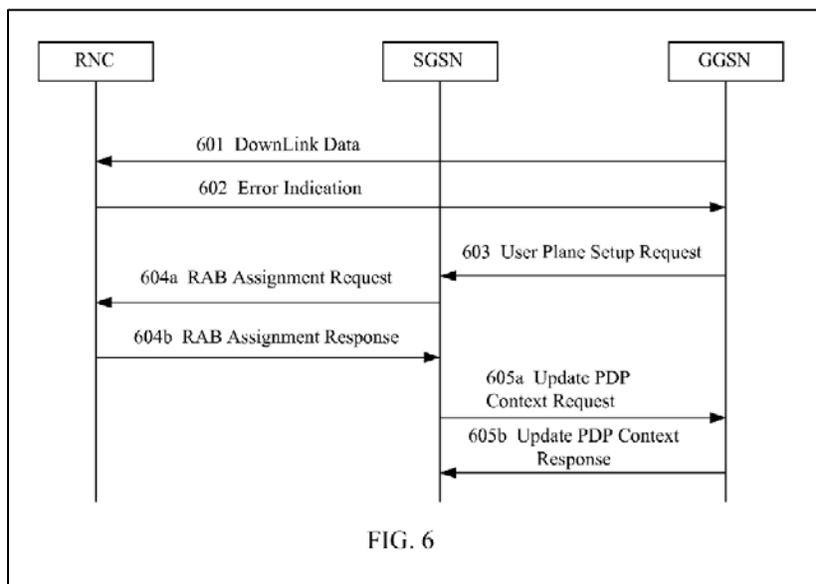
Id. at Figure 6. Regarding the disputed "notification" element, the specification states that "[i]n Step 603, the GGSN receives the error indication message returned by the RNC and *sends a user plane setup request to a corresponding SGSN . . .*" *Id.* at 9:9-12 (emphasis added). As indicated, the recited "notification" is a request to the core network control plane (*i.e.*, SGSN) to recover a downlink data tunnel.

Plaintiff originally contended that "the core network user plane anchor affirmatively directs (i.e., 'instructs') the core network control plane to recover the downlink data tunnel." (Dkt. No. 126 at 18). According to Plaintiff, "the applicants used 'notify' and 'instruct' to refer to the same concept in the patent." (*Id.*) (citing claims 1 and 9). Other than claim 9, the word "instructing,"

"instruct," or "instruction" does not appear in this context. The Court further finds that Defendants' original construction could be misinterpreted as only informing the core network control plane of an error. As indicated, the recited "notification" is a request to take action, and not merely information. Otherwise, the system would wait until the UE signals the SGSN after some delay to re-activate PDP contexts and re-establish the IP bearer. '339 Patent at 2:12–16 ("According to the current processing mechanism, in this case, the GGSN deactivates a packet data protocol (PDP) context to release the entire IP bearer. If a user wants to recover the data transmission later, the user must reactivate the PDP to establish the IP bearer.").

However, Plaintiff's original construction could also be interpreted as requiring "instructions" on how to proceed. The intrinsic evidence states that the core network user plane anchor sends a request to a relevant core network control plane to recover the downlink data tunnel. *Id.* at 3:15–21, 9:9–12. Accordingly, in view of the intrinsic evidence and the parties' agreement on the proper construction of the "notifying" and "notification" terms/phrases, the Court hereby **ADOPTS** the parties' agreed constructions.

IV.   CONSTRUCTION OF DISPUTED TERMS

The parties' dispute focuses on the meaning and scope of nine terms/phrases in the Asserted Patents.

1. "necessary data which is required when a user service processing is restored," "necessary data," "backup necessary data"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"necessary data which is required when a user service processing is restored"	"information necessary for the S- CSCF to handle traffic for a registered user, which includes at least a SIP URL of a P-CSCF assigned for a user device and a contact address of the user device"	Plain and ordinary meaning, which is "data used when restoring processing of the user service"

"necessary data"	"information necessary for the S- CSCF to handle traffic for a registered user, which includes at least a SIP URL of a P-CSCF assigned for a user device and a contact address of the user device"	Plain and ordinary meaning, which is "data used when restoring processing of the user service"
"backup necessary data"	"information necessary for the S- CSCF to handle traffic for a registered user, which includes at least a SIP URL of a P-CSCF assigned for a user device and a contact address of the user device"	Plain and ordinary meaning, which is "data used when restoring processing of the user service"

a) The Parties' Positions

The parties dispute whether the "necessary data" terms should be limited to a disclosed embodiment, as Plaintiff proposes, or if they should be construed more broadly, as Defendants propose. Plaintiff contends that its construction is correct because it captures the described improvement to the prior art. (Dkt. No. 126 at 13). Plaintiff argues that the goal of the '365 Patent is to improve a network's reliability by directing the S-CSCF to back up additional data at a particular point during initial registration. *Id.* According to Plaintiff, the particular data that is stored is important to the invention because it is that data that allows the network component to maintain the user's connectivity. *Id.* Plaintiff further argues that the '365 Patent explicitly defines what makes up the "necessary data" when it explains how the S-CSCF backs up certain data (*i.e.*, the SIP URL of the P-CSCF and a contact address of the user's device) at the HSS. (*Id.*) (citing '365 Patent at 7:28–40). Plaintiff contends that these two data elements serve as the key elements necessary over the prior art process for the S-CSCF to continue handling traffic for the user. (Dkt. No. 126 at 14) ('365 Patent at 13:59–65).

