IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

CONVERSANT WIRELESS LICENSING S.A.R.L.,	)	
Plaintiff,	)	Civil No. 6:20-cv-00323-ADA
v.	)	**JURY TRIAL DEMANDED**
TESLA, INC.,	)	
Defendant.	)	

FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Conversant Wireless Licensing S.A.R.L. ("Conversant") files this Complaint for patent infringement against Defendant Tesla, Inc. ("Tesla" or "Defendant"), alleging as follows:

NATURE OF SUIT

1. This is a claim for patent infringement arising under the patent laws of the United States, Title 35 of the United States Code.

PARTIES

2. Plaintiff Conversant Wireless Licensing S.A.R.L. ("Conversant") is a corporation duly organized and existing under the laws of the Grand Duchy of Luxembourg, having a principal place of business at 12, rue Jean Engling, L-1466, Luxembourg. Conversant has a regular and established place of business and does business relating to the Patents-in-Suit, as defined in section I below, in connection with its wholly-owned subsidiary, Conversant Wireless Licensing Ltd. ("Conversant USA"), a corporation duly organized and existing under the laws of the State of Texas, having a principal place of business at 5630 Granite Parkway #100-247, Suite 247, Plano, TX 75024. All pertinent documents and discovery relevant to this matter either reside at

Conversant USA's local address or will be produced at that address. Conversant is the owner of record of the Patents-in-Suit in this action.

3. Defendant Tesla, Inc. ("Tesla" or "Defendant") is a corporation organized under the laws of the State of Delaware, having a principal place of business at 3500 Deer Creek Road, Palo Alto, CA 94304. Tesla may do business with the fictitious name Tesla Motors, Inc. Tesla can be served with process through its registered agent in the State of Texas, CT Corporation, 1999 Bryan St., Suite 900, Dallas, Texas 75201-3136.

JURISDICTION AND VENUE

4. This action arises under the patent laws of the United States, 35 U.S.C. § 101, *et seq.* This Court has jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

5. Tesla is subject to personal jurisdiction in this Court. This Court has personal jurisdiction over Tesla because Tesla has engaged in continuous, systematic, and substantial activities within this State, including substantial marketing and sales of products within this State and this District. Furthermore, upon information and belief, this Court has personal jurisdiction over Tesla because Tesla has committed acts giving rise to Conversant's claims for patent infringement within and directed to this District.

6. Upon information and belief, Tesla has conducted and does conduct substantial business in this forum, directly and/or through subsidiaries, agents, representatives, or intermediaries, such substantial business including but not limited to: (i) at least a portion of the direct and indirect acts of infringement alleged herein; (ii) purposefully and voluntarily placing one or more infringing products into the stream of commerce with the expectation that they will be purchased by consumers in this forum; or (iii) regularly doing or soliciting business, engaging in other persistent courses of conduct, or deriving substantial revenue from goods and services

provided to individuals in Texas and in this judicial district. Thus, Tesla is subject to this Court's specific and general personal jurisdiction pursuant to due process and the Texas Long Arm Statute.

7. Upon information and belief, Tesla has committed acts of infringement in this District and has one or more regular and established places of business within this District under 28 U.S.C. § 1400(b). Thus, venue is proper in this District under 28 U.S.C. § 1400(b).

8. Tesla maintains a permanent physical presence within this District. For example, it maintains galleries at (1) 12845 Research Boulevard, Austin, Texas 78759; (2) 11600 Century Oaks Terrace, Austin, Texas 78758; and (3) 23011 IH-10 West, San Antonio, Texas 78257. Tesla also maintains service centers in this District, including at 12845 Research Boulevard, Austin, Texas 78759; 23011 IH-10 West, San Antonio, Texas 78257; and 28 Walter Jones, Suite C, El Paso, Texas. Tesla conducts business from at least these locations. Tesla employs employees who work at Tesla's locations in this District.

9. In addition, Tesla maintains charging stations throughout this District. Tesla features commercial signage at each Supercharger station identifying the location as a regular and established place of Tesla's business. Moreover, Superchargers are monitored closely and regularly serviced by Tesla Service Technicians. Tesla's Supercharging stations in this District include at least at the following locations: (1) Austin, TX – Research Boulevard Supercharger, 9607 Research Boulevard, Austin, TX 78759; (2) Austin, TX Supercharger, 6406 N. Interstate 35 Frontage Road, Austin, TX 78752; (3) El Paso Supercharger, 6401 South Desert Boulevard, El Paso, Texas 79932; (4) Fort Stockton, TX Supercharger, 2571 North Front Street, Fort Stockton, Texas 79735; (5) Giddings, TX Supercharger, 3025 East Austin Street, Giddings, Texas 78942; (6) Junction Supercharger, 2415 N Main Street, Junction, Texas 76849; (7) Leon Springs, TX Supercharger, 24165 I-10 #300, San Antonio, Texas 78357; (8) Midland Supercharger, 3001

Antelope Trail, Midland, Texas 79706; (9) Pecos, TX Supercharger, 100 East Pinehurst Street, Pecos, Texas 79772; (10) San Antonio, TX Supercharger, 11745 I-10, San Antonio, Texas 78230; (11) San Marcos, TX Supercharger, 3939 Interstate 35, San Marcos, Texas 78666; (12) Van Horn Supercharger, 1921 Frontage Rd, Van Horn, Texas 79855; and (13) Waco Supercharger, 701 Interstate 35, Bellmead, Texas 76705. Upon information and belief, Tesla also has eight (8) Supercharging stations "coming soon" to this District.

10. Tesla's locations in this District, including at least those identified in paragraphs 8 and 9 above, are regular and established places of business under 28 U.S.C. § 1391, 28 U.S.C. § 1400(b), and *In re Cray, Inc.*, 871 F.3d 1355, 1360 (Fed. Cir. 2017).

a. Tesla's locations in this District, including at least those identified in paragraphs 8 and 9 above, are physical places in this District. Each gallery and service center comprises one or more buildings set apart for the purpose of offering for sale, selling, showcasing, and/or servicing infringing products. Each Supercharging station comprises a physical area set apart for the purpose of charging infringing products. Indeed, Tesla itself advertises its physical locations in this District as places of its business and it features commercial signage at each location.

b. Tesla's locations in this District, including at least those identified in paragraphs 8 and 9 above, are regular and established. Tesla features commercial signage at each location identifying the location as a regular and established place of Tesla's business.

c. Tesla's locations in this District, including at least those identified in paragraphs 8 and 9 above, are places of business of Tesla. Tesla offers its own products and services for sale at its locations.

d. Tesla's locations in this District, including at least those identified in paragraphs 8 and 9 above, are physical, geographical locations in this District from which Tesla carries out its business.

e. Tesla employees work at Tesla's locations, including at least those identified in paragraphs 8 and 9 above. Upon information and belief, these Tesla employees are regularly and physically present at Tesla's locations, including at least those identified in paragraphs 8 and 9 above, during business hours and they are conducting Tesla's business while working there.

11. Further, upon information and belief, Tesla trains future employees (specifically, electric vehicle technicians) in this District at Tesla's START Training Program housed at Texas State Technical College in Waco, Texas. Tesla provides the instructor, training equipment, vehicles, tools, and curriculum for the program. Students are employed by Tesla as hourly interns, and following completion of the program they are placed in a Tesla Service Center in North America.

FACTUAL ALLEGATIONS

I. PATENTS-IN-SUIT

12. United States Patent No. 7,643,456 ("the '456 Patent") is entitled "Transfer of Packet Data to Wireless Terminal." The '456 Patent duly and legally issued on January 5, 2010, from U.S. Patent Application No. 10/957,777, filed on October 4, 2004. The '456 Patent is a continuation of application No. PCT/FI03/00263, filed on April 8, 2003. The '456 Patent is entitled to the benefit of the April 8, 2003 filing date of application No. PCT/FI03/00263. The '456 Patent names Jarkko Jouppi and Janne Rinne as inventors. Conversant is the current owner

of all rights, title, and interest in and to the '456 Patent. A true and correct copy of the '456 Patent is attached hereto as Exhibit A and is incorporated by reference herein.

13. United States Patent No. 9,930,697 ("the '697 Patent") is entitled "Random Access Channel Response Handling with Aggegrated [sic] Component Carriers." The '697 Patent duly and legally issued on March 27, 2018 from U.S. Patent Application No. 14/976,154, filed on December 21, 2015. The '697 Patent is a continuation of application No. 13/248,579, filed on September 29, 2011, now United States Patent No. 9,253,797. United States Patent No. 9,253,797 is a division of application No. 12/384,950, filed on April 10, 2009, now United States Patent No. 8,077,670. The '697 Patent is entitled to the benefit of the April 10, 2009 filing date of United States Patent No. 8,077,670. The '697 Patent names Jianke Fan, Juha S. Korhonen, Mikko J. Rinne, and Esa M. Malkamaki as inventors. Conversant is the current owner of all rights, title, and interest in and to the '697 Patent. A true and correct copy of the '697 Patent is attached hereto as Exhibit B and is incorporated by reference herein.

14. United States Patent No. 9,253,797 ("the '797 Patent") is entitled "Random Access Channel Response Handling with Aggregated Component Carriers." The '797 Patent duly and legally issued on February 2, 2016 from U.S. Patent Application No. 13/248,579, filed on September 29, 2011. The '797 Patent is a division of application No. 12/384,950, filed on April 10, 2009, now United States Patent No. 8,077,670. The '797 Patent is entitled to the benefit of the April 10, 2009 filing date of United States Patent No. 8,077,670. The '797 Patent names Jianke Fan, Juha S. Korhonen, Mikko J. Rinne, and Esa M. Malkamaki as inventors. Conversant

is the current owner of all rights, title, and interest in and to the '797 Patent. A true and correct copy of the '797 Patent is attached hereto as Exhibit C and is incorporated by reference herein.

