

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ERICSSON INC.
Petitioner,

v.

KONINKLIJKE KPN N.V.
Patent Owner.

Case No. IPR2023-00524
Patent 9,372,098

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 9,372,098**

TABLE OF CONTENTS

I.	Introduction.....	1
II.	Mandatory Notices Under 37 C.F.R. § 42.8(a)(1).....	2
	A. Real Party-in-Interest under 37 C.F.R. § 42.8(b)(1)	2
	B. Related Matters under 37 C.F.R. § 42.8(b)(2)	2
	C. Lead and Back-Up Counsel under 37 C.F.R. § 42.8(b)(3)	2
	D. Service Information under 37 C.F.R. § 42.8(b)(4).....	3
III.	Fees	4
IV.	Requirements Under 37 C.F.R. § 42.104	4
	A. Grounds for Standing	4
	B. Priority Date	4
	C. Prior Art.....	5
	D. Identification of Challenge and Statement of Precise Relief Requested	6
V.	Institution is Proper under § 314(a).....	6
VI.	Institution is Proper Under § 325(d).....	7
VII.	Overview of the '098 Patent.....	8
	A. Description of the '098 Patent.....	8
	B. The '098 Patent's Prosecution History	11
	C. Level of Ordinary Skill in the Art.....	14
	D. Claim Listing.....	15
VIII.	Prior Art Summary	15
	A. <i>Krco</i> (EX1009).....	15
	B. <i>Benaouda</i> (EX1010).....	18
	C. TS 24.008 (EX1011)	21
	D. <i>Ananthanarayanan</i> (EX1012).....	21
IX.	Claim Construction.....	22
X.	Asserted Grounds of Invalidity.....	22
	A. Ground 1: <i>Krco</i> in view of <i>Benaouda</i>	22

1.	Motivation to Combine	22
2.	Reasonable Expectation of Success	26
3.	Claim 17	29
	i. [17p] A node in a telecommunications network, said telecommunications network being configured for transferring data from a communication apparatus to a machine-to-machine server, said node being comprising:	29
	ii. [17a] one or more processors for carrying out operations including:	34
	iii. [17b] receiving a wireless signalling message from said communication apparatus, ...	34
	iv. [17c] said received wireless signalling message having inserted in it non-signalling application data generated for a machine-to-machine function by the communication apparatus, ...	36
	v. [17d] wherein wireless signalling messages of the telecommunications network are of a message type specified for carrying signalling data for managing connections in the telecommunications network;	41
	vi. [17e] retrieving said non-signalling application data from the received wireless signalling message; and	42
	vii. [17f] terminating further transmission of the received wireless signalling message and transferring said retrieved non-signalling application data to said machine-to-machine server. 44	
4.	Claim 20	46
	i. [20a] The node of claim 17, wherein the telecommunications network is configured for transferring non-signalling application data from the communication apparatus to the machine-to-machine server in a machine-to-machine communications setting; and	46
	ii. [20b] wherein transferring said non-signalling application data to said machine-to-machine server comprises transferring said non-signalling application data to said machine-to-machine server, while avoiding to establish a	

	complete circuit-switched or packet-switched connection between said communication apparatus and said telecommunications network	46
5.	Claim 18. A node according to claim 17, wherein the node is a serving GPRS support node.	49
6.	Claim 19. A node according to claim 17, wherein the node is a signalling monitor.	50
7.	Claim 1	51
	i. [1p] A method of transferring data from a communication module to a machine-to-machine server over a telecommunications network, the method comprising:	51
	ii. [1a] receiving a wireless signalling message from said communication module at a signalling termination node of the telecommunications network, ...	51
	iii. [1b].....	52
	iv. [1c].....	52
	v. [1d].....	52
	vi. [1e].....	52
8.	Claim 2. The method according to claim 1, wherein the wireless signalling message is a network attach request message.	52
9.	Claim 9. The method according to claim 1, wherein said received wireless signalling message contains address information indicative of said machine-to-machine server.	54
10.	Claim 10. The method according to claim 1, wherein the non-signalling application data comprises alarming data.....	55
11.	Claim 11. The method according to claim 1, wherein the non-signalling application data comprises measurement data.	56
12.	Claim 12. The method according to claim 11, wherein the communication module comprises one or more sensors, and wherein the measurement data comprises measurement data obtained using the one or more sensors.	57
13.	Claim 13	58

i.	[13a].....	58
ii.	[13b].....	58
14.	Claim 14. The method of claim 1, wherein said received wireless signalling message comprises data derived from a sensor of the communication module.	59
15.	Claim 15	59
i.	[15p] A telecommunications network for transferring data from a communication apparatus to a machine-to-machine server, said telecommunications network comprising: ..	59
ii.	[15a] a signalling termination node; and.....	59
iii.	[15b] one or more processors for carrying out operations including:.....	59
iv.	[15c]	59
v.	[15d].....	60
vi.	[15e]	60
vii.	[15f]	60
viii.	[15g].....	60
16.	Claim 16.....	60
i.	[16a].....	60
ii.	[16b].....	60
17.	Claim 21	60
i.	[21p] A communication device comprising:	60
ii.	[21a] a transmitter; and.....	61
iii.	[21b] a processor for causing the communication device to carry out operations including:.....	61
iv.	[21c]	62
v.	[21d].....	62
vi.	[21e].....	62
18.	Claim 22.....	62
19.	Claim 23.....	62
20.	Claim 24.....	62

21.	Claim 25	62
i.	[25a]	62
ii.	[25b]	62
B.	Ground 2: <i>Krco</i> in view of <i>Benaouda</i> and TS 24.008	63
1.	Motivation to Combine	63
2.	Reasonable Expectation of Success	64
3.	Claim 2. The method according to claim 1, wherein the wireless signalling message is a network attach request message.	66
4.	Claim 3. The method according to claim 2, wherein said network attach request message is a location updating request message with a location updating type information element indicating an IMSI attach.	68
5.	Claim 4. The method according to claim 2, wherein said network attach request message is an attach request with an attach type information element indicating a GPRS request or a combined GPRS/IMSI attach.	69
6.	Claim 5	70
i.	[5a] The method according to claim 2, further comprising: transmitting a network attach accept message to the communication module;	70
ii.	[5b] transmitting further data to and/or receiving further data from the communication module; and	70
iii.	[5c] receiving a network detach message from the communication module	71
7.	Claim 6. The method according to claim 2, further comprising transmitting an attach reject message to said communication module, said attach reject message comprising data for said communication module	71
XI.	Conclusion	73

EXHIBIT LIST

Exhibit No.¹	Description
1001	U.S. Patent No. 9,549,098 B2 (“the ’098 Patent”)
1002	Prosecution File History for the ’098 Patent
1003	Declaration of Dr. James Olivier
1004	CV of Dr. James Olivier
1005	Report on the Filing or Determination of an Action Regarding a Patent or Trademark, <i>Koninklijke KPN N.V. v. Telefonaktiebolaget LM Ericsson</i> , No. 2:22-cv-282, (E.D. Tex. July 25, 2022), ECF No. 3
1006	Amended Redacted Complaint, <i>Koninklijke KPN N.V. v. Telefonaktiebolaget LM Ericsson</i> , No. 2:22-cv-282, (E.D. Tex. July 25, 2022), ECF No. 27
1007	Stipulation Regarding Waiver of Service and Answer Deadline, <i>Koninklijke KPN N.V. v. Telefonaktiebolaget LM Ericsson</i> , No. 2:22-cv-282, (E.D. Tex. July 25, 2022), ECF No. 8
1008	Jörg Eberspächer, Hans-Jörg Vögel, Christian Bettstetter, Christian Hartmann, GSM Architecture, Protocols and Services (3rd Edition) (“Eberspächer”)
1009	U.S. Patent No. 9,191,774 B2 to Krco (“ <i>Krco</i> ”)
1010	U.S. Patent Pub. No. 2008/0153521 to Benaouda (“ <i>Benaouda</i> ”)
1011	3GPP TS 24.008 v8.3.0 (“TS 24.008”)
1012	WO Publication No. WO 2008/039973 to Ananthanarayanan (“ <i>Ananthanarayanan</i> ”)
1013	Declaration of Craig Bishop
1014	Claim Listing

¹ Citations to patents are made by column and line cite; citations to patent publications are made by paragraph number; citations to Exhibits 1002 and 1018 are made with reference to the Bates-stamped pagination; citations to other exhibits are made to the page number of the document itself.

Exhibit No.¹	Description
1015	U.S. Patent No. 7,802,292 B2 to Shaw
1016	Convergence Technologies for 3G Networks
1017	WO Publication No. WO 2006/088947 to Geltner
1018	Federal Court Management Statistics (Mar. 31, 2022), <i>available at</i> < https://www.uscourts.gov/statistics/table/na/federal-court-management-statistics/2022/06/30-2 >
1019	<i>Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation</i> (June 21, 2022)
1020	3GPP TS 23.040 v6.9.0 (“TS 23.040”)
1021	U.S. Patent Pub. No. 2006/0217136 A1 to Bantukul
1022	WO Publication No. WO 2009/146740 to Krco

I. INTRODUCTION

Challenged U.S. Patent No. 9,372,098 claims a known solution to a known problem in transferring non-signaling machine-to-machine application data in a telecommunications network. The '098 Patent describes that machine-to-machine applications often transfer limited amounts of data at infrequent intervals, such as in an electricity meter reading application. Some machine-to-machine applications, like an alarming functionality, also require rapid transfer of data. The problem with existing telecommunications systems, says the '098 Patent, is that the process for establishing a communication session for such data transmission is time-consuming and resource-heavy, which lowers the efficiency of machine-to-machine communication.

The '098 Patent's claimed solution to that problem is to send non-signaling machine-to-machine data in a signaling message such as an access request message, so the data can be retrieved, processed, and delivered to a destination server quickly. But as will be shown herein, it was already well-known to include machine-to-machine application data in signaling messages, including in access request messages.

Petitioner Ericsson, Inc. requests institution of *Inter Partes* Review ("IPR") of Claims 1-6 and 9-25 of the '098 Patent and a finding that all challenged claims are unpatentable.

II. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8(a)(1)

A. Real Party-in-Interest under 37 C.F.R. § 42.8(b)(1)

Ericsson Inc. and Telefonaktiebolaget LM Ericsson are the Real Parties-in-Interest. Ericsson Inc. is a wholly-owned subsidiary of Telefonaktiebolaget LM Ericsson. No other parties exercised or could have exercised control over this Petition. No other parties funded or directed this Petition. *See* Office Patent Trial Practice Guide, 77 FR 48756-01, 48759-60, 2012 WL 3276882 (Aug. 14, 2012).

B. Related Matters under 37 C.F.R. § 42.8(b)(2)

Koninklijke KPN N.V. (“Patent Owner”) has asserted the ’098 Patent against Petitioner in a co-pending litigation, *Koninklijke KPN N.V. v. Telefonaktiebolaget LM Ericsson*, Case No. 2:22-cv-282 (E.D. Tex. July 25, 2022). The Original Complaint in that litigation was filed on July 25, 2022. *See* EX1005. The ’098 Patent was first asserted in that litigation in an Amended Complaint, which was filed November 15, 2022. *See* EX1006. Telefonaktiebolaget LM Ericsson waived service. EX1007.

C. Lead and Back-Up Counsel under 37 C.F.R. § 42.8(b)(3)

Petitioner provides the following designation of counsel.

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D. Service Information under 37 C.F.R. § 42.8(b)(4)

A copy of this entire Petition, including all Exhibits and a Power of Attorney, is being served by FEDERAL EXPRESS, costs prepaid, to the address of the attorney or agent of record for Patent Owner in the district court proceedings regarding the '098 Patent: Lexie G. White, Susman Godfrey, L.L.P., 1000 Louisiana

Street, Suite 5100, Houston, TX 77002; and to the address of the attorney or agent of record at the USPTO: McDonnell, Boehnen, Hulbert, & Berghoff LLP, 300 S. Wacker Drive, 32nd Floor, Chicago, IL 60606.

Petitioner consents to electronic service at the address provided above for lead and back-up counsel. A Power of Attorney is filed concurrently herewith under 37 C.F.R. § 42.10(b).

III. FEES

The Office is authorized to charge the fee in 37 C.F.R. § 42.15(a) to Deposit Account No. 02-0384 and any additional fees that are due.

IV. REQUIREMENTS UNDER 37 C.F.R. § 42.104

A. Grounds for Standing

Petitioner certifies that the '098 Patent is eligible for IPR and that Petitioner is not barred or otherwise estopped.

B. Priority Date

The '098 Patent was filed as PCT No. PCT/EP2009/064185 on October 28, 2009, and claims priority to EP 08018761, filed on October 28, 2008. EX1001, Codes 22, 86, 30. Petitioner assumes without conceding that under pre-AIA § 102(b) the date of the first priority application filed “in the United States” was October 28, 2009.

C. Prior Art

Exhibit 1009: U.S. Patent No. 9,191,774 B2 to Krco (“*Krco*”) was filed as PCT Application No. PCT/EP2008/056895 on June 4, 2008, designated the United States, and was filed and published in English. EX1009, Code 22; *see also* EX1022. *Krco* entered national stage under 35 U.S.C. § 371 from PCT No. EP2008/05895 on December 1, 2010. *Id.*, Code 86. *Krco* qualifies as prior art under at least 35 U.S.C. §102(e).

