

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ERICSSON INC.,
Petitioner,

v.

KONINKLIJKE KPN N.V.,
Patent Owner.

IPR2023-00524
Patent 9,372,098 B2

Before NORMAN H. BEAMER, KARA L. SZPONDOWSKI,
and SCOTT RAEVSKY, *Administrative Patent Judges*.

BEAMER, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

On February 15, 2023, Ericsson, Inc. (“Petitioner”) filed a Petition (“Pet.”) pursuant to 35 U.S.C. §§ 311–319 to institute an *inter partes* review of claims 1–6 and 9–25 of U.S. Patent No. 9,372,098 B2 (“the ’098 patent”). Paper 2 (“Pet”), 1. On June 16, 2023, Koninklijke KPN N.V. (“Patent Owner”) filed a Preliminary Response (“Prelim. Resp.”). Paper 6. Subsequently, with our authorization, the parties filed briefs on the issues of discretionary denial and claim construction. (Papers 7, 8, 10, 12).

The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted unless the information presented in the Petition and any preliminary response shows that “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” *See* 37 C.F.R. § 42.108 (2022).

For the reasons expressed below, we determine that, on this record, Petitioner has not established a reasonable likelihood that it would prevail with respect to at least one of the challenged claims of the ’098 patent. Accordingly, we do not institute an *inter partes* review as to the challenged claims on the grounds of unpatentability presented.

II. BACKGROUND

A. *The ’098 Patent*

The ’098 patent, titled “Telecommunications Network And Method Of Transferring User Data In Signaling Messages From A Communication Unit To A Data Processing Centre,” was filed on October 28, 2009 and issued on June 21, 2016. Ex. 1001, codes (54), (22), (45). The ’098 patent is directed to transferring user data, such as alarm data or measurement data,

from a communication module to a data processing center over a telecommunications network using a signalling message that contains the user data. *Id.* at code (57). Figure 1 is reproduced below.

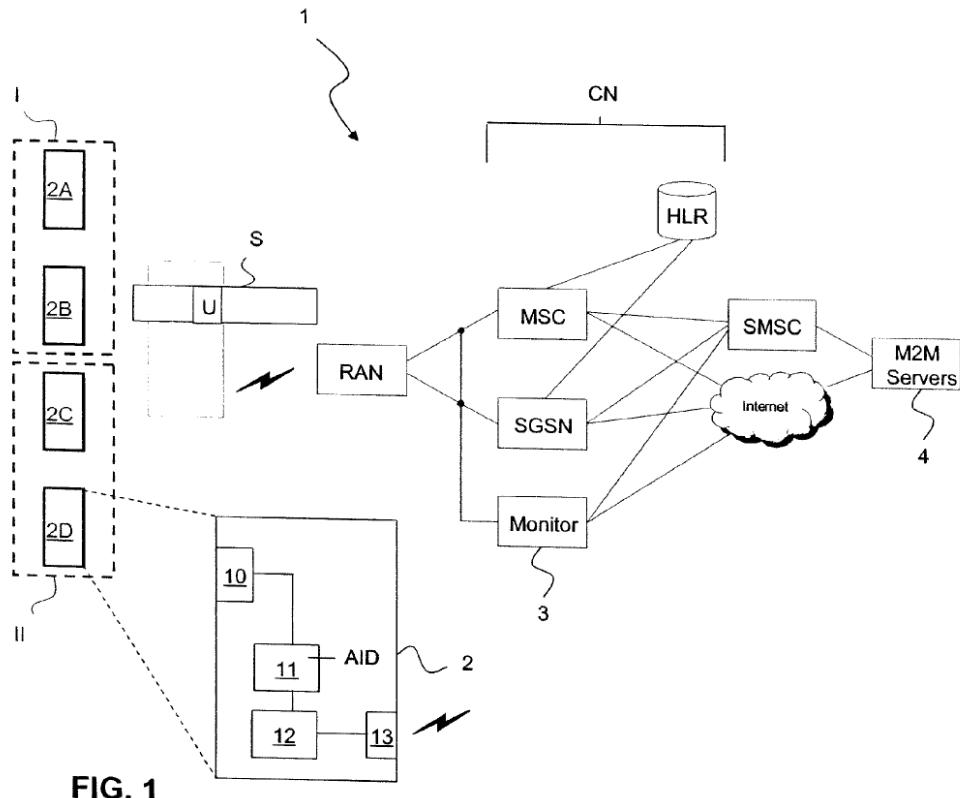


Figure 1 is an illustration of a system for transmitting data in a machine-to-machine (M2M) communication system, in which communication modules 2A–2D include sensors 10, processors 11, encapsulation modules 12, and transmitters 13. Ex. 1001, 3:59–61, 4:6–54. Sensor 10 collects data “U,” such as by monitoring fleet vehicles or data processing facilities to provide alarms in case of emergency or security issues. *Id.* at 4:8–15, 4:34–38. The sensors may be included in the communication modules, or may be “communicatively connected” thereto. *Id.* at 4:34–35.

Data U is provided to processor 11 for processing, such as encryption, and the processed data U is inserted into signalling message “S” by

encapsulation module 12, whereupon the signalling message is transmitted by transmitter 13 to core network CN via Radio Access Network RAN. Ex. 1001, 4:16–17, 4:38–52. Signalling message S can be a Network Attach Request message, an example of which is “a location updating request to request IMSI attach as specified in subclause 9.2.15 of 3GPP TS 24.008 V8.3.0.” *Id.* at 5:30–35, 5:64–66; Ex. 1011, 256.

In core network CN, signalling message S terminates at, for example, mobile switching centre MSC, which extracts user data U from signalling message S and transfers the user data to data processing centres 4 (also referred to as M2M servers) via Short Message Service Centre SMSC or XML messages. Ex. 1001, 1:31, 2:21–25, 4:18–33, 5:23–30, 5:45–49. As stated in the '098 patent:

M2M applications typically involve hundreds or thousands of communication modules that only rarely require access to a telecommunications network. An example involves the electronic reading of e.g. electricity meters at the homes of a large customer base. Other examples include sensors, meters, coffee machines etc that can be equipped with communication modules that allow for reporting status information to a data processing centre over the telecommunications network. The data processing centre may e.g. store the data and/or provide a schedule for maintenance people to repair a machine, meter, sensor etc.

Ex. 1001, 1:31–42.