15. Collectively, the '456 Patent, the '697 Patent, and the '797 Patent are referred to herein as the "Patents-in-Suit."

II. BACKGROUND

16. In 2011, Conversant acquired a portfolio of close to 2,000 patents and patent applications previously owned by Nokia Corporation ("Nokia"), obtaining all right, title, and interest in, to and under the patents and patent applications in the portfolio, including without limitation the right to sue for past, present, or future infringements of the patents and patent applications acquired. By reason of the aforesaid, Conversant has, since 2011, been the owner of the Patents-in-Suit and the right to enforce them. Before Conversant became the owner of the Patents-in-Suit, the Patents-in-Suit were originally invented by agents or employees of, procured by, or assigned to Nokia.

17. Nokia is and has been a member of the European Telecommunications Standards Institute ("ETSI"), a non-profit Standard Setting Organization headquartered in France. Conversant and/or Nokia have made declarations in respect of the Patents-in-Suit to ETSI, one of the organizational partners of the Third Generation Partnership Project ("3GPP") that organizes and maintains the development of telecommunications standards applicable to mobile communications products, devices, and services. Telecommunications standards applicable to wireless mobile communications devices include second generation technologies such as Global System for Mobile ("GSM") and GSM Packet Radio Service ("GPRS"), third generation technologies such as Universal Mobile Telecommunications System ("UMTS") and High Speed Packet Access ("HSPA"), and fourth generation technologies such as Long-Term Evolution ("LTE"). With respect to the Patents-in-Suit, the declarations and affirmations made by

Conversant and/or Nokia include a provision to the effect that the declarant is prepared to grant irrevocable licenses to the Patents-in-Suit on fair, reasonable, and non-discriminatory ("FRAND") terms. Conversant has specifically agreed to grant a license to the Patents-in-Suit under FRAND terms to willing licensees who negotiate in good faith. For example, on July 22, 2014, Conversant made a declaration to ETSI to the effect that it is willing and prepared to grant irrevocable licenses on terms and conditions that are FRAND with respect to the patents that it owns that cover functionality that has been implemented in mobile communications devices that are in compliance with the requirements and technical specifications of the mobile communications standards that are promulgated by and maintained by 3GPP.

III. CONVERSANT'S ATTEMPTS TO LICENSE TESLA

18. On or about December 18, 2018, Conversant sent a letter and FRAND licensing offer to Tesla. The letter stated, "Conversant Wireless owns an extensive patent portfolio related to mobile communications networks, which includes hundreds of patents and patent applications that have been declared essential to 2G, 3G and 4G mobile standards." Conversant then offered a FRAND license to its applicable standard-essential patent ("SEP") portfolio: "Conversant Wireless is offering a FRAND license to its SEP portfolio to manufacturers of vehicles with cellular functionality, including Tesla." As part of its FRAND offer, Conversant provided Tesla with access to a Share File site which included representative claim charts for Conversant's patent portfolio.

19. In addition, Conversant is a member of the Avanci patent pool. As such, upon information and belief, Avanci also offered Tesla a FRAND license to Conversant's SEP patent portfolio, among other patents.

20. As of December 18, 2018, the Shared Site provided by Conversant to Tesla included over 20 claim charts for Conversant's Standard Essential Patents issued in the United

States and foreign countries. At least by having access to this Shared Site, Tesla had knowledge of each of the Patents-in-Suit and its infringement of such patents, prior to the filing of this lawsuit.

21. After Tesla ignored Conversant's December 18, 2018 FRAND license offer, on February 26, 2019, Conversant again contacted Tesla to follow up on its previous offer, stating in part, "As you are well aware, FRAND licensing of Standard Essential Patents (SEPs) requires active participation of both sides in the negotiations."

22. Tesla finally responded on April 4, 2019 but failed to provide any material response to Conversant's FRAND offer and related correspondence.

23. After no further communication from Tesla, on or about February 26, 2020, Conversant filed patent infringement complaints against Tesla, Inc. and its German subsidiary Tesla Germany GmbH before the Mannheim Regional Court in Germany.

24. On March 16, 2020, Conversant again contacted Tesla, informing it of the German patent infringement complaints, stating "Tesla's failure to provide a material response or any further communication raises doubts as to its actual willingness to take a license. We also understand that Tesla has not taken the parallel pool offer from Avanci, which presents an alternative opportunity to license our portfolio. . . . We remain open and willing to discuss our bilateral license offer and hope that a meeting can be arranged promptly."

25. On March 26, 2020, Tesla responded by requesting a copy of the German patent infringement complaints and indicating that "Tesla is and remains a willing licensee of the Conversant portfolio for applicable standard-essential-patents ("SEP")," and suggested that Tesla would formulate a counteroffer for Conversant's portfolio for applicable SEPs.

26. On April 6, 2020, Conversant responded by again offering a FRAND license to its SEP portfolio: "I can confirm that our applicable SEPs can be licensed either through the Avanci

pool or by way of our bilateral FRAND license offer presented to you in December 2019. As we understand that you have declined our bilateral FRAND offer, we now look forward to your mentioned counter offer."

27. To date, Tesla has not taken a license to Conversant's patent portfolio, or any of the Patents-in-Suit.

IV. THE TESLA STANDARD-COMPLIANT PRODUCTS

28. As further discussed below, Tesla has directly and indirectly infringed and continues to directly and indirectly infringe each of the Patents-in-Suit by engaging in acts constituting infringement under 35 U.S.C. § 271(a), (b), and/or (c), including without limitation by one or more of making, using, selling and offering to sell, in this District and elsewhere in the United States, and importing into this District and elsewhere in the United States Tesla's connected vehicle products (the "Tesla Standard-Compliant Products").

29. Tesla is doing business in the United States, and, more particularly, in the this District by making, using, selling, importing, and/or offering for sale the Tesla Standard-Compliant Products, including without limitation Tesla's Model S, Model 3, Model X, Model Y, Cybertruck, and Roadster that infringe one or more of the patent claims involved in this action.

30. Upon information and belief, and as widely reported, the Tesla Standard-Compliant Products, including the above-referenced connected vehicles, are compliant with at least 3G and/or 4G/LTE cellular network standards . *See, e.g.*, *Tesla unveils world's first mass-produced, highway capable EV*, Tesla Investors, Mar. 26, 2009, https://ir.tesla.com/news-releases/news-release-details/tesla-unveils-worlds-first-mass-produced-highway-capable-ev (describing "in-car 3G connectivity"); Roger Cheng, *Tesla taps AT&T to bring cellular connection to its cars*, CNET, Oct. 17, 2013, https://www.cnet.com/news/tesla-taps-at-t-to-bring-cellular-connection-to-its-cars

(describing 3G and HSPA+ capability); *First LTE-enabled Tesla Model S delivered*, Electrek, June 5, 2015, https://electrek.co/2015/06/05/first-lte-enabled-model-s-delivered (reporting new Model S delivered with working 4G/LTE capability); *Tesla to Acquire SolarCity: Presentation to Proxy Advisory Firms*, Form S-4 File No.:333-213390, Oct. 25, 2016, at 16 (stating vehicle features include 4G/LTE connectivity); Russ Mitchell, *Tesla Model 3 has some unusual features, including an instrument-free dash*, Seattle Times, Aug. 5, 2017, https://www.seattletimes.com/business/tesla-model-3-has-some-unusual-features-including-an-instrument-free-dash (reporting Model 3 is 4G/LTE capable); Ryan Whittwam, *Tesla will begin charging $10 per month for "Premium" LTE features*, Dec. 9, 2019, https://www.extremetech.com/extreme/303159-tesla-will-begin-charging-10-per-month-for-premium-lte-features (reporting that all Tesla vehicles are 4G/LTE capable) (collectively attached hereto as Exhibit D).

31. Tesla's Support webpage confirms that the Tesla Standard-Compliant Products, including Tesla's Model 3, Model S, Model X, and Model Y connected vehicles, come with cellular connection capabilities. *See, e.g.*, *Support: Connectivity*, Tesla, https://www.tesla.com/support/connectivity (attached hereto as Exhibit E). At a minimum, Tesla offers its connectively package with 3G and 4G/LTE cellular free for the first year (for orders of Model S, Model X, Model Y, and Model 3 with Premium Interior) and 30 days (for orders of Model 3 Standard Range and Standard Range Plus), and charges $9.99 per month thereafter. *See id.*

32. Further, the Owner's Manuals for the Tesla Standard-Compliant Products, including Tesla's Model 3, Model S, Model X, and Model Y connected vehicles, confirm that the Tesla Standard-Compliant Products are compliant with at least 3G and/or 4G/LTE cellular network

standards. For example, the Owner's Manual for the Model S describes how the internet connection of the Model S can be switched from a cellular connection ("usually LTE or 3G") to a Wi-Fi connection. *See, e.g.*, Model S Owner's Manual, v. 2020.4 North America, at 156 (attached hereto as Exhibit F).

COUNT 1—INFRINGEMENT OF THE '456 PATENT

33. Conversant incorporates by reference the allegations set forth in Paragraphs 1–32 of this Complaint as though fully set forth herein.

34. In violation of 35 U.S.C. § 271(a), Tesla is and has been directly infringing one or more of the '456 Patent's claims, including at least Claim 7, by making, using, offering to sell, and/or selling in the United States, and/or importing into the United States, without authority, products that support 3G and/or 4G/LTE connectivity, including without limitation the Tesla Standard-Compliant Products as defined above. Each of the Tesla Standard-Compliant Products comprises hardware and software components that together practice every element of one or more claims of the '456 Patent, including at least Claim 7. These components include those hardware and software components that enable the set of wireless cellular communications functionalities known as 3G and/or 4G/LTE and implement 3G and/or 4G/LTE in compliance with the requirements of the technical standards applicable to mobile communications, including the technical standards promulgated by 3GPP and various subsequent releases and versions thereof. These components enable the Tesla Standard-Compliant Products to perform 3G and/or 4G/LTE communications functionality.