Plaintiff further argues that Defendants' construction reads "necessary" out of the words of the claim. (Dkt. No. 126 at 14). According to Plaintiff, Defendants' construction fails to capture

the described invention because it would allow for less than all the data needed by the S-CSCF to handle traffic for the user after a failure or restart. (*Id.* at 15). Plaintiff further argues that Defendants' construction recaptures the described prior art and renders the claimed "subscription data" redundant. *Id.*

Defendants respond that the "necessary data" terms have easily-understood meanings as recited in the claims themselves with language repeated throughout the specification. (Dkt. No. 130 at 12). Defendants contend that the terms mean "data used when restoring processing of the user service." *Id.* Defendants argue that Plaintiff's construction should be rejected because it improperly reads limitations from an embodiment, while ignoring the plain language of the claim. (*Id.*) (citing '365 Patent at 7:23–24, 7:28–40). Defendants further argue that the specification's discussion of the embodiment is not lexicography. (Dkt. No. 130 at 13). Defendants also contend that their construction does not read "necessary" out of the claims. *Id.*

Plaintiff replies that Defendants' constructions render other claim terms superfluous and fail to give effect to the patentees' inventive contributions. (Dkt. No. 141 at 6). Plaintiff further argues that Defendants' claim differentiation argument for the "restoration data" term does not apply to the terms in the '365 Patent. *Id.* Plaintiff contends that there are no dependent claims in the '365 Patent that include the SIP URL and contact address limitations, as there are in the '617 Patent. *Id.* Plaintiff also contends that Defendants' constructions impermissibly broaden the meaning of "necessary data." *Id.*

For the following reasons, the Court finds that the terms/phrases **"necessary data which is required when a user service processing is restored," "necessary data,"** and **"backup necessary data"** should be construed to mean **"information necessary for the S-CSCF to handle traffic for a registered user, which includes at least a SIP URL of a P-CSCF assigned**

for a user device and a contact address of the user device."

        b) Analysis

The term "necessary data" and the phrase "necessary data which is required when a user service processing is restored" appear in claims 1 and 27 of the '365 Patent. The term "backup necessary data" appears in claim 27 of the '365 Patent. The Court finds that the terms and phrase are used consistently in the claims and are intended to have the same general meaning in each claim. Indeed, the parties propose identical constructions for all three terms/phrases.

The Court further finds that the intrinsic evidence indicates that "necessary data" is: (1) information necessary for the S-CSCF to handle traffic for a registered user, and (2) includes at least a SIP URL of a P-CSCF assigned for a user device and a contact address of the user device. The Detailed Description section states that "[a] core concept of the present invention lies in that, when a user registers with an S-CSCF, *necessary data* used in a restoring process is backed up on a storage entity in a network, for example, an HSS." '617 Patent at 6:37–40 (emphasis added). The specification further states that "FIG. 4 is an overall flow chart of the present invention," and adds that "[i]n Step 401, when an S-CSCF receives a user registration, the S-CSCF backs up *necessary data* which is required when a user service processing is restored on an HSS." *Id.* at 6:51–54 (emphasis added).

The specification continues: "Here, the S-CSCF backs up the data on the HSS through a transmission of a new information cell, that is, AVP User-Backup-Data, defined in an embodiment of the present invention." *Id.* at 6:55–58. The specification then states that the AVP User-Backup-Data "*at least includes the following information*: A SIP URL of the P-CSCF through which the path of the user registration passes is adapted to address the P-CSCF when a called service is restored; and A contact address of the user registration is adapted to address the user terminal when

the called service is restored." *Id.* at 7:31–40 (emphasis added). Thus, the specification explicitly defines the minimal information included as "necessary data."

The specification further explains that by backing up this necessary data in the HSS where it can be restored, the S-CSCF does not need to wait until re-registration to obtain the address for the user's P-CSCF. *Id.* at 13:59–65 ("After acquiring the subscription data and the backup data of the user, the S-CSCF2 restores the registration record of the called user, and forwards, according to the P-CSCF address and the contact address of the user provided in the backup data (9. INVITE), the session setup request to the P-CSCF with which the called user registers. Then, the session is continued."). Similarly, storing a contact address of the user's device allows the newly-assigned S-CSCF (or the restarted S-CSCF) to contact and establish a connection to the user device.

Accordingly, the Court finds that the '365 Patent explicitly defines "necessary data." *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1320-21 (Fed. Cir. 2005) (holding that a specification can define terms expressly or by implication) (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). Specifically, "necessary data" means "information necessary for the S-CSCF to handle traffic for a registered user, which includes at least a SIP URL of a P-CSCF assigned for a user device and a contact address of the user device."