Exhibit 1010: U.S. Patent App. Pub. No. 2008/0153521 A1 to Benaouda (“*Benaouda*”) was filed on December 22, 2006 as Appl. No. 11/643,709, and published on June 26, 2008. EX1010, Codes 21, 22, 43. *Benaouda* qualifies as prior art under at least §§ 102(a), 102(b), and 102(e).

Exhibit 1011: 3GPP TS 24.008 v8.3.0 (“TS 24.008”) was published by 3GPP in September 2008. EX1013, ¶¶ 42-48. TS 24.008 qualifies as prior art under at least 35 U.S.C. §§ 102(a) and 102(b).

Exhibit 1012: WO 2008/039973 A1 to Ananthanarayanan (“*Ananthanarayanan*”) was filed on September 28, 2007, designated the United States, and was filed and published in English. EX1012, Code 22. *Ananthanarayanan* has an international publication date of April 3, 2008. *Id.*, Code 43. *Ananthanarayanan* qualifies as prior art under at least 35 U.S.C. §§ 102(a), 102(b), and 102(e).

D. Identification of Challenge and Statement of Precise Relief Requested

Petitioner requests IPR of Claims 1-6 and 9-25 of the '098 Patent based on the following grounds:

Ground	Claims	Prior Art
1	1-2, 9-25	<i>Krco</i> in view of <i>Benaouda</i>
2	2-6	<i>Krco</i> in view of <i>Benaouda</i> and TS 24.008

Submitted with this Petition is a declaration of Dr. James Olivier (EX1003), a qualified technical expert. EX1003, ¶¶ 34-43.

V. INSTITUTION IS PROPER UNDER § 314(A)

The factors set forth in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 6 (P.T.A.B. Mar. 20, 2020) (“*Fintiv-I*”) (precedential) and the Interim Guidance (EX1019) favor institution. The Board should not exercise its discretion because the merits of this petition are compelling. EX1019, pp. 4-5. Furthermore, Ericsson filed this petition quickly, just three months after KPN first asserted the '098 Patent against Ericsson Inc. and Telefonaktiebolaget LM Ericsson in the Eastern District of Texas. EX1006. That litigation is just beginning, and thus the *Fintiv* factors favor institution. EX1019, pp. 3, 8-9; EX1018, p. 35 (showing a median 24.5-month time-to-trial); *Samsung Elecs. Co. v. Staton Techiya, LLC*, IPR2022-00324, Paper 13, at 12 (PTAB July 11, 2022) (applying the median).

In addition to the nascent stage of the case, Petitioner intends to file a motion to stay in the event of institution. The Board has treated related factors as neutral after declining to speculate on the outcome of a stay motion. *See, e.g., HP Inc. v. Slingshot Printing LLC*, IPR2020-01084, Paper 13 at 9 (P.T.A.B. Jan. 14, 2021).

“[I]t is often reasonable for a petitioner to wait to file its petition until it learns which claims are being asserted against it in the parallel proceeding.” *Fintiv-I*, at 11. Here, Petitioner promptly filed this Petition within six weeks of receiving infringement contentions. Due to Petitioner’s diligence, it would be premature at the time of this Petition to argue regarding the timing of respective milestones in the proceeding versus the litigation. Thus, if Patent Owner raises § 314(a) arguments in a Preliminary Response, Petitioner respectfully requests the opportunity to reply before institution, to address expected schedules and whether a prior art stipulation would be appropriate.

VI. INSTITUTION IS PROPER UNDER § 325(D)

None of the *Becton, Dickinson* factors weigh in favor of discretionary denial under § 325(d). *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (P.T.A.B. Dec. 15, 2017) (precedential). *Krco*, *Benaouda*, and *Ananthanarayanan* are new references that were not disclosed, cited, or considered during prosecution. And although TS 24.008 is listed on the face of the ’098 Patent, there is no evidence in the record that TS 24.008 was substantively considered at any

depth by the Examiner. The Board has declined to exercise its discretion to deny institution in situations where Petitioner relied upon prior art that was cited on the face of the challenged patent, but was “not applied by the examiner...in any rejection of claims.” *Comcast Cable Communs., LLC v. Promptu Sys. Corp.*, Case No. IPR2018-00342, Paper 13 at 17 (PTAB July 19, 2018). Moreover, because neither *Krco*, *Benaouda*, nor *Ananthanarayanan* were before the Examiner, this Petition thus does not present a situation in which “the same or substantially the same prior art or arguments previously were presented to the Office.” 35 U.S.C. § 325(d). The Board should, therefore, grant this Petition.

VII. OVERVIEW OF THE '098 PATENT

A. Description of the '098 Patent

The '098 Patent is directed to “a telecommunications network and a method of transferring user data from a communication module to a data processing centre in a machine-to-machine communications setting.” EX1001, 1:19-22. The '098 Patent characterizes machine-to-machine (M2M) systems as typically requiring “nothing or only a limited amount of data to report,” and in some implementations, “it is required that data can rapidly be sent from a communication module to a data processing centre.” *Id.*, 1:43-45. An object of the '098 Patent is “to provide a method and telecommunications network that allow for efficient and fast

communications of limited amounts of data in a machine-to-machine environment.”
Id., 1:53-56.

The steps of the claimed method for communicating data include: (1) receiving a wireless signaling message at a “signaling termination node,” the wireless signaling message inserted in it “non-signaling application data,” (2) retrieving the non-signaling application data from the wireless signaling message, (3) transferring the retrieved non-signaling application data to a machine-to-machine server, and (4) terminating further transmission of the wireless signaling message.

Claim 1 of the '098 Patent is representative, and recites:

1. A method of transferring data from a communication module to machine-to-machine server over a telecommunications network, the method comprising:

receiving a wireless signalling message from said communication module at a signalling termination node of the telecommunications network, said received wireless signalling message inserted in it non-signalling application data generated for a machine-to-machine function by the communication module, wherein wireless signalling messages of the telecommunications network are of a message type specified for carrying signalling data for managing connections in the telecommunications network;

retrieving said non-signalling application data from the received wireless signalling message; and

terminating further transmission of the received wireless signalling message and transferring said retrieved non-signalling application data to said machine-to-machine server.

The '098 Patent states that the claimed “*signalling message*” received from a communication module “can be a network attach request message,” which the '098

Patent acknowledges was disclosed in well-known technical specifications at the time of the '098 Patent's filing. *Id.*, 5:30-40, 5:64-66; *see also id.*, 7:57-61 (identifying other well-known examples of a “*signalling message*”). The '098 Patent explains that “[t]he attach message is typically one of the first messages received from the communication module in the telecommunications network.” *Id.*, 2:38-41. Thus, by transmitting the “*non-signalling application data*” via a “*signalling message*” such as the network attach request, “it is possible to rapidly transmit data to the telecommunications network.” *Id.*, 2:8-11.

The network attach request may be accepted or rejected. *Id.*, 5:52-7:8 (describing “an embodiment for circuit switched (CS) data wherein the attach request is accepted.”); 7:9-7:44 (describing “an embodiment for circuit switched data (now denying the attach request).”). In both cases, the “*non-signalling application data*” is “encapsulated” in the attach request message, sent to a network node (*e.g.*, an MSC (Mobile Switching Center) or an SGSN (serving GPRS support node)), retrieved at the network node, and transferred further to an “M2M server.” *See, e.g.*, EX1001, 4:40-43, 5:23-49, 7:14-17. Figure 2A of the '098 Patent, copied and annotated below, is an example of the '098 Patent's method for transferring the “*non-signalling application data*”:

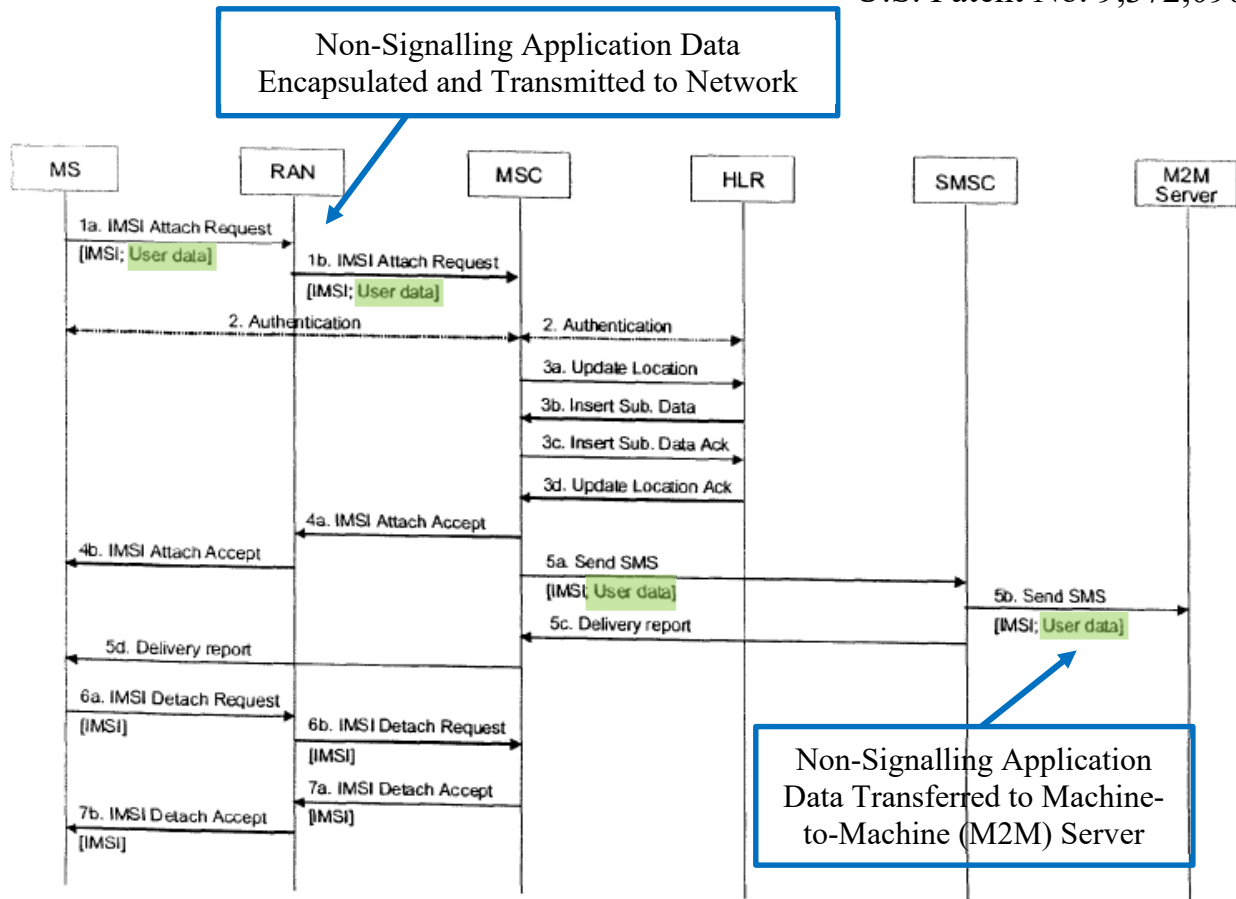


FIG. 2A

B. The '098 Patent's Prosecution History

The PCT application that led to the '098 Patent was filed as a national stage entry in the U.S. on April 28, 2011. EX1002, 333 (transmittal of application). The Patent Office issued a first Office Action on June 20, 2013, in which the Examiner rejected then-pending claims 1-24. *Id.*, 229. The Examiner rejected Claims 1-13, 15, and 17-24 over US 2007/0232306 to Johannesson in view of US 2006/0262742 to Dommaraju (referred to by the Examiner and applicant as “Domm”), rejected claim 14 over Johannesson in view of Dommaraju and US 2010/0203898 to Noldus, and

rejected claim 16 over Johannesson. *Id.*, 236-250. In response to the Office Action, applicant filed an amendment to the claims on September 5, 2013, and in the remarks accompanying this amendment, applicant argued that the cited references did not disclose a “signalling message containing application data of a program run by the communication module.” *Id.*, 222. While these remarks acknowledged that Dommaraju taught the transmission of “network data,” such as “IMSI, PTMSI, TLLI, and RAI parameters,” applicant highlighted the differences between application-layer data and network-layer data, and argued that Dommaraju’s network data was “certainly not application data as recited in claim 1.” *See id.*

The Examiner did not find these remarks persuasive, and issued a second Office Action on December 4, 2013, rejecting then-pending claims 1-10, 12-14, 16-22, and 24-28, again asserting Johannesson and Dommaraju.² In its February 4, 2014, response to this Office Action, applicant did not amend the claims, and instead re-asserted its earlier argument and argued that the Examiner improperly analyzed an earlier version of the claims. *Id.*, 170-171. The Examiner issued another Office Action on March 24, 2014, again asserting that Dommaraju teaches the claimed

² Applicant canceled claims 11, 15, and 23 in its September 5, 2013 response. EX1002, 215, 217.

“application data” (*id.*, 120-121); again, applicant argued otherwise in its August 25, 2014 response (*id.*, 104-105).

On December 15, 2014, the Examiner issued another Office Action again asserting that Dommaraju teaches the claimed “application data.” *Id.*, 75-76. On May 21, 2015, applicant amended the independent claims to specify that the “application data” was “non-signalling application data generated for a machine-to-machine function”:

1. (Currently amended) A method of transferring data from a communication module to a machine-to-machine server over a telecommunications network, the method comprising:

~~wirelessly~~ receiving a wireless signalling message from said communication module at a signalling termination node of the telecommunications network, said received wireless signalling message containing having inserted in it non-signalling application data of a program run generated for a machine-to-machine function by the communication module, wherein wireless signalling messages of the telecommunications network are configured for carrying signalling data for managing connections in the telecommunications network; and

retrieving said non-signalling application data from the received wireless signalling message; and

terminating further transmission of the received wireless signalling message and transferring said retrieved non-signalling application data of said program run by the communication module to said machine-to-machine server.