35. It is necessary to practice one or more of the claims of the '456 Patent to comply with the requirements of certain standards applicable to mobile communications. For example, it

is necessary to practice at least Claim 7 from the '456 Patent to comply with certain 3G and/or 4G/LTE standards.

36. The Tesla Standard-Compliant Products comply with the applicable standards covered by the claims of the '456 Patent.

37. The Tesla Standard Compliant Products comprise at least the wireless terminal of Claim 7 of the '456 Patent.

38. The applicable standards covered by the claims of the '456 Patent describe, at least, the wireless terminal of Claim 7 of the '456 Patent.

39. By way of example, Claim 7 of the '456 Patent requires "the wireless terminal being configured to transmit a configuration signal to a network node in a mobile system for activating or modifying a packet data protocol context."

40. The applicable standards covered by the claims of the '456 Patent, including but not limited to 3GPP TS 24.301 V11.5.0 (2012-12), describe the wireless terminal being configured to transmit a configuration signal to a network node in a mobile system for activating or modifying a packet data protocol context:

3.2 Abbreviations

. . . .

EPS Evolved Packet System

. . . .

6.5.3 UE requested bearer resource allocation procedure

6.5.3.1 General

The purpose of the UE requested bearer resource allocation procedure is for a UE to request an allocation of bearer resources for a traffic flow aggregate. The UE requests a specific QoS demand (QCI) and optionally sends a GBR requirement for a new traffic flow aggregate. If accepted by the network, this procedure invokes a dedicated EPS bearer context activation procedure (see subclause 6.4.2) or an EPS bearer context modification procedure (see subclause 6.4.3).

. . . .

6.5.3.2 UE requested bearer resource allocation procedure initiation

In order to request the allocation of bearer resources for one traffic flow aggregate, the UE shall send a BEARER RESOURCE ALLOCATION REQUEST message to the MME, start timer T3480 and enter the state PROCEDURE TRANSACTION PENDING (see example in figure 6.5.3.2.1).

The UE shall include the EPS bearer identity of the default EPS bearer associated with the requested bearer resource in the Linked EPS bearer identity IE. The UE shall set the TFT operation code in the Traffic flow aggregate IE to "Create new TFT". In the Required traffic flow QoS IE, the UE shall indicate a QCI and, if the UE also includes a GBR, the additional GBR required for the traffic flow aggregate.

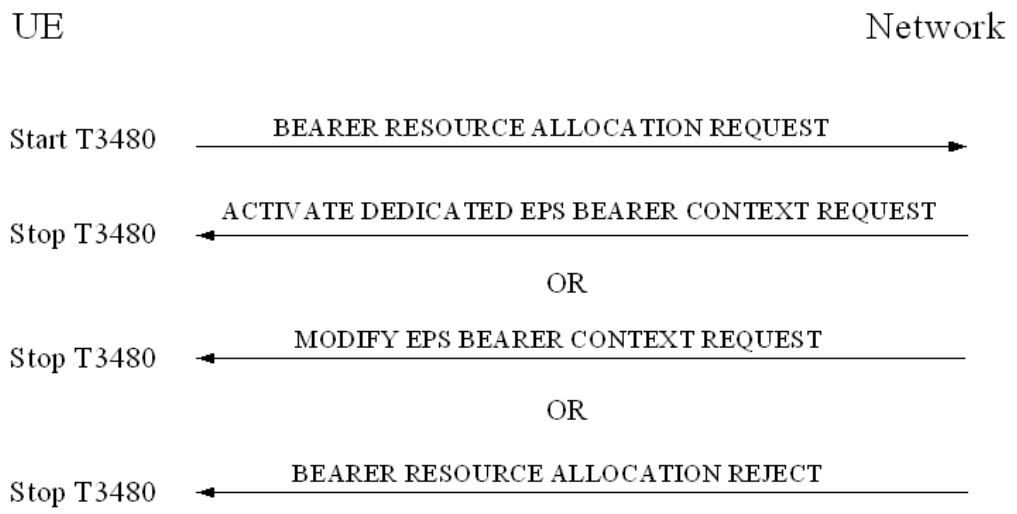

Figure 6.5.3.2.1: UE requested bearer resource allocation procedure

(3GPP TS 24.301 V11.5.0 (2012-12), at 24, 189–90).

41. In addition, the applicable standards covered by the claims of the '456 Patent, including but not limited to 3GPP TS 24.008 V11.8.0 (2013-09), describe the wireless terminal being configured to transmit a configuration signal to a network node in a mobile system for activating or modifying a packet data protocol context:

> **2.1.2 Vocabulary**
>
> . . . .
>
> - A default PDP context is a PDP context activated by the PDP context activation procedure that establishes a PDN connection. The default PDP context remains active during the lifetime of the PDN connection.
>
> . . . .
>
> **6.1.3.2 Secondary PDP Context Activation Procedure**
>
> The purpose of this procedure is to establish an additional PDP context between the MS and the network for a specific Traffic Flow Template (TFT) and QoS profile on a specific NSAPI, when one or more PDP contexts has/have already been established for the particular PDP address and APN. The MS shall include a request for a TFT if a PDP context without a TFT is presently active for the particular PDP address, or the BCM is 'MS/NW'. Depending on the selected Bearer Control Mode being 'MS only' or 'MS/NW', the secondary PDP context activation procedure may either be initiated by the MS or by either the MS or the network, respectively. If there is a PDN connection for emergency bearer services established, the MS shall not initiate a secondary PDP context activation procedure for this connection unless triggered by the network.

(3GPP TS 24.008 V11.8.0 (2013-09), at 38, 40, 287).

42. In addition, the applicable standards covered by the claims of the '456 Patent, including but not limited to 3GPP TS 23.060 V11.8.0 (2013-12), describe the wireless terminal

being configured to transmit a configuration signal to a network node in a mobile system for activating or modifying a packet data protocol context:

> **9.2.1A Principles for mapping between PDP Contexts and EPS Bearers**
>
> The following text describes the general principles used by an SGSN using S4 when mapping between PDP Contexts and EPS Bearers.
>
> The MS is using PDP Context Activation, Modification and Deactivation functions, and PDP Contexts are therefore used between MS and SGSN. An SGSN using Gn/Gp only will use these procedures towards GGSNs as well. An SGSN using S4 will for a specific PDP Context towards an MS map these procedures into equivalent procedures using EPS Bearer towards S GW and P GW. EPS Bearer procedures will not be used between MS and SGSN.
>
> The following principles are to be used:
>
> - 1:1 mapping between one PDP context and one EPS Bearer;

(3GPP TS 23.060 V11.8.0 (2013-12), at 206.)

43. In addition, the applicable standards covered by the claims of the ’456 Patent, including but not limited to 3GPP TS 36.300 V11.4.0 (2012-12), describe the wireless terminal

being configured to transmit a configuration signal to a network node in a mobile system for activating or modifying a packet data protocol context:

> **13.1 Bearer service architecture**
>
> The EPS bearer service layered architecture is depicted in Figure 13.1-1 below, where:
>
> . . . .

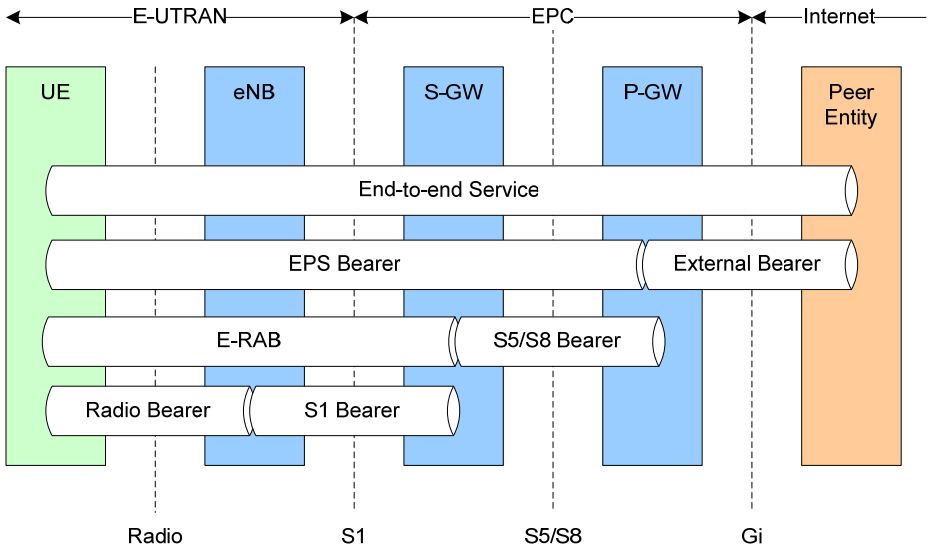

Figure 13.1-1: EPS Bearer Service Architecture

(3GPP TS 36.300 V11.4.0 (2012-12), at 98–99.)

44. By way of example, Claim 7 of the ’456 Patent requires “a packet data protocol context for linking a packet radio network to an external system.”

45. The applicable standards covered by the claims of the ’456 Patent, including but not limited to 3GPP TS 24.301 V11.5.0 (2012-12), describe a packet data protocol context for linking a packet radio network to an external system:

> **6 Elementary procedures for EPS session management**
>
> **6.1 Overview**
>
> **6.1.1 General**
>
> This clause describes the procedures used for EPS session management (ESM) at the radio interface (reference point "LTE-Uu").
>
> . . . .
>
> The ESM comprises procedures for:
>
> - the activation, deactivation and modification of EPS bearer contexts; and
> - the request for resources (IP connectivity to a PDN or dedicated bearer resources) by the UE.
>
> Each EPS bearer context represents an EPS bearer between the UE and a PDN. EPS bearer contexts can remain activated even if the radio and S1 bearers constituting the corresponding EPS bearers between UE and MME are temporarily released.
>
> An EPS bearer context can be either a default bearer context or a dedicated bearer context.
>
> A default EPS bearer context is activated when the UE requests a connection to a PDN.
>
> . . . .
>
> A dedicated EPS bearer context is always linked to a default EPS bearer context and represents additional EPS bearer resources between the UE and the PDN. The network can initiate the activation of dedicated EPS bearer contexts together with the activation of the default EPS bearer context or at any time later, as long as the default EPS bearer context remains activated.