Turning to Defendants' construction, the Court finds that it would read "necessary" out of the claims. Defendants define "necessary data" as "data that is used" for restoration. This construction fails to capture the explicit definition of "necessary data" provided in the specification. Moreover, it would allow for less than all the data needed by the S-CSCF after a failure or restart. Defendants argue that Plaintiff's construction improperly reads limitations from an embodiment, while ignoring the plain language of the claim. (Dkt. No. 130 at 12). The Court disagrees. As indicated above, the specification states "*[a] core concept of the present invention*

lies in that, when a user registers with an S-CSCF, *necessary data* used in a restoring process is backed up on a storage entity in a network, for example, an HSS." '617 Patent at 6:37–40 (emphasis added). The specification further states that the necessary data includes at least "a SIP URL of a P-CSCF assigned for a user device and a contact address of the user device." *Id.* at 7:31–40. In sum, Defendants' constructions would read "necessary" out of the claims and would not capture "the core concept of the present invention."

c) Court's Construction

The Court construes the terms/phrase **"necessary data which is required when a user service processing is restored," "necessary data,"** and **"backup necessary data"** to mean **"information necessary for the S-CSCF to handle traffic for a registered user, which includes at least a SIP URL of a P-CSCF assigned for a user device and a contact address of the user device."**

2. "is error"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"is error"	"is invalid"	indefinite/incapable of construction

a) The Parties' Positions

The parties agree that this term does not make sense as written, but dispute whether it can be corrected by the Court. Plaintiff contends that the term "is error" is the result of poor grammar. (Dkt. No. 126 at 20). Plaintiff argues that its proposed correction is supported by the specification and prosecution history. *Id.* Plaintiff further argues that the need to recover a downlink data tunnel is owed to an invalid downlink data tunnel for the user plane. (*Id.* at 21) (citing '339 Patent at Title, 2:30–32, 3:24–25, 5:6–7). Plaintiff contends that the '339 Patent describes the error indication as relating to the invalidation of a downlink data tunnel. (Dkt. No. 126 at 21) (citing '339 Patent at 3:15–27).

Plaintiff also argues that nothing in the prosecution history suggests a different interpretation of the claims. (Dkt. No. 126 at 22). According to Plaintiff, the prosecution history consistently contains the same two "is error" mistakes in every submission by the applicant to the USPTO. *Id.* Plaintiff contends that there is no indication that "a user plane . . . is error" is anything but a reference to an "invalid" user plane because of an invalid downlink data tunnel of the user plane. *Id.*

Defendants respond that there is a reasonable debate about the appropriate correction because the claim is subject to multiple possible corrections. (Dkt. No. 130 at 15). Defendants contend that Plaintiff's construction bases the recovery determination on the status of the tunnel (*i.e.,* "invalid"). *Id.* Defendants argue that an alternative correction would base the recovery determination on an "error indication." *Id.* Defendants contend that in other asserted claims and the specification, the determination to recover the downlink data tunnel requires an error indication sent from the access network device. *Id.* (citing '339 Patent at 3:65–4:3, claim 1). According to Defendants, there is a reasonable debate as to the appropriate correction. (Dkt. No. 130 at 16).

Regarding Plaintiff's correction, Defendants do not dispute that the patent relates to recovery of an invalid tunnel. *Id.* However, Defendants contend that referring to an "invalid" tunnel has nothing to do with the claim language at issue. *Id.* Defendants argue that Plaintiff had a chance to fix its "poor grammar" with the USPTO, but did not. *Id.* Defendants contend that Plaintiff's decision to raise this error with the Court rather than the USPTO indicates that the correction is subject to reasonable debate. *Id.*

Plaintiff replies that Defendants do not dispute that Plaintiff's construction is a reasonable correction. (Dkt. No.141 at 7). Plaintiff argues that Defendants' alternative correction requires injecting five words to the phrase and deleting two, whereas its construction changes "error" to

"invalid." *Id.* According to Plaintiff, Defendants' proposed interpretation improperly extrapolates a particular embodiment of the invention and engrafts it onto the typographical error. *Id.* Plaintiff further contends that the referenced error indication simply indicates that the user plane is invalid. *Id.* According to Plaintiff, Defendants' interpretation is just another way of repeating what the claim already recites. *Id.*

For the following reasons, the Court finds that the term **"is error"** should be corrected to **"is invalid."**

b) Analysis

The term "is error" appears in claim 11 of the '356 Patent. The Court agrees that the claim does not make sense as written. The Court further agrees that the claim language should either be corrected or found invalid. The general rule regarding correcting claim language is that "[t]he district court can correct an error only if the error is evident from the face of the patent." *Group One, Ltd. v. Hallmark Cards, Inc.*, 407 F.3d 1297, 1303 (Fed. Cir. 2005). Two additional requirements must be met to permit correction: "(1) the correction is not subject to reasonable debate based on consideration of the claim language and the specification and (2) the prosecution history does not suggest a different interpretation of the claims." *Novo Indus., L.P. v. Micro Molds Corp.*, 350 F.3d 1348, 1357 (Fed. Cir. 2003). If these conditions are satisfied, then the patent should not be invalidated based on the error unless there is "evidence of culpability or intent to deceive by delaying formal correction." *Hoffer v. Microsoft Corp.*, 405 F.3d 1326, 1331 (Fed. Cir. 2005). The Court finds that all the requirements are met, and that there is no evidence of culpability or intent to deceive.