After transfer of the user data to the data processing center, communications module 2 initiates a detach procedure to inform the network that it no longer needs to be attached. Ex. 1001, 5:55–56, 6:45–47.¹

¹ An alternative embodiment omits the detach step so that “further data may be sent.” Ex. 1001, 2:55–64.

The '098 patent asserts that the use of signalling messages to transmit machine-to-machine data "allow[as] for efficient and fast communications of limited amounts of data in a machine to-machine environment," and

[b]y inserting the user data in the signalling message(s), it is possible to rapidly transmit data to the telecommunications network, while resources can be saved since it is not required to establish a complete circuit-switched or packet-switched connection between the communication module and the telecommunications network.

Ex. 1001, 1:54–56, 2:8–14.

B. Illustrative Claim

Independent claim 17 is reproduced below.

17. 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 [sic] comprising:

one or more processors for carrying out operations including:

receiving a wireless signalling message from said communication apparatus, said received wireless signalling message having inserted in it non-signalling application data generated for a machine-to-machine function by the communication apparatus, 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.

Ex. 1001, 11:49–12:6.

Of note, the requirement, “having inserted in it non-signalling application data generated for a machine-to-machine function,” was added during prosecution to distinguish cited references. Ex. 1002, 57, 63–65. This claim requirement is dispositive for our Decision as set forth below.

C. References

Petitioner relies on the following references (Pet. 5, 6):

- Krco et al., U.S. Patent No. 9,191,774 B2 (“Krco”). Ex. 1009.
- Benaouda et al., U.S. Patent Pub. No. 2008/0153521 (“Benaouda”). Ex. 1010.
- 3GPP TS 24.008 v8.3.0 (“TS 24.008”). Ex. 1011.

Petitioner also refers to WO Publication No. WO 2008/039973 to Ananthanarayanan, et al. Pet. 5; Ex. 1012. In addition, Petitioner filed the Declaration of Dr. James Olivier in support of the Petition. Ex. 1003 (“Olivier Decl.”).

D. Asserted Challenges to Patentability

Petitioner challenges the patentability of claims 1–6 and 9–25 of the '098 patent on the following bases (Pet. 6):

Claims Challenged	35 U.S.C. § ²	References
1–2, 9–25	103	Krco, Benaouda
2–6	103	Krco, Benaouda, TS 24.008

E. Real Parties in Interest

Petitioner identifies Ericsson Inc. and Telefonaktiebolaget LM Ericsson as real parties in interest. Pet. 2. Patent Owner identifies itself as a real party in interest. Paper 4, 1.

F. Related Proceedings

The parties identify *Koninklijke KPN N.V. v. Telefonaktiebolaget LM Ericsson et al.*, No. 2:22-cv-00282 (E.D. Tex.), as a related proceeding. Pet. 2; Paper 4, 1.

III. ANALYSIS OF PETITIONER'S CHALLENGE

A. Legal Standards

To prevail in its challenge, Petitioner must show a reasonable likelihood that at least one claim is unpatentable. 35 U.S.C. § 314(a). Under § 314, the Board is required to make a binary choice to institute review or not. *SAS Institute Inc. v. Iancu*, 138 S.Ct. 1348, 1355 (2018). “In an IPR,

² The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), included amendments to 35 U.S.C. §§ 102 and 103 that became effective after the filing of the application for the '098 patent. Therefore, we apply the pre-AIA versions of these sections.

the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (2012) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to the patent owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective indicia of non-obviousness (also called secondary considerations), such as commercial success, long-felt but unsolved needs, and failure of others.³ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). We analyze grounds based on obviousness in accordance with the above-stated principles.

³ The record does not include evidence or argument regarding objective indicia of nonobviousness.

B. Level of Skill in the Art

In determining whether an invention would have been obvious at the time it was made, 35 U.S.C. § 103(a) requires us to resolve the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. The person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field. *Id.* In a given case, one or more factors may predominate. *Id.*

Petitioner asserts that a person of ordinary skill in the art at the time of the alleged invention of the '098 patent:

[W]ould 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. . . . A POSITA would also have familiarity with the wireless standards and protocols relating to data transmission and subscriber management. . . . This definition is approximate, and more education may substitute for industry experience or vice versa.

Pet. 14 (citing Olivier Decl. ¶ 41). Patent Owner does not contest Petitioner's proposal at this stage of the proceeding. Prelim. Resp. 1–2.

Petitioner's proposal is consistent with the level of ordinary skill in the art reflected by the asserted prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *GPAC*, 57 F.3d at 1579. On this record, the level of ordinary skill is neither in dispute nor dispositive of any challenge. For purposes of this Decision, we apply Petitioner's articulation.

C. Claim Construction

The Petition was accorded a filing date of February 15, 2023. Paper 5. In an *inter partes* review for a petition filed on or after November 13, 2018, a claim “shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b). We apply the claim construction standard from *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (*en banc*).

Claim terms need only be construed to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

Petitioner submits that the Board need not construe any claim term.
Pet. 22.

Patent Owner submits that:

“Signalling” is a term of art that refers to “[t]he exchange of information specifically concerned with the establishment and control of connections, and with management, in a telecommunications network.” A POSITA would thus understand “non-signalling data” to refer to data that is not specifically concerned with the establishment and control of connections, and with management, in a telecommunications network.

Prelim. Resp. 6 (citing Pachamanov Decl. ¶¶ 48–49; Ex. 2003, 25).⁴

Patent Owner’s expert relies on the above definition of “signalling” based on a telecommunication standards document, “3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Vocabulary for 3GPP Specifications.” Ex. 2003. Patent Owner

⁴ “Pachamanov Decl.” refers to the Declaration of Dr. Radostin Pachamanov submitted by Patent Owner. Ex. 2001.

argues that this definition applies to this proceeding given that 3GPP specifications are cited throughout the ‘098 patent and elsewhere in the record. Prelim. Resp. 13 (citing Ex. 1001, 2:48–51, 5:64–67, 7:57–61, 9:19–25; Ex. 1011 (3GPP TS 24.008 v8.3.0); Ex. 1020 (3GPP TS 23.040 v6.9.0). As discussed further in Section III.D.3.c) below, this definition is consistent with the record before us and we adopt it for purposes of this Decision.

D. Alleged Obviousness of Claims 1–2 and 9–25 Over Krco and Benaouda

Petitioner challenges claims 1–2 and 9–25 as obvious over the combination of Krco and Benaouda. Pet. 22–62.