(3GPP TS 24.301 V11.5.0 (2012-12), at 157).

46. In addition, the applicable standards covered by the claims of the '456 Patent, including but not limited to 3GPP TS 36.300 V11.4.0 (2012-12), describe a packet data protocol context for linking a packet radio network to an external system:

13.1 Bearer service architecture

The EPS bearer service layered architecture is depicted in Figure 13.1-1 below, where:

. . . .

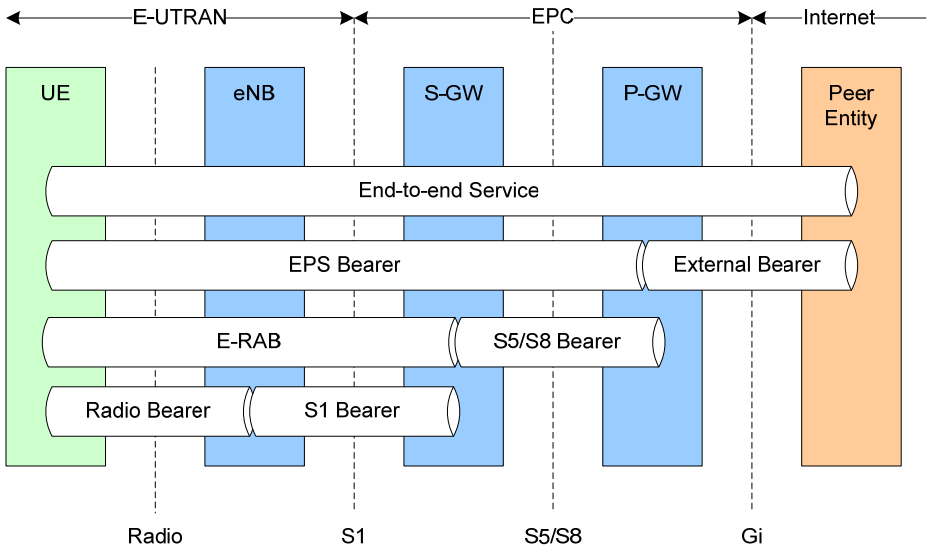

Figure 13.1-1: EPS Bearer Service Architecture

(3GPP TS 36.300 V11.4.0 (2012-12), at 98–99.)

47. In addition, the applicable standards covered by the claims of the '456 Patent, including but not limited to 3GPP TS 23.401 V11.4.0 (2012-12), describe a packet data protocol context for linking a packet radio network to an external system:

3.2 Abbreviations

. . . .

EPS Evolved Packet System

. . . .

4.2 Architecture reference model

4.2.1 Non-roaming architecture

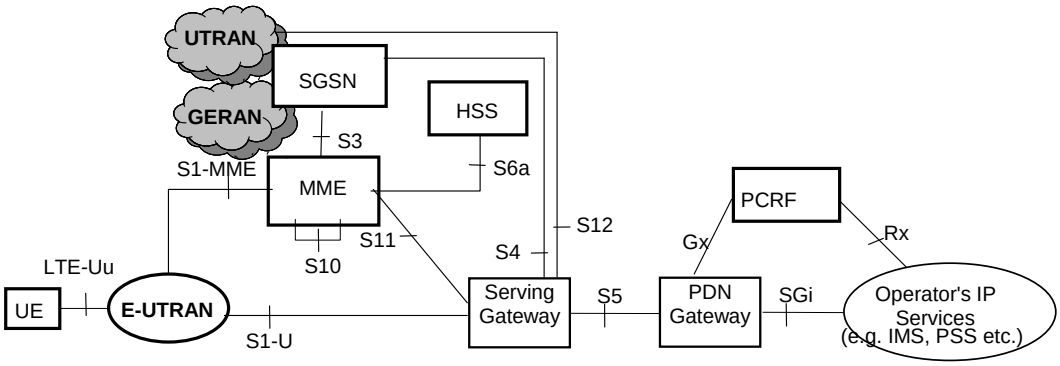

Figure 4.2.1-1: Non-roaming architecture for 3GPP accesses

. . . .

4.7 Overall QoS concept

4.7.1 PDN connectivity service

The Evolved Packet System provides IP connectivity between a UE and a PLMN external packet data network. This is referred to as PDN Connectivity Service.

The PDN Connectivity Service supports the transport of traffic flow aggregate(s), consisting of one or more Service Data Flows (SDFs).

(3GPP TS 23.401 V11.4.0 (2012-12), at 14, 16, 61.)

48. By way of example, Claim 7 of the ’456 Patent requires the limitation “wherein the wireless terminal is configured to check if a filter used for mapping data flows at the network node is determined by a separate network element.”

49. The applicable standards covered by the claims of the ’456 Patent, including but not limited to 3GPP TS 24.008 V11.8.0 (2013-09), describe that the wireless terminal is configured to check if a filter used for mapping data flows at the network node is determined by a separate network element:

> **10.5.6.12 Traffic Flow Template**
>
> The purpose of the *traffic flow template* information element is to specify the TFT parameters and operations for a PDP context. In addition, this information element may be used to transfer extra parameters to the network (e.g. the Authorization Token; see 3GPP TS 24.229 [95]). The TFT may contain packet filters for the downlink direction, the uplink direction or packet filters that apply for both directions. The packet filters determine the traffic mapping to PDP contexts. The downlink packet filters shall be applied by the network and the uplink packet filters shall be applied by the MS. A packet filter that applies for both directions shall be applied by the network as a downlink packet filter and by the MS as an uplink filter.

(3GPP TS 24.008 V11.8.0 (2013-09), at 576.)

50. In addition, the applicable standards covered by the claims of the ’456 Patent, including but not limited to 3GPP TS 36.300 V11.4.0 (2012-12), describe that the wireless terminal is configured to check if a filter used for mapping data flows at the network node is determined by a separate network element:

> **4.1 Functional Split**
>
> . . . .
>
> The PDN Gateway (P-GW) hosts the following functions (see 3GPP TS 23.401 [17]):
>
> - Per-user based packet filtering (by e.g. deep packet inspection);
>
> . . . .

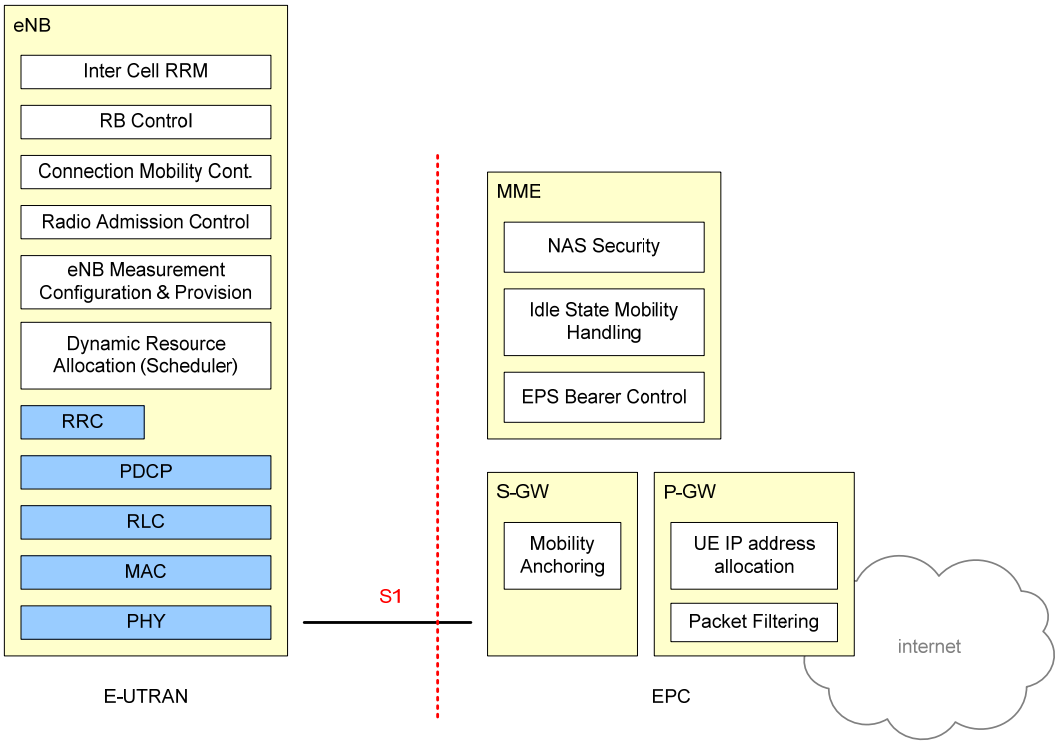

Figure 4.1-1: Functional Split between E-UTRAN and EPC

. . . .

13.1 Bearer service architecture

The EPS bearer service layered architecture is depicted in Figure 13.1-1 below, where:

- An UL TFT in the UE binds an SDF to an EPS bearer in the uplink direction. Multiple SDFs can be multiplexed onto the same EPS bearer by including multiple uplink packet filters in the UL TFT.

- A DL TFT in the PDN GW binds an SDF to an EPS bearer in the downlink direction. Multiple SDFs can be multiplexed onto the same EPS bearer by including multiple downlink packet filters in the DL TFT.

. . . .

- A PDN GW stores a mapping between a downlink packet filter and an S5/S8a bearer to create the binding between an SDF and an S5/S8a bearer in the downlink.

. . . .