First, the Court finds that the mistake is evident from the face of the patent and is not subject to reasonable debate based on the claim language and specification. The specification

repeatedly states that the need to recover the downlink data tunnel is because of an invalid downlink data tunnel for the user plane. *See, e.g.*, '339 Patent at Title ("recovering *invalid* downlink data tunnel"); 2:30–32 ("the present invention is directed to a method for processing *an invalidation* of a downlink data tunnel between networks, which is capable of improving the speed of recovering a data transmission after the downlink data tunnel becomes invalid"); 3:24–25 ("[o]nce the downlink data tunnel becomes *invalid*"); 5:6–7 ("once the downlink data tunnel between the RNC and the GGSN is *invalid*") (emphases added). Accordingly, the notification received from the core network user plane anchor is that the downlink data tunnel is now invalid.

Second, nothing in the prosecution history suggests a different interpretation of the claims. The prosecution history consistently contains "is error" throughout the prosecution. *See, e.g.*, Dkt. No. 126-1 at 5 (PTO Patent Application, at ¶ 0014 (Jan. 24, 2012)); Dkt. No. 126-2 at 4 (Original Claim 13 (Jan. 24, 2012)); Dkt. No. 126-3 at 5 (Reply to Office Action (Dec. 11, 2013)). Finally, there is no evidence before the Court of culpability or intent to deceive by delaying formal correction.

Defendants argue that there is reasonable debate about the appropriate correction because the claim is subject to multiple possible corrections. (Dkt. No. 130 at 15). According to Defendants, an alternative correction would base the recovery determination on an "error indication." *Id*. Defendants contend that in the other asserted claims and the specification, the determination to recover the downlink data tunnel requires an error indication sent from the access network device. *Id.*

The Court finds that Defendants' argument ignores the context of claim 11. Claim 11 is drafted from the perspective of the core network control plane (*i.e.*, SGSN). The claims and the specification state that the "core network user plane anchor" (*i.e.*, GGSN), not the core network

control plane (*i.e.*, SGSN), receives an error indication of a data tunnel from an access network device. Indeed, Figure 6 illustrates "the GGSN receive[ing] the error indication message [602] returned by the RNC and send[ing] a user plane setup request [603] to a corresponding SGSN." '339 Patent at 9:9–11. In other words, the "notification" in claim 11 is a "request from a core network user plane anchor to recover a downlink data tunnel." *See, e.g.*, Section III. Construction of Agreed Terms ("notification").

The "notification" is not an "error indication," as Defendants now suggest. Instead, it is the request received from the core network user plane anchor when the "user plane using a One Tunnel technology" is invalid. Therefore, Defendants' alternative correction is inconsistent with the claim language and related intrinsic evidence. Accordingly, the Court finds that the mistake is evident from the face of the patent and is not subject to reasonable debate. Indeed, Defendants agreed at the claim construction hearing that "invalid" was a reasonable correction, just not the correction they proposed. Finally, in reaching its conclusion, the Court has considered the extrinsic evidence submitted by the parties, and given it its proper weight in light of the intrinsic evidence.

c) Court's Construction

The term **"is error"** is corrected to **"is invalid"** in claim 11 of the '356 Patent.

> 3. **The "unit" terms ("receiving unit . . ." / "sending unit . . ." / "storage unit . . .")**

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"receiving unit . . . configured to receive an error indication of a data tunnel from an access network device . . . [and] receive an update packet data protocol (PDP) context request from the core network control plane"	Plain and ordinary meaning. Not subject to 112, ¶ 6. If the Court determines this term is subject to 112, **Functions:** receive (i) an error indication of a data tunnel from an access network device followed by (ii) an update packet data protocol (PDP) context request from the core network control plane **Structure:** receiving unit 801 in Fig. 8 of a core network user plane anchor, and equivalents thereof.	**Function:** receive an error notification of a data tunnel from an access network device and receive an update packet data protocol (PDP) context request from the core network control plane **Structure:** The specification fails to set forth any algorithm or corresponding structure for the claimed function. Claim is indefinite.
"sending unit . . . configured to instruct a core network control plane to recover a downlink data tunnel if a user plane corresponding to the error indication uses a One Tunnel technology"	Plain and ordinary meaning. Not subject to 112, ¶ 6. If the Court determines this term is subject to 112, ¶ 6: **Function:** instruct a core network control plane to recover a downlink data tunnel if a user plane corresponding to the error indication uses a One Tunnel technology **Structure:** sending unit 802 in Fig. 8 of a core network user plane anchor, and equivalents thereof.	**Function:** instruct a core network control plane to recover a downlink data tunnel if a user plane corresponding to the error indication uses a One Tunnel technology **Structure:** The specification fails to set forth any algorithm or corresponding structure for the claimed function. Claim is indefinite.
"storage unit configured to update a corresponding PDP context according to the update PDP context request"	Plain and ordinary meaning. Not subject to 112, ¶ 6. If the Court determines this term is subject to 112, ¶ 6: **Function:** update a corresponding PDP context according to the update PDP context request **Structure:** storage unit 803 in Fig. 8 of a core network user plane anchor, and equivalents thereof	**Function:** update a corresponding PDP context according to the update PDP context request **Structure:** The specification fails to set forth any algorithm or corresponding structure for the claimed function. Claim is indefinite.

