UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner

IPR2025-01258
U.S. Patent No. 9,622,032

PETITION FOR *INTER PARTES* REVIEW
UNDER 35 U.S.C. § 312 AND 37 C.F.R. § 42.104

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CLAIM LISTING

Claim 1	
[1.0]	A method associated with a provider of presence related services and a mobile station that stores in a memory first checking data and uses the first checking data to determine whether or not a defining signal received from a radio communication defining device is a distinctive defining signal, the distinctive defining signal at least partly defines a special area by its coverage, the method comprising:
[1.1]	one or more servers of a provider of presence related services receiving from the mobile station via a mobile telephone network an updating signal that identifies the mobile station's presence in the special area, the provider of presence related services being different than the mobile telephone network; and
[1.2]	storing in the one or more servers a parameters database having an operating parameter whose value is determined at least in part by the updating signal received from the mobile station; and
[1.3]	sending from the one or more servers to the mobile station second checking data different from the first checking data to modify the special area.
Claim 2	
[2.0]	The method according to claim 1, wherein the operating parameter is a tariff flag or a service flag that enables or disables a special tariff or a service for the mobile station.
Claim 3	
[3.0]	A method associated with the use of a mobile station that stores and uses checking data to determine whether or not a defining signal received from a radio communication defining device is a distinctive defining signal, the distinctive defining signal at least partly defines a special area by its coverage, the method comprising:

[3.1]	sending from the mobile station to at least one server of a provider of presence related services an updating signal via a mobile telephone network that identifies the mobile station's presence in the special area, the updating signal being indicative of the mobile station's presence in the special area, the provider of presence related services being different than the mobile telephone network; and
[3.2]	receiving in the mobile station from the at least one server second checking data different from the first checking data to modify the special area.
Claim 4	
[4.0]	The method according to claim 3, further comprising the mobile station retransmitting the updating signal upon not receiving the acknowledgement from the at least one server.
Claim 5	
[5.0]	The method according to claim 1, further comprising: determining when the mobile station is switched off; and upon determining that the mobile station is switched off setting the value of the operating parameter to an initial value.
Claim 6	
[6.0]	The method according to claim 3, receiving in the mobile station from the at least one server of the provider of presence related services an acknowledgement of a reception of the updating signal.

I. INTRODUCTION

U.S. Patent No. 9,622,032 (the "'032 patent," Ex.1001) discloses and claims methods for providing location-based services or tariffs to a mobile station when it is in a special geographic area. The '032 patent was erroneously allowed because the prior art allegedly did not disclose sending *second checking data* (e.g., base station identification code(s)) different from *first checking data* to modify a special geographic area defined by a list of such codes or a location service provider being different than the mobile telephone network.

But it was well known for location-service providers to send different identification codes to define and update special areas, for the location-service providers to be different than the mobile networks, and the mobile station to monitor its location based on its stored identification codes. The prior art has many examples of location-service providers existing outside of mobile networks, maintaining identification codes that define special areas, and providing new and changed base-station identifiers to mobile stations. Thus, the '032 patent merely claims concepts already known in the prior art.

Accordingly, pursuant to 35 U.S.C. §§311, 314(a), and 37 C.F.R. §42.100, Apple Inc. ("Petitioner") respectfully requests that the Board review and cancel as unpatentable under 35 U.S.C. §103 claims 1-6 ("Challenged Claims") of the '032 patent.

II. GROUNDS FOR STANDING

Petitioner certifies the ’032 patent is eligible for IPR and Petitioner is not barred or estopped from requesting IPR challenging the patent claims. 37 C.F.R. §42.104(a).

III. NOTE

Petitioner cites to exhibits’ original page numbers. **Emphasis** in quoted material has been added. Claim terms are presented in *italics*.

IV. TECHNICAL BACKGROUND

See Ex.1003 ¶¶31-32.

V. SUMMARY OF THE ’032 PATENT

The ’032 patent “relates to a method for monitoring a mobile station presence in a special area.” Ex.1001 (’032 patent), 1:25-26. The method determines whether a mobile station is in a special area using “checking data” stored in the mobile station, rather than in a “radio communication defining device” (e.g., “base station of a mobile telephone network”). Ex.1001, 2:53-64, 15:31-32.

A mobile station receives “defining signals” from the base station. Ex.1001, 15:27-32. The defining signal includes an identifier of the base station that enables a determination whether the mobile station is present in a “special area” (defined by the coverage area of a particular set of base stations) in which services/tariffs are to be provided. Ex.1001, 15:59-16:3, 17:7-14. Fig. 1 illustrates a special area (104) comprising the coverage areas of three base stations (105) and a mobile station (100) in the special area (104):

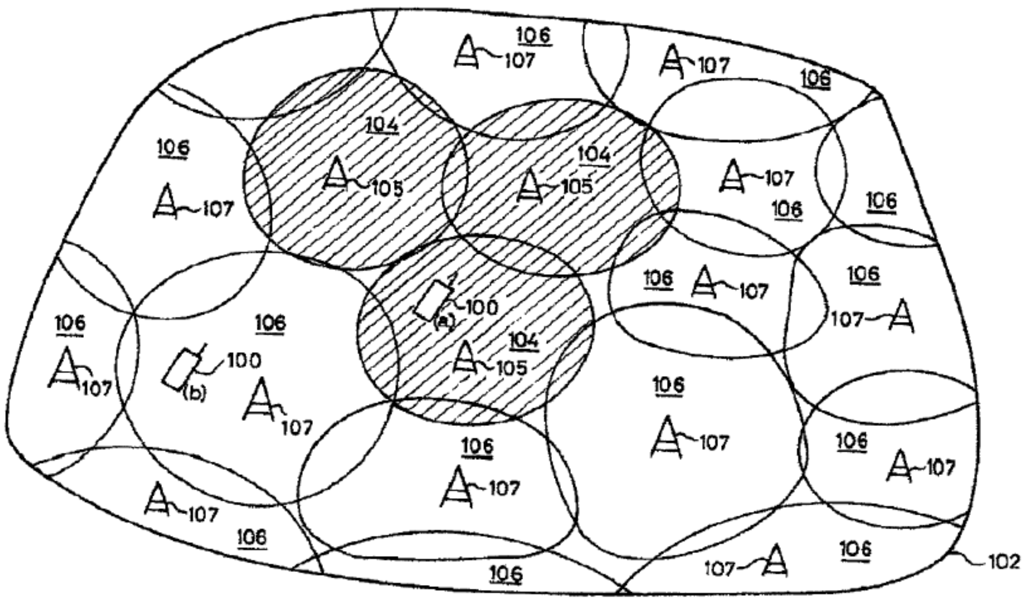


FIG_1

’032 patent, Fig. 1

The mobile station monitors for a defining signal. Ex.1001, 15:38-50. In response to receiving the defining signal, the mobile station determines it is in a special area if the identification code in the signal equals locally stored checking data. Ex.1001, 6:62-7:7; *see also* 15:51-58. If within one, “the mobile station sends an updating signal to the mobile telephone network,” which provides the updating signal to a server that is operated by a provider different from that of the network. Ex.1001, 16:14-59; *see* 4:34-42, 11:56-61.

The server has a "parameters database [that] associate[s] each special area defined with the mobile stations whose presence in such special area is monitored," with special tariffs/services available or not depending on presence in a special area. Ex.1001, 12:13-25. Manipulation of the database's "operating parameters" includes activating or deactivating flags. Ex.1001, 12:26-31; *see also* 17:20-27. Predetermined services are then enabled or disabled for the mobile station. Ex.1001, 17:44-47. The special areas can be modified by the server with new "checking data" sent to the mobile station. Ex.1001, 14:26-57; Ex.1003 ¶¶33-41.

VI. PROSECUTION HISTORY

The Examiner rejected pending independent claim 1 because Vimpari (Ex.1010) discloses "*upon determining that the mobile station is switched off setting the value of the operating parameter to an initial value*." Ex.1002 (Prosecution History), 200-202. Instead of traversing this use of Vimpari[1], Applicant removed these limitations and added them to a new dependent claim ([5.0]). Ex.1002, 244-245 (amendments), 247-249 (responding to rejections without addressing Vimpari).

Applicant added "*sending from the one or more servers to the mobile station second checking data different from the first checking data to modify the special*

[1] Vimpari is used in Ground 3.

area" ([1.3], [3.2]) to both independent claims. Ex.1002, 244-245. The Examiner then allowed the claims and identified the added limitation and "*the provider of presence related services being different than the mobile telephone network*" ([1.1], [3.1]) as the reasons for allowance. Ex.1002, 262.

VII. PRIORITY DATE OF THE '032 PATENT

The '032 patent claims foreign priority, through a chain of continuations, to a European patent application filed March 28, 2006. All references relied on in the Grounds of this Petition qualify as prior art as of this earliest possible priority date, and thus this Petition does not challenge the propriety of the priority claim. Petitioner does not concede that the '032 patent is entitled to its claimed priority and reserves the right to challenge its priority claim in this and all other proceedings.

VIII. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art ("POSITA"), as of March 28, 2006, would have been knowledgeable and familiar with the use of location determination in the provision of location-based services in a wireless communications network (*e.g.*, a cellular telephone or Wi-Fi network). Such a POSITA would have had a bachelor's degree in electrical engineering, computer science, computer engineering, or a related field, and two years of experience relating to research, design, and development of wireless communications networks. Lack of professional experience may be remedied by additional education, and vice versa. Ex.1003 ¶¶24-26.

IX. CLAIM CONSTRUCTION

Claim terms in IPRs are construed according to their "ordinary and customary meaning" to POSITAs. 37 C.F.R. §42.100(b). Petitioner submits that, for the purposes of this proceeding and the grounds presented herein, no claim term requires express construction. Ex.1003 ¶42; *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

X. RELIEF REQUESTED AND THE REASONS FOR THE REQUESTED RELIEF

Petitioner asks that the Board institute a trial for *inter partes* review and cancel the Challenged Claims in view of the analysis below.

XI. IDENTIFICATION OF HOW THE CLAIMS ARE UNPATENTABLE

A. Challenged claims

Petitioner challenges claims 1-6 of the '032 patent, of which claims 1-4 and 6 are asserted in the co-pending litigation.

B. Statutory grounds for challenges

Grounds	Claims	Basis (pre-AIA §103)
#1	1-3	Putkiranta, Granberg, and Kraufvelin
#2	4, 6	Putkiranta, Granberg, Kraufvelin, and Duan
#3	5	Putkiranta, Granberg, Kraufvelin, and Vimpari
#4	1-3, 5	Nam and Noldus
#5	4, 6	Nam, Noldus, and Duan

U.S. Patent 8,615,256 (Ex.1005, "**Putkiranta**"), filed October 17, 2000, and issued December 24, 2013, is prior art under §102(e).

U.S. Patent 6,122,510 (Ex.1037, "**Granberg**"), filed November 4, 1997, and issued September 19, 2000, is prior art under §§102(a), (b), and (e).

U.S. Pub. 2006/0135174 (Ex.1006, "**Kraufvelin**"), filed as PCT/EP2007/052939 on October 3, 2003, in English, designating the U.S., and was published June 22, 2006, is prior art under §102(e).

Canadian Pub. CA2523595 (Ex.1015, "**Duan**"), published on December 23, 2004, in English, is prior art under §§102(a)-(b).

International Pub. WO2000/027152 (Ex.1010, "**Vimpari**"), filed on October 29, 1999, in English, designating the U.S. and published May 11, 2000, is prior art under §§102(a)-(b).

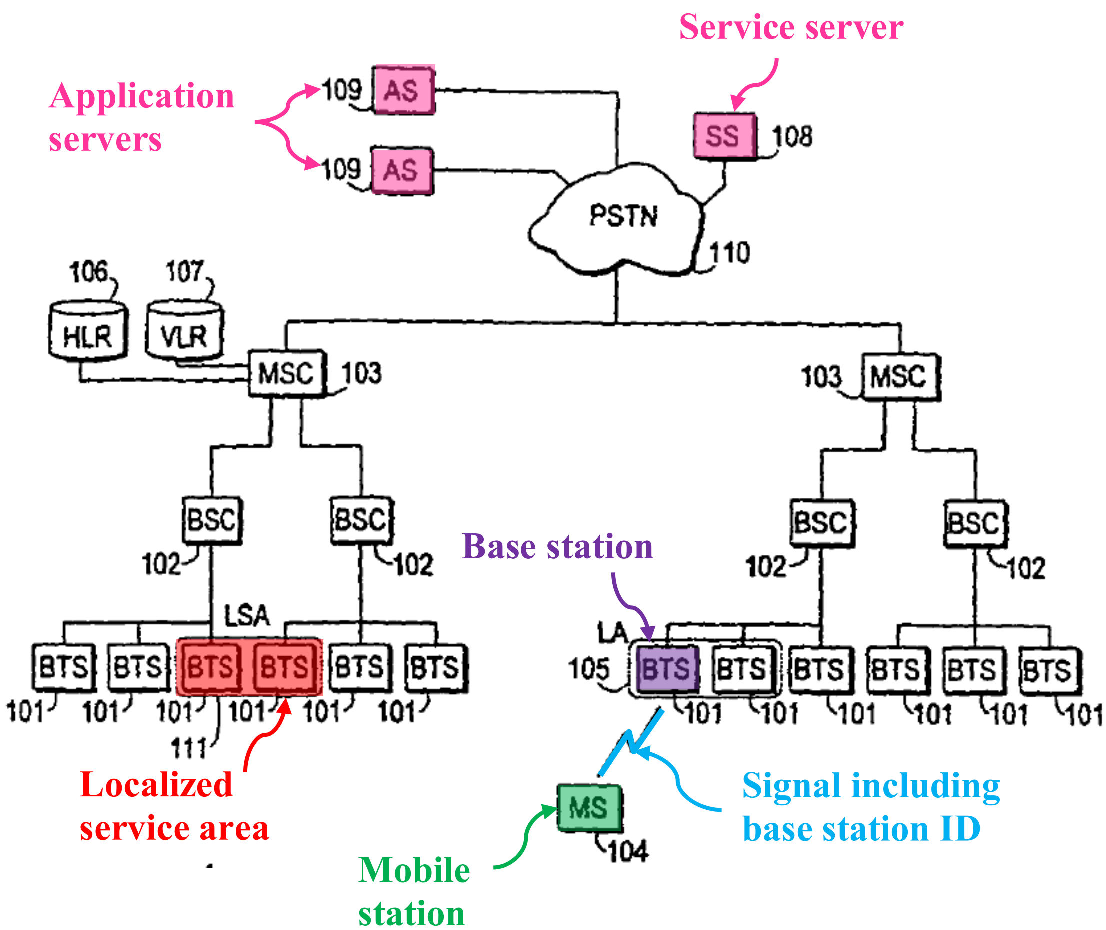
U.S. Pub. 2006/0014531 (Ex.1013, "**Nam**"), filed on December 29, 2004, and published on January 19, 2006, is prior art under §§102(a) and (e).

U.S. Pub. 2010/0167725 (Ex.1038, "**Noldus**"), filed on November 18, 2009, as a national-stage entry of PCT/EP2005/011713, filed on October 31, 2005, in English and designating the U.S., published on July 1, 2012, and is prior art under §102(e).

C. Ground 1: Claims 1-3 are obvious over Putkiranta, Granberg, and Kraufvelin.

1. Putkiranta

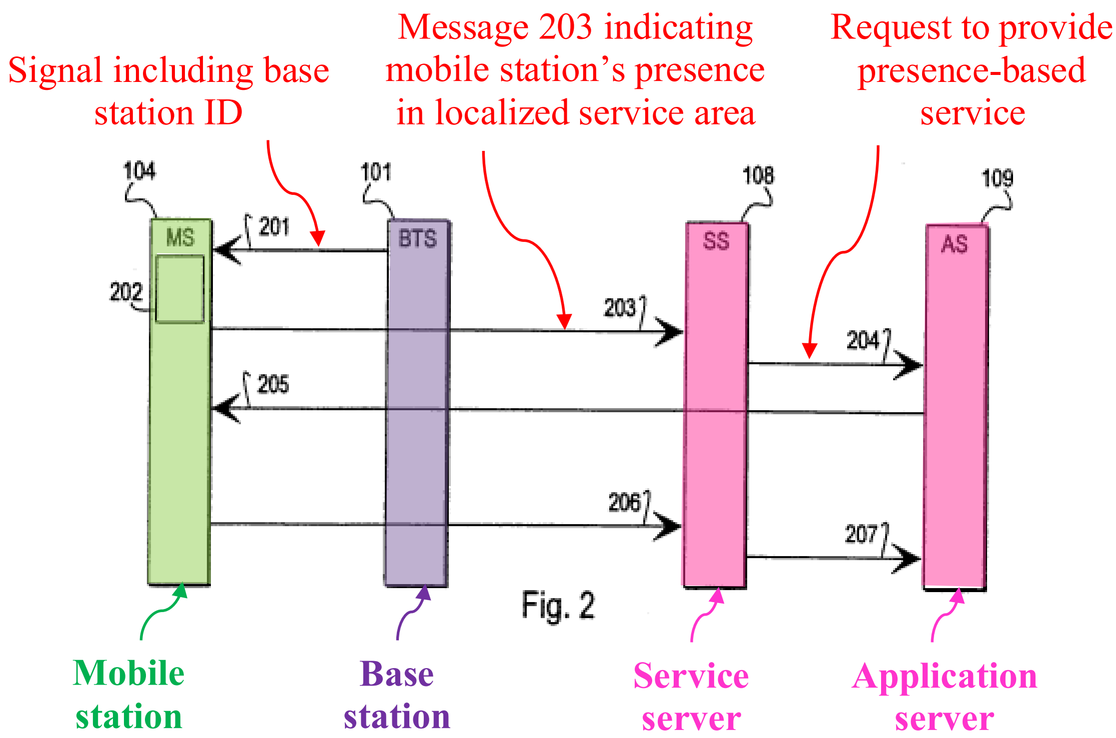
Putkiranta describes "a method…for making services provided by a network available to the user in various ways depending on the location of the user." Ex.1005, 2:9-12. Fig. 1 shows the "cellular radio system" (Ex.1005, 4:13):



Ex.1005, Detail of Fig. 1 (annotated)

Putkiranta describes a "localized service area" as a geographic area in which certain services are to be provided to mobile stations (MS) 104 currently located in that area. Ex.1005, 3:8-15. The localized service area can be defined as the geographic area covered by a set of base stations (BTS) (e.g., a set of "cells"). Ex.1005, 4:35-51.