Id., 54. In the remarks accompanying this amendment, applicant argued that the data extracted from an attach request message in Dommaraju—*i.e.*, the IMSI, PTMSI, TLLI, and RAI—“are ‘parameters that may be associated with a particular subscriber’s connection’” and therefore not “non-signalling application data generated for a machine-to-machine function.” *Id.*, 64.

The Examiner found these remarks persuasive and issued a notice of allowance on February 25, 2016. *Id.*, 7. The Examiner also suggested an additional amendment, which applicant authorized, to clarify that that the “wireless signalling message of the telecommunications network are *of a message type specified* for carrying signalling data for managing connections in the telecommunications network.” *Id.*, 12-13.

C. Level of Ordinary Skill in the Art

A person of ordinary skill in the art at the time of the alleged invention of the '098 Patent would have had a degree in electrical engineering or a similar discipline, with at least three years of relevant industry or research experience, including designing or implementing cellular systems. EX1003, ¶ 41. A POSITA would also have familiarity with the wireless standards and protocols relating to data transmission and subscriber management. *Id.* This definition is approximate, and more education may substitute for industry experience or vice versa. *Id.*

D. Claim Listing

Exhibit 1014 is a claim listing that enumerates each claim element. Bracketed notations (*e.g.*, [1a], [1b], etc.) will be used to refer to individual limitations.

VIII. PRIOR ART SUMMARY

A. *Krco* (EX1009)

Krco describes a mobile communications system and method “for distribution of information in a primary cellular network.” EX1009, Abstract. *Krco* discloses a system wherein a UE is connected to one or more “second entities” (*e.g.*, sensors) or “second networks” (*e.g.*, network of sensors), which may relate to “Machine to Machine (M2M) type of services” such as “health monitoring, burglar alarms, [and] automatic meter reading.” *Id.*, 1:29-52, 3:52-59, 4:3-9. The UE forwards data from the M2M sensors to an M2M service provider, which provides similar M2M services. *Id.*, 3:60-62, 4:10-16. In order for the service provider to be aware of the M2M sensors’ “existence, location, and availability,” the UE sends “secondary data”—information about the M2M sensors’ properties—to the M2M service provider. *Id.*, 1:59-2:24. The UE does so by including the M2M sensor data in a “first message,” such as “a Location Update Request or a Routing Area Update request message,” which a POSITA would recognize as well-known signaling messages. *Id.*, 4:24-26, 4:44-47; *see also* EX1003, ¶ 83. Similarly, the ’098 Patent also uses a “location updating request” message to transmit its “application data” to

an M2M server. *See* EX1001, 5:64-66 (describing a “location updating request to request IMSI attach” as an example of a “signalling message” carrying application data).

In transmitting the M2M sensor data to the M2M service provider, the UE first sends a Location Update Request containing the M2M sensor data to a “third entity” (*e.g.*, an MSC (Mobile Switching Center), *see* EX1009, 4:53-55) that is located in a “third network” (*e.g.*, a cellular network). *Id.*, 4:17-21, 4:24-26. The MSC then extracts the M2M sensor data and sends it to a “fourth entity” (*e.g.*, an “availability server”), which stores the M2M sensor data and forwards it to an M2M service provider that is authorized to access the data. *Id.*, 6:45-62. Figure 2 of *Krco*, copied and annotated below, illustrates this process:

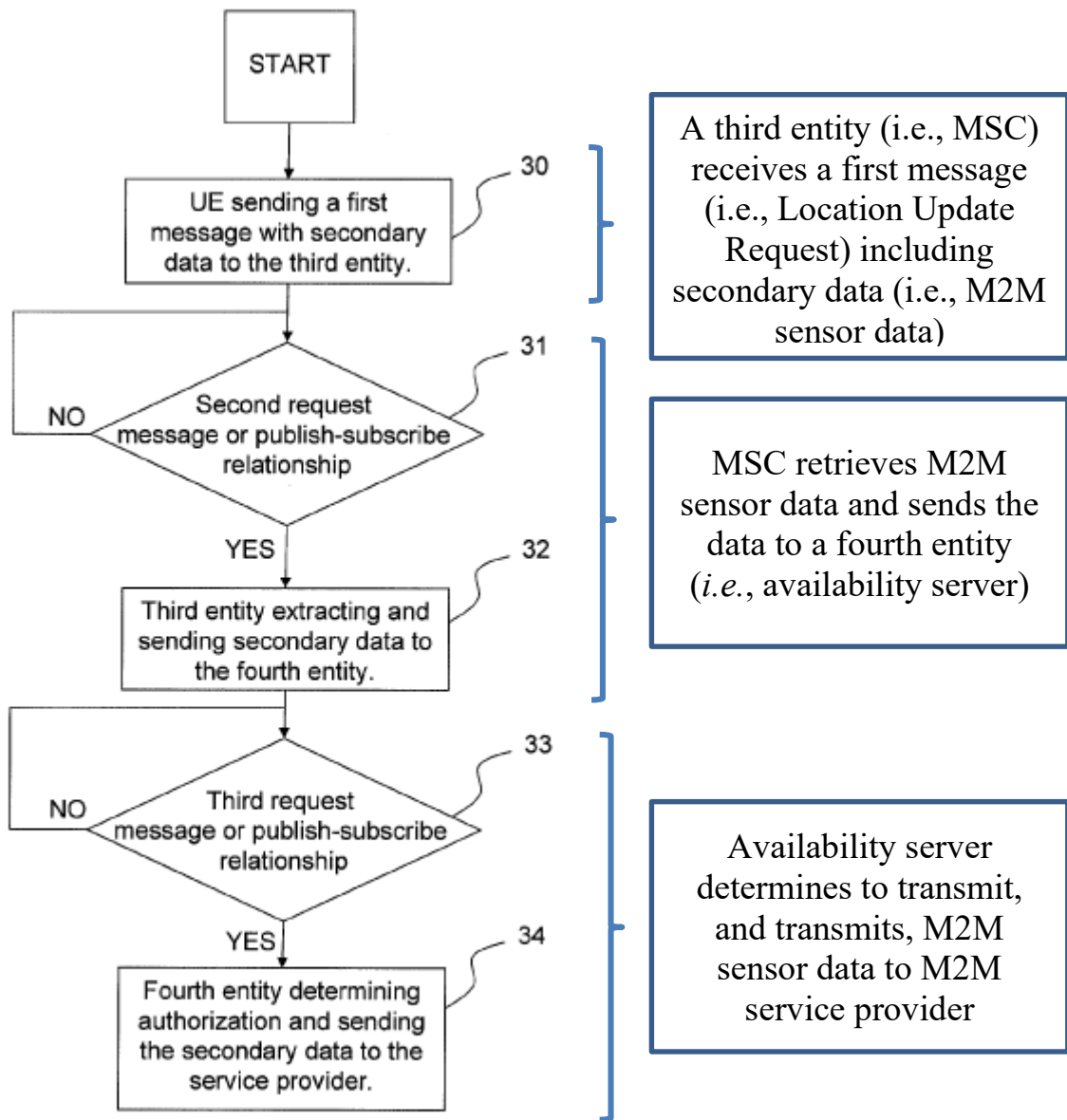


FIG 2

Krco's secondary data (i.e., M2M sensor data) comprises information about the "second entities" (i.e., M2M sensors) and "second networks" (i.e., networks of M2M sensors), for example: "the number of second networks or second entities included in the information element, identity of the second network or entity together

with the local validity, the type of second network or entity, location of the second network or entity relative to the UE position.” *Id.*, 5:45-53. This information is included in an information element (*e.g.*, called “ExtDeviceInfo”) that is separate from the signaling data found in the Location Update Request. *Id.*, 4:64-5:63. The signaling data may relate to a protocol discriminator, skip indicator, message type, location area identification, and P-TMSI, for example. *Id.*

Unlike that signaling data and the data identified in the prior art during prosecution (*e.g.*, the “IMSI, PTMSI, TLLI and RAI within the attach request message,” EX1002, 238), *Krco*’s M2M sensor data is not related to a location update or registration procedure. Instead, this data is application data of the M2M sensor from which it originated. Accordingly, *Krco*’s secondary data corresponds to the claimed “*non-signaling application data generated for a machine-to-machine function.*” *Id.*, 4:48-52.

B. *Benaouda* (EX1010)

Benaouda discloses a machine-to-machine (M2M) system for efficient transmission of M2M data via SMS (Short Message Service) text messages, which are messages that can be used for user data or signaling. EX1010, [0001], [0006]; *see also* EX1021, [0019] (“Further, it will be appreciated by those of ordinary skill in the art that SMS service can involve the exchange of signaling information between SMS entities in a wireless communication network (*e.g.*, person-to-person

messaging, person-to-machine messaging, and machine-to-machine messaging).”); *see also* EX1010, [0005] (“In a typical implementation, SMS communications to/from a mobile station use a signaling channel over the airlink and use out-of-band **signaling resources** of the mobile phone network for transport to/from a server platform referred to as a SMSC.” (emphasis added)). *Benaouda* uses SMS text messages to communicate M2M measurement data, such as utility meter readings, between M2M devices and their corresponding M2M applications. *Id.*, [0006], [0023], [0063].

Benaouda’s communication system involves an M2M device transmitting the SMS message to an access network. *Id.*, [0067]. TS 23.040 (EX1020) describes how SMS communications work in a GSM network. EX1020, 9. TS 23.040 explains that SMS messages follow different formats, which may be based on the device that sends the message. *Id.*, 14, 42-43. For example, an SMS message that is sent from a mobile station to the network takes the “SMS-SUBMIT” format. *Id.* A POSITA would have understood that when *Benaouda*’s system is implemented in a GSM network, *Benaouda*’s SMS messages would take an “SMS-SUBMIT” format, because these message are sent from an M2M device (*i.e.*, a mobile station), to the network. EX1003, ¶ 90; *see also* EX1020, 14, 42-43. TS 23.040 discloses the various elements included in an SMS-SUBMIT type message:

Abbr.	Reference	p1)	p2)	Description
TP-MTI	TP-Message-Type-Indicator	M	2b	Parameter describing the message type.
TP-RD	TP-Reject-Duplicates	M	b	Parameter indicating whether or not the SC shall accept an SMS-SUBMIT for an SM still held in the SC which has the same TP-MR and the same TP-DA as a previously submitted SM from the same OA
TP-VPF	TP-Validity-Period-Format	M	2b	Parameter indicating whether or not the TP-VP field is present.
TP-RP	TP-Reply-Path	M	b	Parameter indicating the request for Reply Path.
TP-UDHI	TP-User-Data-Header-Indicator	O	b	Parameter indicating that the TP-UD field contains a Header.
TP-SRR	TP-Status-Report-Request	O	b	Parameter indicating if the MS is requesting a status report.
TP-MR	TP-Message-Reference	M	l	Parameter identifying the SMS-SUBMIT.
TP-DA	TP-Destination-Address	M	2-12o	Address of the destination SME.
TP-PID	TP-Protocol-Identifier	M	o	Parameter identifying the above layer protocol, if any.
TP-DCS	TP-Data-Coding-Scheme	M	o	Parameter identifying the coding scheme within the TP-User-Data.
TP-VP	TP-Validity-Period	O	o/7o	Parameter identifying the time from where the message is no longer valid.
TP-UDL	TP-User-Data-Length	M	l	Parameter indicating the length of the TP-User-Data field to follow.
TP-UD	TP-User-Data	O	3)	

EX1020, 47; *see also* EX1010, [0046] (“An SMS message includes source and destination address fields.”).

As shown, an SMS-SUBMIT type SMS message includes a number of elements that a POSITA would considering “signaling data.” For example, the “TP-Message-Type-Indicator” element describes the SMS message type, the “TP-Destination-Address” element identifies the address of the destination SME (short message entity), and the TP-Reply-Path element indicates whether the transmitting mobile station (*e.g.*, the M2M device sending the SMS message) is requesting the network to commit to deliver a reply to the mobile station. EX1020, 47, 21 (describing “Reply Path”). A POSITA would have understood that at least each of

these elements affects the connection between the mobile station transmitting the SMS message and the short message entity receiving the SMS message, and would thus be considered “signaling data.” EX1003, ¶ 91.

C. TS 24.008 (EX1011)

TS 24.008 is a 3GPP technical specification that “specifies the procedures used at the radio interface core network protocols within the 3rd generation mobile telecommunications system and the digital cellular telecommunications system.” EX1011, 24. For example, TS 24.008 describes the procedures and signaling messages used for third-generation mobility management, which generally “support[s] the mobility of user terminals” and “provide[s] connection management services” to the network components. *Id.*, 35.

D. *Ananthanarayanan* (EX1012)

Like the '098 Patent, *Ananthanarayanan* describes bundling application data into a signaling message to increase communication efficiency in a wireless communications network. EX1012, [0007]-[0010]. *Ananthanarayanan* discloses a system and method for “bundling a connection request and a reservation for QoS resources into an access message at an access terminal; and transmitting the access message to an access network.” *Id.*, [0009]. “Additionally, application layer data (e.g. a DataoverSignaling (DOS) message) may also be bundled in the access

channel message to expedite communication with an end application (e.g., the group server, application resident another AT, etc.).” EX1012, [0032].