1. Krco

Krco, titled “Method For Distribution Of Information Of Networks Or Entities Using UE As Gateway,” was filed on June 4, 2008 and issued on November 17, 2015. Ex. 1009, codes (54), (22), (45). Krco discloses distribution of information in a primary cellular network, in which user equipment forwards information about the location and properties of a second network or entity to a service provider. *Id.* at code (57). As stated in Krco:

The object of the present invention is solved by means of a User Equipment (UE) for distribution of information in a primary cellular network. At least one second network or at least one second entity is using the UE for forwarding information between the second network or entity and a service provider, where the second network or entity provides the UE with information about its properties. The UE is adapted to send a first message to a third entity in a third network to inform about the location and properties of the UE. . . . What particularly characterizes the UE is that it is adapted to send secondary data in the first message to the third entity. Said

secondary data comprises information about the properties of the second network or entity.

Ex. 1009, 2:11–24.

Krco's network can be used to transfer data in a machine-to-machine (M2M) environment, such as from cameras and sensors used in health care, from built-in RFID readers, and from wireless sensor networks (WSN) for “habitat monitoring, health monitoring, burglar alarms, automatic meter reading, home automation and other types of Machine to Machine (M2M) type of services.” *Id.* at 1:29–33. Krco asserts, “[b]y embedding Wireless Sensor Network (WSN) properties (such as the availability) in the already existing signalling in a cellular network, efficiency will be enhanced both in terms of network usage and development complexity for the individual service developer.” *Id.* at 3:9–14. Figure 1 is reproduced below.

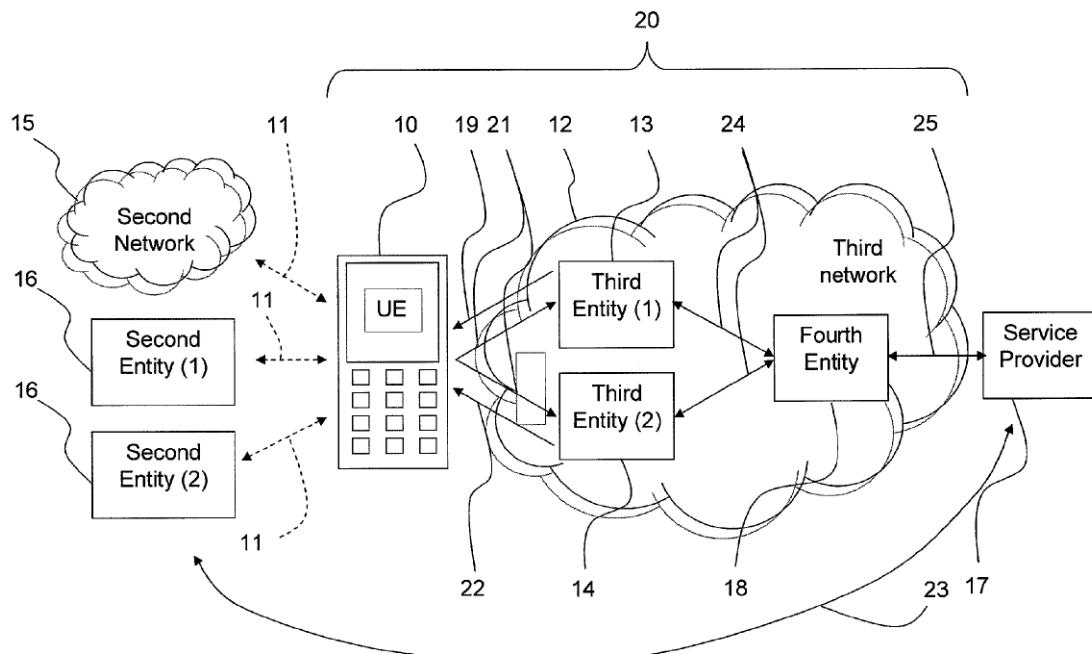


FIG 1

Figure 1 illustrates primary cellular network 20 that includes User Entity (UE) 10, such as a mobile phone, and Third Network 12, such as a Wireless

Code Division Multiple Access (WCDMA) network. Ex. 1009, 3:27–28, 3:52–54, 3:60, 4:7–10, 4:15–16. Third Network 12 includes Third Entity 13, such as a Mobile Switching Center (MSC) for a circuit switched network, or Third Entity 14, such as a Serving Generic Packet Radio Services (GPRS) Support Node for a packet switched network, and Fourth Entity 18, which is an “availability server” performing an authenticating and authorizing function. *Id.* at 3:52–54, 4:53–60, 5:64–66, 6:60–64.

Second Network 15 and/or Second Entities 16 use UE 10 to forward information to Service Provider 17. Ex. 1009, 3:55–57. Second Network 15 could be a Wireless Sensor Network, for instance monitoring temperature, pressure, sound, moving objects and pollutant, and Second Entity 16 could be a camera, a disc drive or any other means capable of providing the information. *Id.* at 4:3–7. Service Provider 17 is an entity offering services like environment and habitat monitoring, health monitoring, burglar alarms, automatic meter reading, home automation and other types of Machine to Machine (M2M) type of services. *Id.* at 4:11–14.

The Second Network/Entities connect to UE 10 via wireless or wired connection 11. *Id.* at 3:57–59. For example, sensors to monitor conditions, such as temperature, pressure, sound, moving objects and pollutants can be connected to a mobile phone UE. *Id.* at 1:44–48. Alternatively, devices such as Automatic Meter Readers or burglar alarms can combine a second entity with the UE. *Id.* at 1:65–2:2, 3:60–64, claim 3. The main purpose of UE 10 is to provide information or data collected by Second Network 15 or Entity 16 to Service Provider 17. *Id.* at 3:64–66. However, first the second network or entity must provide Service Provider 17 with information about its location, properties and status. *Id.* at 3:57–59, 3:63–4:2. To do this,

UE 10 sends a signalling message to Third Network 12 — for example, a Location Update Request to Mobile Switching Center (MSC) — which is normally used to inform Third Network 12 about the location and properties of UE 10, but which for purposes of Krco, is also embedded with “secondary information” about the location and properties of the second network or entity. *Id.* at 4:17–21, 4:24–25, 4:30–56, 5:35–40. In particular, the secondary information, also referred to as “ExtDeviceInfo,” includes:

- IE ExtDeviceNum (4 bits) — Number of secondary networks or entities in the new information element.
- ID (4 bits) — Identity of an external device, local validity.
- Type (2 bytes) — Identifies the type of second network or device/devices (for example a WSN).
- Location (4 bytes) — Location of the external device relative to the UE position.