As shown in Putkiranta's Fig. 2 below, when a mobile station receives a signal from a base station including its base-station identifier (indicating the mobile station is located within the base station's coverage area), the mobile station determines, based on a stored "list of the identifiers of the base transceiver stations the cells of which make a particular localized service area," whether the base station is part of a localized service area. Ex.1005, 5:3-8, 6:3-6. If so, the mobile station sends a message 203 to the service server indicating that it has "arrived in a certain localized service area." Ex.1005, 6:3-12. Upon receipt of this message, "the service server reads from its memory which services should be offered to the mobile station in that localized service area and sends a service request 204 to the appropriate application server." Ex.1005, 6:27-30. In response to the service request "the application server provides the mobile station with a service," such as, for example, "call pricing or prioritization," "routing of incoming email messages to a mobile station instead of the user's desktop workstation," or "activation or inactivation of automatic call transfer and/or voice mail service." Ex.1005, 6:38-52. Putkiranta's Fig. 2 shows this process (Ex.1003 ¶¶46-48):



Ex.1005, Fig. 2 (annotated)

2. Granberg

Granberg describes a "mobile communications network 10" that includes a "database that stores and manages subscriptions" for subscriber devices (*e.g.*, cell phones). Ex.1037, 5:38-40, 6:3-4. Granberg states that the database "stores a number of subscriber records," each including "individual subscriber data such as MSISDN, IMSI, current VLR location, and supplementary services data." Ex.1037, 7:40-44. Granberg explains that "each subscriber record may include one or more network-specific indicators, *e.g.*, one or more flags, corresponding to one or more network-specific services." Ex.1037, 7:45-48. "Each network-specific indicator is then set or activated when that subscriber is to receive a corresponding network-based service in a network that supports that network-based service." Ex.1037, 7:49-53. Or, "[i]f that subscriber is not to receive the service" in the network in which it is located, "the flag is reset or otherwise deactivated." Ex.1037, 7:53-54.

Granberg explains that "when a mobile station enters into a visiting location or service area," a request is sent for data about the roaming mobile station from the mobile's home location register (HLR), which triggers the HLR's updating of the "network-specific indicators" to activate or deactivate "network-based services" as appropriate for the particular network where the mobile station is located. Ex.1037, 5:61-64, 7:34-54, 8:11-22; Ex.1003 ¶¶49-50.

3. Kraufvelin

Kraufvelin describes a method similar to Putkiranta's in which a mobile station notifies the network when it is within the coverage area of a base station (e.g., when it receives a signal including the base station's identifier) included within an "area of interest" (similar to Putkiranta's "localized service area"). Ex.1006, Abstract, ¶60. Kraufvelin further explains that, because "operators tune their networks," "a cell-ID may no longer correspond with the intended geographic area" set by the service provider. Ex.1006 ¶108. Thus, Kraufvelin describes verifying the cell-ID returned by the mobile station "to ensure that the cell is still within the intended geographical area…by comparing the current cell-IDs of the intended geographical area stored in the network with the cell-ID returned response from the terminal." Ex.1006 ¶109. If the cell-ID does not match the intended geographical area, then "updated cell-ID information may be provided to the [mobile] terminal." Ex.1006 ¶111; Ex.1003 ¶51.

4. Reasons to combine Putkiranta, Granberg, and Kraufvelin

A POSITA would have been motivated to combine the teachings of Putkiranta, Granberg, and Kraufvelin for several reasons. Ex.1003 ¶52. Combining Granberg's implementation details for maintaining records in a database that tracks mobile stations with Putkiranta's service-profile teachings would have been obvious, beneficial, and predictable. Ex.1003 ¶52. Putkiranta describes storing service profiles for mobile stations in a service server, leaving implementation details up to a POSITA, motivating a POSITA to turn to Granberg's well-known database teachings. Ex.1003 ¶52. Further, combining Kraufvelin's implementation details for sending updated cell identifiers with Putkiranta's location-based service teachings would have also been obvious, beneficial, and predictable. Ex.1003 ¶52.

a) Putkiranta, Granberg, and Kraufvelin are analogous art to the '032 patent

As a threshold matter, Putkiranta, Granberg, and Kraufvelin are analogous art because they are in the same field of endeavor as the '032 patent, namely monitoring the presence of a mobile station in a particular area. Ex.1003 ¶53; *see, e.g.*, Ex.1001, 1:25-29; Ex.1005, 1:16-20 (using information concerning the location of a mobile station for providing services); Ex.1037, Abstract (selectively providing services to mobile stations when roaming on networks); Ex.1006, Abstract (monitoring the presence of mobile stations relative to area of interest).

Moreover, Putkiranta, Granberg, and Kraufvelin are reasonably pertinent to problems addressed in the '032 patent. Ex.1003 ¶¶54-55. A problem the '032 patent attempts to solve is how to add special areas without modifying the base stations broadcasting in those areas. Ex.1001, 2:6-11. Putkiranta teaches the mobile stations storing information to determine their own locations, rather than the network making the determination. Ex.1005, 2:9-18. Granberg provides another solution, using databases "to more efficiently store information for network-specific information supplementary services for large numbers of mobile subscribers" and "efficiently administer and update network-specific supplementary services" for those subscribers. Ex.1037, 3:57-63, 4:10-29. Kraufvelin also provides a solution that overcomes problems with location-based services including, for example, overloading communication-network resources, by sending information to the mobile station so it may determine when it is in an area where location-based services are provided. Ex.1006 ¶¶12-13, 55-0061.

b) Granberg

A POSITA would have been motivated to turn to Granberg's database teachings for details when implementing Putkiranta's service-server teachings.

Ex.1003 ¶56.

Putkiranta discloses a service server that "maintain[s] information about which mobile stations are in which localized service areas and which services should be offered to them" in a "service profile" for each user. Ex.1005, 6:22-25, 6:42-44. A database was a well-known, straightforward way to store and maintain Putkiranta's service profiles associated with mobile stations, including mobile-station identity, localized service areas, and services offered in each localized service area. Ex.1003 ¶¶57-58 (citing Ex.1066 (Fundamentals of Database Systems), 4-5; Ex.1067 (Introduction to Databases), 4; Ex.1007 (Andersson), 2:24-39, 4:61-5:4; Ex.1068 (Liao), 3). Granberg provides examples of these well-known database structures, including storing "network-specific indicators, e.g., one or more flags, corresponding to one or more network-specific services" that are "set or activated" when the mobile station is supposed to receive that service or "reset or otherwise deactivated" if not. Ex.1037, 7:45-54; Ex.1003 ¶59.

Applying Granberg's database teachings is simply a practical and conventional way to implement profile-management functionality with Putkiranta's service-server teachings. Ex.1003 ¶60. Both references operate within the context of cellular networks, where subscriber profiles are routinely maintained in structured databases—thus, they are compatible. Ex.1003 ¶61. The use of a database structure like Granberg's to store location-based service data is a predictable and routine implementation detail for any system that manages per-user, location-dependent services/tariffs, like Putkiranta. Ex.1003 ¶61. Implementing Granberg's predictable and routine databases facilitates efficient verification and troubleshooting of service configurations in Putkiranta's system. *See* Ex.1037, 7:44-54; Ex.1039 (O'Toole), 16:38-42 (describing the utility of a "status table" for "troubleshooting" network services); Ex.1003 ¶61; *see also KSR Int'l v. Teleflex Inc.*, 550 U.S. 398, 417 (2007) (finding obviousness when a known technique "would improve similar devices in the same way").

A POSITA would have had a reasonable expectation of success using Granberg's database teachings with Putkiranta's service-profile and service-server teachings. Ex.1003 ¶62. Putkiranta's service server would have included a mechanism to store and manage the service profiles that includes location-based service rules. *See* Ex.1005, 6:22-25, 6:42-44; Ex.1003 ¶62. Granberg's database teachings provide a well-understood, standardized way to store and manage such profiles, including fields for flags regarding network-specific services. Ex.1037, 4:10-29, 6:3-15, 7:45-54; Ex.1003 ¶63. Granberg teaches doing so to provide information regarding the mobile station's configured services when visiting different network areas. Ex.1037, 5:61-64; Ex.1003 ¶63.

Moreover, implementing Granberg's database-structure teachings with Putkiranta's service-server teachings leverages established database practices for managing subscriber data in telecommunications networks. Ex.1003 ¶64. The service server's function of determining which services to offer based on location naturally fits with the use of a profile database that includes allowed locations and service flags. Ex.1003 ¶64. Thus, a POSITA would have been motivated to combine Granberg with Putkiranta as a straightforward implementation for managing service profiles. Ex.1003 ¶64.

c) Kraufvelin

A POSITA would have been further motivated to implement a process, based on Kraufvelin's teachings, by which Putkiranta's service server updates the cell identifiers stored in the mobile station. Ex.1003 ¶65. Doing so would ensure the mobile station has an up-to-date and accurate list of cell identifiers to compare against, even as the network changes, improving the reliability and accuracy of Putkiranta's location-based services. Ex.1003 ¶65.

Putkiranta teaches storing a list of "base station specific identifiers…in the mobile station." Ex.1005, 5:1-8. Further, Putkiranta teaches that, in some cases, when the network changes the base-station identifiers associated with a particular area (*e.g.*, by adding more base stations), an updated list of identifiers is sent to the mobile station to accommodate the changes. Ex.1005, 5:14-22. But Putkiranta leaves implementation details for this process up to POSITAs. Ex.1003 ¶66.

A well-known way to provide such updates was to send updated lists from the source (e.g., Putkiranta's service server) to the mobile stations. Ex.1003 ¶67. Kraufvelin confirms this, disclosing a method of providing location services to a mobile station. Ex.1006 ¶¶46 (nodes providing services), 54-61 (a list of Cell IDs for a geographic area); Ex.1003 ¶¶68-69. As cell identifiers change, Kraufvelin teaches sending updated cell IDs to the mobile stations to update in their local memory. Ex.1006 ¶¶108-111. Skilled artisans would have employed Kraufvelin's approach because it provides a straightforward way to update cell identifiers, consistent with Putkiranta's "simplest case" that stores cell identifiers in the mobile station's memory. Ex.1005, 5:3-6; Ex.1003 ¶69.

A POSITA would have reasonably expected success implementing Kraufvelin's teachings with Putkiranta's service server teachings. Ex.1003 ¶70. Kraufvelin and Putkiranta are compatible–both are directed towards maintaining cell identifiers that define special geographic areas and providing services therewith. Ex.1003 ¶70. Further, Putkiranta discloses the mobile station and the service server communicating with each other via a network. Ex.1005, 4:13-34, 6:6-21, 7:17-20. Similarly, Kraufvelin teaches network elements (e.g., LCS node, gateway mobile location center (GMLC)) communicating location information with a mobile station. Ex.1006 ¶¶60, 107-109.

Moreover, Kraufvelin teaches "the elements of the location service functionality may be implemented **anywhere** in the telecommunications system," "in any appropriate entity." Ex.1006 ¶46; *see also* ¶¶58-59. Thus, a POSITA would have expected success when implementing Kraufvelin's teachings of sending updated cell identifiers with Putkiranta's teachings of the service server and mobile station communicating with each other, so that the service server can update the list of identifiers that define each localized service area. Ex.1003 ¶71.

5. Claim 1

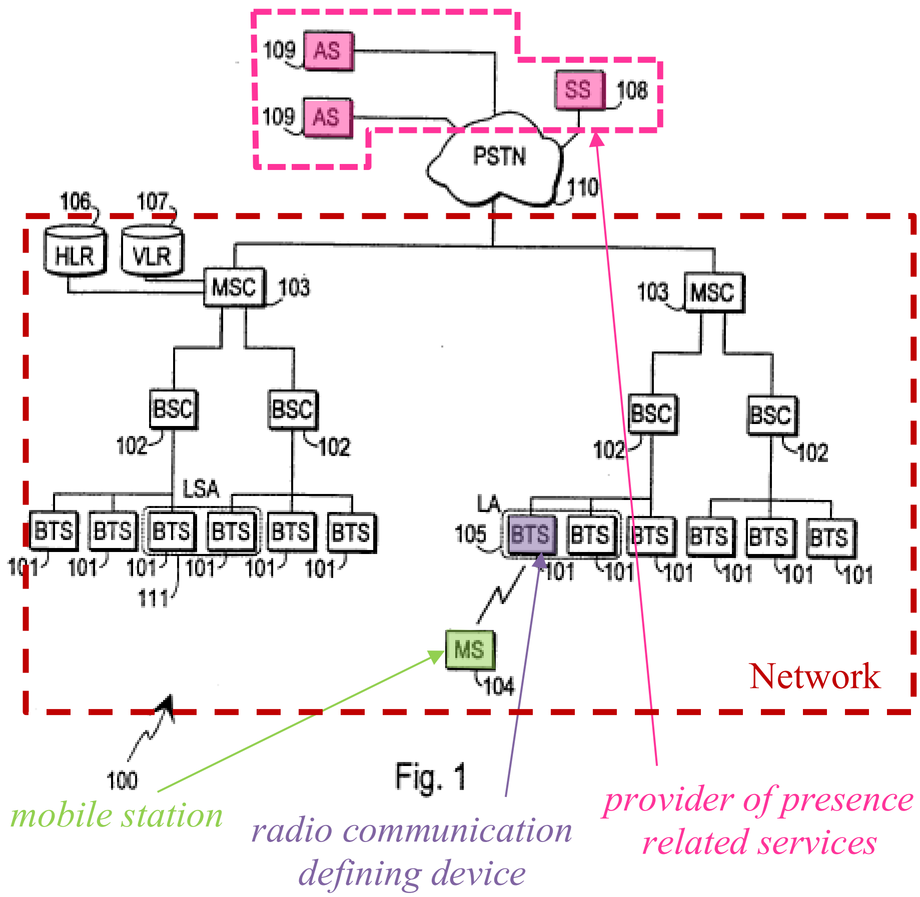
[1.0] ***A method associated with a provider of presence related services and a mobile station that stores in a memory first checking data and uses the first checking data to determine whether or not a defining signal received from a radio communication defining device is a distinctive defining signal, the distinctive defining signal at least partly defines a special area by its coverage, the method comprising:***

To the extent the preamble ([1.0]) is limiting, it is met, in the combination, by Putkiranta.

First, Putkiranta discloses "a method…for making services provided by a network available to the user" based "on the location of the user" (*a method associated with…*). Ex.1005, 2:9-12.

Second, Putkiranta discloses a "service server" that "maintain[s] information about which mobile stations [*a mobile station*] are in which localized service areas and which services should be offered to them accordingly" and an "application server" that provides the service to the user. Ex.1005, 6:22-26. These servers "may be maintained by…a service provider" (*a provider of presence related services*). Ex.1005, 3:31-33.