"receiving unit . . . configured to receive a notification from a core network user plane anchor to recover a downlink data tunnel if a user plane using a One Tunnel technology is error"	Plain and ordinary meaning. Not subject to 112, ¶ 6. If the Court determines this term is subject to 112, ¶ 6: **Function:** receive a notification from a core network user plane anchor to recover a downlink data tunnel if a user plane using a One Tunnel technology [is error] **Structure:** receiving unit 801 in Fig. 8 of a core network user plane anchor, and equivalents thereof	**Function:** receive a notification from a core network user plane anchor to recover a downlink data tunnel if a user plane using a One Tunnel technology is error **Structure:** The specification fails to set forth any algorithm or corresponding structure for the claimed function. Claim is indefinite.
"sending unit . . . configured to send a radio access bearer (RAB) assignment request to an access network device . . . and . . . send an update packet data protocol PDP context request to the core network user plane anchor to update corresponding PDP context"	Plain and ordinary meaning. Not subject to 112, ¶ 6. If the Court determines this term is subject to 112, ¶ 6: **Functions:** send (i) a radio access bearer (RAB) assignment request to an access network device followed by (ii) an update packet data protocol PDP context request to the core network user plane anchor to update corresponding PDP context **Structure:** sending unit 802 in Fig. 8 of a core network user plane anchor, and equivalents thereof	**Function:** send a radio access bearer (RAB) assignment request to an access network device and send an update packet data protocol PDP context request to the core network user plane anchor to update corresponding PDP context **Structure:** The specification fails to set forth any algorithm or corresponding structure for the claimed function. Claim is indefinite.

a) The Parties' Positions

The parties dispute whether the "unit" terms are subject to § 112 ¶ 6. Defendants contend that the terms are governed by § 112(6) because a person of ordinary skill would not understand the identity of these components in light of the functions they perform in the claims. (Dkt. No. 130 at 18). Defendants further contend that the terms are indefinite because the specification does not recite sufficient structure. *Id.* Specifically, Defendants argue that each of the disputed terms contain the nonce word "unit," coupled with a function, which combined are not terms that have an understood meaning in the art. (*Id.* at 20) (citing Dkt. No. 130-1 at ¶ 25). Defendants further argue that the claimed "units" do not belong to a class of structures either. *Id.*

Defendants argue that the claimed "sending unit," "receiving unit," and "storage unit" must

each be a component or set of components within a "communication device," such as the GGSN or SGSN in the embodiments represented by Figure 7. (*Id.* at 20). Defendants further argue that Figure 8 of the 339 Patent is a "schematic structural view" of a "device" according to the purported invention, but contains no structural details. (*Id.*) (citing Dkt. No. 130-1 at ¶ 26.). According to Defendants, Figure 8 only discloses generic boxes for the "sending unit," "receiving unit," and "storage unit" within the GGSN. (Dkt. No. 130 at 20). Defendants contend that nothing in the specification, prosecution history, or other intrinsic evidence sheds light on whether a person of ordinary skill in the art would understand the "unit" terms to connote structure. (Dkt. No. 130 at 21) (citing Dkt. No. 130-1 at ¶ 26).

Defendants also argue that the meaning of the "unit" terms depends on their context. (Dkt. No. 130 at 21). Defendants contend that network elements within a packet core network (*e.g.*, GGSNs and SGSNs) are computer servers that communicate with other network elements (*e.g.*, the RNC or "access network device") over a wired connection via Internet Protocol. (*Id.* at 22). Defendants argue that in the context of communications between a mobile device and a base station, receivers and transmitters are known structures for the transmission of radio waves, but radio communication plays no part in the '339 Patent. (*Id.* at 21–22) (citing Dkt. No. 130-1 at ¶ 24). According to Defendants, the claimed "sending" and "receiving" units are not those typically associated with wireless devices. (Dkt. No. 130 at 22) (citing Dkt. No. 130-1 at ¶ 24). Defendants also argue that even if the "unit" terms had a common understanding in the context of a packet core network, a person of ordinary skill would not understand the identity of these components in light of the functions they perform in the claims. (Dkt. No. 130 at 22) (citing Dkt. No. 130-1 at ¶ 27).

Regarding the sending and receiving units, Defendants argue that a person of ordinary skill

would be unable to recognize any sending (or receiving) unit that performs the functionality recited in claims 9 and 11. (Dkt. No. 130 at 23) (citing Dkt. No. 130-1 at ¶ 28). Regarding the storage units, Defendants argue that a person of ordinary skill in the art would be unable to identify a well-understood structure within a GGSN that performs the recited function. (Dkt. No. 130 at 23) (citing Dkt. No. 130-1 at ¶ 30). Defendants contend that no other evidence of structure is found for these terms in the patent or the understanding of those in art. (Dkt. No. 130 at 23) (citing Dkt. No. 130-1 at ¶ 31). According to Defendants, a person of ordinary skill in the art would not even understand if the "unit" terms are directed to software or hardware. (Dkt. No. 130 at 23) (citing Dkt. No. 130-1 at ¶¶ 28, 30, 31).