Ex. 1009, 5:41–63.

After receiving the Location Update Request message, the Mobile Switching Center (MSC) (for example) extracts the secondary data (ExtDeviceInfo) from the Request message, and sends the secondary data to fourth entity 18, which subsequently sends the secondary data to service provider 17 if the service provider has the authorization. Ex. 1009, 6:45–50, 7:54–65. After the secondary information containing the existence, location, and/or availability of the one or more M2M type networks or entities is provided to service provider 17, M2M data collected by the M2M networks or entities is transmitted via the cellular network to the M2M service provider via standard circuit switched or packet switched network techniques. *Id.* at 4:27–29, claim 1.

2. *Benaouda*

Benaouda, titled “MDN-Less SMS Messaging (Network Solution) For Wireless M2M Application,” was filed on December 22, 2006 and issued on June 26, 2008. Ex. 1010, codes (54), (43), (22). Benaouda is directed to Machine-to-Machine (M2M) communications using the short message service (SMS), where routing through the network is based on the MIN (Mobile Identifier Number) or the IMSI (International Mobile Station Identifier) of the M2M client, instead of assigning a telephone number, such as a mobile directory number (MDN), for every client. *Id.* at code (57).

Benaouda recognizes that using assigned telephone numbers has “many disadvantages and will be impractical and costly to implement,” because MDN numbering resources are finite and it is challenging to wireless service providers to manage MDN usage as the number of wireless service users grow substantially adding to the burden of a dwindling numbering resource pool. Ex. 1010, ¶¶ 7–8. SMS traffic uses the signalling portion of the network to transmit the M2M data. *Id.* at ¶ 5, 37. A gateway server pulls M2M data from the SMS packet payload and passes it over to the appropriate M2M application that resides on the M2M customer network. *Id.* at ¶ 55. Typically, an outbound M2M data message from a M2M device will relate to a parameter reading, e.g. from a utility meter or other telemetry device, and an inbound M2M data message directed to a M2M device will relate to a command or control information, e.g. to direct a M2M device to take a reading or perform a remote control function. *Id.* at ¶ 62.

3. *Independent Claim 17⁵*
a) *Petitioner's Challenge*
(1) *Preamble*

The preamble of claim 17 states:

A node in a telecommunications network, said telecommunications network being configured for transferring data from a communication apparatus to a machine-to-machine server. . . .

Ex. 1001, 11:49–52.⁶ Petitioner generally relies on the disclosures in Krco of cellular network 20 for the “telecommunication network,” Mobile Switching Center (MSC) 13 or Serving Generic Packet Radio Services (GPRS) Support Node (SGSN) 14 for the “node,” UE 10 with attached sensors for the “communication apparatus,” and Service Provider 17 for the “machine-to-machine server.” Pet. 29–33 (citing Ex. 1009, Fig. 1, 1:43–52, 2:60–3:4, 3:52–4:23, 4:53–60, 6:57–67, 7:54–62; Olivier Decl. ¶¶ 116, 118, 120). For the “transferring data” provision of the preamble, Petitioner relies on the disclosure in Krco of secondary data transferred from UE 10 to Service Provider 17 via Mobile Switching Center (MSC) 13 or Serving Generic Packet Radio Services (GPRS) Support Node (SGSN) 14. *Id.*

(2) *processors*

For the claim 17 requirement of “one or more processors for carrying out operations . . .” Petitioner relies on its declarant Dr. Olivier’s testimony

⁵ We adopt Petitioner’s election to consider independent claim 17 first. Pet. 22.

⁶ For this Decision, we make no determination whether or not the preamble of claim 17 is limiting.

that it was well known that processors would have been included in the Mobile Switching Center (MSC) 13 or Serving Generic Packet Radio Services (GPRS) Support Node (SGSN) 14. Pet. 34 (citing Olivier Decl. ¶ 123).

(3) wireless signalling message

For the claim 17 requirement of “receiving a wireless signalling message from said communication apparatus . . . 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,” Petitioner relies on the Location Update Request received by Mobile Switching Center (MSC) 13, or alternatively the Routing Area Update message received by serving GPRS support node (SGSN) 14. Pet. 34–36, 41–42 (citing Ex. 1009, 2:60–3:4, 3:53–54, 4:24–47, 4:53–55, 4:64–5:34; Olivier Decl. ¶¶ 125–126). In particular, for the requirement that the “wireless signalling messages of the telecommunications network are of a message type specified for carrying signalling data for managing connections in the telecommunications network,” Petitioner relies on Krco’s disclosure that the Location Update Request and Routing Area Update messages include information elements used to register the UE with the network to facilitate further communication. *Id.* at 41–42 (citing Ex. 1009, 4:24–40, 4:64–5:34; Olivier Decl. ¶¶ 138–139).

(4) non-signalling application data

(a) Reliance on Krco alone

For the claim 17 requirement of “said received wireless signalling message having inserted in it non-signalling application data generated for a

machine-to-machine function by the communication apparatus,” Petitioner first considers Krco alone, relying on Krco’s disclosure of secondary data embedded in the Location Update Request. Pet. 36–39 (citing Ex. 1009, 1:43–52, 2:60–3:4, 3:9–14, 3:57–59, 4:3–9, 4:46–52, 5:37–53; Olivier Decl. ¶¶ 127–130). Petitioner argues:

[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.

Pet. 37 (citing Olivier Decl. ¶ 128). Petitioner also argues that “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.* (citing Olivier Decl. ¶ 129). Petitioner notes that Krco touts the enhanced efficiency realized by embedding the secondary data in the signalling message, which Petitioner equates to the stated efficiencies in the ’098 patent of embedding application data in the signalling messages. *Id.* at 37–38 (citing Ex. 1001, 1:53–56; Ex. 1009, 3:9–14).