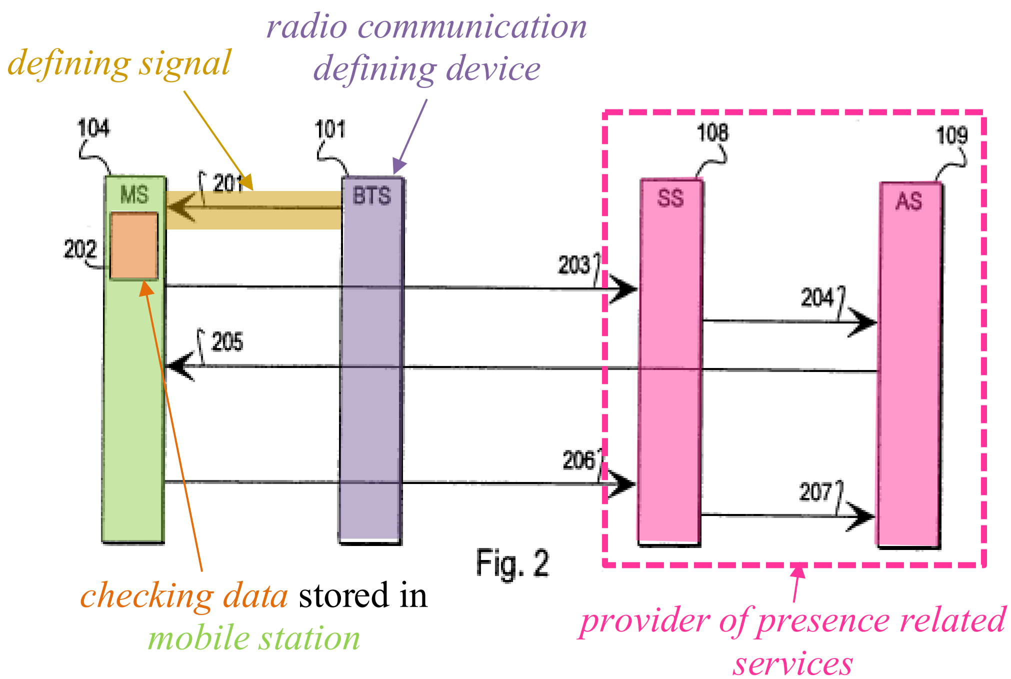
As shown in Fig. 1, Putkiranta's *mobile station* and servers (*provider*) communicate with each other over the mobile network via "base transceiver stations (BTS)" (*a radio communication defining device*). Ex.1005, 4:13-34:



Ex.1005, Fig. 1 (annotated)

Third, the base station(s) covering the current location of the mobile station sends a "known general control information message [201]…to the mobile station, comprising a base station specific identifier" (*defining signal*). Ex.1005, 5:65-6:1.

Fig. 2 shows the mobile station *receiv[ing]* message 201 (*defining signal*) from the base station (*radio communication defining device*):



Ex.1005, Fig. 2 (annotated)

Fourth, Putkiranta explains that "the memory of the mobile station stores a list of the identifiers [*first checking data*] of the base transceiver stations" (*mobile station that stores in a memory first checking data*). Ex.1005, 5:1-6. As the mobile station moves through the network from the coverage of one base station to another, the *mobile station* "compar[es] the received identifier [from the current base station] with the list in the memory" to "find[] out whether it is located in a certain localized service area." Ex.1005, 5:3-8. If the received identifier matches an identifier in the list, the mobile station determines that it is *distinctive* from other messages 201 received from base stations outside the localized service area (*mobile station…uses the first checking data to determine whether or not a defining signal received from a radiocommunication defining device is a distinctive defining signal*).

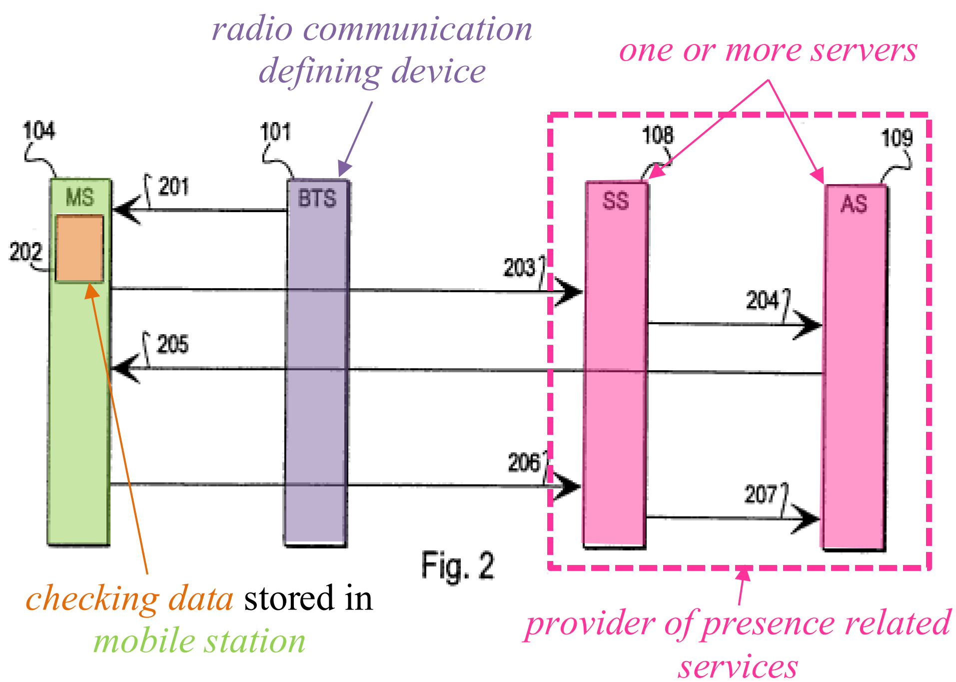
Fifth, when Putkiranta's "mobile station (MS) 104 is connected via radio to at least one base transceiver station 101," "the mobile station [is] located in that location area (LA) 105 to which **the coverage area, or cell**, of that particular base transceiver station belongs." Ex.1005, 4:16-20. Accordingly, the "list of the identifiers of the base transceiver stations" (*first checking data*) stored in the memory of the *mobile station* defines "the cells [that] make a **particular localized service area**" (*special area*). Ex.1005, 5:1-8; *see also* 4:35-45 ("[A] service area always comprises a certain cell or certain cells.").

Thus, because "the mobile station detects that it has arrived in a certain localized service area" (*special area*) by comparing the received identifier to the stored list of base-station-specific identifiers, an identifier of message 201 from the base station that matches an identifier in the list (*distinctive defining signal*) *at least partly defines* the localized service area (*special area*) *by its coverage*. Ex.1005, 6:3-6; Ex.1003 ¶¶72-80.

[1.1] ***one or more servers of a provider of presence related services receiving from the mobile station via a mobile telephone network an updating signal that identifies the mobile station's presence in the special area, the provider of***

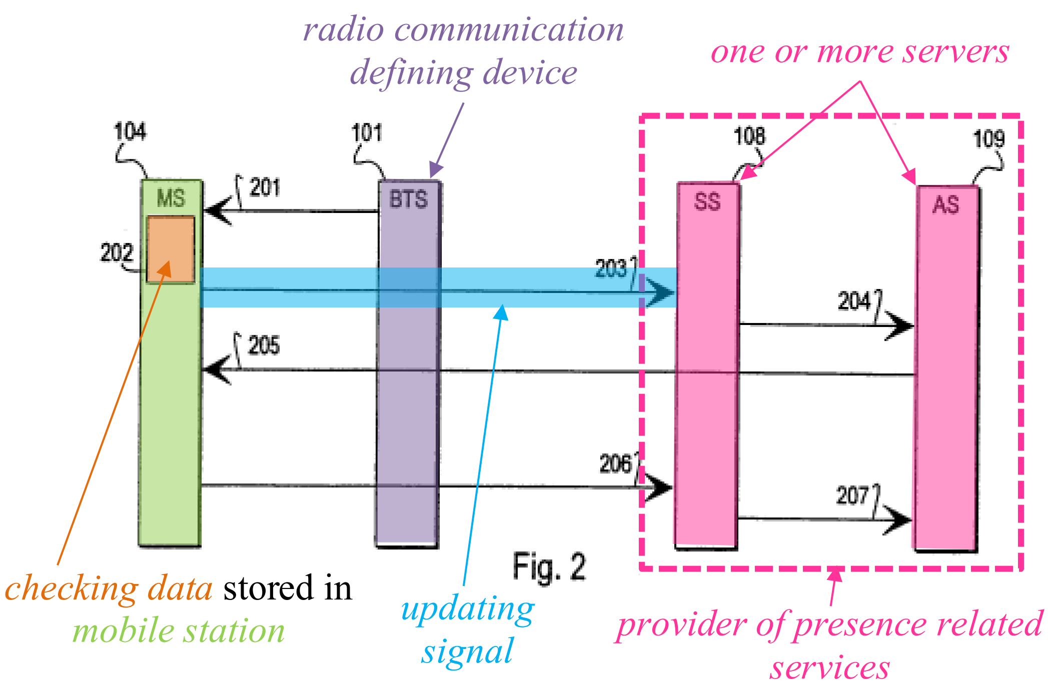
presence related services being different than the mobile telephone network; and

First, in the combination, Putkiranta teaches that a "service server" (*provider*) offers services to a user in localized service areas (*presence related services*) using the service and application servers (*one or more servers of a provider*). Ex.1005, 6:22-26; *see* [1.0]. The functions of the service and application servers "can be integrated in one device." Ex.1005, 7:47-51; Fig. 2:



Ex.1005, Fig. 2 (annotated)

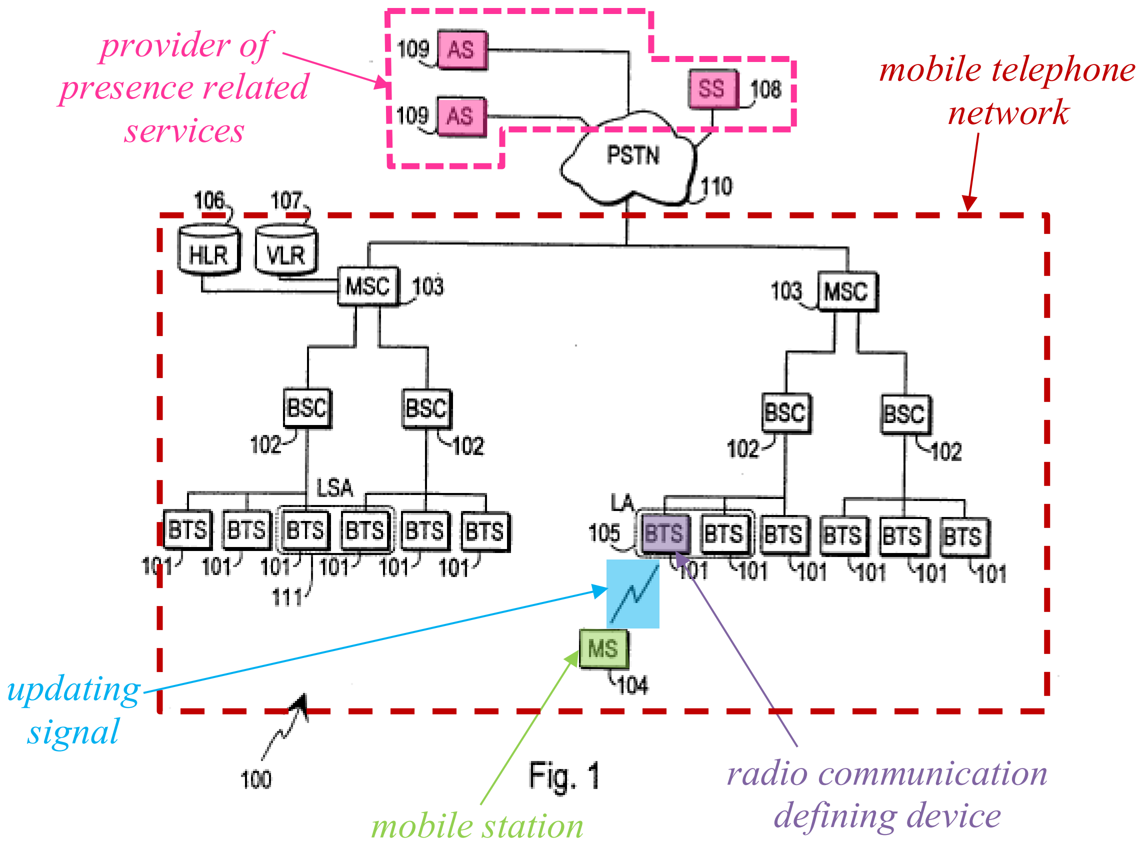
Second, as further demonstrated at [1.0], Putkiranta's *mobile station* determines it is in a "certain localized service area" (*special area*) after comparing the identifier received from the base station to a list of identifiers stored on the mobile device. Ex.1005, 6:3-6. In response to "detect[ing] that it has arrived in a certain localized service area," "the mobile station sends to the service server a **message 203** [*updating signal*]" (*one or more servers…receiving from the mobile station…an updating signal*). Ex.1005, 6:3-9, Fig. 2, 9:53-54, 2:34-41 ("the mobile station is arranged so as to send—in response to the recognition of a localized service area—**a notification of its arrival in the localized service area**").



Ex.1005, Fig. 2 (annotated)

Accordingly, Putkiranta's message 203 indicates that the mobile station is in the localized service area (*updating signal that identifies the mobile station's presence in the special area*). Ex.1005, 6:3-9.

Third, Putkiranta teaches that the mobile station sends the message via the cellular radio network (*one or more servers…receiving from the mobile station via* *a mobile telephone network an updating signal*). Ex.1005, 6:13-21 (message sent as SMS or free-form data message over cellular radio network), 4:13-27 (mobile station connected to cellular radio network via base transceiver stations, the servers are connected to the network); Fig. 1:



Ex.1005, Fig. 1 (annotated)

Fourth, Putkiranta explains that "an outside service provider" provides services to a user over the network such that "the services provided by said service provider are located physically elsewhere than at switching centers" of the network. Ex.1005, 1:29-33; *see* 3:31-33 (differentiating between servers operated by a "network operator" and servers operated by a "service provider"). Particularly, Putkiranta's service and application servers are operated by an outside service provider (*provider of presence related services*) such that the servers are connected to the cellular radio network (*mobile telephone network*) "via the public switched telephone network (PSTN) 110" instead of being part of the cellular network. Ex.1005, 4:28-34. Thus, Putkiranta's service *provider…[is]different than* the cellular radio network (*mobile telephone network*). Ex.1003 ¶¶81-87.

[1.2] ***storing in the one or more servers a parameters database having an operating parameter whose value is determined at least in part by the updating signal received from the mobile station; and***

First, in the combination, Putkiranta explains that the service server (*one or more servers*) "is arranged to maintain information concerning the location of mobile stations in localized service areas" and includes a "means for changing the service selection offered to a mobile station" when the mobile station indicates it is in a localized service area. Ex.1005, 2:22-32; *see* 6:22-25. In Putkiranta, the information regarding the services available to the *mobile station* includes "a whole **service profile** defined for it in a localized service area." Ex.1005, 6:42-44. This service profile includes fields (*operating parameter[s]*) that correspond to various services/tariffs, including "call pricing," "modulation method, data rate and/or connection quality…between the base station and mobile station," "routing of incoming email messages," "activation or inactivation of automatic call transfer and/or voice mail service," or "receiv[ing] messages periodically e.g. with regard to the weather, traffic, [or] stock exchange rates." Ex.1005, 6:42-56.

The service server "maintain[s] information concerning the location of mobile stations" (service profiles) and "chang[es] the service selection offered to mobile stations in response to receiving…mobile station generated messages describing the location of the mobile stations" (via the application server). Ex.1005, 6:22-30, 2:27-30. Thus, Putkiranta teaches that the service offered (*value* of the *operating parameter*) *is determined at least in part by* the message 203 (*updating signal*) *received from the mobile station*.

Second, as explained in §XI.C.4, Granberg teaches "**a database** that stores and manages subscriptions" (*parameters database*). Ex.1037, 6:3-4. Granberg explains that the database "stores a number of subscriber records," each including "individual subscriber data such as MSISDN, IMSI, current VLR location, and supplementary services data." Ex.1037, 7:40-44. Each record includes "**one or more network-specific indicators**" (*operating parameters*) "*e.g.*, one or more flags, **corresponding to one or more network-specific services**." Ex.1037, 7:45-48. "**Each network-specific indicator is then set or activated when that subscriber is** to receive a corresponding network-based service **in a network that supports that network-based service**" (*operating parameters whose value is determined at least in part by the updating signal received from the mobile* *station*). Ex.1037, 7:49-53. Or, "[i]f that subscriber is not to receive the service" in the particular network, "the flag is reset or otherwise deactivated." Ex.1037, 7:53-54.