IX. CLAIM CONSTRUCTION

Without conceding that the claims satisfy 35 U.S.C. § 112, Petitioner respectfully submits that the Board need not expressly construe any term because the prior art invalidates the claims under any plausible construction, in accordance with 37 C.F.R. § 41.100(b). EX1003, ¶ 80.

X. ASSERTED GROUNDS OF INVALIDITY

A. Ground 1: *Krco* in view of *Benaouda*

PO has asserted only Claims 17 and 20 in the district court litigation. Ground 1 therefore analyzes Claims 17 and 20 first, followed by Claims 18-19 (which depend from Claim 17), 1-2, 9-16, and 21-25, in that order.

1. Motivation to Combine

A POSITA would have been motivated to combine *Krco* with *Benaouda* for several reasons.

Krco discloses a system for transmitting device data about M2M sensors to an M2M service provider. EX1009, 1:43-52, 3:60-4:2. This sensor data is used by an M2M service provider to know the presence and availability of the M2M sensors. *Id.*, 5:37-63, 4:48-52. *Krco* describes how a UE embeds this data “in the already existing signalling in a cellular network,” such as a Location Update Request

signaling message, when transmitting the device data to a cellular network for later transmission to the M2M service provider. *Id.*, 3:9-14. *Krco*'s technique for transmitting sensor data enhances efficiency "both in terms of network usage and development complexity for the individual service developer." *Id.*, 3:9-14, 4:24-40.

Similarly, *Benaouda* discloses a system for transmitting M2M measurement data collected by M2M devices via SMS messages, which utilize signaling resources of a mobile phone network. EX1010, [0005], [0013], [0030]. As discussed above in Section VIII.B, a POSITA would have understood *Benaouda*'s SMS message to be a "signalling message" because it contains signaling data. *See supra*, Section VIII.B.

A POSITA would have been motivated to combine *Krco*'s Location Update Request message technique with the embedded M2M measurement data taught by *Benaouda*. EX1003, ¶ 100. Such a combination would have involved a simple substitution of one known element for another to obtain predictable results. *See KSR Int'l*, 550 U.S. at 416; EX1003, ¶ 100. *Krco* discloses a UE that bundles M2M sensor data (e.g., sensor identity, type, or location), into an "ExtDeviceInfo" information element of a Location Update Request signaling message. EX1009, 2:11-24, 4:24-40, 5:37-63. A POSITA would have understood that the data sent in this manner was not restricted, and that any data, including the M2M measurement data discussed in *Benaouda*, could be included in the ExtDeviceInfo information element.

EX1003, ¶ 100. Indeed, the name of this information element—ExtDeviceInfo—indicates that it could be extended to include any sort of device information. *Id.* Such a modification would have involved simply substituting, or supplementing, *Krco*'s M2M sensor data with *Benaouda*'s M2M measurement data, which would predictably result in *Benaouda*'s M2M measurement data being embedded into a Location Update Request message and transmitted to an M2M service provider. EX1003, ¶ 100. Such a modification would have been obvious in light of the knowledge of a POSITA.

As an example of why it would be obvious to include *Benaouda*'s M2M measurement data in *Krco*'s Location Update Request signaling message, *Ananthanarayanan* discloses a system that suggests the proposed modification. *Ananthanarayanan* discloses a that a terminal bundles application-layer data (*e.g.*, in a DataoverSignaling (DOS) message) into an access channel message that is sent by the terminal to request traffic channel resources for a communication session. EX1012, [0032]. The access channel message is a “ConnectionRequest” message that includes other information for establishing a traffic channel, such as “route update information (RouteUpdate), provisioning for any QoS services used for the communication (ReservationOnRequest), etc.” *Id.*, [0032]-[0033]. Thus, a POSITA would have understood *Ananthanarayanan*'s access channel message to be a signaling message because it contains signaling data that facilitates traffic channel

establishment between the terminal and the access network. EX1003, ¶ 101. *Ananthanarayanan*'s disclosure of bundling application-layer data in the access channel signaling message therefore suggests to a POSITA why it would be obvious to include data like *Benaouda*'s M2M measurement data, which a POSITA would understand to be "application layer data," in *Krco*'s Location Update Request signaling message. *Id.*

A POSITA would have recognized that applying such a basic technique, bundling M2M measurement data into a signaling message from a UE, would have yielded predictable results and an improved system, such as a UE that can more efficiently transfer M2M measurement data by bundling this data in a Location Update Request message. *Id.*, ¶ 102.

Further, in light of *Krco*'s teachings, a POSITA would have been motivated to look to similar references like *Benaouda* for implementation details. EX1003, ¶ 103. *Krco* teaches a service provider that offers machine-to-machine services, such as health monitoring, burglar alarms, and automatic metering. EX1009, 4:10-16. A POSITA would have been motivated to look to similar references, such as *Benaouda*, for implementation details of the service provider. EX1003, ¶ 103. *Benaouda* discloses an "M2M application" that, like *Krco*'s service provider, "provides [] M2M capability and function" such as utility meter reading, alarm reporting, and medical telemetry. EX1010, [0025]. And *Benaouda* explains that its

M2M application “is an application hosted on a server or host computer.” *Id.* A POSITA would have been motivated to look to similar references, such as *Benaouda*, for the implementation details of a machine-to-machine service provider, and would have turned to *Benaouda*’s teachings that such a service provider could be implemented on a server or host computer. EX1003, ¶ 103.

Similarly, *Krco* discloses transmitting “secondary data” (*i.e.*, M2M device data) to an M2M service provider that offers M2M services like health monitoring, burglar alarms, and automatic metering. EX1009, 1:60-62, 4:10-26. *Benaouda* transmits M2M measurement data from an M2M device to an M2M application, which offers similar M2M services, via an SMS message. EX1010, [0013], [0025], [0056]. In addition to the M2M measurement data, *Benaouda*’s SMS message includes a short code that identifies the M2M application to which the M2M measurement data is to be sent. *Id.*, [0013]. A POSITA would have been motivated to look to similar references, such as *Benaouda*, for the implementation details of delivering M2M device data to the proper M2M service provider, and would have turned to *Benaouda*’s teachings about identifying a destination application via an address of the destination application. EX1003, ¶ 104.

2. Reasonable Expectation of Success

A POSITA would have had a reasonable expectation of success when combining *Krco* with *Benaouda*. EX1003, ¶ 105. *Krco* does not require the data

included in the “ExtDeviceInfo” information element to comprise any unique formatting or data type, nor does *Krco* foreclose the inclusion of other types of data in its Location Update Request/Routing Area Update message. *Id.* As discussed above with reference to Section X.A.1, *Ananthanarayanan* discloses a system wherein application-layer data is bundled into a signaling message and transmitted to an access network for further processing. A POSITA would thus have had a reasonable expectation of success in inserting M2M application-layer data, like *Benaouda*’s M2M measurement data, into *Krco*’s Location Update Request message, as the Location Update Request message was itself a well-known signaling message. EX1003, ¶ 106. Similarly, a POSITA would reasonably expect success in modifying *Krco* to transmit M2M data as disclosed in *Benaouda*, because *Benaouda* discloses transmitting M2M data in an SMS message, which was well-known to be a signaling message. *Id.*; *see also supra*, Section VIII.B. This modification would involve a simple substitution of elements that would not have involved undue experimentation and instead would have required only basic network design ability. *See supra*, Section X.A.1; EX1003, ¶ 106.

Further, a POSITA would have reasonably expected success in implementing *Krco*’s service provider such that it is or includes a server, as taught by *Benaouda*. EX1003, ¶ 107. *Krco* teaches a service provider that offers machine-to-machine services (*e.g.*, health monitoring, burglar alarms, and automatic metering) (EX1009,

4:10-16); *Benaouda* teaches an M2M application that “provides [] M2M capability and function” (e.g., as utility meter reading, alarm reporting, and medical telemetry) (EX1010, [0025]). A POSITA would have understood *Krco*’s service provider to be equivalent to *Benaouda*’s M2M application given their similar functionalities. EX1003, ¶ 107. Thus, because *Benaouda* explains that its M2M application “is an application hosted on a server or host computer” (EX1010, [0025]), a POSITA would have reasonably expected success when implementing *Krco*’s service provider as, or including, a server. EX1003, ¶ 107.

A POSITA also would have reasonably expected success in implementing *Krco*’s Location Update Request message such that it includes the address of a service provider to which M2M device data is to be sent, as taught by *Benaouda*. EX1003, ¶ 108. *Krco* teaches transmitting M2M device data to an M2M service provider. EX1009, 7:54-62. *Benaouda* transmits M2M measurement data via an SMS message, which also includes a short code that identifies the M2M application to which the M2M measurement data is to be sent. EX1010, [0013]. As described above, a POSITA would have understood *Krco*’s Location Update Request message and *Benaouda*’s SMS message to both be signaling messages. *See supra*, Section X.A.1; *see also* EX1003, ¶¶ 83, 89-91. Further, a POSITA would have understood that *Krco*’s “ExtDeviceInfo” information element could be extended to include additional information, such as the address of a service provider to which M2M

device data is to be sent. EX1003, ¶ 108. Thus, a POSITA would have reasonably expected success in adding information identifying the address of a destination service provider to *Krco*'s Location Update Request message, as *Benaouda* teaches that this data is already found in a similar signaling message. *Id.*

3. Claim 17

i. [17p] A node in a telecommunications network, said telecommunications network being configured for transferring data from a communication apparatus to a machine-to-machine server, said node being comprising:

If the preamble is limiting, *Krco* discloses the preamble.

Krco discloses a “telecommunications network configured for transferring data from a communication apparatus to a machine-to-machine server” through at least its disclosure of a “cellular network 20.” *Krco* illustrates an embodiment of a “cellular network 20” in Figure 1, reproduced below:

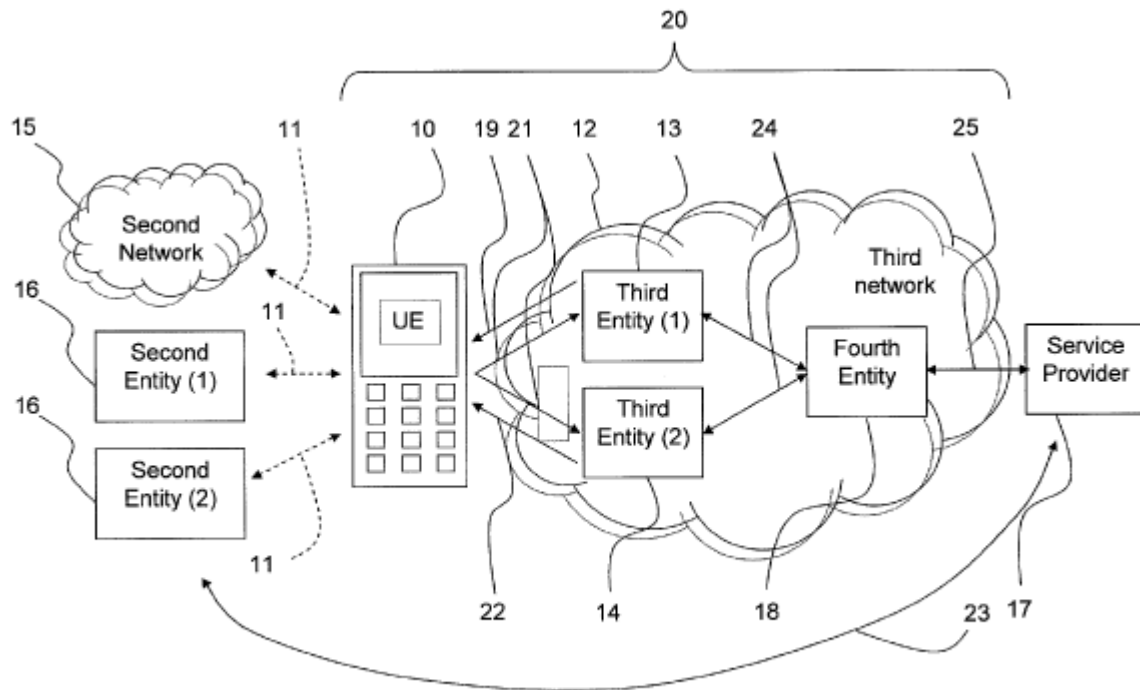


FIG 1

EX1009, Fig. 1; *see also id.*, 4:17-23.

Krco discloses that its cellular network facilitates communication between UE 10 and service provider 17 via “third network 12,” which “could be a core network of some kind, such as a Wireless Code Division Multiple Access (WCDMA) network.” *Id.*, 3:60-4:9. Third network 12 includes “third entity 13, 14,” which may be a Mobile Switching Center (MSC) or a Serving Generic Packet Radio Services (GPRS) Support Node (SGSN), which are well-known network nodes implemented in telecommunications networks and therefore disclose “[a] node in a telecommunications network.” *Id.*, 4:53-60; *see also* EX1003, ¶ 118.

Krco's UE 10 discloses "*a communication apparatus.*" *Krco*'s "UE" is an umbrella term for any "device whose intention is to forward information between the second network 15 or entity 16 and the service provider 17." *Id.*, 3:60-64 ("Such a device is for instance an M2M device for AMR [automatic meter reading] or a security application such as a burglar alarm."). The UE "communicates wirelessly" with the core network to forward information between sensor devices connected to the UE and a machine-to-machine (M2M) service provider. *Id.*, 3:52-4:16. Thus, *Krco*'s UE discloses "*a communication apparatus*" at least because it is capable of wireless communication.