Defendants further contend that the '339 Patent never identifies what hardware or software make up the claimed "unit[s]" within the "communication device" in claims 9 or 11. (Dkt. No. 130 at 24). Defendants argue that if these "unit" terms are construed as hardware, the specification does not point to any hardware (or any other structures) that could perform the stated functions. *Id.* Defendants further argue that if the "unit" terms are construed as software, the specification neither discloses a processor that executes the corresponding function nor an algorithm for the claimed functionality. *Id.* Defendants contend that Plaintiff fails to identify any specific structure in its briefing or in the patent for any of the "unit" terms, and instead points to the generic boxes in Figure 8 (receiving unit 801, sending unit 802, and storage unit 803). *Id.*

Plaintiff responds that none of these terms use the "means for" language. (Dkt. No. 126 at 24). Plaintiff argues that each of these terms use well-understood terms in the networking and communications arts, and include clauses describing how these structures are "configured to" interact by receiving, sending, or storing types of data. (*Id.* at 25). Plaintiff contends that each of these terms are described as being structurally within a larger network component (such as a

GGSN or SGSN communication device) that must include those structures to achieve their purpose. *Id.*

Plaintiff further argues that the intrinsic evidence demonstrates that persons of ordinary skill in the art would readily understand the necessary structure of the receiving unit, sending unit, and storage unit of the claimed communications device such as a SGSN or GGSN. (*Id.* at 26) (citing '339 Patent at 3:54–57). Plaintiff contends that Fig. 7 identifies the connections between the communication devices in the claimed system, and Fig. 8 identifies the connections between a "receiving unit," "sending unit," and "storage unit" in the communication device. (Dkt. No. 126 at 26). Plaintiff also argues that the full claim limitations describe the inputs and outputs of these components, and what it is that they "receive," "send," or "update" in storage, respectively. *Id.*

In the alternative, Plaintiff argues that even if these terms are construed under § 112, ¶ 6, the written description sets forth sufficient structure to perform their function. (*Id.* at 27). Plaintiff contends that the claim language describing how the components are configured provides all that is necessary to describe sufficient structure for the terms. (*Id.* at 28). Plaintiff further contends that the "receiving unit" receives, the "sending unit" sends, and the "storage unit" updates. *Id.* Plaintiff argues that what is claimed is communication device with a receiving unit, sending unit, and storage unit (e.g., a GGSN or SGSN) configured to receive, send, and update in an inventive way. *Id*.

In its reply, Plaintiff argues that although Defendants characterize "unit" as a nonce term, a person of ordinary skill in the art would understand the prefixes of these terms (*i.e.*, sending, receiving, storage) to impart structural meaning. (Dkt. No. 141 at 9) (citing Dkt. No. 143 at ¶ 34). Plaintiff further argues that Defendants admit that these terms relate to components found within network elements (*e.g.*, GGSN/MME or SGSN) within a packet core network, and a person of

ordinary skill in the art would understand the components within those elements to have specific structure. (Dkt. No. 141 at 9) (citing Dkt. No. 143 at ¶ 35). Plaintiff also argues that the unit terms here are described within the context of their inputs, outputs, and interactions with other units in ways that inform the character of these limitations. (Dkt. No. 141 at 9). Plaintiff further contends that the specification supports the character of these limitations because it describes the functionality of the unit terms and depicts their arrangement within the claimed invention. (*Id.* at 10).

In the alternative, Plaintiff argues that the unit terms do have sufficient structure within the '339 Patent. (*Id.* at 10). Plaintiff contends that what is claimed is a communication device configured to receive, send, and update in an inventive arrangement within the network, not any inventive mechanism underlying its receiving, sending, or storage units. *Id.* According to Plaintiff, Defendants cannot plausibly argue that the requisite circuitry or algorithm is more complex than the claimed functions themselves (*i.e.*, receiving, storing, or updating). (*Id.* at 11). Plaintiff contends that person of ordinary skill in the art would only need to understand that the receiving unit receives, the sending unit sends, and the storage unit updates, and that they interact in the claimed manner. (*Id.*) (citing Dkt. No. 143 at ¶¶ 35-36).

For the following reasons, the Court finds that the term **"receiving unit"** is not subject to § 112, ¶ 6, and should be construed to mean **"receiving unit of a core network user plane anchor"** in claim 9 of the '339 Patent, and should be construed to mean **"receiving unit of a core network control plane"** in claim 11 of the '339 Patent. The Court further finds that the term **"sending unit"** is not subject to § 112, ¶ 6, and should be construed to mean **"sending unit of a core network user plane anchor"** in claim 9 of the '339 Patent, and should be construed to mean **"sending unit of a core network control plane"** in claim 11 of the '339 Patent. The Court also

finds that the term **"storage unit"** is not subject to § 112, ¶ 6, and should be construed to mean **"storage unit of a core network user plane anchor"** in claim 9 of the '339 Patent.

b) Analysis

The phrase "receiving unit . . . configured to receive an error indication of a data tunnel from an access network device . . . [and] receive an update packet data protocol (PDP) context request from the core network control plane" appears in claim 9 of the '339 Patent. The phrase "sending unit . . . configured to instruct a core network control plane to recover a downlink data tunnel if a user plane corresponding to the error indication uses a One Tunnel technology" appears in claim 9 of the '339 Patent. The phrase "storage unit configured to update a corresponding PDP context according to the update PDP context request" appears in claim 9 of the '339 Patent. The phrase "receiving unit . . . configured to receive a notification from a core network user plane anchor to recover a downlink data tunnel if a user plane using a One Tunnel technology is error" appears in claim 11 of the '339 Patent. The phrase "sending unit . . . configured to send a radio access bearer (RAB) assignment request to an access network device . . . and . . . send an update packet data protocol PDP context request to the core network user plane anchor to update corresponding PDP context" appears in claim 11 of the '339 Patent. As indicated, none of the claims recite the word "means."