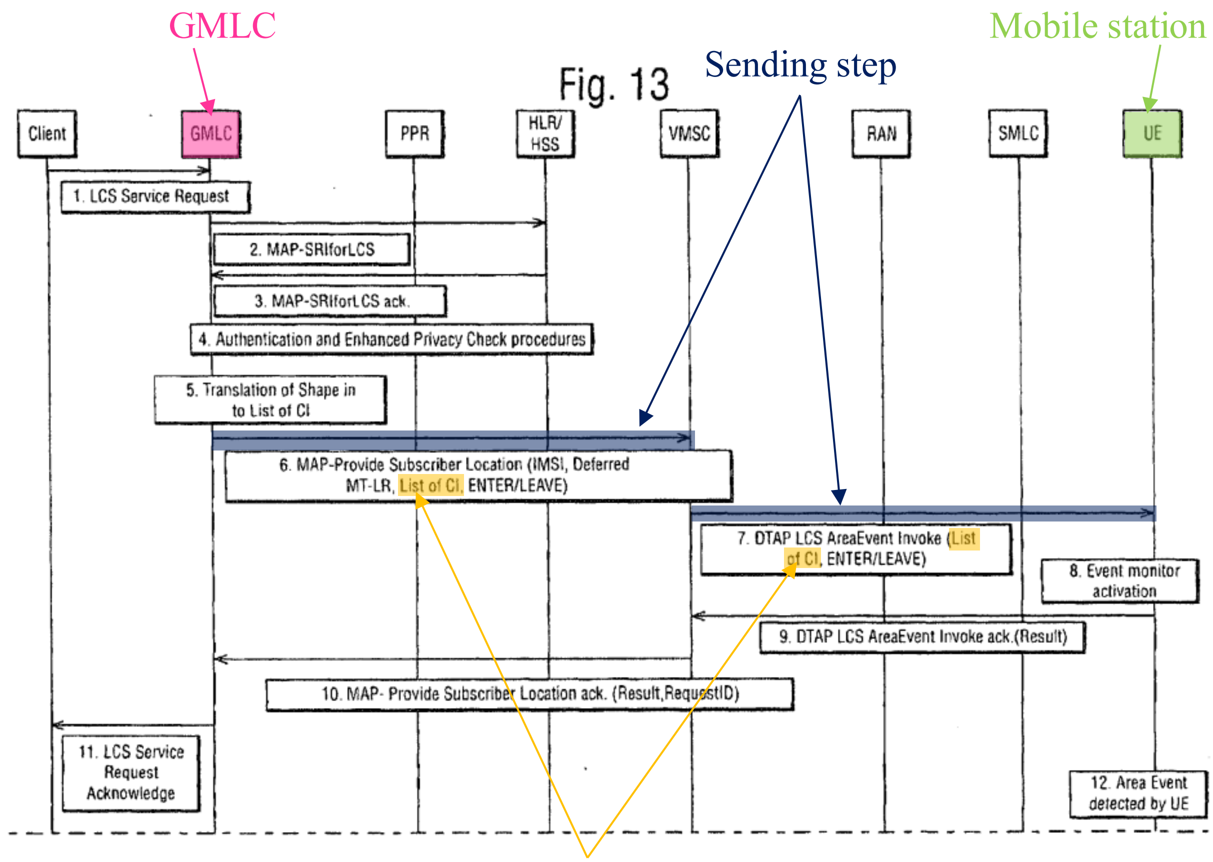
In the combination, Putkiranta's service server (*one or more servers*) maintains a database (as Granberg teaches) including each service profile (*storing in the one or more servers a parameters database*) with fields/indicators/flags corresponding to the services offered (*parameters database having operating parameter[s]*) as determined by the localized service area indicated in the message received from the *mobile station* (*whose value is determined at least in part by the updating signal*). Ex.1003 ¶¶88-93.

[1.3] *sending from the one or more servers to the mobile station second checking data different from the first checking data to modify the special area.*

First, as demonstrated at [1.0], Putkiranta's *mobile station* "stores a list" of base-station identifiers (*first checking data*) that it compares to received identifiers to determine whether it is in a localized service area. Ex.1005, 5:3-8.

Second, Putkiranta explains that networks change the base stations associated with a particular localized service area (*special area*) by, for example, adding a new base station in an area. Ex.1005, 5:14-22. Putkiranta teaches that the list of identifiers stored in the mobile station needs to be updated to accommodate these changes, and that one well-known way to do so was to "send the identifier of the new base station" to the mobile station. Ex.1005, 5:14-22 (teaching sending identifiers and a different embodiment that does not send identifiers). Thus, it would have been obvious that the service server (*one or more servers*) sends base-station identifier updates (*second checking data*) to the mobile station. Ex.1003 ¶96.

This implementation was fundamentally well known, as Kraufvelin further demonstrates. Ex.1003 ¶97. Like Putkiranta, Kraufvelin explains that network "operators tune their networks on a daily basis" by changing the geographic area associated with certain base stations or changing the identifier (Cell-ID) associated with a base station. Ex.1006 ¶108. As a result, "a cell-ID may no longer correspond with the intended geographical area." Ex.1006 ¶108. The network or service provider therefore "update[s] the predefined area definition in all mobiles" (e.g., when the Cell-ID reported by the mobile station does not match the new Cell-IDs associated with the area). Ex.1006 ¶111. This update includes providing "the updated cell-ID information" to the mobile station (*sending…to the mobile station second checking data different from the first checking data to modify the special area*). Ex.1006 ¶110; *see also* ¶¶46, 56-60, 80 (location services node operates in cooperation with network nodes like a GMLC to send/update cell IDs to mobile stations). Kraufvelin illustrates an example of sending cell IDs to the mobile station in Fig. 13:



Ex.1006, Fig. 13 (annotated)

In combination, when changes to Putkiranta's special area occur, the change(s) to cell identifiers (e.g., new/changed cell identifiers) would be sent from Putkiranta's service server to the mobile station, as further confirmed and taught by Kraufvelin (*sending from the one or more servers to the mobile station second checking data different from the first checking data to modify the special area*). *See* Section X.C.4; Ex.1003 ¶¶94-99.

6. Claim 2

[2.0] ***The method according to claim 1, wherein the operating parameter is a***

tariff flag or a service flag that enables or disables a special tariff or a service for the mobile station.

Putkiranta discloses a service server that stores services/tariffs offered (*operating parameter*) for the mobile station in localized service areas, with examples including "call pricing" (*special tariff*) and services (*a service*) including "call…prioritization," "modulation method, data rate and/or connection quality," "routing of incoming email messages," "activation or inactivation of automatic call transfer and/or voice mail service," or "receiv[ing] messages periodically" e.g. regarding the weather, traffic, or stock exchange rates. Ex.1005, 6:42-56; [1.2].

The service server "maintain[s] information concerning the location of mobile stations" (service profiles) and "chang[es] the service selection offered to mobile stations in response to receiving…mobile station generated messages describing the location of the mobile stations" (via the application server). Ex.1005, 6:22-30, 2:52-53. It would have been obvious that the service server stores fields (*operating parameter[s]*) corresponding to each of these tariffs/services as a *tariff flag or a service flag* so that the tariffs/services offered are changed (*enabled or disabled*), because it was well known to use tariff/service flags for storing information for location-based services, as Granberg further confirms. Ex.1003 ¶¶102-103.

In the combination, Putkiranta's service server activates or deactivates "network-specific indicator[s]" (*operating parameter*) associated with a "network-based service," based on the teachings of Granberg. *See* [1.2]. Granberg teaches that its database's **"**network-specific indicators" "corresponding to one or more network-specific services" include "**one or more flags**" (*a service flag*). Ex.1037, 7:45-48. Granberg further teaches that activating or deactivating the flag activates or deactivates (*enables or disables*) a corresponding *service for the mobile station*. Ex.1037, 7:49-54 (the flag is "activated when that subscriber is to receive a corresponding network-based service," and "deactivated" when "that subscriber is not to receive the service"). Further, in the combination the activating/deactivating would have also included flags for tariffs (*tariff flag*), based on Putkiranta's "call pricing" teaching with Granberg's flag teaching (*the operating parameter is a tariff flag or a service flag that enables or disables a special tariff or a service for the mobile station*). *See* Section X.C.4; Ex.1003 ¶¶100-105.

7. Claim 3

[3.0] ***A method associated with the use of a mobile station that stores and uses checking data to determine whether or not a defining signal received from a radio communication defining device is a distinctive defining signal, the distinctive defining signal at least partly defines a special area by its coverage, the method comprising:***

See [1.0]; Ex.1003 ¶106.

[3.1] ***sending from the mobile station to at least one server of a provider of presence related services an updating signal via a mobile telephone network that identifies the mobile station's presence in the special area, the updating signal being indicative of the mobile station's presence in the special area, the provider of presence related services being different than the mobile telephone network;***

and

Limitation [3.1] is substantially similar to [1.1], except that [3.1] is from the mobile station's perspective and [1.1] is from the server's perspective. Because the reasons shown at [1.1] also included the mobile station sending the updating signal, the combination also demonstrates [3.1]. Ex.1003 ¶¶107-108.

[3.2] ***receiving in the mobile station from the at least one server second checking data different from the first checking data to modify the special area.***

Limitation [3.2] is substantially similar to [1.3], except that [3.2] is from the mobile station's perspective and [1.3] is from the server's perspective. Because the reasons shown at [1.3] also included the mobile station receiving the checking data, the combination also demonstrates [3.2]. Ex.1003 ¶¶109-110.

D. Ground 2: Claims 4 and 6 are obvious over Putkiranta, Granberg, Kraufvelin, and Duan.

1. Duan

Duan is directed to a "method for reporting location reports by target user equipment (UE) in Location Service (LCS)." Ex.1015, 1. Duan discloses a process in which a network element that receives a location report from a UE (mobile station) sends an acknowledgement of the location report to the mobile station to confirm receipt. Ex.1015, 7:13-24. Thus, "the target UE will not end its processing procedure after report[ing] a location report to [the network], but determine[s] the subsequent operations according to whether it has received a location report acknowledgement." Ex.1015, 9:20-24. If the UE does not receive the acknowledgement "within the designated time period," the UE will retransmit the location report and start the process over. Ex.1015, 9:25- 10:6. This process "reduces[s] errors in the reporting process of location reports and lower[s] the uncertainty in the implementation of LCS." Ex.1015, 7:13-16; Ex.1003 ¶¶111-114.

2. Reasons to combine Putkiranta, Granberg, Kraufvelin, and Duan

A POSITA would have been motivated to combine the teachings of Putkiranta, Granberg, Kraufvelin, and Duan for several reasons. Ex.1003 ¶115. Combining Duan's implementation details for network elements acknowledging the receipt of signals from mobile stations, or triggering retransmission, with Putkiranta's updating signal and system teachings would have been obvious, beneficial, and predictable. Ex.1003 ¶115. Putkiranta describes communicating between system entities, including mobile station and service server, leaving implementation details up to a POSITA, motivating a POSITA to turn to Duan's teachings of well-known acknowledgement/non-acknowledgement (ack/nack) operations. Ex.1003 ¶115.

As a threshold matter, Duan is also analogous art because it is within the same field of endeavor as the '032 patent. Ex.1003 ¶116. As discussed in §XI.C.4 above, the '032 patent, Putkiranta, Granberg, and Kraufvelin are directed to the field of providing services to a mobile station based on its location. Similarly, Duan is related to a "method for reporting location reports by target user equipment (UE) in Location Service (LCS)" system. Ex.1015, 2.

Further, Duan is reasonably pertinent to problems addressed in the '032 patent. Ex.1003 ¶¶117-118. The '032 patent describes situations where the mobile station has to send a signal to the server again because it did not receive an acknowledgment from the server. Ex.1001, 3:42-47. Duan provides a well-known and well-implemented solution to this problem with a mobile station waiting for the network "to return a location report acknowledgement within the designated time period" and retransmitting the location report if not received. Ex.1015, 9:25-10:6.

Putkiranta already contemplates using acknowledgments between the service server and mobile station to confirm receipt of a message. Ex.1005, 7:17-22 (messages from the service server "must be acknowledged by the mobile stations"). Putkiranta does so at a general level, leaving implementation details up to POSITAs. Ex.1003 ¶119.

As Duan demonstrates, this was a well-known detail. Ex.1003 ¶¶120-125. Duan teaches a process for sending an acknowledgment message to the mobile station confirming receipt of a location-report message from the mobile station. Ex.1015, 9:25- 10:6. Absent this acknowledgment process, "the target UE is unable to learn whether the reported location report has been properly processed" by the network element. Ex.1015, 6:17- 7:4; *see* 6:3-7 (uncertainty increases when no ACK). Accordingly, Duan's acknowledgement process includes having the receiving network element send an acknowledgment to the mobile station when it receives a location report therefrom and, if the mobile station does not receive the acknowledgment, retransmitting the location report. Ex.1015, 10:16-11:9.

Acknowledgments are commonly sent from the receiving element in a telecommunications system to the transmitting element, thus ensuring that messages are actually received. Ex.1003 ¶¶120-122 (citing Ex.1042 (Strong) ¶5 ("**Any controller that has been able to correctly receive the data message sends <u>an acknowledgement bit</u>**…and the device transmitting the message checks for the presence of the acknowledgement bit."); Ex.1049 (Prasad), 60, 63-64 (transmitting a positive ACK, indicating that the transmission was successful), 66-69 (similar for fragmented signals), Figs. 3.9, 3.11; Ex.1006 ¶¶76-78, 84; Ex.1050 (Goodman), 95). Moreover, it was also well known to retransmit the message to ensure receipt in the absence of an ACK. Ex.1003 ¶¶123-124 (citing Ex.1042 ¶5 ("**if no acknowledgement** bit is detected, the device **re-transmits** the data frame.")); Ex.1049, 60 (similar), 66-69 (similar)).

Therefore, a POSITA would have been motivated to implement Duan's acknowledgment process teachings with Putkiranta's teachings to ensure that the service server receives the message indicating the mobile station is in the localized service area. Ex.1003 ¶126. Stated otherwise, the combination would have improved reliability. As a result, Putkiranta's service server teachings would be modified to include an acknowledgment to the mobile station upon receipt of the message, as taught by Duan. Ex.1015, 9:25- 10:6; Ex.1003 ¶127. If the acknowledgment is not received, Putkiranta's mobile station would retransmit the message, as further taught by Duan. Ex.1015, 10:16- 11:9; Ex.1003 ¶127.

A POSITA would have had a reasonable expectation of success combining Duan's acknowledgment teachings with Putkiranta's system teachings. Ex.1003 ¶128. Putkiranta's mobile station and service server communicate with each other via the network, including acknowledgments from the mobile station to the service server. Ex.1005, 4:13-34, 6:6-21, 7:17-22. A POSITA would have understood that the reverse would also occur—the service server sending an acknowledgment to the mobile station confirming receipt of a message, as Duan further demonstrates. Ex.1003 ¶128. Duan's acknowledgment teachings would have been a simple and conventional way to ensure that the message was received and improve the provision of services when a mobile station enters a localized service area. Ex.1003 ¶128.

3. Claim 6[2]

[6.0] ***The method according to claim 3, receiving in the mobile station from the at least one server of the provider of presence related services an acknowledgement of a reception of the updating signal.***

In the combination, Putkiranta teaches that the mobile station sends a message 203 (*updating signal*) to the service server. Ex.1005, 6:3-9; [1.1]. Putkiranta further teaches generally sending acknowledgements between the mobile station and the service server. For example, after the service server sends a message to the mobile station, the mobile station sends an acknowledgement back to the service server (if still in the localized service area) or fails to send an acknowledgment (if no longer in the area). Ex.1005, 7:17-22. Together, these disclosures in Putkiranta render obvious the service server likewise sending *an acknowledgement of a reception of the updating signal*. Ex.1003 ¶132.

Indeed, sending acknowledgments was widely used to minimize communication errors. Ex.1003 ¶130. For example, in the combination, Duan teaches that the network element sends “a location report acknowledgement” to the mobile station in response to receiving a “location report” from the mobile station.

[2] Claim 6 is addressed first because claim 6 describes the mobile station receiving an acknowledgement and claim 4 describes what happens when the mobile station does not receive the acknowledgment.

Ex.1015, 10:28-29. In the combination, Putkiranta, as modified based on Duan, teaches the mobile station receiving an acknowledgement from the service server confirming receipt of message 203 (*receiving in the mobile station from the at least one server of the provider of presence related services an acknowledgement of a reception of the updating signal*). *See* §XI.D.2; Ex.1003 ¶¶129-133.

4. Claim 4

[4.0] ***The method according to claim 3, further comprising the mobile station retransmitting the updating signal upon not receiving the acknowledgement from the at least one server.***[3]

In the combination, Putkiranta, as modified based on Duan (*see* §XI.D.2), teaches that the *mobile station receiv[es]* an *acknowledgment* from the service server (*server*) confirming that it has received the message 203 indicating the mobile station is in the localized service area (*updating signal*). *See* [6.0].

It would have further been obvious for Putkiranta's mobile station to retransmit the message 203 (*updating signal*) if it did not receive an acknowledgment from the service server. Ex.1003 ¶136. It was well known for the

[3] The term "the acknowledgment" appears to lack antecedent basis. For the purposes of this proceeding only, the art is applied to "**an** acknowledgment." Petitioner reserves the right to argue this term lacks antecedent basis in other proceedings.

device transmitting a message to retransmit if no acknowledgment is received from the intended recipient. Ex.1003 ¶136. For example, Duan teaches the mobile station retransmitting the location report if it does not receive acknowledgment from the network within a designated time period. Ex.1015, 11:3-9.