(b) Reliance on the Krco/Benaouda/Ananthanarayanan combination

Further to the requirement of inserting non-signalling application data in the wireless signalling messages, Petitioner argues in the alternative that, even if the secondary data of Krco is not considered “non-signalling application data,” it would have been obvious in light of Benaouda (and further in light of Ananthanarayanan) to embed non-signalling application data in the signalling messages of Krco. Pet. 22–29, 39–41. In particular, Petitioner argues that one of ordinary skill would have been motivated to

combine *Krco* with *Benaouda* because both disclosed systems that, according to Petitioner, insert M2M data in preexisting signalling messages — Location Update Requests in *Krco* and SMS messages in *Benaouda*.⁷ *Id.* at 22–23, 39 (citing Ex. 1009, 1:43–52, 2:11–24, 3:9–14, 3:60–4:2, 4:24–40, 4:48–52, 5:37–63; Ex. 1010 ¶¶ 5, 13, 30; Olivier Decl. ¶¶ 100, 133). Therefore, argues Petitioner, inserting the M2M measurement data of *Benaouda* into the Location Update Request messages of *Krco* would have involved a simple substitution of one known element for another to obtain predictable results. *Id.* Petitioner further argues, “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*.” *Id.* at 40 (citing Olivier Decl. ¶ 134).

Petitioner notes that the contents of “ExtDeviceInfo” (which Petitioner interprets as an abbreviation for “extended device information”) of the Location Update Request message of *Krco* are not restricted and therefore the M2M measurement data of *Benaouda* could be included in the ExtDeviceInfo element. *Id.* at 23–24 (citing Olivier Decl. ¶ 100). Petitioner argues that the combination would have been motivated given that both *Krco*

⁷ Petitioner relies on “3GPP TS 23.040,” a technical specification for the SMS messaging service, as support for characterizing the SMS message format used in *Benaouda* as containing signalling data, such as SMS message type and destination address, in addition to M2M measurement data. Pet. 19–21 (citing Ex. 1020, 9, 14, 21, 42–43, 47; Olivier Decl. ¶¶ 90–91).

and Benaouda provide M2M services such as health monitoring, burglar alarms, and automatic metering. *Id.* at 25–26, 39–40 (citing Ex. 1009, 1:60–62, 4:10–26.; Ex. 1010 ¶¶ 13, 25–26, 56; Olivier Decl. ¶¶ 103–104, 133).⁸

Petitioner also argues that one of ordinary skill would have had a reasonable expectation of success in combining Krc0 with Benaouda, given that additional M2M data can readily be included in the ExtDeviceInfo element of Krc0, and that making use of a Location Update Request in place of SMS would have been a simple substitution of known elements. Pet. 26–29, 41 (citing Olivier Decl. ¶¶ 105–108, 135).

(5) retrieving

For the claim 17 requirement of “retrieving said non-signalling application data from the received wireless signalling message,” Petitioner relies on the disclosure in Krc0 of Mobile Switching Center (MSC) 13 extracting the secondary data from the Location Update Request message, and on the above-discussed alternative in which the Benaouda application data is also embedded in — and thus extracted from — the message. Pet. 42–43 (citing Ex. 1009, 4:53–63, 6:45–67; Olivier Decl. ¶¶ 142–143).

(6) terminating/transferring

For the claim 17 requirement of “terminating further transmission of the received wireless signalling message and transferring said retrieved non-

⁸ Petitioner further relies on Ananthanarayanan in support of its obviousness argument, given that it discloses a terminal that 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. Pet. 24–25 (citing Ex. 1012 ¶ 32–33; Olivier Decl. ¶ 101).

signalling application data to said machine-to-machine server,” Petitioner relies on the disclosure in Krco of Mobile Switching Center (MSC) 13 transferring the extracted secondary data to the availability server 18 and thence to service provider 17, and on the above-discussed alternative in which the Benaouda application data is also embedded the message, and thus transferred as required. Pet. 44–45 (citing Ex. 1009, 6:45–50, 6:57–64, 7:54–62; Olivier Decl. ¶ 149). Petitioner argues that, given that the Location Update Request message is not transferred to availability server 18, it would have been obvious to one of ordinary skill that the Location Update Request message would be terminated in Mobile Switching Center (MSC) 13. *Id.* at 44 (citing Olivier Decl. ¶¶ 146–147).

- b) Patent Owner’s Preliminary Response Regarding the “non-signalling application data” Requirement*
 - (1) Response to Petitioner’s reliance on Krco alone*

Patent Owner argues that Petitioner’s challenges fail because Krco’s secondary data is not “non-signalling application data” and it would not have been obvious to include such data as “secondary data.” Prelim. Resp. 5–34.⁹ As an initial matter, as discussed in Section III.C above, Patent Owner proposes that “signalling” refers to “[t]he exchange of information specifically concerned with the establishment and control of connections, and with management, in a telecommunications network.” *Id.* at 6 (citing

⁹ Patent Owner also argues that Petitioner’s challenges fail because Krco does not teach or disclose the claimed “communication module.” Prelim. Resp. 34–49. Given our determination in Section III.D.3.c below regarding the “non-signalling application data” requirement, we do not need to address the communication module argument.

Pachamanov Decl. ¶ 48; Ex. 2003, 25). Therefore, argues Patent Owner, a person of ordinary skill in the art would understand “non-signalling data” to refer to data that is not specifically concerned with the establishment and control of connections, and with management, in a telecommunications network. *Id.* (citing Pachamanov Decl. ¶ 49).

Applying this definition, Patent Owner argues that the secondary data of Krco is not “non-signalling application data” because it is specifically concerned with the establishment, control, and management of the connection between the second network/entity the M2M service provider. Prelim. Resp. 6 (citing Pachamanov Decl. ¶ 50). Patent Owner notes that Krco describes the additional secondary data that is embedded in the Location Update Request message in the same way it describes the signalling data that is normally contained in that message. *Id.* at 6–7. Specifically, Krco states:

The update procedure [using the Location Update Request message] is used to inform the third network 12 *about the properties of the UE.*

....

The secondary data [embedded in the Location Update Request message] comprises information *about the properties of the second network or entity.*

Ex. 1009, 4:39–47 (emphasis added). Both the regular signalling data normally used in the Location Update Request message and the embedded secondary data are used to describe the properties of the device (UE 10 or Second Network/Entity 15/16) being connected to communicate with a network destination (Network 12 or Service Provider 17). Prelim. Resp. 7 (citing Ex. 1009, 4:16–53; Pachamanov Decl. ¶ 51). In both cases, the information about the properties of the UE and the second network or

second entity “preferably relates to availability information.” *Id.* (citing Ex. 1009, 4:48–49). Patent Owner quotes from the Petition as confirming that “*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.* at 9 (citing Pet. 15). Patent Owner argues that in both cases, the information “about the properties,” including “existence, location, and availability,” of the device is used for “establishment and control of connections, and with management, in a telecommunications network,” and therefore is signalling data. *Id.* at 7–10 (citing Ex. 1009, 1:59–2:24, 4:41–47, 5:10–12, 5:29; Pachamanov Decl. ¶¶ 52–57).