Further, *Krco* explains that its UE may be connected with a sensor (or network of sensors) "through a wireless or wired connection," which a POSITA would have understood to mean that the UE and the sensor(s) could be considered to be a single, integrated device. EX1009, 3:57-59, EX1003, ¶ 116 (citing, as evidence of the knowledge of a POSITA, EX1017, [0023] (describing a "remote station" with integrated sensors, such as a "temperature sensor, a water sensor, a smoke detector, a carbon-monoxide detector, and/or any other suitable sensor or combination of sensors.")); *see also In reLarson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965) (holding "that the use of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice."). This is consistent with the '098 Patent's description of a "communication

module” (which a POSITA would understand to be the same as a “*communications apparatus*”), which “comprises or is communicatively connected to a sensor 10.” EX1001, 4:34-35; EX1003, ¶ 116.

Krco discloses “*a telecommunications network configured for transferring data from a communication apparatus to a machine-to-machine server,*” at least through its disclosure of a cellular network (*i.e.*, “*a telecommunications network*”) that facilitates the transfer of “secondary data” from a UE (*i.e.*, “*a communications apparatus*”) to a service provider (*i.e.*, “*a machine-to-machine server,*” as explained below). For example, *Krco* discloses “a method for distribution of information in a primary cellular network” wherein a UE transmits “secondary data” about a “second network or entity” to a “third entity” in the cellular network. *See id.*, 2:60-3:4; *see also supra*, Section VIII.A (describing *Krco*’s specific embodiments wherein the “secondary data” is M2M sensor data, the “second network or entity” is an M2M sensor or network of M2M sensors, and the “third entity” is an MSC). The third entity (*i.e.*, MSC) then forwards the secondary data (*i.e.*, M2M device data) to a “fourth entity” in the core network, which acts as an “availability server” that “enable[s] the service provider as an external entity to reach the secondary data.” EX1009, 6:57-67, 7:54-62. Thus, *Krco*’s cellular network is “*configured for transferring data from a communication apparatus to a machine-to-machine server.*”

Krco's "service provider 17" is or includes "a machine-to-machine server."

The service provider offers several types of M2M services, such as health monitoring, burglar alarms, and automatic meter reading. *Id.*, 4:10-14. *Krco* describes that this M2M functionality is facilitated by the data collected by a sensor or network of sensors and sent to the service provider. *Id.*, 1:43-52, 3:60-62. A POSITA would have understood that such an entity would be implemented via a server that receives and processes the M2M data in fulfillment of its services. EX1003, ¶ 120.

If Patent Owner contends that *Krco's* "service provider" is not, or does not render obvious, a "*machine-to-machine server*," then a POSITA would have found it obvious that an entity providing such machine-to-machine services would be implemented as a server in light of *Benaouda*. EX1003, ¶ 121. *Benaouda* discloses an "M2M application" that is "implemented on a server or host computer, which provides the M2M capabilities and function of an M2M customer, *e.g.* meter reading for a utility customer." EX1010, [0025]. A POSITA would have understood *Benaouda's* M2M application to be equivalent to *Krco's* M2M service provider, as both entities provide similar M2M services. EX1003, ¶ 121. And because *Benaouda's* M2M application is "implemented on a server or host computer," a POSITA would have found it obvious that *Krco's* M2M service provider is also

implemented on a server and thereby discloses a “*machine-to-machine server*.”
EX1010, [0025]; EX1003, ¶ 121.

ii. [17a] one or more processors for carrying out operations including:

Krco discloses this claim element. *Krco* discloses a cellular network that includes an MSC (*see* Limitation [17p]), and it was well-known to a POSITA that an MSC would have required a processor that would have allowed the MSC to carry out its operations. EX1003, ¶ 123 (citing, as evidence of the knowledge of a POSITA, EX1015, 12:21-32 (“The MSC 116 may also receive communications from one or more other network elements 702 and/or service providers 160, via input 716 and/or other inputs. *A processor 714 and logic 712* may operate cooperatively.”), Fig.7 (illustrating an MSC with a processor and logic)).

iii. [17b] receiving a wireless signalling message from said communication apparatus,

Krco discloses this claim element. As discussed above with reference to Claim Element [17p], *Krco* discloses a method for transferring “secondary data” (*i.e.*, M2M sensor data) from a UE (*i.e.*, “*a communications apparatus*”) to an M2M service provider (*i.e.*, “*a machine-to-machine server*”) through a cellular network (*i.e.*, “*a telecommunications network*”). EX1009, 2:60-3:4. *Krco* discloses that this data transfer first involves transferring the M2M sensor data from the UE to a mobile switching center (MSC) or a serving GPRS support node (SGSN) via a Location

Update Request (when operating in a circuit-switched network) or Routing Area Update message (when operating in a packet-switched network). EX1009, 4:24-47. *Krco* discloses that the Location Update Request and Routing Area Update Request messages “comprise[] a number of Information Elements (IE),” which carry particular pieces of data, such as those related to a protocol discriminator and update request message identity. *Id.*, 4:64-5:34.

A POSITA would have understood *Krco*’s Location Update Request (or Routing Area Update) message to disclose “*a wireless signalling message.*” EX1003, ¶ 125. A POSITA would have recognized the Location Update Request (and Routing Area Update) message as a well-known signaling message involved in mobility management functionality. EX1003, ¶ 125; *see also* EX1008, 148 (listing the “Location updating request” message as an example of a Layer 3 Mobility Management *signaling message*). And *Krco* discloses that the UE wirelessly communicates with a third network comprising “third entities” (*e.g.*, MSCs or SGSNs), so a POSITA would have understood a Location Update Request messages to be a “*wireless signaling message.*” EX1009, 3:53-54, 4:53-55; EX1003, ¶¶ 125-126. Indeed, the ’098 Patent acknowledges that a location updating request is an example of “a network attach request message,” which the ’098 Patent characterizes as a “signalling message.” *See* EX1001, 5:30-32 (“The signalling message S can be a network attach request message in order to provide rapid transfer of the user

data.”), 5:57-6:1 (identifying a “location updating request” as an example of a network attach request).

Thus, *Krco*’s disclosure of receiving the Location Update Request (or Routing Area Update Request) message at the MSC (or SGSN) teaches Claim Element [17b].

iv. [17c] said received wireless signalling message having inserted in it non-signalling application data generated for a machine-to-machine function by the communication apparatus,

Krco discloses this claim element. As discussed above with reference to Claim Element [17p], *Krco* discloses a method for transferring “secondary data” (i.e., M2M sensor data) from a UE via a Location Update Request (or Routing Area Update) message (i.e., a “wireless signalling message”). *See also* EX1009, 2:60-3:4. *Krco* discloses that the “secondary data comprises information about the properties of the second network or entity,” which may be an M2M sensor or network of M2M sensors. *Id.*, 1:43-52, 4:3-9, 4:46-47. This data is “embedded” (i.e., “inserted”) into the Location Update Request message by the UE. Specifically, the UE embeds the data within an information element of the Location Update Request whose data comprises, for example, “the number of second networks or second entities included in the information element, identity of the second network or entity together with the local validity, the type of second network or entity, location of the second network or entity relative to the UE position.” *Id.*, 5:37-53.

The secondary data is provided to the UE from the sensor or network of sensors to which the UE is connected. *Id.*, 3:57-59. A POSITA would have found it obvious that *Krco*'s sensors would comprise a program module that processes and facilitates the sensors' data collection and communication to the UE. EX1003, ¶ 127.

A POSITA would have understood *Krco*'s "secondary data" (*i.e.*, M2M sensor data) to be "*non-signalling application data generated for a machine-to-machine function by the communication module.*" *Id.*, ¶ 128. *Krco* describes that the secondary data (*i.e.*, M2M sensor data) generally "relates to availability information" that "indicates" if the UE and its connected M2M sensor(s) are "present" for use. EX1009, 4:48-52. As such, a POSITA would have understood that the secondary data (*i.e.*, M2M sensor data), which indicates the identities, types, and locations of the M2M sensors connected to the UE, is "*application data*" at least because it identifies the M2M sensors' device type, which indicates the application in which the M2M sensor is implemented. EX1003, ¶ 128. Further, a POSITA would have understood that the secondary data (*i.e.*, M2M sensor data) is "*generated for a machine-to-machine function*" because this data is intended to support the monitoring of the M2M sensors. *Id.*

Further, a POSITA would have understood that *Krco*'s secondary data (*i.e.*, M2M sensor data) is "*non-signalling*" data because it is data about the M2M sensors, not signals. *Id.*, ¶ 129. As discussed above in Section VII.B, the '098 Patent was

allowed based on applicant's amendment and accompanying remarks narrowing the claimed "application data" to be "*non-signalling* application data." *See supra*, Section VII.B; *see also* EX1002, 7, 64. And the efficiencies that accompany this technique for inserting "non-signalling application data" in a "signalling message" met the objective of the '098 Patent, *i.e.*, "allow[ing] for efficient and fast communications of limited amounts of data in a machine-to-machine environment." EX1001, 1:53-56. *Krco*, too, touts the that "efficiency will be enhanced both in terms of network usage and development complexity" by embedding the secondary data (*i.e.*, M2M sensor data) "in the already-existing signalling in a cellular network." EX1009, 3:9-14. Thus, the limitation that apparently led to allowance already existed in *Krco*, and *Krco* had already identified in its own system the purported benefits of the '098 Patent.

As discussed above with reference to Claim Element [17p], a POSITA would have understood that the UE and the sensors to which the UE is connected could be implemented as a single device. EX1003, ¶ 130. Thus, because the sensors (*i.e.*, the "second entities") generate and provide the secondary data, a POSITA would have understood that the combined UE-sensor device (*i.e.*, the "*communication module*") would have generated the secondary data. *Id.* This is consistent with the '098 Patent's description of a "*communication apparatus*," which "comprises or is

communicatively connected to a sensor 10” that generates M2M data. EX1001, 4:34-49.

Krco also describes that the “[t]he secondary data is in the present invention embedded into the existing first messages” (*i.e.*, the Location Update Request or Routing Area Update message). EX1009, 5:37-38. Because *Krco* discloses that it is the UE (*i.e.*, the communication module) that transmits the Location Update Request message, a POSITA would have understood that it is the UE that embeds (*i.e.*, “*insert[s]*”) the secondary data into the Location Update Request message.

Thus, *Krco* discloses this claim element.

If Patent Owner contends that the “secondary data” in *Krco* is not “*non-signalling application data generated for a machine-to-machine function,*” it would have nevertheless been obvious to a POSITA to include such data in *Krco*’s Location Updating Request message in light of *Benaouda* and *Ananthanarayanan*. EX1003, ¶ 133. *Benaouda* discloses a method for transferring data from an M2M device to a server hosting an M2M application through a mobile network. *See, e.g.*, EX1010, [0013]. *Benaouda* discloses that this data is generated by the M2M device in accordance with its M2M functionality. For example, *Benaouda* discloses that its M2M system can be implemented as a meter reading service “which provides the M2M capability and function of an M2M customer”:

*In a utility meter reading example, **the M2M device 11 would be the actual meter reader.** There would be similar M2M devices 11 at many premises of customers of the utility company, **and the application 13 would enable the utility company to obtain and process meter reading data from the many devices 11, e.g. for purposes of billing the customers for their respective utility usage.** **The M2M devices 11 and the M2M application 13 communicate data via an Internet Protocol (IP) data network, such as the exemplary Internet 15, and a public mobile/wireless communication network shown as a public cellular telephone network 17 in the example.***

EX1010, [0025]-[0026] (emphasis added).

As disclosed, *Benaouda*'s M2M devices can operate as utility readers, for example, and, in accordance with that M2M function, generate and transmit meter reading data. *Id.* Under a system implementing *Krco*'s method for data transmission via a Location Update Request message, a POSITA would have understood that the M2M data as disclosed in *Benaouda* could be inserted into *Krco*'s Location Update Request (or Routing Area Update) message such that the Location Update Request (or Routing Area Update) message would transmit this data to the M2M service provider instead of (or along with) the secondary data (i.e., M2M sensor data) described in *Krco*. EX1003, ¶ 134.

As discussed above in Section X.A.1, a POSITA would have been motivated to combine *Krco* with *Benaouda* in the manner proposed. In particular, a POSITA seeking to implement *Krco*'s method for transmitting device data via a Location

Update Request message would have found it obvious to transmit M2M measurement data via the Location Update Request message, at least because a POSITA would have been aware of similar teachings, such as those disclosed by *Ananthanarayanan*, wherein application-layer data is bundled in an access channel signaling message (*i.e.*, a “*signalling message*”). *See supra*, Section X.A.1; EX1003, ¶ 135. Accordingly, implementing *Krco*’s method of transmitting device data to transmit M2M measurement data as disclosed in *Benaouda* would have involved a simple substitution of one element (*i.e.*, *Krco*’s M2M device data) for another (*i.e.*, *Benaouda*’s M2M measurement data), in order to achieve a predictable result. *See supra*, Section X.A.1; EX1003, ¶ 135.

v. [17d] wherein wireless signalling messages of the telecommunications network are of a message type specified for carrying signalling data for managing connections in the telecommunications network;

Krco’s Location Update Request/Routing Area Update messages (*i.e.*, “*wireless signalling messages of the telecommunications network*”) are “*of a message type specified for carrying signalling data for managing connections in the telecommunications network.*” *Krco* discloses that the Location Update Request and Routing Area Update messages are involved in the “location update procedure (circuit switched domain) or the routing area update procedure (packet switched domain),” respectively, during which the “UE is registered in the third network.”