In the combination, therefore, Putkiranta's mobile station sends the message 203 again if it did not receive an acknowledgement from the service server, according to Duan's teachings (*the mobile station retransmitting the updating signal upon not receiving the acknowledgement from the at least one server*). *See* §XI.D.2; Ex.1003 ¶¶134-139.

E. Ground 3: Claims 5 is obvious over Putkiranta in view of Granberg, Kraufvelin, and Vimpari.

1. Vimpari

Vimpari describes a method "for locating a mobile station," which "is advantageously applied for defining call tariffs, or for defining available services on the basis of the location of the mobile station in question." Ex.1010, 1:4-8. When the mobile station is in a home area, the network "sets lower tariffs for said mobile station." Ex.1010, 6:9-18. When the mobile station is outside the home area, the network "returns to normal tariffs for said mobile station." Ex.1010, 6:21-29. "Normal tariffs are returned also if the mobile station is switched off, or its connection to the base station is interrupted for some other reason." Ex.1010, 6:29-31; Ex.1003 ¶¶140-142.

2. Reasons to combine Putkiranta, Granberg, Kraufvelin, and Vimpari

A POSITA would have been motivated to combine the teachings of Putkiranta, Granberg, and Kraufvelin with the teachings of Vimpari for several reasons as discussed further below. Ex.1003 ¶143. Combining Vimpari's implementation details about how to handle switched-off mobile stations with Putkiranta's location-based service teachings would have been obvious, beneficial, and predictable. Ex.1003 ¶143. Putkiranta describes providing different services, including different pricing, depending upon the mobile station's location, leaving implementation details up to a POSITA regarding how to handle situations when the mobile station is off, motivating a POSITA to turn to Vimpari's teachings. Ex.1003 ¶143.

As a threshold matter, Vimpari is analogous art because it is within the same field of endeavor as the '032 patent. Ex.1003 ¶144. As discussed in §XI.E.2 above, the '032 patent, Putkiranta, Granberg, and Kraufvelin are directed to the field of providing services to a mobile station based on its location. Similarly, Vimpari is related to "defining call tariffs, or for defining available services on the basis of the location of the mobile station in question." Ex.1010, 1:4-8.

Vimpari is also reasonably pertinent to problems addressed in the '032 patent. Ex.1003 ¶¶145-146. The '032 patent states that one of the problems it was facing was how to deal with situations where the mobile station is switched off.

Ex.1001, 15:21-27. Vimpari provides a well-known solution to this problem: returning "[n]ormal tariffs…if the mobile station is switched off, or its connection to the base station is interrupted for some other reason" instead of applying lower tariffs. Ex.1010, 6:29-31.

Putkiranta explains that, when the mobile station is not in a localized service area, the services provided in that area are terminated. Ex.1005, 6:64-7:2. Putkiranta's service server determines that services should not be provided to the mobile station by sending a message to the mobile station and, if it does not respond, terminating the services. Ex.1005, 7:17-22. Putkiranta leaves implementation details for the various scenarios in which the mobile station does not respond up to POSITAs. Ex.1003 ¶147. Vimpari provides these implementation details. Ex.1003 ¶148.

Vimpari teaches that, instead of a lower tariff that is applied in, e.g., a home area, "[n]ormal tariffs are returned [] if the mobile station is switched off." Ex.1010, 6:13-31. In fact, Vimpari indicates that the case in which the mobile station is switched off and the case in which the mobile station stops communicating with the network (similar to the case in Putkiranta) are treated similarly. Ex.1010, 6:29-31 ("Normal tariffs are returned also if the mobile station is switched off, **or if its connection to the base station is interrupted for some other reason**."); Ex.1003 ¶148.

Vimpari thus confirms the obviousness of setting the parameter associated with services/tariffs applied to a mobile station to a default/initial value when the mobile station is switched off. Ex.1003 ¶¶149-153. Vimpari particularly confirms that a switched-off mobile station is tantamount to the mobile station no longer responding, as in Putkiranta. Ex.1003 ¶¶149-153. By setting an initial value in these scenarios, the service server simplifies tracking the services/tariffs provided to the mobile station when it is turned on and allows for better resource allocation to active mobile stations. Ex.1003 ¶¶149-153. Accordingly, when Putkiranta's system determines that a mobile station is not responding (e.g., because it is switched off per Vimpari's teachings), Putkiranta's service server would set the services/tariffs to an initial value. Ex.1003 ¶153.

Applying Vimpari's teachings of setting an initial value when a mobile station is unresponsive, such as occurs when the mobile station is switched off, to Putkiranta's service server and system teachings is nothing more than the implementation of a known technique (location-based services, including call pricing) to improve a similar method in the same way (setting an initial value when a mobile station unresponsive, including when off). Ex.1003 ¶154.

3. Claim 5

[5.0] ***The method according to claim 1, further comprising: determining when the mobile station is switched off; and upon determining that the mobile station***

is switched off setting the value of the operating parameter to an initial value.

The combination renders obvious Putkiranta's service server (*server*) storing service profiles implemented using network-specific indicators (*operating parameters*), as taught by Granberg, that are available to a mobile station in each localized service area. *See* [1.2].

The '032 patent discusses the mobile station being switched off as the mobile station not being detected in any special area: "set[ting] the values of the operating parameters managed in the parameters database to a set of initial values when the mobile station is **switched off (as at that time it is not present in any special area)** in order to start operating the mobile station when it is switched on." Ex.1001, 15:21-27; *see also* 4:22-28 (the server updating the operating parameters when the mobile station is off).

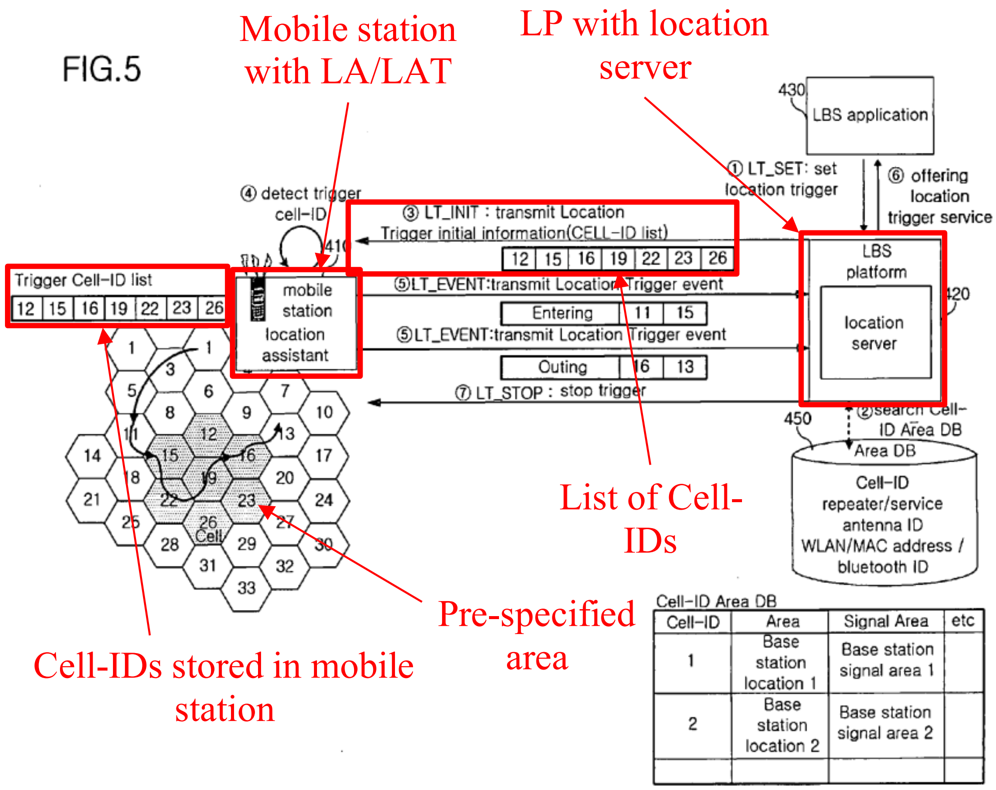
Putkiranta teaches a similar concept to that in the '032 patent. Ex.1003 ¶157. Putkiranta teaches terminating services depending on whether the mobile station responds to messages. Ex.1005, 7:17-22. The server determines that services should not be provided to the mobile station if the mobile station does not respond. Ex.1005, 7:17-22. It would have been obvious that the mobile station being switched off is merely a specific situation of the mobile station not responding. Ex.1003 ¶157. Thus, when Putkiranta teaches terminating the service due to nonresponse, the combination teaches setting fields/indicators (*operating* *parameter[s]*) corresponding to services/tariffs in a database of the service server to a default/initial value (i.e. none). Ex.1003 ¶157. Therefore, [5.0] is obvious over Putkiranta-Granberg alone.

[5.0] is further obvious in view of Vimpari. Vimpari explains that "if the mobile station is switched off," "[n]ormal tariffs" are applied instead of the "lower tariffs" that are available to the mobile station in a defined geographic area (e.g., a home area). Ex.1010, 6:13-31. In combination, therefore, Putkiranta's service server would *set[]* the field/indicator to *an initial value* if the mobile station does not respond, indicating the mobile station is *switched off* (as Vimpari teaches) (*determining when the mobile station is switched off; and upon determining that the mobile station is switched off setting the value of the operating parameter to an initial value*). Ex.1003 ¶¶155-159.

F. Ground 4: Claims 1-3 and 5 are obvious over Nam and Noldus.

1. Nam

Nam relates to "a location trigger system for a location-based service" where a mobile station (MS) receives the location-based services via a mobile network from a location server. Ex.1013, Abstract. The location server is embedded within a location-based services platform, "LBS platform (LP)." Ex.1013 ¶85. The mobile station has an embedded location assistant (LAT), used for "location trigger detection." Ex.1013 ¶¶83-84; Fig. 5:



Ex.1013, Fig. 5 (annotated)

The mobile station uses "a Cell-ID and regional information" to invoke trigger events as the mobile station enters/exits different network cells. Ex.1013 ¶¶80-81. After the mobile station stores a list of Cell-IDs associated with one or more "pre-specified area[s]" from the LP, the mobile station "monitors whether the MS enters the pre-specified area and transmits a corresponding trigger event to the LP" as an "LT_EVENT…message" requesting location-based services. Ex.1013 ¶¶91, 105. In response, the LP sends a location trigger action that provides a location trigger service to the mobile station. Ex.1013 ¶¶106, 111; Ex.1003 ¶¶160-

162.

2. Noldus

Noldus similarly discloses methods for tracking mobile-station presence in dedicated service areas and providing location-based services in those areas. Ex.1038 ¶1. Noldus' system includes a cellular network, mobile stations that receive location services in network cells, and "a zone server (20), connected to a zone database (21)" maintaining a "record for each defined zone" for a mobile station. Ex.1038 ¶60. These records have fields including a zone-record identification, a mobile-station identifier, a state of presence, a zone, and "list of cells that build-up the zone." Ex.1038 ¶¶60, 69.

When the mobile station moves into different cells, an application on the mobile station sends a "cell change message" to the zone server, which updates the relevant database record. Ex.1038 ¶¶134, 140; *see also* ¶60. The zone server updates the database records when any record is "edit[ed], delet[ed] or creat[ed]…in the zone database," including the zone definition. Ex.1038 ¶¶62, 127. The zone server "performs the required updates" to the zone database, including cell identifiers that define the changed zone, and synchronizes the zone definition with the mobile station. Ex.1038 ¶¶127, 69, 133; *see* ¶144; Ex.1003 ¶¶163-166.

3. Reasons to combine Nam and Noldus

A POSITA would have been motivated to combine Noldus with Nam for several reasons noted below. Ex.1003 ¶167. Combining Noldus' implementation details for a common, practical, and useful database for location services at a server with Nam's LP and location server teachings would have been obvious, beneficial, and predictable. Ex.1003 ¶167. Nam describes the LP receiving a location event trigger from a mobile station and providing location services in response, leaving implementation details of how the LP internally manages the information up to POSITAs, motivating the POSITA to turn to Noldus' teachings of well-known database and information-management teachings. Ex.1003 ¶167.

As a threshold matter, Nam and Noldus are analogous art because they are in the same field of endeavor as the '032 patent, namely monitoring the presence of a mobile station in a particular area. Ex.1003 ¶168; *see* Ex.1001, 1:25-29; Ex.1013 ¶32 ("relates to Location-Based Services" including "separately process[ing] location trigger detection from the MS, thereby setting various user customized services."); Ex.1038 ¶1 ("[M]ethod…for establishing presence of a mobile station in at least one dedicated service area [and] delivering information to users of mobile communication terminals receiving service from a dedicated service area.").

Nam and Noldus are also reasonably pertinent to problems addressed in the '032 patent. Ex.1003 ¶169. The '032 patent states that one problem it attempts to solve is how to add special areas without modifying the network's base stations broadcasting in those areas. Ex.1001, 2:6-11. Nam and Noldus solve this problem by storing data for determining the special area on the mobile station. Ex.1013 ¶¶32 (MS processes location-trigger detection, instead of base station); Ex.1038 ¶¶14 (reducing burden on network), 20 ("triggering the mobile station to provide location information").

First, Nam discloses a location server of an LP with multiple databases that store information relevant to providing a service/tariff to the mobile station. Ex.1013 ¶¶148-149 ("location trigger [database]" and "Location Trigger Operation Log [database]"). Nam leaves implementation details regarding such databases up to POSITAs. Ex.1003 ¶170.

Database structures were well known in the art and, thus, a POSITA would have been familiar with how to store location information using databases. Ex.1003 ¶171 (citing Ex.1050, 4-5; Ex.1050, 4; Ex.1007, 2:24-39; Ex.1050, 3); *see* §XI.C.4. For example, Noldus discloses a "zone server" with a "zone database" having "zone records," each including fields that store various information including mobile-station identifier, list of cells defining the zone, and mobile-station current location (e.g., zone). Ex.1038 ¶¶67, 69; Ex.1003 ¶172. Noldus teaches updating the record/field for the current location of the mobile station as the mobile station enters/exits defined zones so that the database maintains the presence of the mobile station in the zone. Ex.1038 ¶¶60, 76, 83.

A POSITA would have been motivated to combine Noldus's database teachings with Nam's location-server teachings, as a simple and convenient way of storing information relevant to providing location-based services, such as those Nam teaches, in record fields of a database and updating those fields in response to messages regarding mobile-station presence. Ex.1003 ¶173 (citing Ex.1038 ¶¶134, 140). Indeed, Nam's location server already teaches recording information regarding services/tariffs in a database responsive to a message from the mobile station indicating its presence in a defined area. Ex.1003 ¶173 (citing Ex.1013 ¶¶148-149). Using Noldus's database teachings with Nam's LP teachings would therefore have predictably improved Nam's ability to maintain up-to-date information for providing services/tariffs to the mobile station. Ex.1003 ¶173.

A POSITA would have had a reasonable expectation of success applying Noldus's database teachings to Nam's location-server teachings. Ex.1003 ¶174. Nam already teaches using a database for location-area information in a system that provides location-based services. Ex.1013 ¶35. Noldus similarly teaches storing presence-related information in a location database to facilitate location-based services. Ex.1038 ¶¶1, 60, 69, 134, 140. Thus, Nam's and Noldus' systems were already compatible, and Noldus' database teachings are merely implementation details consistent with Nam's overall system. Ex.1003 ¶174. Indeed, Nam-Noldus is merely the combination of known elements (Nam's location system teachings, Noldus' zone database teachings to track location information), according to known methods (Nam's signaling and Noldus' storing/updating the database) to yield predictable results (Nam's LP updating database records in response to receiving location messaging from mobile stations). Ex.1003 ¶175.

Second, a POSITA would have been further motivated to combine Noldus' teaching of sending updated lists of cell identifiers to mobile stations with Nam's setting and handling location triggers and related messaging. Ex.1003 ¶176. Nam teaches setting trigger-defining cell identifiers for specific areas, including transmission for initialization. Ex.1003 ¶¶176-177. In Nam, a location server of the location-based service (LBS) platform (LP) sends an initialization message containing a list of Cell-IDs that define special areas for services, so that the mobile station can monitor for presence in those area. Ex.1013 ¶¶91, 103, 110. Nam also teaches the desirability of updating the location-trigger status. Ex.1013 ¶¶111 (stopping location trigger), 107 (stopping or halting location triggers).

Noldus demonstrates the obviousness of a server (like Nam's location server) sending an updated list of Cell-IDs to the mobile station after original initialization. Ex.1003 ¶178. Noldus teaches dynamically managing zones in which certain services are provided. Ex.1003 ¶¶178-179. Noldus's zone server maintains records that include a list of cell identifiers for each zone and provides mechanisms for editing that list. Ex.1038 ¶¶62, 67, 69. When a zone is modified, the updated list of cell identifiers is sent to the mobile station as an update to the zone application stored on the mobile station, ensuring that it has the current definition of the zone. *See, e.g.*, Ex.1038 ¶¶133, 144. Thus, a POSITA would have been motivated to turn to Noldus' teachings about sending any changes of cell identifiers to impacted mobile stations, as a mere implementation detail in Nam's location-based system teachings. Ex.1003 ¶¶180-183. Noldus's approach to updating the MS with new cell identifier lists would be a natural enhancement to ensure the continued accuracy and reliability of Nam's location-based service as the network evolves. Ex.1003 ¶181.