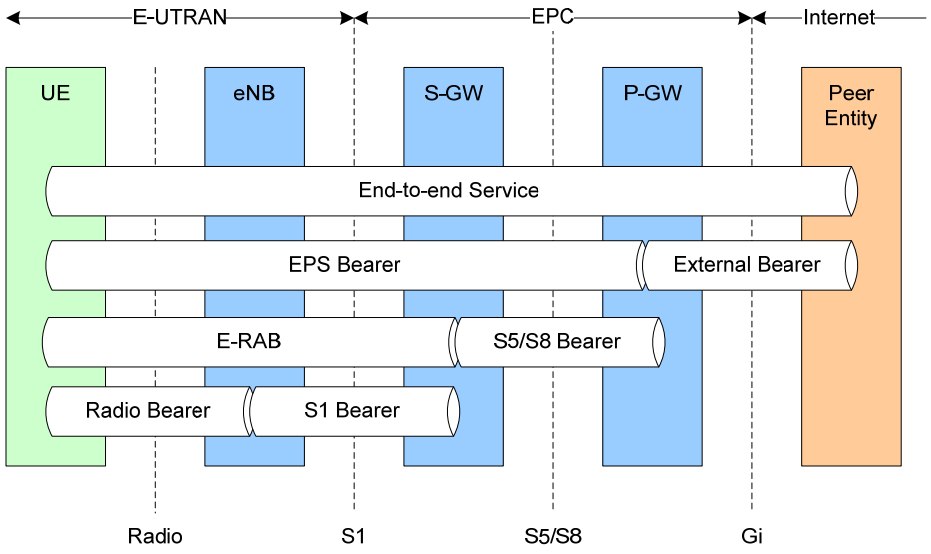

Figure 13.1-1: EPS Bearer Service Architecture

(3GPP TS 36.300 V11.4.0 (2012-12), at 20–22, 98–99.)

51. In addition, the applicable standards covered by the claims of the '456 Patent, including but not limited to 3GPP TS 23.401 V11.4.0 (2012-12), describe that the wireless terminal is configured to check if a filter used for mapping data flows at the network node is determined by a separate network element:

4.2 Architecture reference model

4.2.1 Non-roaming architecture

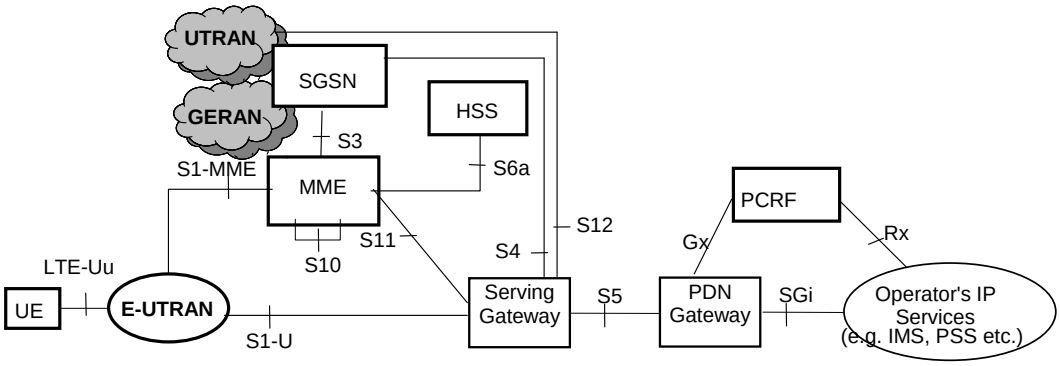

Figure 4.2.1-1: Non-roaming architecture for 3GPP accesses

. . . .

4.4 Network elements

. . . .

4.4.3.3 PDN GW

The PDN GW is the gateway which terminates the SGi interface towards the PDN.

. . . .

Additionally the PDN GW includes the following functions for the GTP-based S5/S8:

- UL and DL bearer binding as defined in TS 23.203 [6];
- UL bearer binding verification as defined in TS 23.203 [6];

. . . .

4.4.7 PCRF

4.4.7.1 General

PCRF is the policy and charging control element. PCRF functions are described in more detail in TS 23.203 [6].

. . . .

4.7.6 Bearer Control Mode in EPC

The Bearer Control Mode (BCM) for E-UTRAN access is always UE/NW. Hence, explicit signalling between the UE and the network to determine BCM for E-UTRAN access does not occur.

. . . .

5.4.5 UE requested bearer resource modification

. . . .

1. . . . .

The TAD indicates one requested operation (add, modify, or delete packet filters). If traffic flows are added, the TAD includes the packet filter(s) (consisting of the packet filter information including packet filter precedence, but without a packet filter identifier) to be added. The UE also sends the QCI requested and GBR, if applicable, for the added traffic flows. If the UE wants to link the new packet filter(s) to an existing packet filter to enable the usage of existing bearer resources for the new packet filter(s), the UE shall provide an existing packet filter identifier together with the new packet filter(s).

. . . .

5. . . . .

The PDN GW inserts, modifies or removes packet filter(s) corresponding to the TAD into the TFT for the EPS bearer. When a new packet filter is inserted into a TFT, the PDN GW assigns a new packet filter identifier which is unique within the TFT. The PDN GW maintains the relation between the SDF filter identifier in the PCC rule received from the PCRF and the packet filter identifier of the TFT of this EPS bearer. If all of the packet filter(s) for a dedicated EPS bearer have been removed from the TFT, the PDN GW performs the PDN GW Initiated Bearer Deactivation Procedure.

(3GPP TS 23.401 V11.4.0 (2012-12), at 16, 52, 54–55, 67, 154–56.)

52. In addition, the applicable standards covered by the claims of the '456 Patent, including but not limited to 3GPP TS 23.203 V11.11.0 (2013-09), describe that the wireless terminal is configured to check if a filter used for mapping data flows at the network node is determined by a separate network element:

> **6.2 Functional entities**
>
> **6.2.1 Policy Control and Charging Rules Function (PCRF)**
>
> **6.2.1.0 General**
>
> The PCRF encompasses policy control decision and flow based charging control functionalities.
>
> The PCRF provides network control regarding the service data flow detection, gating, QoS and flow based charging (except credit management) towards the PCEF.
>
> . . . .
>
> The PCRF shall decide how certain service data flow/detected application traffic shall be treated in the PCEF and in the TDF, if applicable, and ensure that the PCEF user plane traffic mapping and treatment is in accordance with the user's subscription profile.
>
> . . . .
>
> **6.2.2 Policy and Charging Enforcement Function (PCEF)**
>
> **6.2.2.1 General**
>
> The PCEF encompasses service data flow detection, policy enforcement and flow based charging functionalities.
>
> This functional entity is located at the Gateway (e.g. GGSN in the GPRS case, and PDG in the WLAN case). It provides service data flow detection, user plane traffic handling, triggering control plane session management (where the IP CAN permits), QoS handling, and service data flow measurement as well as online and offline charging interactions.
>
> . . . .
>
> The PCEF is enforcing the Policy Control as indicated by the PCRF in two different ways:

- Gate enforcement. The PCEF shall allow a service data flow, which is subject to policy control, to pass through the PCEF if and only if the corresponding gate is open;

- QoS enforcement:

. . . .

6.2.2.2 Service data flow detection

. . . .

Service data flow filters identifying the service data flow may:

- be a pattern for matching the IP 5 tuple (source IP address or IPv6 network prefix, destination IP address or IPv6 network prefix, source port number, destination port number, protocol ID of the protocol above IP). In the pattern:

. . . .

6.2.3 Application Function (AF)

The Application Function (AF) is an element offering applications that require dynamic policy and/or charging control over the IP CAN user plane behaviour. The AF shall communicate with the PCRF to transfer dynamic session information, required for PCRF decisions as well as to receive IP CAN specific information and notifications about IP CAN bearer level events. One example of an AF is the P CSCF of the IM CN subsystem.

. . . .

6.7 IP flow mobility Routing rule

6.7.1 General

. . . .

The Packet filter may comprise any number of packet filters, containing information for matching service data flows. The format of the packet filters is the same as the service data flow filter described in clause 6.2.2.2. A default packet filter can be specified by using wild card filter.

. . . .

A.1 GPRS

A.1.0 General

The GPRS IP CAN employs, for an IP CAN session, the concept of PDP contexts in order to provide an information transmission path of defined capacity (QoS). For GPRS, the IP CAN bearer is the PDP context.

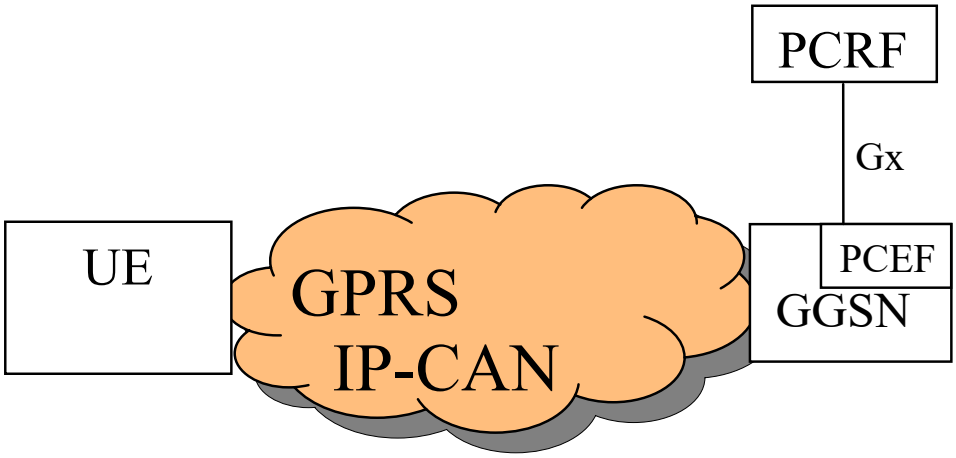

Figure A.1: The GPRS IP CAN

. . . .