EX1009, 4:24-40. A POSITA would have understood “registration” to be a well-known procedure in which the UE connects with the access network to facilitate future communication. EX1003, ¶ 138. As evidence of this understanding, EX1008 discloses that mobility management functions, such as “location registration” and “location updating,” and the data exchanged during these procedures, “are the foundation for creating the functions needed for routing and switching of user connections and for the associated services.” EX1008, 183.

Further, as discussed above with reference to Claim Element [17b] and Section VIII.A, the Location Update Request and Routing Area Update messages include a number of information elements that relate to, for example, protocol discriminator and update request message identity information (EX1009, 4:64-5:34; *see also supra*, Sections VIII.A, X.A.3.iii), which a POSITA would have understood to be signaling data for managing a UE’s registration. EX1003, ¶ 139. Thus, the *Krco-Benaouda* combination’s Location Update Request/Routing Area Update messages “*are of a message type specified for carrying signalling data for managing connections in the telecommunications network.*”.

vi. [17e] retrieving said non-signalling application data from the received wireless signalling message; and

Krco discloses this claim element. As discussed above, *Krco* discloses that when a UE transmits a Location Update Request message containing “secondary

data,” it first transfers the message to an MSC, which then “extract[s] the secondary data from the” Location Update Request message and sends this data to another entity. *See* EX1009, 4:53-63, 6:45-67. A POSITA would have understood that by “extracting” the secondary data (*i.e.*, the “*non-signalling application data*”) from the Location Update request message (*i.e.*, the “*wireless signalling message*”), Krco discloses “*retrieving said non-signalling application data from the received wireless signalling message.*” EX1003, ¶ 142.

If Patent Owner contends that the “secondary data” (*i.e.*, M2M sensor data) in *Krco* is not “*non-signalling application data generated for a machine-to-machine function*,” a POSITA would have found it obvious to modify *Krco* to include M2M measurement data as taught by *Benaouda* in the Location Update Request message. *See supra*, Section X.A.3.iv; EX1003, ¶ 143. In such a case, a POSITA would have found it obvious to extract the M2M measurement data from the modified Location Update Request message configured according to the *Krco-Benaouda* combination. *Id.* A POSITA would have found it obvious to perform this extraction to further transmit the data to a service provider that is authorized to access the data as taught by *Krco*. *Id.* Thus, the *Krco-Benaouda* combination also renders obvious this claim element.

vii. [17f] terminating further transmission of the received wireless signalling message and transferring said retrieved non-signalling application data to said machine-to-machine server.

Krco discloses, or at least renders obvious, this claim element. *Krco* discloses that a UE first transmits “secondary data” via a “first message” (*e.g.*, a Location Update Request message) to an MSC, which then “extract[s] the secondary data from the first message, and send[s] the secondary data to the fourth entity” (*e.g.*, an “availability server”). EX1009, 6:45-50. The MSC does not forward the original Location Update Message itself, however, along with the extracted secondary data, which a POSITA would have understood to mean that that Location Update Request message (*i.e.*, the “signalling message”) was terminated in the MSC. EX1003, ¶ 146. It would have been obvious to a POSITA, based on his/her common sense and ordinary ingenuity, to terminate further transmission of the Location Update Request message (*i.e.*, the “*received wireless signalling message*”) after the secondary data is extracted. EX1003, ¶ 147. The ’098 Patent acknowledges this understanding, explaining that “the signalling messages terminate at [] nodes” such as the MSC and SGSN. EX1001, 2:21-25.

Krco also discloses that once the secondary data (*i.e.*, M2M sensor data) is extracted from the Location Update Request message by the MSC, the secondary data is transferred to the service provider (*i.e.*, the “*machine-to-machine server*”).

Krco discloses that upon the extracting the secondary data, the MSC “send[s] the secondary data to the fourth entity,” which is another entity in the core network that acts as an “availability server.” EX1009, 6:45-50, 6:57-64. This availability server “control[s] the distribution of the secondary data,” and “send[s] the secondary data to the service provider 17 if the service provider has the authorization” to receive the secondary data (i.e., the M2M sensor data). *Id.*, 6:57-64, 7:54-62. *Krco* therefore discloses this claim element.

If Patent Owner contends that the “secondary data” in *Krco* is not “*non-signalling application data generated for a machine-to-machine function*,” a POSITA would have found it obvious to modify *Krco* to include M2M measurement data as taught by *Benaouda* in the Location Update Request message. *See supra*, Section X.A.3.iv; EX1003, ¶ 149. In such a case, a POSITA would have found it obvious to extract the M2M measurement data from the modified Location Update Request message configured according to the *Krco-Benaouda* combination, and terminate further transmission of the Location Update Request message. EX1003, ¶ 149 And A POSITA would have found it obvious to transfer this extracted data to a service provider that is authorized to access the data as taught by *Krco*. *Id.* Thus, the *Krco-Benaouda* combination also renders obvious this claim element.

4. Claim 20

i. [20a] The node of claim 17, wherein the telecommunications network is configured for transferring non-signalling application data from the communication apparatus to the machine-to-machine server in a machine-to-machine communications setting; and

The *Krco-Benaouda* combination discloses this claim element. As discussed above with reference to Claim Element [17p], *Krco* and the *Krco-Benaouda* combination disclose a telecommunications system wherein a UE transmits M2M data (*i.e.*, *Krco*'s M2M sensor data or *Benaouda*'s M2M measurement data) to an M2M service provider. A POSITA would have understood this process for transferring M2M data to occur in a “*machine-to-machine communications setting*” given the involvement of the M2M-related entities. EX1003, ¶ 151. Thus, for at least the same reasons discussed above in Section X.A.3.i, the *Krco-Benaouda* combination discloses this claim element.

ii. [20b] wherein transferring said non-signalling application data to said machine-to-machine server comprises transferring said non-signalling application data to said machine-to-machine server, while avoiding to establish a complete circuit-switched or packet-switched connection between said communication apparatus and said telecommunications network

The *Krco-Benaouda* combination renders obvious this claim element. *Krco* discloses that “[a]s part of the registration procedure of the UE in the third network

12, the location update procedure (circuit switched domain) or the routing area update procedure (packet switched domain) is triggered and the UE is registered in the third network.” EX1009, 4:24-40. A POSITA would have understood that such registration does not result in a “*complete circuit-switched connection or packet-switched connection*” between the UE and the telecommunications network. EX1003, ¶ 152. Establishing a complete circuit-switched or packet-switched connection requires a separate procedure for establishing a communication session. See EX1003, ¶¶ 61, 152.

For example, in a GPRS system, once a mobile station has attached to a network (*i.e.*, the mobile station is registered with the network), the mobile station cannot send or receive data (*i.e.*, complete a packet-switched connection between the mobile station and the network) until a particular communication session, called a packet data protocol (PDP) context, has been established. EX1016, 135 (“Once the mobile device has registered with the mobile network, **it cannot start to send and receive data over the packet core until it has established a session**, which is known as having a packet data protocol context (PDP context).”), 131 (“A PDP context is required to transfer data over the GPRS network; however **data transmission and reception are not possible until the mobile device moves to the ready state**. The mobile device can be paged in the standby state and asked to move to the ready state. This state is very similar to the GSM idle state.”). Figure 6.138

of EX1016, copied and annotated below, shows an example of the “Packet connection establishment” procedure whereby a PDP context is established.

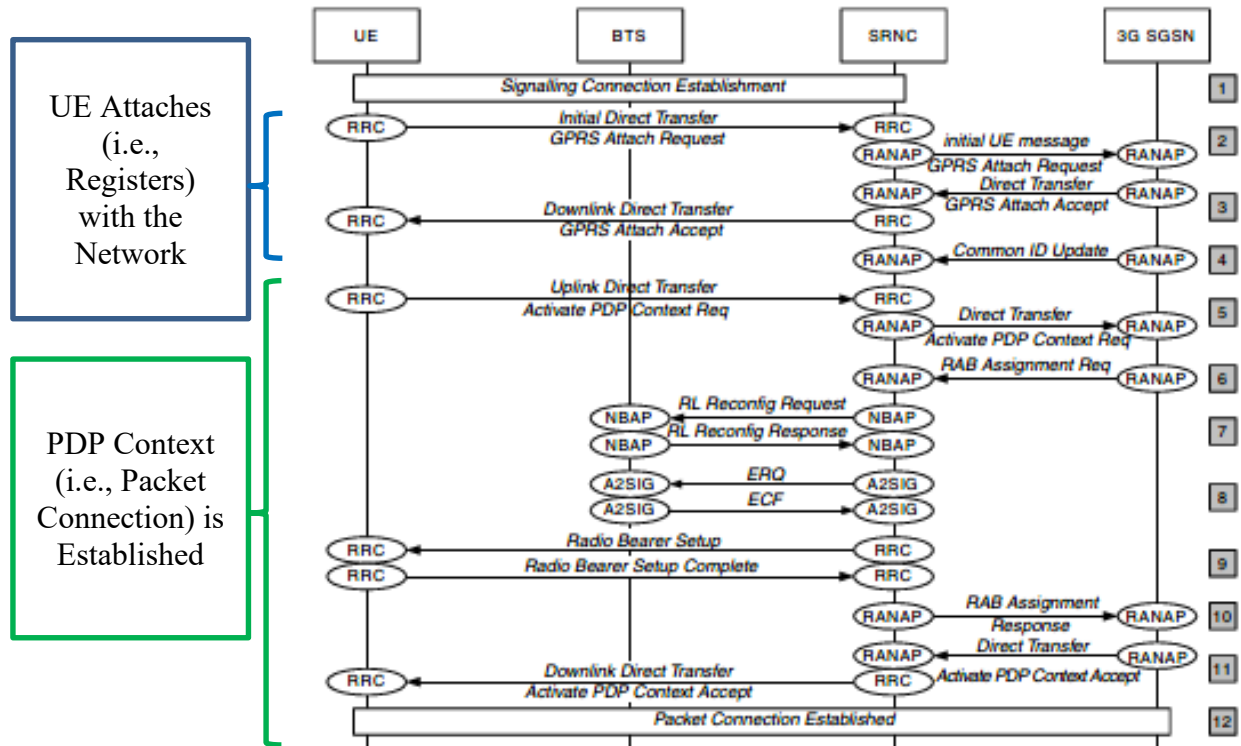


Figure 6.138 Packet connection establishment

EX1016, 413 (Fig. 6.138).

As shown in the Figure 6.138 above, the PDP context establishment procedure occurs *after* the UE is attached (i.e., registered) with the network and occurs only if additional signaling is used to trigger this additional process. *See also* EX1016, 413 (“To transfer data, the UE must establish a PDP context. This is done through the *activate PDP context request*.” (emphasis original)); *see also* EX1003, ¶¶ 61, 153. If the UE does not send an “Activate PDP Context Req” message, there will never be a complete packet-switched connection to the network. EX1003, ¶ 153.

Thus, because the *Krco-Benaouda* combination uses a Location Update Request (or Routing Area Update) message (*i.e.*, an attach/registration request message), and not a session establishment request message (e.g., an “activate PDP context req” message), to transfer the M2M data (*e.g.*, *Krco*’s M2M sensor data or *Benaouda*’s M2M measurement data) (*i.e.*, the “*non-signalling application data*”) to an M2M service provider (*i.e.*, a “*machine-to-machine server*”), the *Krco-Benaouda* combination transmits this data “*while avoiding to establish a complete circuit-switched or packet-switched connection between said communication module and said telecommunications network.*” Indeed, neither *Krco* nor *Benaouda* disclose any procedures for establishing a complete circuit-switched or packet-switched connection. The *Krco-Benaouda* combination therefore renders obvious this claim element.

5. Claim 18. A node according to claim 17, wherein the node is a serving GPRS support node.

Krco discloses Claim 18. As discussed above with reference to Claim 17, *Krco* discloses an MSC that receives a Location Update Request message containing secondary data and forwards the secondary data to other network devices. *See supra*, Sections X.A.3.i, VIII.A; *see also* EX1009, 4:24-63, 6:45-67. *Krco* describes that a Serving GPRS Support Node (SGSN) can also perform this function of receiving a Routing Update Request message that contains secondary data and forwarding the

secondary data to additional network nodes. EX1009, 4:24-40, 4:53-53. *Krco* explains that the SGSN is used in a “packet switched network,” while the MSC is used in a “circuit switched network.” *Id.* A POSITA would have understood that the SGSN was a well-known network component that performs the functions of the MSC in a packet switched network. EX1003, ¶ 155; EX1016, 81-82. An SGSN thus discloses the claimed node, and *Krco* discloses that the same process of transmitting secondary data through an MSC is equally applicable to transmit secondary data through an SGSN. EX1009, 4:53-63. This is consistent with the ’098 Patent itself, which describes the SGSN as an alternative to the MSC. EX1001, 2:17-25.