Third, a POSITA would have been further motivated to turn to Noldus' teachings for handling scenarios in which the mobile station is switched off. Ex.1003 ¶184. A POSITA would have understood that the mobile station may disconnect from the network for a variety of reasons, including when it switches off. Ex.1003 ¶184. Noldus describes how a zone server handles mobile stations that are off—tracking that status via the dynamically-updated database. Ex.1003 ¶185. When the mobile station is "switched off," "the status field of the zone record is OUT" (a default value) and, when the mobile station "switches on," the zone server "changes the state field of the zone record." Ex.1038 ¶139. A POSITA would have therefore been motivated to turn to Noldus' teaching for beneficially tracking power status via the database, to simplify tracking the services/tariffs provided to the mobile station when it is turned on and allow for better resource allocation to switched-on mobile stations. *See* Ex.1013 ¶171; Ex.1003 ¶¶185-187.

A POSITA would have had a reasonable expectation of success combining Nam and Noldus. Ex.1003 ¶188. Both Nam and Noldus rely on the transmission of area-defining information (such as cell identifiers) from a central server to the mobile station, and both systems are designed to process such information on the MS to trigger location-based events. Ex.1003 ¶¶188-189. The communication protocols and data structures described in Nam (e.g., LT_INIT messages carrying cell-identifier lists) are compatible with the mechanisms described in Noldus for sending updated zone definitions. Ex.1003 ¶¶190-191. The underlying mobile-network infrastructure, messaging capabilities, and database-management techniques are well established in the art. Ex.1003 ¶¶190-191.

4. Claim 1

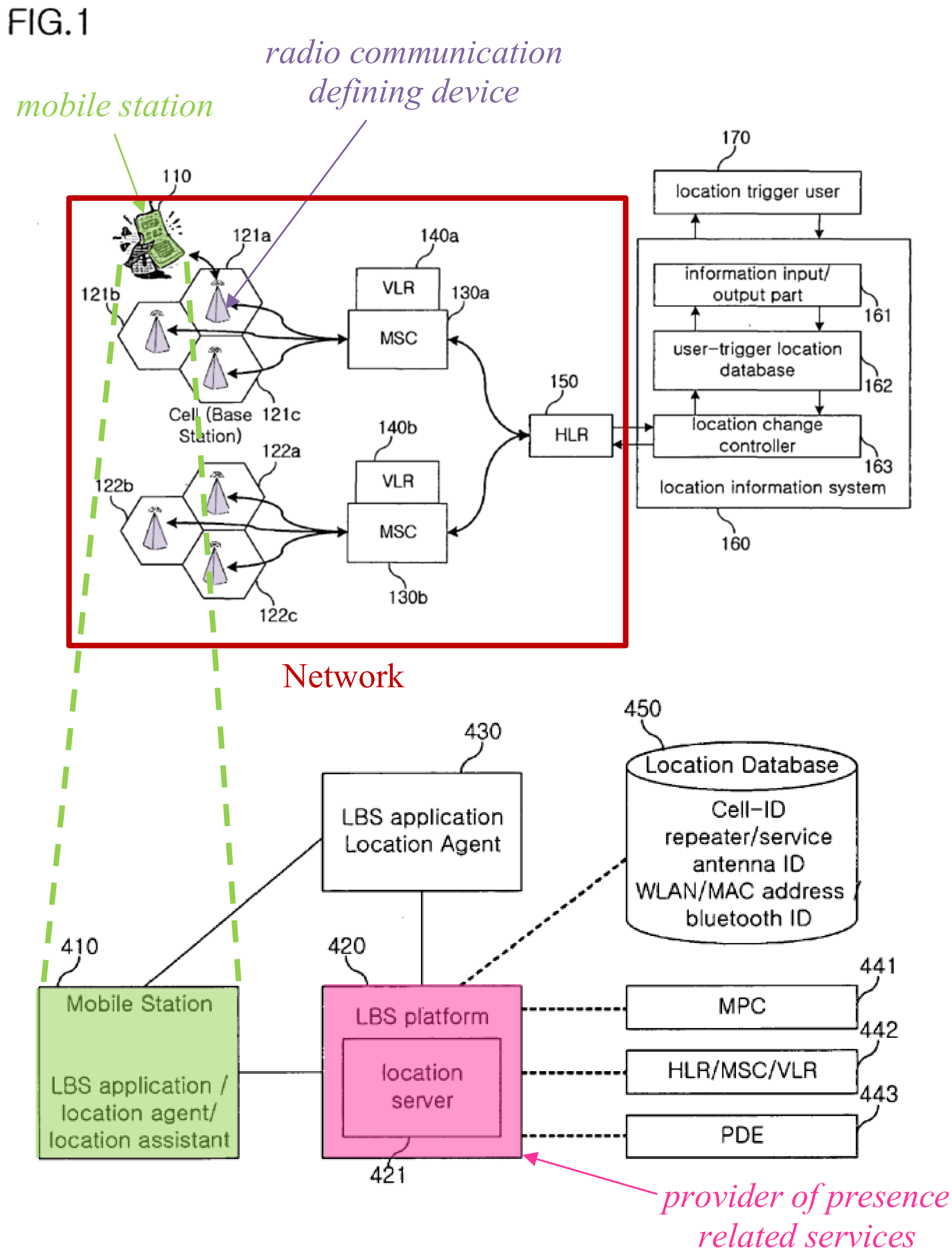
[1.0]

To the extent the preamble [1.0] is limiting, it is met by the combination.

First, Nam discloses methods that include "monitor[ing] a current location of an MS [mobile station] in a communication network, and notif[ying] the MS of entering in, being in, or outing from a pre-specified area, and provides user-customized services" (*A method associated with…*). Ex.1013 ¶¶79-80.

Second, Nam discloses a mobile station (MS, *a mobile station*) that is "a mobile network-enabled device" and a location-based service (LBS) platform (LP) (*a provider of presence related services*) that includes "a user management system" for providing location-based services to the MS. Ex.1013 ¶¶78, 85; *see* ¶¶56, 175-176 (the LP "offer[s] location-based services" to the MS when it enters/leaves a particular area).

The mobile station and LP communicate together over the mobile network via "base stations" (*a radio communication defining device*), with the mobile station "receiv[ing] signals from the base station to maintain mobility" (*a defining signal received from a radio communication defining device*). Ex.1013 ¶¶91-92. Further, Nam illustrates cellular networks including multiple base stations with coverage areas through which the mobile station traverses. *See* Figs. 1 and 4:



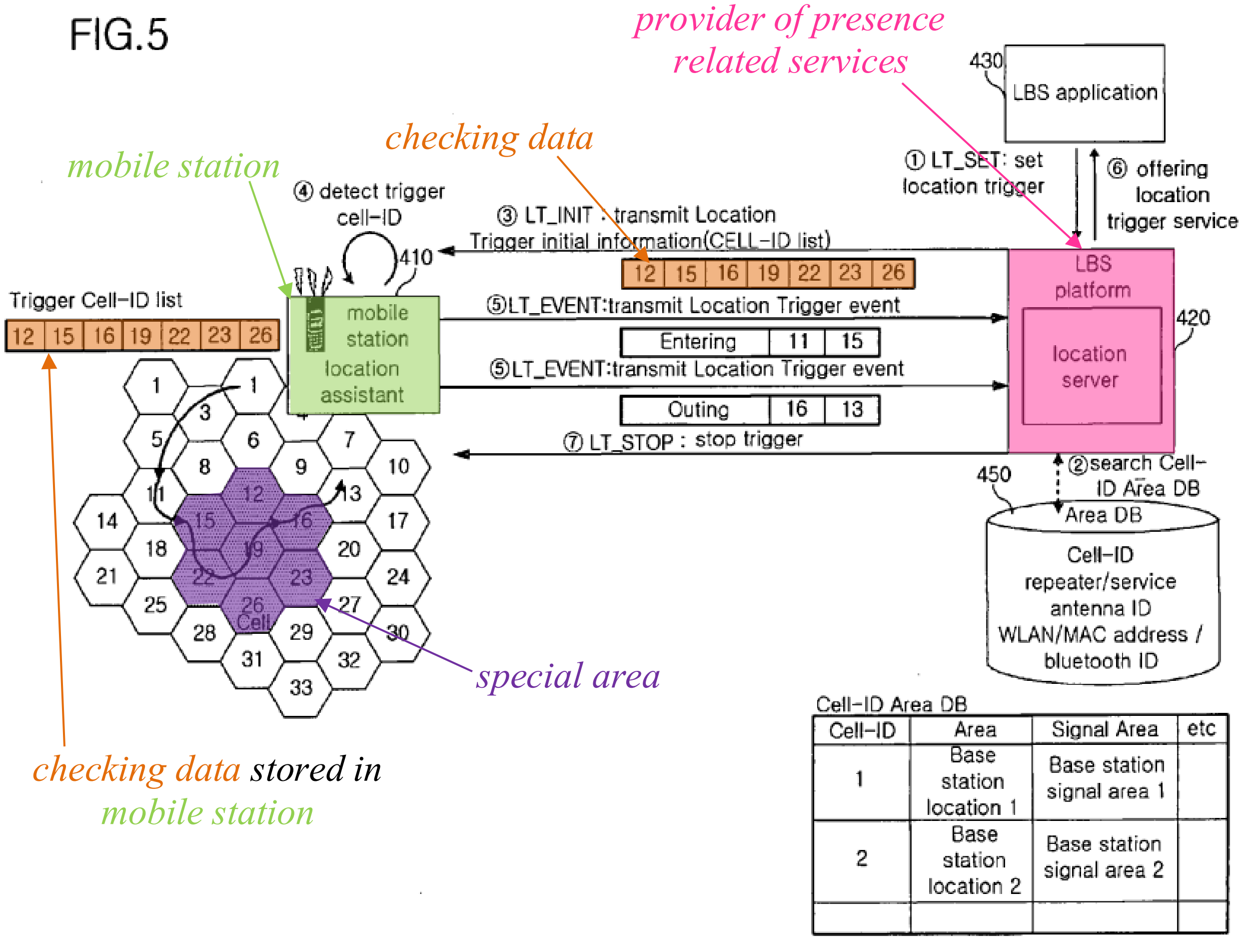
Ex.1013, Figs. 1, 4 (annotated)

Third, Nam teaches *storing* in a mobile station's *memory first checking data*. The LP sends a "Cell-ID" or a "location list" of Cell-IDs (*first checking data*) to the MS, where the Cell-IDs are respectively "associated with a pre-specified area." Ex.1013 ¶¶91, 102. The Cell-IDs are "saved in the LAT [location assistant] of the MS." Ex.1013 ¶¶176, 103; *see also* ¶84. Thus, Nam teaches *a mobile station that stores…first checking data*. Ex.1003 ¶197.

The Cell-IDs are saved (*stor[ed]*) *in a memory* of the mobile station. Ex.1003 ¶198. It was fundamentally well known that a mobile station includes a memory that stores information, like Cell-IDs related to location-based services. Ex.1003 ¶198 (citing Ex.1043 (Gray), 4:1-23, 4:41-46 (mobile unit includes a "data storage element 306" storing identifiers); Ex.1044 (Jokimies), 3:27-44, 4:37-45 (mobile station includes "a memory 14 for storing programs")). Indeed, Nam's mobile station later uses the information it had received "from a base station to identify locations," by comparing the Cell-ID stored in the MS to the Cell-ID in a current base-station signal (*a mobile station that stores in a memory first checking data and uses the first checking data…*). Ex.1013 ¶¶91-92, 110.

Fourth, Nam teaches that when the mobile station enters a cell whose Cell-ID matches a Cell-ID in the list, then "a location trigger event starts" where "a corresponding location trigger service" is provided to the MS. Ex.1013 ¶111. Because the "Cell-ID" is extracted from a signal from a base station, the signal with that matching Cell-ID is *distinctive* (*mobile station…uses the first checking* *data to determine whether or not a defining signal received from a radio communication defining device is a distinctive defining signal*).

Finally, Nam teaches that each *distinctive defining signal at least partly defines a special area by its coverage*. Nam's location triggers are set by "transmit[ting] **a Cell-ID associated with a pre-specified area** to the [mobile station] 410." Ex.1013 ¶91. This Cell-ID information sets a location trigger "in base station coverage areas." Ex.1013 ¶114. Fig. 5 shows exemplary cell coverage areas, as specified by the "trigger Cell-ID list" (where each cell-ID is further shown to have a corresponding "[b]ase station signal area") (Ex.1013 ¶¶109-110):



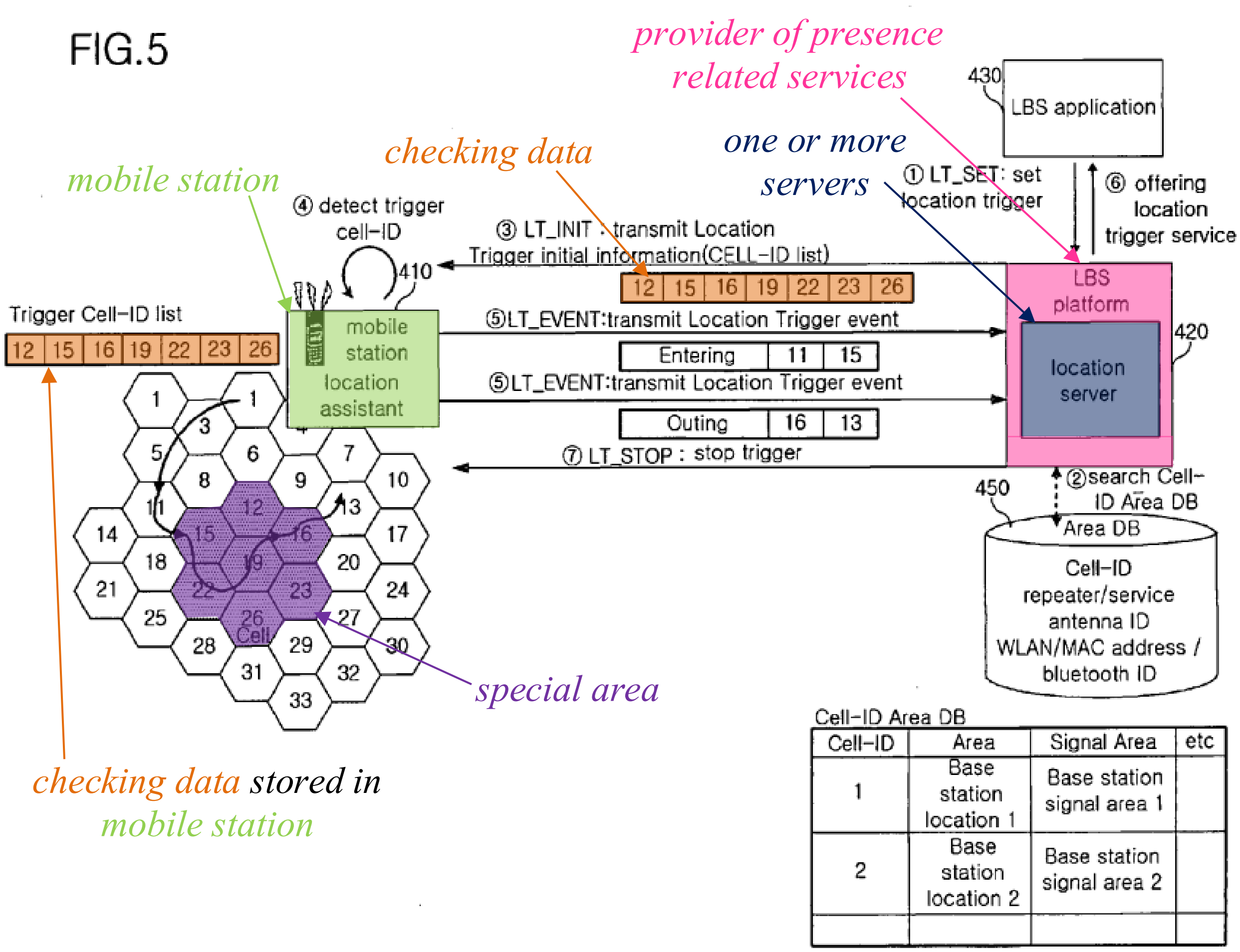
Ex.1013, Fig. 5 (annotated)

The list of trigger Cell-IDs corresponds to the shaded cells defining a *special area*, with each cell coverage corresponding to a different listed cell-ID. Nam, therefore, teaches that each base station has a coverage area and that a list of cell-IDs associated with a set of base stations defines the coverages thereof as a *special area*. Indeed, Nam recognized that it was "conventional" for Cell-IDs to define an area for location event triggers using the "base station signal coverage areas." Ex.1013 ¶114; Ex.1003 ¶¶193-205.