A.4 3GPP Accesses (GERAN/UTRAN/E-UTRAN) - GTP-based EPC

A.4.0 General

For 3GPP Access (GTP-based), architecture details are described in TS 23.401 [17] and in TS 23.060 [12].

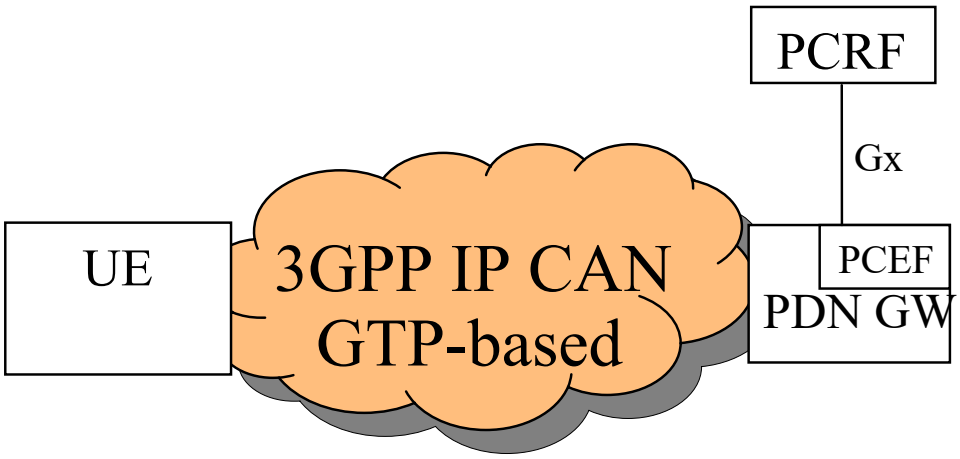

Figure A.1: The 3GPP EPS IP CAN (GTP-based)

(3GPP TS 23.203 V11.11.0 (2013-09), at 44, 54–55, 57–58, 62, 77, 112, 122.)

53. In addition, the applicable standards covered by the claims of the '456 Patent, including but not limited to 3GPP TS 23.207 V11.0.0 (2012-09), describe that the wireless terminal is configured to check if a filter used for mapping data flows at the network node is determined by a separate network element:

> **Annex C (informative):**
>
> **Sample Mapping of SDP Descriptions Into QoS Authorization**
>
> . . . .
>
> The session initiator includes an SDP in the SIP INVITE message that lists every codec that the originator is willing to support for this session. When the message arrives at the destination endpoint, it responds with the subset that it is also willing to support for the session by selectively accept or decline those media types in the original list. When multiple media codecs are listed, the caller and called party's media fields must be aligned—that is, there must be the same number, and they must be listed in the same order. QoS authorization is performed for this common subset. The P-CSCF(PDF) shall use the SDP contained in the SIP signalling to calculate the proper authorization. The authorization shall include limits on IP resources, and restrictions on IP packet flows, and may include restrictions on IP destinations. These restrictions are expressed as a data rate and QoS class for the combined set of IP flows, and a set of filter specs.
>
> The QoS authorization for a session shall include an Authorization-Token, which shall be assigned by the P-CSCF(PDF). The Authorization-Token shall contain information that identifies the P-CSCF(PDF) that generated the token. Each authorized session may include several flow authorizations. Each flow authorization may include an authorization for one or more flows. The authorization shall contain the following information:
>
> - Filter Specs (IP flow 5-tuples that identify the set of flows)
> - Data rate and QoS class that describes the authorized resource for the set of flows
> - The IP flow 5-tuples includes Source Address, Source Port, Destination Address, Destination Port and Protocol ID. Note that some fields may be wildcarded.

(3GPP TS 23.207 V11.0.0 (2012-09), at 29.)

54. By way of example, Claim 7 of the ’456 Patent requires the limitation “wherein the wireless terminal is configured to generate said configuration signal without filter information.”

55. The applicable standards covered by the claims of the ’456 Patent, including but not limited to 3GPP TS 24.301 V11.5.0 (2012-12), describe that the wireless terminal is configured to generate said configuration signal without filter information:

8.3.8 Bearer resource allocation request

8.3.8.1 Message definition

This message is sent by the UE to the network to request the allocation of a dedicated bearer resource. See table 8.3.8.1.

Message type: BEARER RESOURCE ALLOCATION REQUEST

Significance: dual

Direction: UE to network

Table 8.3.8.1: BEARER RESOURCE ALLOCATION REQUEST message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 9.2	M	V	1/2
	EPS bearer identity	EPS bearer identity 9.3.2	M	V	1/2
	Procedure transaction identity	Procedure transaction identity 9.4	M	V	1
	Bearer resource allocation request message identity	Message type 9.8	M	V	1
	Linked EPS bearer identity	Linked EPS bearer identity 9.9.4.6	M	V	1/2
	Spare half octet	Spare half octet 9.9.2.9	M	V	1/2
	Traffic flow aggregate	Traffic flow aggregate description 9.9.4.15	M	LV	2-256
	Required traffic flow QoS	EPS quality of service 9.9.4.3	M	LV	2-14
27	Protocol configuration options	Protocol configuration options 9.9.4.11	O	TLV	3-253
C-	Device properties	Device properties 9.9.2.0A	O	TV	1

. . . .

9.9.4 EPS Session Management (ESM) information elements

. . . .

9.9.4.15 Traffic flow aggregate description

The purpose of the Traffic flow aggregate description information element is to specify the aggregate of one of more packet filters and their related parameters and operations. The traffic flow aggregate description may contain the aggregate of packet filters for the downlink direction, the uplink direction or packet filters that apply for both directions. The packet filters determine the traffic mapping to EPS bearer contexts. The downlink packet filters shall be applied by the network, and the uplink packet filters shall be applied by the UE. A packet filter that applies for both directions shall be applied by the network as a downlink packet filter and by the UE as an uplink packet filter.

When the traffic flow aggregate description is used in the UE requested bearer resource allocation procedure or the UE requested bearer resource modification procedure, it is associated to a particular procedure identified by a procedure transaction identity (PTI). Therefore, the UE shall release the traffic flow aggregate description when the UE requested bearer resource allocation procedure or the UE requested bearer resource modification procedure is completed. The UE shall not include the packet filters of a particular traffic flow aggregate description in any other traffic flow aggregate description when multiple UE requested bearer resource allocation procedures and/or UE requested bearer resource modification procedures are ongoing in parallel.

The Traffic flow aggregate description information element is encoded using the same format as the Traffic flow template (TFT) information element (see subclause 10.5.6.12 in 3GPP TS 24.008 [13]). When sending this IE in the BEARER RESOURCE ALLOCATION REQUEST message or the BEARER RESOURCE MODIFICATION REQUEST message, the UE shall set the packet filter identifier values to 0 if the packet filters are newly created; otherwise, the UE shall set the packet filter identifier values from those of already assigned packet filter identifiers of the existing EPS bearer, so that they are unique across all packet filters for the EPS bearer context indicated by the EPS bearer identity IE.

(3GPP TS 24.301 V11.5.0 (2012-12), at 246, 298, 310–11).

56. In addition, the applicable standards covered by the claims of the '456 Patent, including but not limited to 3GPP TS 23.401 V11.4.0 (2012-12), describe that the wireless terminal is configured to generate said configuration signal without filter information:

3.2 Abbreviations

. . . .

TAD Traffic Aggregate Description

. . . .

5.4.5 UE requested bearer resource modification

. . . .

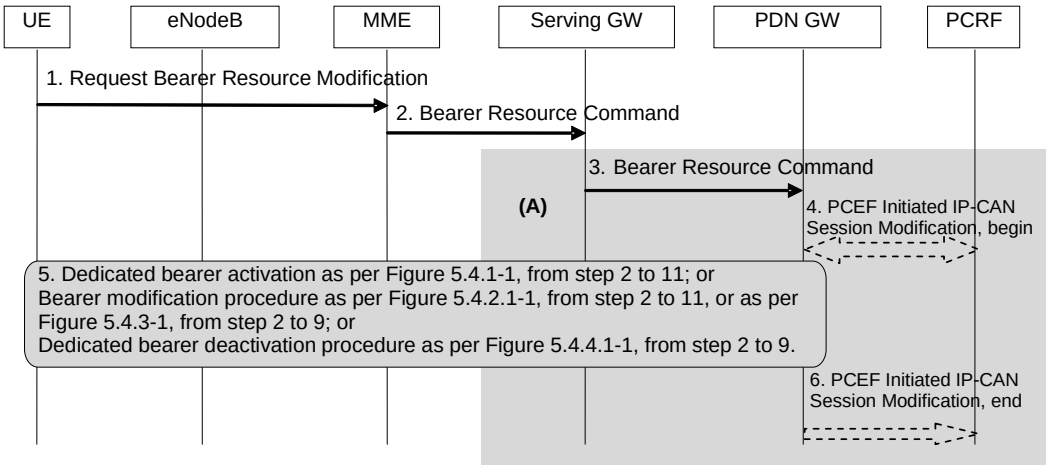

Figure 5.4.5-1: UE requested bearer resource modification

. . . .

1. . . . .

> The TAD indicates one requested operation (add, modify, or delete packet filters). If traffic flows are added, the TAD includes the packet filter(s) (consisting of the packet filter information including packet filter precedence, but without a packet filter identifier) to be added. The UE also sends the QCI requested and GBR, if applicable, for the added traffic flows. If the UE wants to link the new packet filter(s) to an existing packet filter to enable the usage of existing bearer resources for the new packet filter(s), the UE shall provide an existing packet filter identifier together with the new packet filter(s).

. . . .

5. . . . .