6. Claim 19. A node according to claim 17, wherein the node is a signalling monitor.

Krco discloses Claim 19. A POSITA would have understood that the MSC and SGSN described in *Krco* are signaling monitors. EX1003, ¶ 156. As discussed above with reference to Limitations [17p] and [17b], the MSC is a well-known network component that receives signaling messages in a telecommunications system. *See supra*, Sections X.A.3.i, X.A.3.iii. A POSITA would have understood that as part of this role, the MSC would have monitored for the signaling messages that it receives and would thus be considered a “*signalling monitor*.” EX1003, ¶ 156. And because a POSITA would have understood *Krco*’s SGSN to have the

same functionality as the MSC, the POSITA would have considered the SGSN a “*signalling monitor*” as well. EX1003, ¶¶ 155-156.

7. Claim 1

i. [1p] A method of transferring data from a communication module to a machine-to-machine server over a telecommunications network, the method comprising:

If the preamble is limiting, the *Krco-Benaouda* combination discloses the preamble. Claim Element [1p]’s recitation of a “*communication module*” corresponds to Claim Element [17p]’s recitation of a “*communication apparatus*” and thus is disclosed for the same reasons explained in Claim Element [17p]. And *Krco* discloses Claim Element [1p] for at least the same reasons *Krco* discloses a “*telecommunications network configured for transferring data from a communication apparatus to a machine-to-machine server*” discussed above with reference to Claim Element [17p].

ii. [1a] receiving a wireless signalling message from said communication module at a signalling termination node of the telecommunications network,

Krco discloses, or at least renders obvious, this claim element. As discussed above with reference to Claim Element [17p], *Krco* discloses a method for transferring “secondary data” (i.e., M2M sensor data) from a UE (i.e., “*a communications module*”) in a Location Update Request message (i.e., a “*wireless signalling message*”) through an MSC or SGSN. EX1009, 2:60-3:4, 4:53-60. And

as discussed above with reference to Claim Element [17f], *Krco* discloses, or at least renders obvious, that the MSC or SGSN “*terminat[es] further transmission of the received wireless signalling message.*” For at least the same reasons discussed above with reference to Claim Element [17f], a POSITA would have understood *Krco*’s MSC and SGSN to disclose a “*signalling termination node of the telecommunications network.*” EX1003, ¶ 158.

iii. [1b]

See Claim Element [17c].

iv. [1c]

See Claim Element [17d].

v. [1d]

See Claim Element [17e].

vi. [1e]

See Claim Element [17f].

8. Claim 2. The method according to claim 1, wherein the wireless signalling message is a network attach request message.

Krco discloses Claim 2. As discussed above with reference to Claims 1 and 17, *Krco* uses a Location Update Request message (*i.e.*, a “*wireless signalling message*”) to transmit secondary data from a UE to a cellular network for further processing. *Krco* explains that location update is part of the “registration procedure”

in which “the UE is registered in the third network.” EX1009, 4:24-40. A POSITA would have understood *Krco*’s “Location Update Request” message to be a well-known signaling message that can trigger the registration procedure. EX1003, ¶ 163. Further, a POSITA would have understood that by completing the registration procedure, a UE (*e.g.*, an M2M device) would become “attached” to the network because the network would have the UE’s information and location necessary to fulfil future communications. *Id.* Thus, a POSITA would have recognized *Krco*’s Location Update Request message as disclosing a “*network attach request message.*” *Id.*

Indeed, the ’098 Patent acknowledges that a “location updating request” message, which a POSITA would have understood to be the same as *Krco*’s “Location Update Request” message (EX1003, ¶ 154), is an example of “a network attach request message,” which the ’098 Patent characterizes as a “signalling message.” *See* EX1001, 5:30-32 (“The signalling message S can be a network attach request message in order to provide rapid transfer of the user data.”), 5:57-6:1 (identifying a “location updating request” as an example of a network attach request).

9. Claim 9. The method according to claim 1, wherein said received wireless signalling message contains address information indicative of said machine-to-machine server.

The *Krco-Benaouda* combination renders obvious Claim 9. As discussed above with reference to Claims 1 and 17, *Krco* discloses transmitting a Location Update Request Message (*i.e.*, a “signalling message”) from a UE to an M2M service provider (*i.e.*, a “machine-to-machine server”). In doing so, the UE transmits the Location Update Request message to a core network, which holds the secondary data included in the Location Update Request message in a “fourth entity,” such as an “availability server.” EX1009, 6:51-67. The availability server determines whether a service provider is authorized to access the secondary data before sending the secondary data to the service provider. *Id.*, 7:54-62. A POSITA would have found it obvious in light of *Benaouda* for the UE to include in the “ExtDeviceInfo” information element of *Krco*’s Location Update Request message address information indicative of an M2M service provider, so the availability server could send the secondary data to the proper M2M service provider. EX1003, ¶¶ 166-167.

Benaouda discloses transmitting M2M data to a server hosting an M2M application. EX1010, [0013]. *Benaouda* further discloses that the M2M data is included in a message that also includes “a short code associated with a machine-to-machine application as a destination address.” *Id.* The M2M data is transmitted to the “server hosting the machine-to-machine application associated with the short

code.” *Id.*; *see also id.*, [0039] (“Each server hosting a M2M application 13 is assigned a short code. Hence, the MC 29 routes outgoing messages using a short code for the destination address of the M2M application.”). As discussed above with reference to Claim Element [17p], a POSITA would have understood *Krco*’s service provider to be equivalent to *Benaouda*’s M2M application, which is hosted on a server. *Supra*, Section X.A.3.i; EX1003, ¶ 167. Accordingly, a POSITA would have found it obvious to include address information indicative of a service provider, as taught by *Benaouda*, in *Krco*’s Location Update Request message (*e.g.*, in the “ExtDeviceInfo” information element) to indicate an M2M service provider’s address to which associated secondary data is to be sent. EX1003, ¶ 167; *see also supra*, Section X.A.1. Thus, the *Krco-Benaouda* combination renders obvious Claim 9.

10. Claim 10. The method according to claim 1, wherein the non-signalling application data comprises alarming data.

The *Krco-Benaouda* combination renders obvious Claim 10. *Krco* discloses a communications system wherein M2M sensors generate and transmit M2M data, which may be related to “environment and habitat monitoring, health monitoring, burglar alarms, automatic meter reading, home automation and other types of Machine to Machine (M2M) type of services.” *See, e.g.*, EX1009, 1:42-59. As discussed above with reference to Claim Element [17c], A POSITA would have

understood that a UE operating according to the *Krco-Benaouda* combination could transmit the M2M data gathered by *Krco*'s M2M sensors in *Krco*'s Location Update Request message. EX1003, ¶ 169; *see also supra*, Section X.A.3.iv. And a POSITA would have also understood that any “burglar alarm” data gathered by *Krco*'s M2M sensors, when packaged into the Location Update Request message (*i.e.*, the “*signalling message*”) of the *Krco-Benaouda* combination, would be “*non-signalling application data*” because this data is associated with the M2M device's M2M function and does not assist in signaling functions such as connection management. EX1003, ¶ 169. Thus, the *Krco-Benaouda* combination renders obvious Claim 10.

11. Claim 11. The method according to claim 1, wherein the non-signalling application data comprises measurement data.

The *Krco-Benaouda* combination renders obvious Claim 11. *Krco* discloses a communications system wherein M2M sensors generate and transmit M2M data, which may be related to “environment and habitat monitoring, health monitoring, burglar alarms, automatic meter reading, home automation and other types of Machine to Machine (M2M) type of services.” *See, e.g.*, EX1009, 1:42-59. A POSITA would have understood that any of these applications would have involved the gathering and transmission of “*measurement data*.” EX1003, ¶ 170. For example, a POSITA would have understood a health monitoring application to

involve an M2M sensor that measures a user's physical characteristics (such a heartrate) and transmits that measurement data to a medical service provider. *Id.* As discussed above with reference to Claim Element [17c], a POSITA would have understood that a UE operating according to the *Krco-Benaouda* combination could transmit the M2M data gathered by *Krco*'s M2M sensors in *Krco*'s Location Update Request message. *Id.*; *see also supra*, Section X.A.3.iv. And a POSITA would have understood that measurement data (*e.g.*, associated with a health monitoring functionality), when packaged into the Location Update Request message (*i.e.*, the “*signalling message*”) of the *Krco-Benaouda* combination, would be “*non-signalling application data*” because this data is associated with the M2M device's M2M function and does not assist in signaling functions such as connection management. EX1003, ¶ 170. Thus, the *Krco-Benaouda* combination renders obvious Claim 11.

12. Claim 12. The method according to claim 11, wherein the communication module comprises one or more sensors, and wherein the measurement data comprises measurement data obtained using the one or more sensors.

The *Krco-Benaouda* combination discloses Claim 12. As discussed above with reference to Claim Element [17p], *Krco* discloses a UE that may be connected with a sensor (or network of sensors) “through a wireless or wired connection,” which a POSITA would have understood to mean that the UE and the sensor(s) could

be considered to be a single, integrated device. EX1009, 3:57-59, EX1003, ¶ 171 (citing, as evidence of the knowledge of a POSITA, EX1017, [0023] (describing a “remote station” with integrated sensors, such as a “temperature sensor, a water sensor, a smoke detector, a carbon-monoxide detector, and/or any other suitable sensor or combination of sensors.”)). *Krco* states that the UE could itself be “for instance an M2M device for AMR [automated meter reading] or a security application such as a burglar alarm.” EX1009, 3:60-64. And as discussed above with reference to Claim 11, a POSITA would have understood that M2M sensors operating in accordance with their M2M functionalities would generate and transmit measurement data. *Supra*, Section X.A.11. Accordingly, a POSITA would have understood that the UE would include “*one or more sensors*” from which the measurement data could be obtained. EX1003, ¶ 172. Thus, the *Krco-Benaouda* combination renders obvious Claim 11.

13. Claim 13

i. [13a]

See Claim Element [20a].

ii. [13b]

See Claim Element [20b].

14. Claim 14. The method of claim 1, wherein said received wireless signalling message comprises data derived from a sensor of the communication module.

For the same reasons discussed above with reference to Claim 12, *Krco-Benaouda* combination renders Claim 14 obvious. *See supra*, Section X.A.12.

15. Claim 15

i. [15p] A telecommunications network for transferring data from a communication apparatus to a machine-to-machine server, said telecommunications network comprising:

If the preamble is limiting, *Krco* combination discloses the preamble. Claim Element [15p]’s recitation of a “*telecommunications network for transferring data from a communication apparatus to a machine-to-machine server*” corresponds to Claim Element [17p]’s recitation of a “*telecommunications network being configured for transferring data from a communication apparatus to a machine-to-machine server.*” Thus, *Krco* discloses Claim Element [15p] for the same reasons explained in Claim Element [17p].

ii. [15a] a signalling termination node; and

See Claim Elements [1a], [17f].

iii. [15b] one or more processors for carrying out operations including:

See Claim Element [17a].

iv. [15c]

See Claim Element [17b].

v. [15d]

See Claim Element [17c].

vi. [15e]

See Claim Element [17d].

vii. [15f]

See Claim Element [17e].

viii. [15g]

See Claim Element [17f].

16. Claim 16

i. [16a]

See Claim Element [20a].

ii. [16b]

See Claim Element [20b].

17. Claim 21

i. [21p] A communication device comprising:

If the preamble is limiting, *Krco* discloses the preamble. Claim Element [21p]’s recitation of a “*communication device*” corresponds to Claim Element [17p]’s “*communication apparatus*” and is thus disclosed for the same reasons explained in Claim Element [17p].

ii. [21a] a transmitter; and

Krco renders obvious this claim element. As discussed above with reference to Claim Element [17p], *Krco*'s UE (*i.e.*, “*communication apparatus*” or “*communication device*”) wirelessly communicates with a core network to transmit M2M data, and it was well-known to a POSITA that such a device would have required a transmitter that would have allowed the UE to carry out such communications. EX1003, ¶ 187 (citing, as evidence of the knowledge of a POSITA, EX1017, [0025] (describing a “remote station” used in machine-to-machine systems, where the remote station “may also exchange data with other network devices via a wireless communication interface 222 and an *antenna 224*, which connects to a network access server 104” (emphasis added))).

iii. [21b] a processor for causing the communication device to carry out operations including:

Krco discloses this claim element. *Krco* discloses a cellular network that includes a UE that transmits data about connected M2M sensors (*see* Limitation [17p]), and it was well-known to a POSITA that such a device would have required a processor that would have allowed the M2M device to carry out its operations. EX1003, ¶ 188 (citing, as evidence of the knowledge of a POSITA, EX1017, [0022]-[0023] (describing a “remote station” used in machine-to-machine systems, where the remote station “includes a main unit 202 which preferably includes one or more processors 2014”).

iv. [21c]

See Claim Element [17c].

v. [21d]

See Claim Elements [17b]-[17d].

vi. [21e]

See Claim Elements [17b]-[17d], [17f], [1a], and [21a].

18. Claim 22.

See Claim 10.

19. Claim 23.

See Claim 11.

20. Claim 24.

See Claim 12.

21. Claim 25

i. [25a]

See Claim Element [20a].

ii. [25b]

See Claim Element [20b].

B. Ground 2: *Krco* in view of *Benaouda* and TS 24.008

1. Motivation to Combine

As discussed above in Ground 1, a POSITA would have been motivated to combine *Krco* with *Benaouda*. A POSITA would have been motivated to further combine these references with TS 24.008.