[1.1]

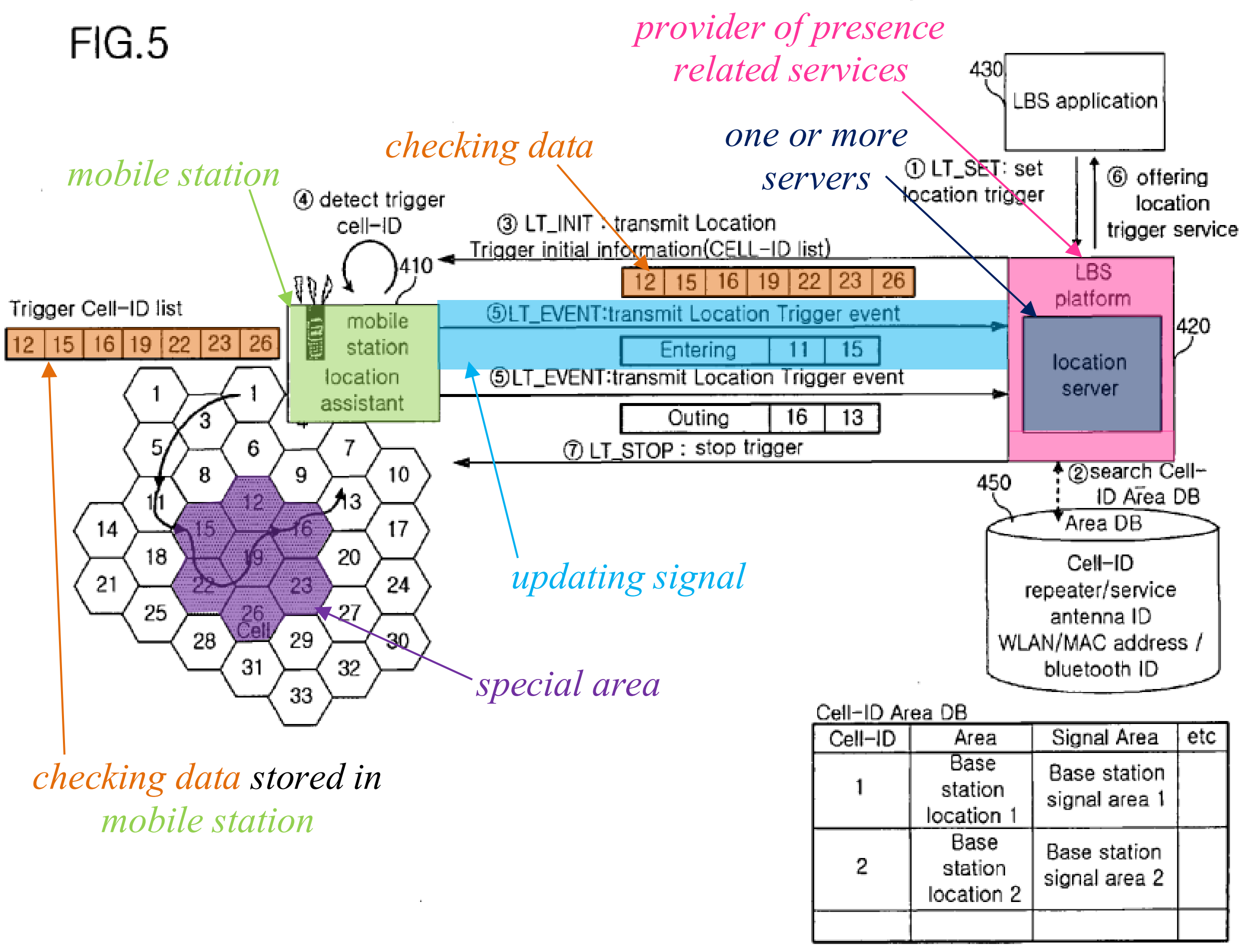
First, Nam discloses that the *provider of presence related services* includes *one or more servers*. Nam's "location trigger system" includes "a **location server** installed to the LP." Ex.1013 ¶40; [1.0]. The LP is "a software platform" operated by a *provider of presence related services* that "embeds a location server (LS) 421" for "performing the location trigger." Ex.1013 ¶85; Fig. 5 (*see also* Figs. 4, 11):

FIG.5



Ex.1013, Fig. 5 (annotated)

Second, Nam further discloses that the location server LS *receiv[es]* an *updating signal that identifies the mobile station's presence in the special area*. During normal operation (e.g., after sending the list of Cell-IDs to the mobile station, *see* [1.0]), when the mobile station enters a different cell, the mobile station "monitors whether the MS enters the pre-specified area **and transmits a corresponding trigger event to the LP to invoke the location trigger**." Ex.1013 ¶91. Fig. 5 illustrates sending of the trigger event to the server of the LP (*an updating signal that identifies the mobile station's presence in the special area*):



Ex.1013, Fig. 5 (annotated)

The mobile station sends the "LT_EVENT…message" to the LP when a trigger event occurs; the message includes "a trigger ID, a positioning method, an invoked event, assisted information." Ex.1013 ¶105. Thus, if the mobile station enters a special area (detected by cell-ID), the mobile station sends the LT_EVENT message (*updating signal*) with the cell-ID for the area entered. Ex.1013 ¶105.

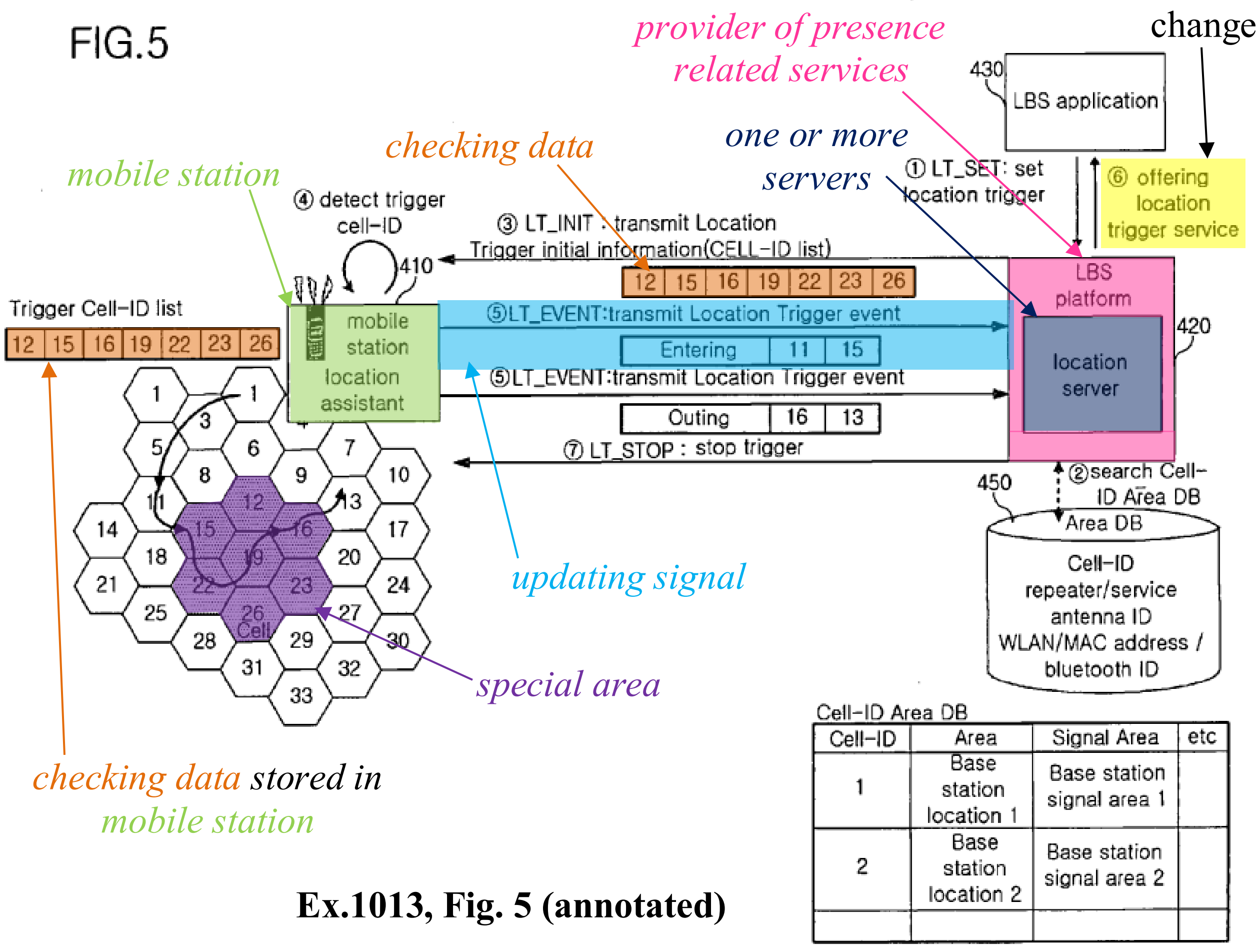
Third, Nam discloses that the *server[]* receives an *updating signal via a mobile telephone network*. Nam's mobile station operates "on a network," used as "a **mobile network-enabled device** and/or its user." Ex.1013 ¶39, 78. Indeed, Nam's system focuses on "a current location of an MS **in a communication network**." Ex.1013 ¶80. The "MCP 441, the HLR/MSCNLR 442, and the PDE 443 **are communication equipment forming**" the communication network "**that the LP accesses** to obtain[] location information." Ex.1013 ¶86.

The mobile station "transmits a corresponding trigger event to the LP" (*provider*) as a "message." Ex.1013 ¶¶91, 105, 175. That message is sent via the base station of the "communication network" (*e.g.*, including the MCP, HLR/MSCNLR, PDE, etc.). Because both the MS and LP communicate via the network, Nam's mobile station would have transmitted the trigger-event message (*updating signal*) to the LP (*provider*) via the communication network (*mobile telephone network*) (*one or more servers…receiving from the mobile station via a mobile telephone network an updating signal*). Ex.1003 ¶211.

Fourth, Nam teaches that the LP (*provider*) is *different than the mobile telephone network*. Nam's location-based services are provided by a service provider that is external to the network and that accesses the network via, e.g., "a CRM server." Ex.1013 ¶8. Nam teaches that "the MCP 441, the HLR/MSCNLR 442, and the PDE 443 are communication equipment form[] a network **that the LP accesses** to obtain[] location information." Ex.1013 ¶86; *see also* ¶¶14, 31-32, 90. Thus, because the LP accesses the network, Nam teaches that the LP (*provider*) is *different than* the communication network. Ex.1003 ¶¶213 (Ex.1015, 1:19-2:7 (the LCS client is an external entity that accesses the network)), 206-214.

[1.2]

First, Nam's LP (*provider*) receives a trigger-event message (*updating signal*) from the MS (*mobile station*). Ex.1013 ¶111; *see* [1.1]. In response, the LP "**provides** the LA [location agent] 430 with **a corresponding location trigger service in accordance to the [message]**." Ex.1013 ¶111. That is, Nam teaches the *server* of the LP makes a change in response to the trigger-event message (*updating signal*) *received from the mobile station*, shown in Fig. 5 (yellow):



Ex.1013, Fig. 5 (annotated)

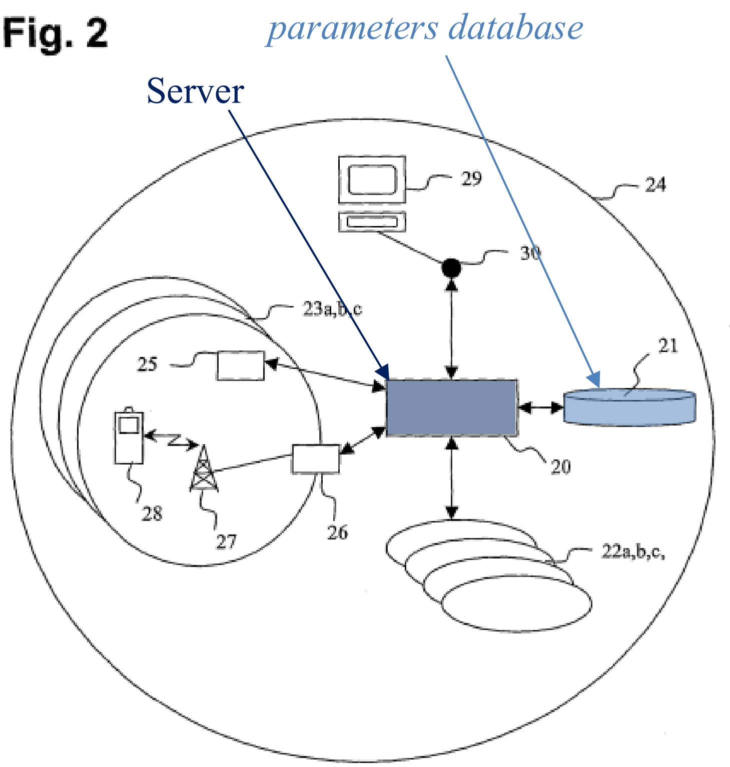
The location server includes various databases that are updated when it receives the trigger-event message from the MS. Ex.1013 ¶¶148-149. Thus, the databases (*parameters database[s]*) collectively store information in fields corresponding to the services/tariffs (*operating parameter[s]*) provided to the MS in the pre-defined area indicated by the trigger-event message (*updating signal*) that are updated in response thereto. Ex.1003 ¶217.

Second, Nam teaches using the location-based services to charge different amounts based on MS location. In one example, the "location trigger" is a "mobile-telephone charge discount service." Ex.1013 ¶171, Fig. 16. When the mobile station enters a discounted area, specified by a "trigger-specified Cell-ID area," the "discount charge area flag [is set] to 1, and the flag is set to 0 when the MS leaves the discount charge area." Ex.1013 ¶171.

While in Nam's example the flag is stored in the MS itself, Nam expressly teaches that "[t]he mobile-telephone charge discount service can be provided without using the discount area flag" at the MS. Ex.1013 ¶173. Instead, the MS sends the location-trigger message to the LP "when the MS enters a discount charge area, and the user is offered the discount service and pays a discounted mobile-telephone bill." Ex.1013 ¶173. It would have been obvious that the location server's database would maintain the discount-service information and change the discount service in response to (*determined by*) the location-trigger message (*updating signal*). Ex.1003 ¶219. Further, based on Nam's combined server and flag teachings, it would have been obvious for the server to change the *value* of one or more flags (*operating parameter*) to implement Nam's teaching of the server offering the discounted service. Ex.1003 ¶219.