In addition, Patent Owner cites a statement in Krco that its goal is to “enhance the possibility to build 3rd party services” by “providing a standardized interface for external entities to reach signalling information.” Prelim. Resp. 10 (citing Ex. 1009, 3:14–16; Pachamanov Decl. ¶ 58). Patent Owner argues that, given that the “external entity” referred to is the M2M Service Provider, and given that it is the secondary data that the Service Provider reaches, Krco “expressly teaches” that the secondary data is signalling information. *Id.* at 10, 13–14 (citing Pachamanov Decl. ¶ 63).

Patent Owner also cites claim 1 of Krco as confirming that the same type of signalling data being conveyed for the UE is also being conveyed for the second entity/network:

[O]btain M2M *properties ... indicating an existence, location, and/or availability of the one or more M2M type networks or entities* [and] send[ing] the M2M properties to a core network of the cellular network that is configured to forward those M2M

properties to the M2M type service provider, by embedding the M2M properties within ***a message that indicates a location and/or availability of the UE*** and sending that message to the core network ***as part of a process to update the core network about the location and/or availability of the UE.***

Prelim. Resp. 10–11 (citing Ex. 1009, claim 1; Pachamanov Decl. ¶ 59) (emphasis added). Again, argues Patent Owner, this claim language shows that both the secondary data and the message in which it is embedded indicate location and availability, and thus are signalling data. *Id.* Patent Owner also provides a table which it argues shows that the information elements (IE) of the secondary data are a form of signalling data:

IE of Secondary Data (Ex. 1009, 5:55–63)	IE of Location Update Request (Ex. 1009, 5:4–14)
ID (4 bits)	Mobile identity
Type (2 bytes)	Update type
Location (4 bytes)	Location area identification

Prelim. Resp. 11 (citing Pachamanov Decl. ¶ 60). As shown in the table, both secondary data and the regular information of the Location Update Request indicate identity, type, and location, which Patent Owner characterizes as signalling data per its definition, “information specifically concerned with the establishment and control of connections, and with management, in a telecommunications network.” *Id.*

Patent Owner further challenges Petitioner’s assertion that the secondary data is not signalling data because “it is data about the M2M sensors, not signals.” Prelim. Resp. 12 (citing Pet. 37). Patent Owner argues that its definition of “signalling” (“[t]he exchange of information specifically concerned with the establishment and control of connections,

and with management, in a telecommunications network”) encompasses information about devices, such as mobile identity and location. *Id.* at 12–13 (citing Pachamanov Decl. ¶¶ 61–62).

*(2) Response to Petitioner’s reliance on the
Krcō/Benaouda/Ananthanarayanan
combination*

Patent Owner argues that it would not have been obvious to include Benaouda’s M2M measurement data in the secondary data of Krcō. Prelim. Resp. 16–34. First, Patent Owner argues that Petitioner is wrong to characterize Benaouda as disclosing transmitting M2M measurement data in a signalling message. *Id.* at 16–21. Patent Owner cites the language of claim 1 requiring a signalling message “of a message type specified for carrying signalling data for managing connections in the telecommunications network,” and argues that, although SMS messages are transmitted over signalling channels, they are not of a message type specified for carrying signalling data for managing connections. *Id.* at 17 (citing Pachamanov Decl. ¶¶ 66–67). Patent Owner explains that SMS was designed to exploit underutilized signalling channels by allowing user data (SMS messages) to be transmitted during periods of low signalling traffic, and SMS messages are of a type specified for carrying user data, not signalling data. *Id.* at 17–21 (citing Ex. 1008, 129–130; Ex. 1020, 47, Ex. 2008, 11:17–34; Ex. 2009, 3:1–15; Pachamanov Decl. ¶¶ 68, 71–73).

In response to Petitioner’s argument that SMS messages contain signalling data, such as SMS message type and destination address (discussed above at note 7), Patent Owner argues that “*any* message of *any* type transmitted in *any* telecommunications network would be a “signalling

message” using Petitioner’s criterion — for example, any message with a header, such as an IP packet, would qualify. Prelim. Resp. 19–20 (citing Ex. 1008-2, 253; Pachamanov Decl. ¶¶ 69–70).

Patent Owner further argues that, even if an SMS message could qualify as a signalling message, the Location Update Request of Krco is significantly different from the SMS messages used in Benaouda, and a combination of Krco and Benaouda would not have taught or suggested the non-signalling application data requirement. Prelim. Resp. 21–34. Patent Owner argues that one of ordinary skill would have at most modified Krco to transmit M2M measurement data using SMS, while still relying on the Location Update Request message (for example) to transmit the M2M signalling data (the secondary data of Krco). *Id.* at 22–23 (citing Pachamanov Decl. ¶ 75). Patent Owner argues that Petitioner’s assertion that the combination of Krco and Benaouda would have involved a simple substitution of one known element for another fails because the secondary data of Krco is required in order to inform the M2M provider about the existence, availability and location of the second entity/network. *Id.* at 23–24 (citing Pachamanov Decl. ¶ 76).

Nor, argues Patent Owner, would one of ordinary skill be motivated to add the M2M measurement data of Benaouda to the secondary signalling data of Krco. Prelim. Resp. 24. In response to Petitioner’s argument that this “could” be done, Patent Owner responds that the mere possibility that something could be done does not mean that it would have been obvious. *Id.* at 24–25 (citing *PersonalWeb Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 994 (Fed. Cir. 2017)). Patent Owner points out that Krco, after using the secondary data embedded in the Location Update Request message to

inform the M2M provider about the existence, availability and location of the second entity/network, then transmits the ongoing M2M measurement data generated by the second entity/network to the M2M provider over the cellular network using a normal established packet switching or circuit switching connection, not via the Location Update Request or other signalling message. *Id.* at 25–26 (citing Pachamanov Decl. ¶ 79). Patent Owner cites claim 1 of Krco, which provides for M2M properties indicating the existence, location, and/or availability of the M2M networks/entities to be embedded in a message that indicates a location and/or availability of the UE (*e.g.*, the secondary data embedded in the Location Update Request message), but *separately* provides for transmission of the M2M data collected by the M2M networks/entities via the cellular network, and explicitly requires that “*said M2M properties are different than said M2M data.*” *Id.* (citing Ex. 1009, 1:23–28, claim 1) (emphasis added).