Krco generally relates to the use of a Location Update Request message or a Routing Area Update message to transmit M2M sensor data through a telecommunications network. EX1009, 4:24-47. A POSITA would have searched for other references or standards to understand details about these messages and how they are implemented in a telecommunications system. EX1003, ¶ 110. One such reference is TS 24.008, which is a 3GPP specification that provides details about the various signaling messages utilized in telecommunications networks, such as the “location updating request” message, which a POSITA would have understood to be the same as *Krco*’s “Location Update Request” message. *See, e.g.*, EX1011, 256; *see also* EX1003, ¶ 110. A POSITA therefore would have been motivated to seek out more detailed descriptions of the messages used in *Krco*, such as those described by TS 24.008, when implementing when implementing *Krco*’s teachings. *Id.*

Further, *Krco* acknowledges that its teachings may be applied in a variety of wireless communications settings. *See* EX1009, 8:14-19 (“A person skilled in the art would realize that any technique for wireless communication and any type of

access network can be used together with the present invention.”). A POSITA would have searched for other references or standards to understand details of other wireless communications technologies that are not described in *Krco*. EX1003, ¶ 111. One such reference is TS 24.008, which “specifies the procedures used at the radio interface core network protocols within the 3rd generation mobile telecommunications system and the digital cellular telecommunications system.” EX1011, 24. A POSITA therefore would have been motivated to seek out more detailed descriptions of other wireless communications technologies, such as those described by TS 24.008, when implementing the teachings of *Krco* within the context of those wireless communications technologies.

2. Reasonable Expectation of Success

As discussed above in Ground 1, a POSITA would have had a reasonable expectation of success in combining *Krco* with *Benaouda*. A POSITA would have had a reasonable expectation of success when combining these references with TS 24.008. EX1003, ¶ 112. First, TS 24.008 provides more details about the “Location Update Request” message used in *Krco*, so a POSITA would have reasonable expected success in utilizing those details when implementing *Krco*’s Location Update Request message. *Id.*

Second, *Krco* itself states that “[a] person skilled in the art would realize that any technique for wireless communication and any type of access network can be

used together with the present invention.” EX1009, 8:14-19. So a POSITA would have reasonably expected success in implementing the techniques taught in *Krco* within the context of the wireless communication protocols described in TS 24.008. EX1003, ¶ 113. Implementing *Krco*’s concepts in the context of network layer 3 signaling protocols (*e.g.*, GPRS and LTE signaling protocols) disclosed by TS 24.008 would have involved rudimentary network design skill that was well within the capabilities of a POSITA. *Id.* The concepts relied upon in *Krco* involve basic network signaling between a UE and an access network, and a POSITA would have had a reasonable expectation of success in applying those concepts within a GPRS signaling protocol as disclosed in TS 24.008. *Id.* This is particularly true when GPRS and LTE were well-known at the time just before the alleged invention of the ’098 Patent in 2008. *Id.*

As an example embodiment of operation, a POSITA would have modified the *Krco-Benaouda* system so that, when operating in a 3GPP (*e.g.*, GPRS) system, *Krco*’s UE would bundle machine-to-machine data in a GPRS attach request message as disclosed by TS 24.008. A POSITA would have had a reasonable expectation of success in making that combination, because this combined system merely substitutes *Krco*’s Location Update Request message with a similar message from the GPRS generation (*e.g.*, the GPRS “attach request” messages). As a result, implementing the *Krco-Benaouda* combination’s method—inserting M2M data into

a signaling message—in the context of TS 24.008’s GPRS signaling messages would not have involved undue experimentation and instead only would have required basic network design ability. EX1003, ¶ 114.

3. Claim 2. The method according to claim 1, wherein the wireless signalling message is a network attach request message.

Petitioner’s analysis of how *Krco* teaches each element of Claim 2 in Ground 1 is hereby incorporated by reference into this ground. Further, TS 24.008 discloses Claim 2. TS 24.008 discloses a “location updating request,” which “is sent by the mobile station to the network either to request update of its location file (normal updating or periodic updating) or to request IMSI attach.” EX1011, 256 (Section 9.2.15). A POSITA would have understood the “mobile station” to be an example of a “*communications module*,” because a mobile station is a well-known term used to describe mobile devices used to communicate via a telecommunications network. EX1003, ¶ 199; *see also* EX1001, Figs. 2B , 3B (showing an “MS” (*i.e.*, a mobile station) transmitting an “IMSI Attach Request” message and a “GPRS Attach Request” message, respectively). And the ’098 Patent acknowledges that TS 24.008’s location updating request is an example of “a network attach request message,” which the ’098 Patent characterizes as a “signalling message.” *See* EX1001, 5:30-32 (“The signalling message S can be a network attach request message in order to provide rapid transfer of the user data.”), 5:57-6:1 (identifying

“location updating request...as specified in subclause 9.2.15 of 3GPP TS 23.008 V8.3.0” as an example of a network attach request). Thus, TS 24.008’s location updating request message discloses Claim 2.

TS 24.008 also discloses a GPRS “Attach request” message, which “is sent by the MS to the network in order to perform a GPRS or combined GPRS attach.” EX1011, 295 (Section 9.4.1). In the context of the *Krco*-TS 24.008 combination, a POSITA would have understood that a UE operating in the context of a GPRS system would utilize the standardized “Attach request” message to connect with an access network, as described in TS 24.008. EX1003, ¶ 202. A POSITA would have further understood that this message is a “*signalling message*” because it carries signaling data that facilitates the connection between a mobile station (MS) and the access network in a telecommunications system. *Id.*; *see also* EX1011, 295-296.

Indeed, the ’098 Patent admits that TS 24.008’s attach request message is an example of a “*signalling message*”: “The signalling message S can be a network attach request message in order to provide rapid transfer of the user data,” (EX1001, 5:30-32) and “[i]n particular, the communication module 2 may send an Attach Request as specified in subclause 9.4.1 of 3GPP TS 24.008 V8.3.0, indicating that the communication module 2 has become active for the telecommunications network, in order to perform a GPRS attach or a Combined GPRS attach” (*id.*, 7:57-61).

Thus, *Krco* and TS 24.008 each disclose this claim.

4. Claim 3. The method according to claim 2, wherein said network attach request message is a location updating request message with a location updating type information element indicating an IMSI attach.

The *Krco-Benaouda*-TS 24.008 combination discloses Claim 3. As discussed above with reference to Claim 2, *Krco* and TS 24.008 disclose a Location Update Request and location updating request, respectively, which a POSITA would have understood to be similar messages. *See supra*, Section X.B.3; EX1003, ¶ 205. Section 10.5.3.5 of TS 24.008 discloses that the location updating request has a “Location Updating Type information element” which may indicate an “IMSI attach” when this information element is set to a “1 0” value:

Table 10.5.93/3GPP TS 24.008: Location Updating Type information element

LUT (octet 1)			
Bits			
2	1		
0	0		Normal location updating
0	1		Periodic updating
1	0		IMSI attach
1	1		Reserved
FOR (octet 1)			
The Follow-On Request bit (FOR) is coded as follows:			
Bits			
4			
0			No follow-on request pending
1			Follow-on request pending

EX1011, 372 (highlighting added).

Thus, a POSITA would have understood that the Location Update Request (*Krco*)/location updating request (TS 24.008) message discloses Claim 3. EX1003, ¶ 206. The '098 Patent acknowledges that the subject matter of Claim 3 may be found in section 10.5.3.5 of TS 24.008. EX1001, 5:64-6:4 (“IMSI attach can be requested by having the location updating type information element to code for IMSI attach as specified in subclause 10.5.3.5 of the same document.”).

5. Claim 4. The method according to claim 2, wherein said network attach request message is an attach request with an attach type information element indicating a GPRS request or a combined GPRS/IMSI attach.

The *Krco-Benaouda*-TS 24.008 combination discloses Claim 4. As discussed above with reference to Claim 2, TS 24.008 discloses a GPRS “Attach request” message, which “is sent by the MS to the network in order to perform a GPRS or combined GPRS attach.” *See supra*, Section X.B.3; *see also* EX1011, 295 (Section 9.4.1). For the reasons discussed above for Claim 2, TS 24.008’s attach request message discloses Claim 4. The '098 Patent acknowledges that section 9.4.1 of TS 24.008 teaches the subject matter of Claim 4: “In particular, the communication module 2 may send an Attach Request as specified in subclause 9.4.1 of 3GPP TS 24.008 V8.3.0, indicating that the communication module 2 has become active for the telecommunications network, in order to perform a GPRS attach or a Combined GPRS attach.” EX1001, 7:57-61.

6. Claim 5

i. [5a] The method according to claim 2, further comprising: transmitting a network attach accept message to the communication module;

The *Krco-Benaouda*-TS 24.008 combination discloses this claim element. TS 24.008 discloses a “Location updating accept” message, which “is sent by the network to the mobile station to indicate that updating or IMSI attach in the network has been completed.” EX1011, 255 (Section 9.2.13); *see also id.*, 77-78. TS 24.008 also discloses a GPRS “Attach accept” message, which is sent by the network to the MS to indicate that the corresponding attach request has been accepted.” *Id.*, 296 (Section 9.4.2). Thus, TS 24.008 discloses this claim element.

ii. [5b] transmitting further data to and/or receiving further data from the communication module; and

The *Krco-Benaouda*-TS 24.008 combination renders this claim element obvious. TS 24.008 discloses that its various attach procedures (*e.g.*, IMSI attach and GPRS attach) are used to “indicate the IMSI as active in the network” (EX1011, 79 (Section 4.4.3), describing the IMSI attach procedure) or “attach the IMSI” for GPRS or combined GPRS, non-GPRS services (EX1011, 108, describing the GPRS attach procedure). And *Krco* explains that a UE may undergo “registration and attach procedures with the core network before the end user can make a call or use some other network services,” such as “voice calls, SMS,” and “email.” EX1009,

1:14-28. A POSITA would have understood that when such attach procedures disclosed in *Krco* and TS 24.008 are completed, as indicated by an attach accept message, the corresponding mobile station (*i.e.*, “*communication module*,” such as a machine-to-machine device) would have transmitted additional data through the telecommunications network, through, for example, a voice call or email. EX1003, ¶ 209.

iii. [5c] receiving a network detach message from the communication module.

The *Krco-Benaouda*-TS 24.008 combination discloses this claim element. TS 24.008 discloses an “IMSI DETACH INDICATION,” which is “sent from the mobile station” (*i.e.*, the “*communication module*”) to the network to initiate the IMSI detach procedure. EX1011, 75 (Sections 4.3.4, 4.3.4.1). Therefore, TS 24.008’s “IMSI DETACH INDICATION,” discloses this claim element. This understanding is confirmed by the ’098 Patent, which shows, in Figure 2A, an “MS” (mobile station) sending an “IMSI Detach Request” message to the RAN (radio access network). *See* EX1001, Fig. 2A, 8:35-37.

7. Claim 6. The method according to claim 2, further comprising transmitting an attach reject message to said communication module, said attach reject message comprising data for said communication module.

The *Krco-Benaouda*-TS 24.008 combination discloses Claim 6. TS 24.008 discloses a “Location updating reject” message, which “is sent by the network to the

mobile station” (i.e., a “*communication module*”) to indicate that the updating or IMSI attach has failed.” EX1011, 255 (Section 9.2.14). A POSITA would have understood that the “Location updating reject” message to be “*an attach reject message*” because it indicates IMSI attach failure. EX1003, ¶ 213. Further, TS 24.008’s location updating reject message includes several information elements, each of which carries unique data, as shown in table 9.2.16 of TS 24.008, copied below:

Table 9.2.16/3GPP TS 24.008: LOCATION UPDATING REJECT message content

IEI	Information element	Type/Reference	Presence	Format	Length
	Mobility management protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip Indicator	Skip Indicator 10.3.1	M	V	1/2
	Location Updating Reject message type	Message type 10.4	M	V	1
	Reject cause	Reject cause 10.5.3.6	M	V	1

EX1011, 255.

As shown, the information elements contained in the location updating reject message include “Mobility management protocol discriminator,” “Location Updating Reject message type,” and “Reject cause” data. Section 10.5.3.6 of TS 24.008 explains that “[t]he purpose of the Reject Cause information element is to indicate the reason why a request from the mobile station is rejected by the network.” EX1011, 373. Thus, TS 24.008’s location updating reject message “*compris[es] data for said communication module*” at least because it includes reject cause data

that indicates to the mobile station (*i.e.*, the “*communications module*”) why the attach request was rejected. Thus, TS 24.008 discloses this claim element.

Indeed, the '098 Patent acknowledges that a “Location updating reject” message from section 9.2.14 of TS 24.008 is an example of an attach reject message. EX1001, 7:36-42 (“Then, in a final step, the MSC sends an IMSI Attach Reject message to the communication module 2...This message is specified in subclause 9.2.14 of 3GPP TS 24.008, V.8.3.0 as Location updating reject.”).

XI. CONCLUSION

Petitioner respectfully requests institution of IPR and cancelation of Claims 1-6 and 9-25 as unpatentable.

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies on this February 15th, 2023, that true and correct copies of the foregoing PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO. 9,372,098, Exhibits 1001-1022, and Petitioner's power of attorney were served in their entirety on the following parties via FedEx Express® or Express Mail:

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**CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME
LIMITATION, TYPEFACE REQUIREMENTS, AND TYPE STYLE
REQUIREMENTS**

1. This Petition complies with the type-volume limitation of 14,000 words, comprising 13,930 words, excluding the parts exempted by 37 C.F.R. § 42.24(a).

2. This Petition complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word in 14-point Times New Roman.

Respectfully submitted,

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