"It is well settled that '[a] claim limitation that actually uses the word 'means' invokes a rebuttable presumption that § 112, [¶] 6 applies.'" *Apex Inc. v. Raritan Comput., Inc.*, 325 F.3d 1364, 1371 (Fed. Cir. 2003) (quotation omitted). It is also equally understood that "a claim term that does not use 'means' will trigger the rebuttable presumption that § 112, [¶] 6 does not apply." *Id.* (quotation omitted). The presumption against the application of § 112, ¶ 6 may be overcome if a party can "demonstrate[] that the claim term fails to 'recite sufficiently definite structure' or else

recites 'function without reciting sufficient structure for performing that function.'" *Williamson*, 792 F.3d at 1339 (quoting *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000)). "In undertaking this analysis, we ask if the claim language, read in light of the specification, recites sufficiently definite structure to avoid § 112, ¶ 6." *Robert Bosch, LLC v. Snap-On Inc.*, 769 F.3d 1094, 1099 (Fed. Cir. 2014) (citing *Inventio AG v. Thyssenkrupp Elevator Ams. Corp.*, 649 F.3d 1350, 1357 (Fed. Cir. 2011)).

None of the claims recite the word "means." Therefore, there is a rebuttable presumption that § 112, ¶ 6 does not apply. Defendants have failed to rebut the presumption because "the words of the claim are understood by persons of ordinary skill in the art to have sufficiently definite meaning as the name for structure." *Williamson*, 792 F.3d at 1348. The intrinsic evidence demonstrates that a person of ordinary skill in the art would understand the necessary structure of the receiving unit, sending unit, and storage unit. Specifically, these units are part of the recited core network user plane anchor (GGSN) or the recited core network control plane (SGSN). The specification states that "[i]n the actual applications, the core network control plane 701 may be an SGSN, the core network user plane anchor 702 may be a GGSN, and the access network device 703 may be an RNC." '339 Patent at 10:1-4. In fact, Defendants concede that these terms relate to components found within these network elements (*e.g.*, GGSN or SGSN). (Dkt. No. 130 at 22).

Moreover, the claim language describes the inputs and outputs of these components, and what it is that they "receive," "send," or "update," respectively. Claim 9 recites that the "the receiving unit is configured to receive an error indication of a data tunnel from an access network device," and that "the sending unit is configured to instruct a core network control plane to recover a downlink data tunnel." Claim 9 further recites that "the receiving unit is further configured to receive an update packet data protocol (PDP) context request from the core network control plane,"

and that the "storage unit configured to update a corresponding PDP context according to the update PDP context request." Likewise, claim 11 recites that "the receiving unit is configured to receive a notification from a core network user plane anchor to recover a downlink data tunnel," and that "the sending unit is configured to send a radio access bearer (RAB) assignment request to an access network device."

As explained in *E2E*, § 112, ¶ 6 does not apply when the written description provides context as to the "inputs and outputs" and how the claimed components "interact[] with other components . . . in a way that . . . inform[s] the structural character of the limitation-in-question or otherwise impart[s] structure." *E2E Processing, Inc. v. Cabela's Inc.*, 2015 U.S. Dist. LEXIS 86060, *20 (E.D. Tex. July 2, 2015) (quoting *Williamson*, 792 F. 3d at 1351). Figures 3, 4, 5, and 6 show information flowing among the RNC, SGSN, GGSN, and MS. Each arrow in these diagrams indicates the direction of information flow. For example, Figure 6 illustrates the GGSN receiving an error indication 602 from an RNC.
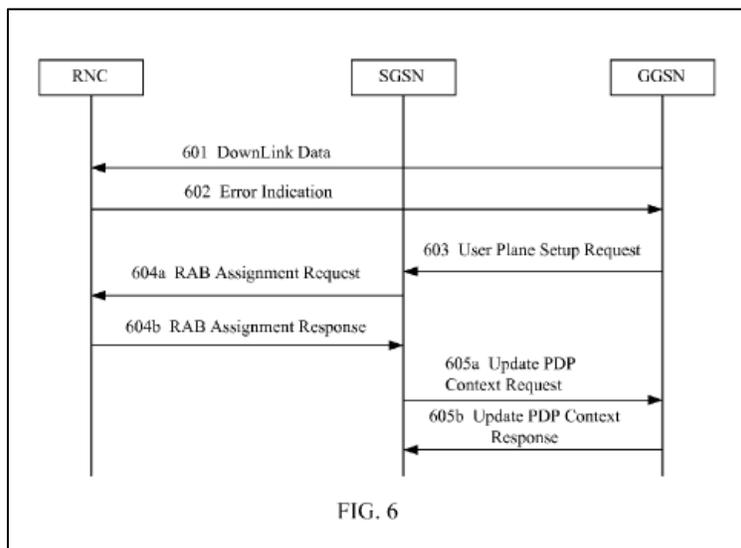

FIG. 6

'339 at Figure 6. Figure 6 also illustrates the GGSN receiving an update packet data protocol (PDP) context request 605a from an SGSN. The figure further illustrates the GGSN sending a user

plane setup request 603 to a corresponding SGSN. Although not shown, a person of ordinary skill in the art would understand that these entities would have "receiving units" and "sending units" as part of their structure because they must be capable of "sending" and "receiving." (Dkt. No. 143 at ¶ 36). Similarly, a person of ordinary skill in the art would understand that each of these components must be capable of storing and updating such information as the PDP context, and would have storage units as part of their structure. (Dkt. No. 143 at ¶¶ 36, 37). Thus, the written description provides context as to the "inputs and outputs" and how the claimed components "interact[] with other components . . . in a way that . . . inform[s] the structural character of the limitation-in-question or otherwise impart[s] structure." *E2E,* 2015 U.S. Dist. LEXIS 86060 at *20 (quoting *Williamson*, 792 F. 3d at 1351).