Patent Owner also disputes Petitioner’s interpretation of “Ext” in the designation, “ExtDeviceInfo,” in Krco as being an abbreviation for “extended,” which Petitioner uses to infer that the secondary data “could be extended to include any sort of device information.” Prelim. Resp. 26 (quoting from Pet. 24). Rather, argues Patent Owner, one of ordinary skill would have recognized that “Ext” stands for “external,” referring to the fact that the secondary data includes the “[i]dentity of an *external* device” and the “[l]ocation of the *external* device.” *Id.* (citing Ex. 1009, 5:59–63; Pachamanov Decl. ¶ 80) (emphasis added).

Patent Owner disputes Petitioner’s assertion that adding M2M measurement data to the ExtDeviceInfo would have been regarded as an improved, more efficient system as conclusory given that Krco transmits the

M2M measurement data using conventional network transmission services, which Petitioner does not demonstrate as being less efficient than the asserted modification. Prelim. Resp. 29–31 (citing Pachamanov Decl. ¶¶ 83–85).¹⁰

For the reasons discussed above, Patent Owner also challenges Petitioner’s assertion that one of ordinary skill would have had a reasonable expectation of success of inserting Benaouda’s M2M measurement data into Krco’s Location Update Request. Prelim. Resp. 32–34 (citing Pachamanov Decl. ¶¶ 86–87). In particular, argues Patent Owner, the purpose, function, and capabilities of the signalling message of Krco is fundamentally different than the purpose, function, and capabilities of the SMS messages of Benaouda, which are designed to carry user data (e.g., M2M measurement data). *Id.* And while Benaouda teaches that its SMS message is suitable for transmitting M2M measurement data, Patent Owner argues, that does not mean that a Location Area Update or Routing Area request would be suitable for the transmission of that same data. *Id.*

¹⁰ Patent Owner further disputes Petitioner’s reliance on Ananthanarayanan. As a threshold matter, Patent Owner argues that reliance on Ananthanarayanan is inappropriate, given that the reference is not listed as part of Petitioner’s invalidity grounds. *Id.* at 1–5, 27, n. 7. Patent Owner further argues that the reference does not support Petitioner’s obviousness arguments, asserting that the reference is designed for a different purpose, using a different type of application data transmitted in a different type of message, is fundamentally different from the approach of Krco, and that Petitioner’s arguments are conclusory and unsupported by any articulated rationale with reasonable underpinnings. *Id.* at 27–28 (citing Pachamanov Decl. ¶¶ 81–82).

c) Analysis

Petitioner has not demonstrated a reasonable likelihood of proving that Krco alone, or considered in combination with Benaouda, would have disclosed, taught, or suggested the claim 1 requirement of “said received wireless signalling message having inserted in it non-signalling application data generated for a machine-to-machine function by the communication apparatus.”

*(1) Petitioner’s reliance
on Krco alone*

Petitioner has not demonstrated a reasonable likelihood of proving that Krco’s secondary data itself is “non-signalling application data.” As discussed in Section III.C above, we agree with Patent Owner’s proposed definition of “signalling” as referring to “[t]he exchange of information specifically concerned with the establishment and control of connections, and with management, in a telecommunications network,” and thus “non-signalling data” refers to data that is not specifically concerned with the establishment and control of connections, and with management, in a telecommunications network. The record shows that the secondary data of Krco deals with establishment and control of connections between the M2M second network/entity and the M2M service provider, and therefore is not non-signalling data.

As stated in Krco, “[t]he main purpose of the UE is to provide information or data collected by the second network 15 or entity 16 to the service provider 17, but in order for the service provider 17 to be aware of the status of the second network 15 or entity 16 purposely built availability schemes . . . have been designed.” Ex. 1009, 3:64–4:2. Krco’s “availability scheme” is to embed the secondary data in a Location Update Request

message (or Routing Area Update Request message), which secondary data “comprises information about the properties of the second network or entity,” and which “preferably relates to availability information.” *Id.* at 4:24–25, 4:46–49, 5:37–38. The “information or data collected by the second network 15 or entity 16” referred to is non-signalling data. But the secondary data in the Location Update Request message, which is the focus of Petitioner’s challenge, and which makes the service provider aware of the status of the second network/entity, is signalling data. The non-signalling data is the M2M measurement data that is transmitted using standard network techniques, via packet or circuit switching protocols, *after* the secondary signalling data is used to inform the service provider of the status of the second network/entity. Pachamanov Decl. ¶¶ 79, 83.

Significantly, the preexisting “information elements” of the Location Area Update message, which are unquestionably signalling data, are correspondingly used to “inform the third network 12 about the properties of the UE.” *Id.* at 4:39–40. This identical characterization of the secondary data and the normal information elements of the Location Update Request message strongly supports a determination that the secondary data is also signalling data.

Indeed, we agree with Patent Owner that the statement in Krc0 that its goal is to “enhance the possibility to build 3rd party services” by “providing a standardized interface for external entities to reach *signalling* information” is an explicit characterization of the secondary data as signalling information. Prelim. Resp. 10 (emphasis added). Likewise, we agree that claim 1 of Krc0 supports this determination, given that it requires “M2M properties . . . indicating an existence, *location*, and/or *availability* of the

one or more M2M type networks or entities,” that are “embedd[ed] . . . within a message that indicates a *location and/or availability* of the UE.” Ex. 1009, claim 1 (emphasis added). As Patent Owner explains, this again characterizes the secondary data in the same way as information that is indisputably signalling data. Prelim. Resp. 10–11.

Further confirming this determination, the specific information elements of the secondary data track corresponding elements of the standard Location Update Request message, as shown in the table presented by Patent Owner (reproduced above at page 24). In addition, we are not persuaded by Petitioner’s argument that the secondary data is non-signalling data because it is data about sensors, not signals. Pet. 37. As Patent Owner correctly observes, the identity and location of the M2M devices is a necessary component of the information concerned with the establishment and control of the connection of the M2M devices to the M2M Service Provider, and thus is part of the signalling data. Prelim. Resp. 12–13.