> The PDN GW inserts, modifies or removes packet filter(s) corresponding to the TAD into the TFT for the EPS bearer. When a new packet filter is inserted into a TFT, the PDN GW assigns a new packet filter identifier which is unique within the TFT. The PDN GW maintains the relation between the SDF filter identifier in the PCC rule received from the PCRF and the packet filter identifier of the TFT of this EPS bearer. If all of the packet filter(s) for a dedicated EPS bearer have been removed from the TFT, the PDN GW performs the PDN GW Initiated Bearer Deactivation Procedure.

(3GPP TS 23.401 V11.4.0 (2012-12), at 14–15, 154–56.)

57. By way of example, Claim 7 of the ’456 Patent requires that the wireless terminal be configured to generate said configuration signal without filter information “in response to the filter associated to a packet data protocol context of the packet radio network and used for mapping the data flows being determined in the separate network element and being sent to the network node by the separate network element.”

58. The applicable standards covered by the claims of the ’456 Patent, including but not limited to 3GPP TS 23.401 V11.4.0 (2012-12), describe that the wireless terminal is configured to generate said configuration signal without filter information in response to the filter associated to a packet data protocol context of the packet radio network and used for mapping the data flows

being determined in the separate network element and being sent to the network node by the separate network element:

5.4.1 Dedicated bearer activation

The dedicated bearer activation procedure for a GTP based S5/S8 is depicted in figure 5.4.1-1.

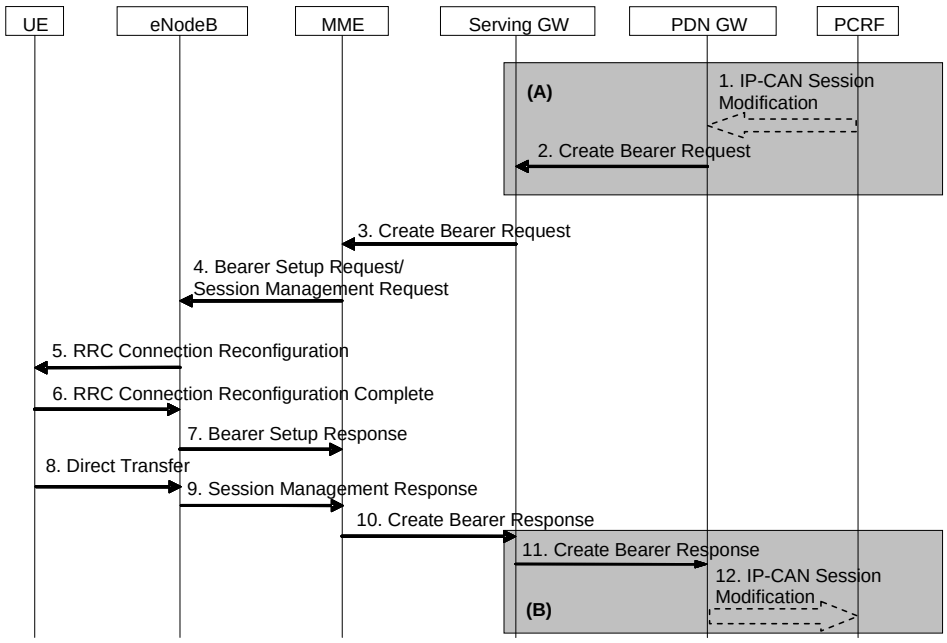

Figure 5.4.1-1: Dedicated Bearer Activation Procedure

. . . .

1. If dynamic PCC is deployed, the PCRF sends a PCC decision provision (QoS policy) message to the PDN GW. This corresponds to the initial steps of the PCRF-Initiated IP CAN Session Modification procedure or to the PCRF response in the PCEF initiated IP-CAN Session Modification procedure as defined in TS 23.203 [6], up to the point that the PDN GW requests IP CAN Bearer Signalling. The PCC decision provision message may indicate that User Location Information and/or UE Time Zone Information is to be provided to the PCRF as defined in TS 23.203 [6]. If dynamic PCC is not deployed, the PDN GW may apply local QoS policy.

2. The PDN GW uses this QoS policy to assign the EPS Bearer QoS, i.e., it assigns the values to the bearer level QoS parameters QCI, ARP, GBR and MBR; see clause 4.7.3. The PGW generates a Charging Id for the dedicated bearer. The PDN GW sends a Create Bearer Request message (IMSI, PTI, EPS Bearer QoS, TFT, S5/S8 TEID, Charging Id, LBI, Protocol Configuration Options) to the Serving GW, the Linked EPS Bearer Identity (LBI) is the EPS Bearer Identity of the default bearer.

. . . .

5.4.5 UE requested bearer resource modification

. . . .

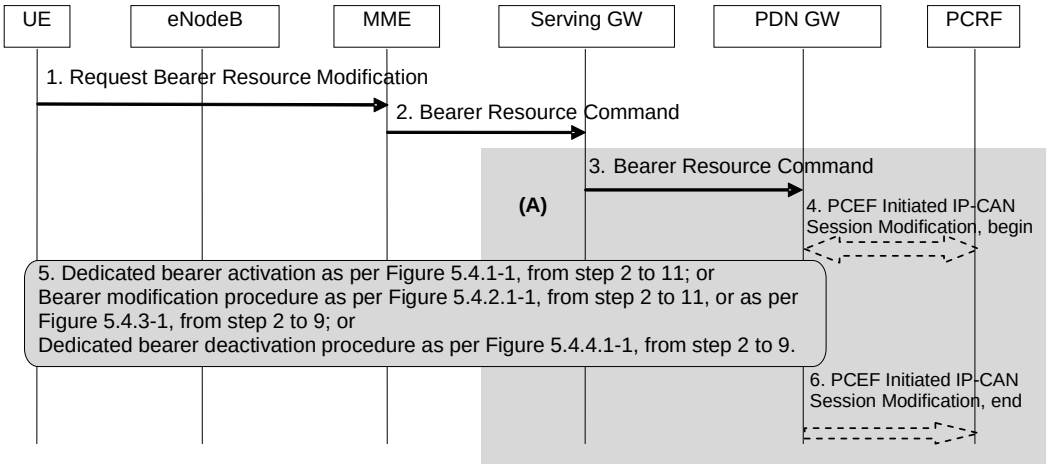

Figure 5.4.5-1: UE requested bearer resource modification

. . . .

4. The PDN GW may either apply a locally configured QoS policy, or it may interact with the PCRF to trigger the appropriate PCC decision, which may take into account subscription information. This corresponds to the beginning of a PCEF-initiated IP CAN Session Modification procedure as defined in TS 23.203 [6], up to the point that the PDN GW requests IP CAN Bearer Signalling. When interacting with PCRF, the PDN GW provides to the PCRF the content of the TAD and, if applicable, the GBR change (increase or decrease) associated with the packet filter information contained in the TAD. The GBR change is either calculated from the current Bearer QoS and the requested Bearer QoS from the UE, or set to the requested GBR if the TAD indicates an add operation and no EPS Bearer Identity was received. If the TAD indicates an add operation, the requested QCI is also provided to the PCRF unless an existing packet filter identifier is provided together with the new packet filter.

. . . .

6. If the PDN GW interacted with the PCRF in step 4, the PDN GW indicates to the PCRF whether the PCC decision could be enforced or not. This corresponds to the completion of the PCEF-initiated IP CAN session modification procedure as defined in TS 23.203 [6] . . . .

(3GPP TS 23.401 V11.4.0 (2012-12), at 142–43, 154–56.)

59. In addition, the applicable standards covered by the claims of the '456 Patent, including but not limited to 3GPP TS 23.203 V11.11.0 (2013-09), describe that the wireless terminal is configured to generate said configuration signal without filter information in response to the filter associated to a packet data protocol context of the packet radio network and used for mapping the data flows being determined in the separate network element and being sent to the network node by the separate network element:

6.2 Functional entities

6.2.1 Policy Control and Charging Rules Function (PCRF)

6.2.1.0 General

The PCRF encompasses policy control decision and flow based charging control functionalities.

The PCRF provides network control regarding the service data flow detection, gating, QoS and flow based charging (except credit management) towards the PCEF.

. . . .

The PCRF shall decide how certain service data flow/detected application traffic shall be treated in the PCEF and in the TDF, if applicable, and ensure that the PCEF user plane traffic mapping and treatment is in accordance with the user's subscription profile.

. . . .

A.4 3GPP Accesses (GERAN/UTRAN/E-UTRAN) - GTP-based EPC

A.4.0 General

For 3GPP Access (GTP-based), architecture details are described in TS 23.401 [17] and in TS 23.060 [12].

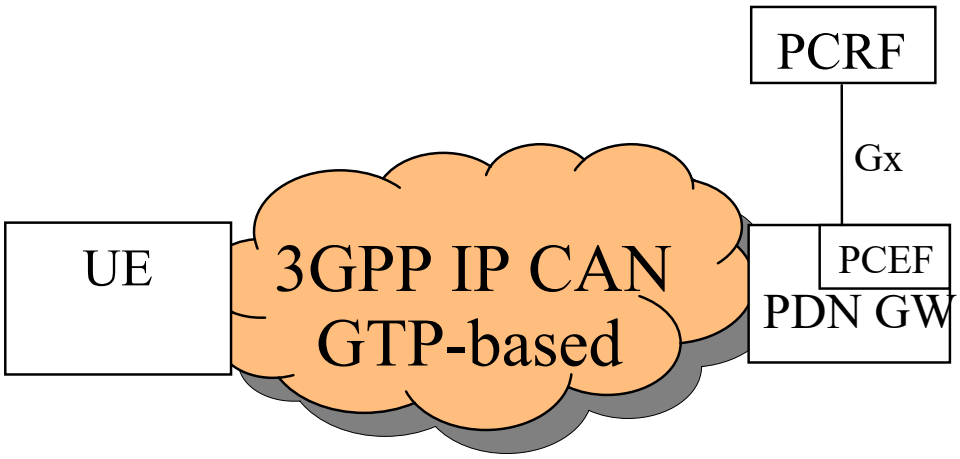

Figure A.1: The 3GPP EPS IP CAN (GTP-based)

. . . .