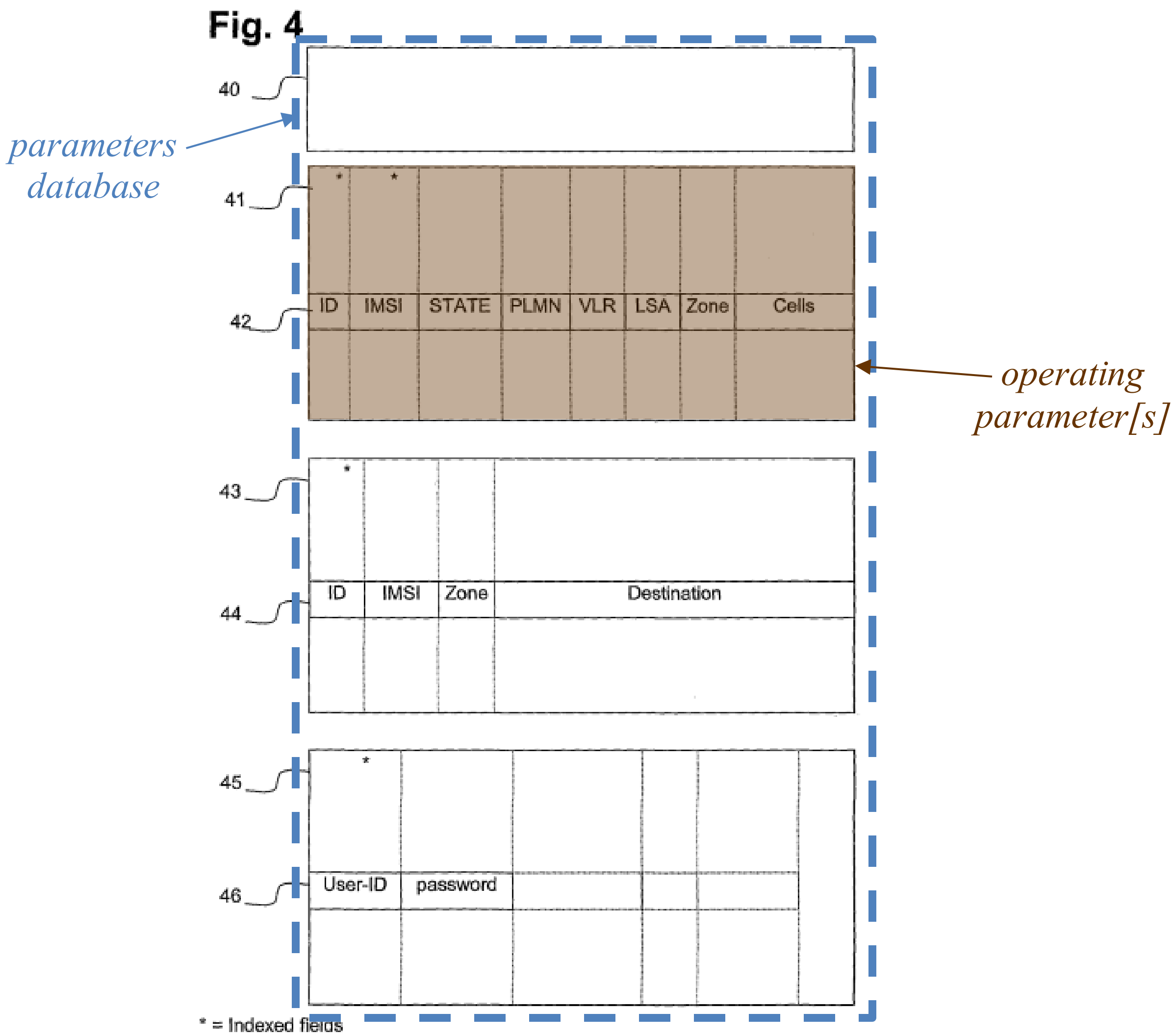
Third, while Nam alone teaches [1.2], this would have been further obvious in combination with Noldus. In Noldus, a "zone server" maintains a "zone database (21) for storing administrative and operational data." Ex.1038 ¶67; Fig. 2:

Fig. 2



Ex.1038, Fig. 2 (annotated)

Noldus' zone database includes multiple "zone records", each including fields (*operating parameter[s]*) that store a mobile-station identifier, a "list of cells that build-up the zone," and current location (zone) of the mobile station (*storing…a parameters database having an operating parameter*). Ex.1038 ¶69; Fig. 4:



Ex.1038, Fig. 4 (annotated)

The zone server communicates with a zone application in a "mobile terminal[]" (*i.e.*, mobile station) and when a mobile station moves into or exits a defined zone, the mobile station "sends a cell change message" to the zone server. Ex.1038 ¶¶131, 134, 140. The zone server updates the zone record in the zone database so that "[e]ach record maintains a state of presence of the mobile station in the defined zone." Ex.1038 ¶¶83, 60. As explained in §XI.F.3, a POSITA would have been motivated to combine Nam's location-server and database teachings with Noldus' zone-database and maintaining-presence-state teachings such that a database stores the service flags corresponding to the offered services/tariffs for each localized service area (*operating parameters*), the list of Cell-IDs corresponding to the localized service area, and a the current location of the mobile station. Ex.1003 ¶223. Thus, when the location server receives a trigger-event message (*updating signal*), the current location is updated in the database and the flag for the service/tariff offered in the localized service area is updated based on the updated location (*storing in the one or more servers a parameters database having an operating parameter whose value is determined at least in part by the updating signal received from the mobile station*). Ex.1003 ¶¶223, 215-224.

[1.3]

First, Nam teaches that the LP (*provider*), which includes a location server (*one or more servers*), sends a trigger Cell-ID list (*checking data*) to the MS (*mobile station*) that defines a pre-defined area (*special area*). *See* [1.0]-[1.1]. Nam's LP does so by sending an initialization message to the MS with "initial information on the location trigger, including a trigger Cell-ID list." Ex.1013 ¶110.

Telecommunications networks frequently change the coverage of base stations by, e.g., adding or removing base stations or changing coverage-area boundaries associated with the base stations. Ex.1003 ¶227 (citing Ex.1047

(Raith), 2:55-63; Ex.1048 (Ahmadi), 14:60-15:1; Ex.1006 ¶¶108, 110-111). Thus, it would have been obvious that, when the list of Cell-IDs defining the pre-defined area changes, Nam's server would send another initialization message with the updated list of Cell-IDs to the MS, in view of Nam's teaching of sending initial information. Ex.1003 ¶227. This alone renders obvious [1.3].

Second, [1.3] is further obvious in view of Noldus. Noldus teaches that the server allows an operator to "edit[], delete[] or creat[e] new zone records in the zone database." Ex.1038 ¶62. To edit a zone definition, Noldus explains that the server retrieves records associated with the mobile station and allows the operator to select a zone definition to edit. Ex.1038 ¶127. In response, the server "performs the required updates," including changing the list of cell identifiers that define the zone. Ex.1038 ¶69.

Once the server has updated the list of cell identifiers defining a zone, the server communicates these changes to the mobile station so that the mobile station has the "correct version." Ex.1038 ¶133 ("zone application" on the mobile station receives updates from the zone computer "when [the zone application] is not a correct version"); *see also* ¶¶135, 144 (sending list of access points making up shadow zone). It would have been obvious that when the zone definition (by cells, *see* Ex.1038 ¶58) in the server is edited, the zone definition no longer matches the version of the zone definition stored in the mobile station. Ex.1003 ¶230.

Accordingly, it would have been obvious that the server sends an update to the application of the mobile station when the zone is edited so that the updated zone definition is sent to the mobile station. Ex.1003 ¶230.

Combined, Nam's pre-defined area (*special area*) associated with a trigger event is edited via the location server (*one or more servers*), as taught by Noldus, and the location server sends an updated trigger Cell-ID list (*second checking data*) to the MS (*mobile station*) to update the *different*, previously stored trigger Cell-ID list (*first checking data*), as further taught by Noldus, thereby *modify[ing]* the pre-defined area (*special area*) in the MS (*sending from the one or more servers to the mobile station second checking data different from the first checking data to modify the special area*). *See* §XI.F.3; Ex.1003 ¶¶225-232.

5. Claim 2

In the combination, Nam teaches databases that store information necessary for determining the services/tariffs provided to the MS in pre-defined areas, and flags for different purposes including a "discount service" where a "discount charge area flag [is set] to 1, and the flag is set to 0 when the MS leaves the discount charge area." Ex.1013 ¶171; *see* [1.2]. Instead of using the flags at the mobile station, Nam further teaches implementing the charge-discount service via the LP. Ex.1013 ¶173.

Based on these combined teachings, it would have been obvious that the discount service offered by the LP (instead of the mobile) would include changing one or more flags (*operating parameter is a tariff flag or a service flag*) in support of the discount service. Ex.1003 ¶235. For example, it would have been obvious based on Nam's combined server (LP) and flag teachings for the LP to change one or more flags to implement the discount-service offering by the LP's server. Ex.1003 ¶235. Accordingly, Nam alone renders obvious claim 2.

Further, it was well known for a server (like Nam's location server) to implement changes in databases, as further demonstrated by Noldus. Ex.1003 ¶236. Noldus teaches that the zone server receives messages from the mobile station indicating its current location and updates the associated record in the zone database to maintain current presence information for the mobile station. *See* Ex.1038 ¶60. In combination, Nam's flag teachings—and implementation at the server instead of at the mobile station—combined with Noldus' updating of database records at the server renders obvious claim 2 (*the operating parameter is a tariff flag or a service flag that enables or disables a special tariff or a service for a mobile station*). Ex.1003 ¶¶233-238.

6. Claim 3

[3.0]

See [1.0]; Ex.1003 ¶239.

[3.1]

Limitation [3.1] is substantially similar to [1.1], except that [3.1] is from the mobile station's perspective and [1.1] is from the server's perspective. Because the reasons shown at [1.1] also included the mobile station sending the updating signal, Nam-Noldus also renders [3.1] obvious. Ex.1003 ¶240.

[3.2]

Limitation [3.2] is substantially similar to [1.3], except that [3.2] is from the mobile station's perspective and [1.3] is from the server's perspective. Because the reasons shown at [1.3] also included the mobile station receiving the checking data, Nam-Noldus also renders [3.2] obvious. Ex.1003 ¶241.

7. Claim 5

Nam discloses a location server with databases that, combined with Noldus's database teachings, store flags/fields (*operating parameter[s]*) associated with the services/tariffs for each mobile station in pre-defined areas that are updated based on location updates from the mobile station. *See* [1.2].

Further, Noldus teaches monitoring mobile stations that are switched off, in a similar manner to how the '032 patent describes the concept. Ex.1003 ¶244. In the '032 patent, the mobile network sets operating-parameter values in the parameters database to a set of initial values "when the mobile station is switched off (as at that time it is not present in any special area)" to start operating the mobile station when it is switched on. Ex.1001, 15:21-27; *see also* 4:22-28.

Noldus, in similar fashion, teaches that, when the mobile station is "switched off," "the status field of the zone record is OUT." Ex.1038 ¶¶138]-139. When the mobile station "switches on," the zone server "changes the state field of the zone record." Ex.1038 ¶139. Thus, the zone server *determin[es] when the mobile station is switched off* because the mobile station is not in communication with the network, and the record is set to OUT (*upon determining that the mobile station is switched off setting the value of the operating parameter to an initial value*). Ex.1038 ¶139 (the mobile station becomes detectable, indicating the mobile station is switched on); Ex.1003 ¶¶242-246.

G. Ground 5: Claims 4 and 6 are obvious over Nam, Noldus, and Duan.

1. Reasons to combine Nam, Noldus, and Duan

A POSITA would have been motivated to combine the teachings of Nam and Noldus with the teachings of Duan for several reasons. Ex.1003 ¶247. Combining Duan's implementation details for network elements acknowledging the receipt of signals from mobile stations, or triggering retransmission, with Nam's updating-signal and system teachings would have been obvious, beneficial, and predictable. Ex.1003 ¶247. Nam describes communicating between system entities, including the mobile station and LP, leaving implementation details up to a POSITA, motivating a POSITA to turn to Duan's teachings of well-known ack/nack operations. Ex.1003 ¶247.

As a threshold matter, Duan is analogous art because Duan is in the same field of endeavor as the ’032 patent. Ex.1003 ¶248. As discussed in §XI.F.3, the ’032 patent, Nam, and Noldus are directed to the field of providing services to a mobile station based on its location. Similarly, Duan is related to a “method for reporting location reports by target user equipment (UE) in Location Service (LCS)” system. Ex.1015, 1. Further, Duan is reasonably pertinent to problems addressed in the ’032 patent, as discussed above in §XI.D.2 (Ground 2). Ex.1003 ¶248.

Nam explains that location-based services monitor the current location of a mobile station to provide accurate services to the user. Ex.1013 ¶¶5-6. Further, Nam improves upon prior systems where modifying network elements resulted in various problems including “communication interruption” that interfered with proper service provision. *See* Ex.1013 ¶31. Nam left some implementation details up to a POSITA, including the use of ack/nack to minimize lost data from any communication interruptions. Ex.1003 ¶249.

But using ack/nack was a well-known detail, as Duan demonstrates. *See* §XI.D.2 (Ground 2); Ex.1003 ¶¶250-254 (citing; Ex.1042 ¶5; Ex.1049, 60, 63-64, 66-69, Figs. 3.9, 3.11; Ex.1006 ¶¶76-78, 84; Ex.1038 ¶143 (using acknowledgement from mobile station to server), Ex.1050, 95). Duan teaches how to send an acknowledgment to the mobile station (*i.e.* UE), confirming receipt of a message indicating the mobile station is in a particular location, and retransmitting the message if no ACK is received. Ex.1015, 9:25- 10:6, 10:16- 11:9; Ex.1003 ¶255.

Therefore, a POSITA would have been motivated to implement Duan's acknowledgment teachings with Nam's system teachings to ensure that the location server receives the message indicating the mobile station is in the pre-defined area. Ex.1003 ¶256. Nam's location server would thus send an acknowledgment to the mobile station upon receipt of the message, as taught by Duan. Ex.1003 ¶257. If the acknowledgment is not received, Nam's mobile station would retransmit the message, as also taught by Duan. Ex.1003 ¶257.

A POSITA would have had a reasonable expectation of success implementing Duan's acknowledgment teachings with Nam's system teachings. Ex.1003 ¶258. Nam explains that the location server and mobile station send messages to one another. Ex.1013 ¶¶110-111. Noldus, similarly, teaches the server and mobile station sending messages to each other. Ex.1038 ¶¶139-143. Noldus also sends acknowledgement messages from the mobile station to the server. Ex.1038 ¶¶139-143. A POSITA would have understood that the reverse would also occur—the server sending an acknowledgment to the mobile station, as Duan confirms. Ex.1003 ¶258. This would have been a simple and conventional way to ensure that the message was received and improve the provision of services when a mobile station enters a pre-defined area/zone. Ex.1003 ¶258.

2. Claim 6

Nam teaches that the MS (*mobile station*) sends a message (*updating signal*) to the location server (*server*) of the LP indicating that the MS is in a pre-defined area. Ex.1013 ¶¶91, 105; *see* [1.1]. Further, Noldus explains that the mobile station "acknowledges" receipt of a message from the zone server. Ex.1038 ¶143. It would have been obvious, based on Nam's communication teachings and Noldus' acknowledgement teachings, for Nam's location server to likewise send acknowledgements to the mobile station. Ex.1003 ¶260.

For example, Duan discloses a mobile station sending a "location report" to a network element and the element sending "a location report acknowledgement" to the mobile station, confirming receipt of the location report. Ex.1015, 10:28-29. In combination, Nam-Noldus-Duan teaches the mobile station receiving an acknowledgement from the location server confirming receipt of the trigger-event message (*receiving in the mobile station from the at least one server of the provider of presence related services an acknowledgement of a reception of the updating signal*). *See* §XI.G.1; Ex.1003 ¶¶259-263.

3. Claim 4

The Nam-Noldus-Duan combination teaches Nam's mobile station receiving an acknowledgment from the location server indicating receipt of the trigger-event message, as taught by Duan. *See* [6.0].

It would have been further obvious for the mobile station to retransmit the message when an acknowledgment is not received. Ex.1003 ¶266. It was well known that the device transmitting a message to another element retransmits the message if no acknowledgment is received to ensure proper receipt of the message by the intended element. Ex.1003 ¶266. Duan confirms this, teaching that the mobile station sends the location report again if it does not receive acknowledgment from the network. Ex.1015, 11:3-9. In combination, Nam's mobile station would send the updating message again if it did not receive an acknowledgement from the LP (*the mobile station retransmitting the updating signal upon not receiving the acknowledgement from the at least one server*), according to Duan's teachings. *See also* §XI.G.1; Ex.1003 ¶¶264-269.

XII. CONCLUSION

Petitioner has established a reasonable likelihood that the Challenged Claims are unpatentable.

Respectfully submitted,

Dated: September 11, 2025
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XIII. MANDATORY NOTICES

A. Real party-in-interest

Pursuant to 37 C.F.R. §42.8(b)(1), Petitioner certifies that the real party-in-interest is Apple, Inc.

B. Related matters

Pursuant to 37 C.F.R. §42.8(b)(2), to the best knowledge of the Petitioner, the ’032 patent is or was involved in the following cases:

Case Heading	Number	Court	Filed
Avant Location Technologies LLC v. Apple Inc.	2-24-cv-00757	EDTX	Sept. 13, 2024
Avant Location Technologies LLC v. Fibar Group SA et al.	2-24-cv-00165	EDTX	March 8, 2024
Avant Location Technologies LLC v. Samsung Electronics Co., Ltd. Et al.	2-24-cv-00133	EDTX	Feb. 23, 2024
Avant Location Technologies LLC v. Ecobee Technologies ULC d/b/a Ecobee	2-23-cv-00354	EDTX	July 31, 2023

C. Lead and back-up counsel and service information

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Please address all correspondence in this proceeding to lead and back-up counsel. Petitioner consents to service in this proceeding by email at the addresses above.

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), Petitioner hereby certifies, in accordance with and reliance on the word count provided by the word-processing system used to prepare this Petition, that the number of words in this paper is 13,926. Pursuant to 37 C.F.R. § 42.24(d), this word count excludes the table of contents, table of authorities, mandatory notices under § 42.8, certificate of service, certificate of word count, appendix of exhibits, and any claim listing.

Dated: September 11, 2025

/Scott T. Jarratt/
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CERTIFICATE OF SERVICE

The undersigned certifies that, in accordance with 37 C.F.R. § 42.6(e) and 37 C.F.R. § 42.105, service was made on Patent Owner as detailed below.

Date of service	September 11, 2025
Manner of service	FEDERAL EXPRESS
Documents served	Petition for *Inter Partes* Review Under 35 U.S.C. § 312 and 37 C.F.R. § 42.104 of U.S. 9,622,032; Petitioner's Power of Attorney; Petitioner's Exhibit List; Exhibits 1001-1007, 1010, 1013, 1015, 1018-1019, 1021, 1037-1039, 1042-1044, 1047-1050, and 1066-1068.
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