Defendants cite authority for the proposition that "unit" is a "nonce" term that is simply a substitute for the word "means." (Dkt. No. 130 at 19) (citing *Via Vadis, LLC v. Buffalo Ams., Inc.*, 2016 U.S. Dist. LEXIS 128160, *15 (W.D. Tex. Sept. 20, 2016) (Yeakel, J.)). The authority cited by Defendants does not address circumstances directly analogous to the above-discussed intrinsic evidence. Moreover, the "the 'prefix' that appears before a purported nonce word may impart structural meaning." *E2E,* 2015 U.S. Dist. LEXIS 86060 at *17. A person of ordinary skill in the art would understand the prefixes of these terms (*i.e.*, sending, receiving, storage) to impart structural meaning in the context of the disclosed network elements. (Dkt. No. 143 at ¶¶ 28-32). The 'receiving unit' receives, the 'sending unit' sends, and the 'storage unit' updates in its respective network element. Given this context, a person of ordinary skill would understand these words in the claims "to have a sufficiently definite meaning as the name for structure." *Williamson*, 792 F.3d at 1348.

Defendants further argue that even if the "unit" terms had a common understanding in the

context of a packet core network, a person of ordinary skill would not understand the identity of these components in light of the functions they perform in the claims. (Dkt. No. 130 at 22). The Court disagrees. Importantly, what is claimed is a communication device configured to receive, send, and update in a particular arrangement within the network. The focus of the claims is not on the inside of the claimed units, but on what inputs and outputs they receive, send, or store, and how they interact with one other within the claimed communication device. Indeed, the Field of the Invention states that "[t]he present invention relates . . . to a method, system, and device for recovering an invalid downlink data tunnel for a user plane between an access network and a core network, having a One Tunnel/Direct Tunnel architecture in a third generation mobile communication system." '339 Patent at 1:18–23.

Although the terms are not subject to § 112 ¶ 6, the Court finds that a person of ordinary skill in the art would understand that the "unit" terms would be contained within an appropriate network element. Specifically, the Court finds that claim 9 is drafted from the perspective of the core network user plane anchor (*i.e.*, GGSN), and claim 11 is drafted from the perspective of the core network control plane (*i.e.*, SGSN). The specification further states that the device illustrated in Figure 8 "is a GGSN device and specifically includes a receiving unit 801 and a sending unit 802." '339 Patent at 10:41–42. Thus, the "receiving unit" in claim 9 is the receiving unit of a "core network user plane anchor." Likewise, the "sending unit" in claim 9 is the sending unit of a "core network user plane anchor," and the "storage unit" is the storage unit of a "core network user plane anchor." Similarly, the "receiving unit" in claim 11 is the receiving unit of a "core network control plane," and the "sending unit" is the sending unit of a "core network control plane."[3] Finally, in

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[3] The Court notes that Plaintiff's alternative construction for the disputed terms in claim 11 of the '339 Patent incorrectly included the sending and receiving unit within the "core network user plane anchor," instead of the "core network control plane." (Dkt. No. 126 at 24). Plaintiff corrected the

reaching its conclusion, the Court has considered the extrinsic evidence submitted by the parties, and given it its proper weight in light of the intrinsic evidence.

c) Court's Construction

The Court finds that the term **"receiving unit"** is not subject to § 112, ¶ 6, and construes the term to mean **"receiving unit of a core network user plane anchor"** in claim 9 of the '339 Patent, and construes the term to mean **"receiving unit of a core network control plane"** in claim 11 of the '339 Patent. The Court further finds that the term **"sending unit"** is not subject to § 112, ¶ 6, and construes the term to mean **"sending unit of a core network user plane anchor"** in claim 9 of the '339 Patent, and construes the term to mean **"sending unit of a core network control plane"** in claim 11 of the '339 Patent. The Court also finds that the term **"storage unit"** is not subject to § 112, ¶ 6, and construes the term to mean **"storage unit of a core network user plane anchor"** in claim 9 of the '339 Patent.

V. CONCLUSION

The Court adopts the constructions above for the disputed and agreed terms of the Asserted Patents. Furthermore, the parties should ensure that all testimony that relates to the terms addressed in this Order is constrained by the Court's reasoning. However, in the presence of the jury the parties should not expressly or implicitly refer to each other's claim construction positions and should not expressly refer to any portion of this Order that is not an actual construction adopted by the Court. The references to the claim construction process should be limited to informing the jury of the constructions adopted by the Court.

It is SO ORDERED.

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error in the parties' Joint Claim Construction Chart. (Dkt. No 149-1 at 21-23).

SIGNED this 15th day of April, 2017.

ROY S. PAYNE
UNITED STATES MAGISTRATE JUDGE