In its Reply To Patent Owner’s Authorized Brief Addressing Petitioner’s Proposed Claim Constructions In The Parallel Litigation, Petitioner asserts that, even under Patent Owner’s proposed construction, “Krc’s secondary data simply notifies a service provider of a sensor’s existence; it does not, however, establish or manage a connection for a sensor or any other device.” Paper 12, 2. However, as discussed above, the sensors are connected to the service providers via the network in order to transmit the M2M measurement data, and the secondary data is used in order to make that connection.

*(2) Petitioner’s reliance on the
Krc0/Benaouda/Ananthanarayanan
combination*

Petitioner also has not demonstrated a reasonable likelihood of proving that it would have been obvious to include Benaouda’s M2M measurement data in the secondary data of Krc0. Petitioner does not acknowledge with the fact that Krc0 already discloses the transmission of M2M measurement data using standard network techniques, via packet or circuit switching protocols, and so one of ordinary skill would not have perceived any need to use, or advantage to using, signalling messages to transmit the M2M measurement data. Pachamanov Decl. ¶¶ 79, 83. As stated in Krc0, “[t]he main purpose of the UE is to provide information or data collected by the second network 15 or entity 16 to the service provider 17.” Ex. 1009, 3:64–66. That this “main purpose” is accomplished by transmitting the M2M measurement data using standard internet techniques is strongly suggested at least by claim 1 of Krc0, which in addition to requiring the secondary data to be embedded on a signalling message, *separately* provides for transmission of the M2M data collected by the M2M networks/entities via the cellular network, and explicitly requires that “said M2M properties [i.e., the secondary data] *are different than* said M2M data.” Ex. 1009, claim 1 (emphasis added).

Krc0 uses existing signalling messages as part of the standard “registration procedure” to inform the network about the properties of the UE, and connect it to the network. Ex. 1009, 4:23–31, 4:39–40, 5:35–36. What “particularly characterizes” Krc0 is that it adds to that standard registration procedure the ability to also connect the M2M devices to the M2M service providers by informing the M2M service providers about the

existence, location and availability of M2M sensors or other devices. *Id.* at 2:21–24, 2:36–40, 4:46–49. This is done by embedding “secondary data,” providing information about the properties of the M2M devices, such as location, identity, type and availability, in a signalling message such as a Location Area Update Request message. *Id.* at 4:44–46, 5:37–63. But after that initial step, the subsequent transmission of M2M measurement data is handled via standard non-signalling data channels. Pachamanov Decl.

¶¶ 79, 83.

Likewise, Benaouda does not use signalling messages to transmit the M2M measurement data — rather, it uses standard SMS messaging to transmit M2M measurement data. Pachamanov Decl. ¶¶ 68–72. We agree with Patent Owner that Petitioner’s rationale for characterizing SMS as a signalling message would equally apply to practically any message with a header, and thus is overly broad. Prelim. Resp. 19–20. Although SMS takes advantage of unused signalling channels, it is not itself a signalling message. Ex. 1008, 129–130; Ex. 2008, 11:17–34; Ex. 2009, 3:1–15. As stated in Benaouda, “[r]ecently there have been proposals to provide M2M communications using the SMS service.” Ex. 1010 ¶ 5. And Krco also suggests that the standard way to transmit M2M measurement data was via SMS. Ex. 1009, 3:64–4:2.

In sum, we do not find any teaching or suggestion in either Krco or Benaouda to transmit the M2M measurement data via a signalling message. Although it may have been technically feasible to transmit M2M measurement data in the signalling message of Krco, there would have been

no motivation to do so. Neither Krco nor Benaouda provide any motivation for transmitting M2M measurement data in a signalling message.¹¹

d) Claim 17 Conclusion

Accordingly, for the reasons set forth above, we determine that the Petition does not demonstrate a reasonable likelihood that Petitioner would prevail in establishing that claim 17 is unpatentable under 35 U.S.C. § 103(a) over the combination of Krco and Benaouda.

4. Claims 1–2, 9–16, and 18–25

The remaining challenged independent claims each include the above-discussed requirement of “having inserted in it non-signalling application data generated for a machine-to-machine function” (claims 1 and 15), or a commensurate limitation (claim 21), and claims 2, 9–14, 16, 18–20, and 22–25 depend from claims 1, 17, 17, or 21. Therefore, for the same reasons as discussed above for claim 17, we determine that the information presented in the Petition does not demonstrate a reasonable likelihood that Petitioner will prevail in establishing that claims 1–2, 9–16, and 18–25, are unpatentable under 35 U.S.C. § 103 over the combination of Krco and Benaouda.

¹¹ Regarding Petitioner’s reliance on Ananthanarayanan (which is not listed as part of Petitioner’s invalidity grounds), we agree that the reference does not support Petitioner’s obviousness arguments, because it is designed for a different purpose, using a different type of application data transmitted in a different type of message, and is fundamentally different from the approach of Krco. *Id.* at 27–28.

E. Alleged Obviousness of Claims 2–6 over Krco, Benaouda, and TS 24.008

Petitioner challenges claims 2–6 as obvious over the combination of Krco, Benaouda, and TS 24.008. Pet. 63–73. TS 24.008 is not relied on for the limitation, “having inserted in it non-signalling application data generated for a machine-to-machine function.” *See id.* Accordingly, given that claims 2–6 depend from independent claim 1, for the reasons set forth above, we determine that the Petition does not demonstrate a reasonable likelihood that Petitioner would prevail in establishing that claims 2–6 are unpatentable under 35 U.S.C. § 103(a) over the combination of Krco, Benaouda, and TS 24.008.

IV. CONCLUSION

After considering the evidence and arguments presented in the Petition and the Preliminary Response, Petitioner has not established a reasonable likelihood of prevailing on its assertion that at least one claim of the '098 patent is unpatentable.¹² Accordingly, we do not institute an *inter partes* review.

V. ORDER

In consideration of the foregoing, it is hereby:
ORDERED that the Petition is denied and no *inter partes* review is instituted.

¹² Given our determination, it is not necessary to address Patent Owner's assertion that the Board should exercise its discretion to deny institution pursuant to *Apple Inc. v. Fintiv, Inc.* Prelim. Resp. 61–67.

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