A.4.3.1.3 Binding mechanism

. . . .

For the 3GPP Access (GTP-based) the Bearer Binding is performed by the PCEF. For GERAN/UTRAN in UE-only mode the Bearer Binding mechanism is restricted by the UE provided binding between a SDF and a bearer for UE initiated resource requests.

The bearer binding mechanism associates the PCC Rule with the EPS bearer to carry the service data flow. The association shall:

- cause the downlink part of the service data flow to be directed to the EPS bearer in the association; and

- assume that the UE directs the uplink part of the service data flow to the EPS bearer in the association.

(3GPP TS 23.203 V11.11.0 (2013-09), at 44, 122, 124–25.)

60. By way of example, Claim 7 of the ’456 Patent requires the limitation “wherein the wireless terminal is configured to transmit, in a packet data protocol context activation request, a

traffic flow template information element in response to the need to create a packet data protocol context."

61. The applicable standards covered by the claims of the '456 Patent, including but not limited to 3GPP TS 24.301 V11.5.0 (2012-12), describe that the wireless terminal is configured to transmit, in a packet data protocol context activation request, a traffic flow template information element in response to the need to create a packet data protocol context:

3.2 Abbreviations

. . . .

EPS Evolved Packet System

. . . .

6.5.3 UE requested bearer resource allocation procedure

6.5.3.1 General

The purpose of the UE requested bearer resource allocation procedure is for a UE to request an allocation of bearer resources for a traffic flow aggregate. The UE requests a specific QoS demand (QCI) and optionally sends a GBR requirement for a new traffic flow aggregate. If accepted by the network, this procedure invokes a dedicated EPS bearer context activation procedure (see subclause 6.4.2) or an EPS bearer context modification procedure (see subclause 6.4.3).

. . . .

6.5.3.2 UE requested bearer resource allocation procedure initiation

In order to request the allocation of bearer resources for one traffic flow aggregate, the UE shall send a BEARER RESOURCE ALLOCATION REQUEST message to the MME, start timer T3480 and enter the state PROCEDURE TRANSACTION PENDING (see example in figure 6.5.3.2.1).

The UE shall include the EPS bearer identity of the default EPS bearer associated with the requested bearer resource in the Linked EPS bearer identity IE. The UE shall set the TFT operation code in the Traffic flow aggregate IE to "Create new TFT". In the Required traffic flow QoS IE, the UE shall indicate a QCI and, if the UE also includes a GBR, the additional GBR required for the traffic flow aggregate.

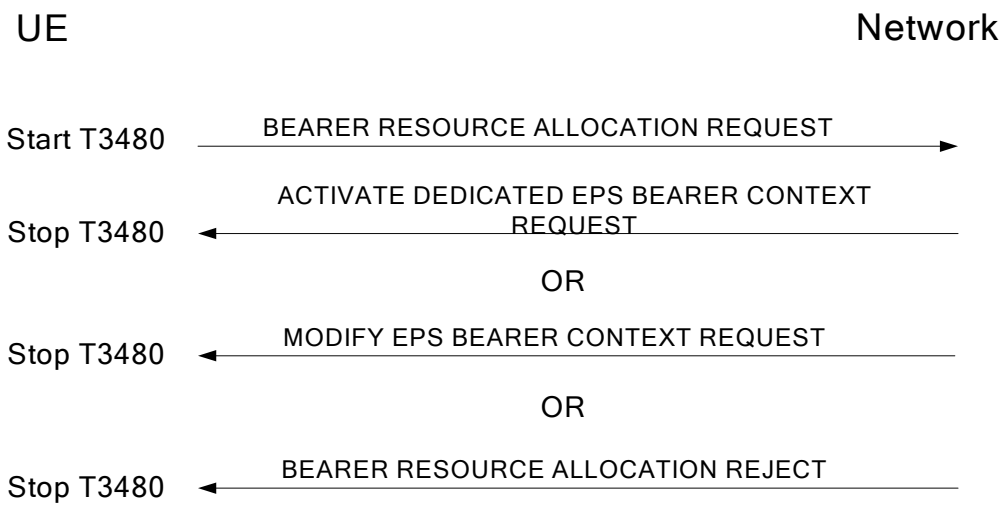

Figure 6.5.3.2.1: UE requested bearer resource allocation procedure

. . . .

8.3.8 Bearer resource allocation request

8.3.8.1 Message definition

This message is sent by the UE to the network to request the allocation of a dedicated bearer resource. See table 8.3.8.1.

Message type: BEARER RESOURCE ALLOCATION REQUEST

Significance: dual

Direction: UE to network

Table 8.3.8.1: BEARER RESOURCE ALLOCATION REQUEST message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 9.2	M	V	1/2
	EPS bearer identity	EPS bearer identity 9.3.2	M	V	1/2
	Procedure transaction identity	Procedure transaction identity 9.4	M	V	1
	Bearer resource allocation request message identity	Message type 9.8	M	V	1
	Linked EPS bearer identity	Linked EPS bearer identity 9.9.4.6	M	V	1/2
	Spare half octet	Spare half octet 9.9.2.9	M	V	1/2
	Traffic flow aggregate	Traffic flow aggregate description 9.9.4.15	M	LV	2-256
	Required traffic flow QoS	EPS quality of service 9.9.4.3	M	LV	2-14
27	Protocol configuration options	Protocol configuration options 9.9.4.11	O	TLV	3-253
C-	Device properties	Device properties 9.9.2.0A	O	TV	1

. . . .

9.9.4 EPS Session Management (ESM) information elements

. . . .

9.9.4.15 Traffic flow aggregate description

The purpose of the Traffic flow aggregate description information element is to specify the aggregate of one of more packet filters and their related parameters and operations. The traffic flow aggregate description may contain the aggregate of packet filters for the downlink direction, the uplink direction or packet filters that apply for both directions. The packet filters determine the traffic mapping to EPS bearer contexts. The downlink packet filters shall be applied by the network, and the uplink packet filters shall be applied by the UE. A packet filter that applies for both directions shall be applied by the network as a downlink packet filter and by the UE as an uplink packet filter.

. . . .

> The Traffic flow aggregate description information element is encoded using the same format as the Traffic flow template (TFT) information element (see subclause 10.5.6.12 in 3GPP TS 24.008 [13]). When sending this IE in the BEARER RESOURCE ALLOCATION REQUEST message or the BEARER RESOURCE MODIFICATION REQUEST message, the UE shall set the packet filter identifier values to 0 if the packet filters are newly created; otherwise, the UE shall set the packet filter identifier values from those of already assigned packet filter identifiers of the existing EPS bearer, so that they are unique across all packet filters for the EPS bearer context indicated by the EPS bearer identity IE.

(3GPP TS 24.301 V11.5.0 (2012-12), at 24, 189–90, 246, 298, 310–11).

62. Upon information and belief, the Tesla Standard-Compliant Products comply or have complied with the applicable standards covered by the claims of the ’456 Patent, including without limitation 3G and/or 4G/LTE, and therefore infringe the ’456 Patent, including at least Claim 7.

63. The Tesla Standard Compliant Products have complied with 3GPP TS 24.301 V11.5.0 (2012-12).

64. The Tesla Standard Compliant Products have complied with 3GPP TS 24.008 V11.8.0 (2013-09).

65. The Tesla Standard Compliant Products have complied with 3GPP TS 23.060 V11.8.0 (2013-12).

66. The Tesla Standard Compliant Products have complied with 3GPP TS 36.300 V11.4.0 (2012-12).

67. The Tesla Standard Compliant Products have complied with 3GPP TS 23.401 V11.4.0 (2012-12).

68. The Tesla Standard Compliant Products have complied with 3GPP TS 23.203 V11.11.0 (2013-09).

69. The Tesla Standard Compliant Products have complied with 3GPP TS 23.207 V11.0.0 (2012-09).

70. Tesla is infringing claims of the ’456 Patent, including at least Claim 7, literally and/or pursuant to the doctrine of equivalents.

71. In violation of 35 U.S.C. § 271(b), Tesla is and has been infringing one or more of the ’456 Patent’s claims, including at least Claim 7, indirectly by inducing the infringement of the ’456 Patent’s claims by third parties, including without limitation manufacturers, resellers, and/or users of Tesla’s Standard-Compliant Products, in this District, and elsewhere in the United States. Direct infringement is the result of activities performed by users of the Tesla Standard-Compliant Products in accordance with the claims of the ’456 Patent.

72. Tesla’s affirmative acts of selling the Tesla’s Standard-Compliant Products, causing the Tesla Standard-Compliant Products to be manufactured and distributed, providing instructive materials and information concerning operation and use of the Tesla Standard-Compliant Products, and maintenance/service for such products, induced users of the Tesla Standard-Compliant Products to infringe the ’456 Patent’s claims by using the vehicles in their normal and customary way. By and through these acts, Tesla knowingly and specifically intends the users of the Tesla Standard-Compliant Products to infringe the ’456 Patent’s claims. Tesla (1) knows and knew of the ’456 Patent since at least prior to the filing of this lawsuit, (2) performs affirmative acts that constitute induced infringement, and (3) knows or should know that those acts would induce actual infringement of one or more of the ’456 Patent’s claims by users of the Tesla Standard-Compliant Products.

73. In violation of 35 U.S.C. § 271(c), Tesla is and has been infringing one or more of the ’456 Patent’s claims, including at least Claim 7, indirectly by contributing to the infringement

of the ’456 Patent’s claims by third parties, including without limitation manufacturers, resellers, and/or users of the Tesla Standard-Compliant Products, in this District, and elsewhere in the United States. Direct infringement is the result of activities performed by manufacturers, resellers, and/or users in relation to the Tesla Standard-Compliant Products, including without limitation use of the Tesla Standard-Compliant Products.

74. Upon information and belief, Tesla at least installs, configures, and sells Tesla Standard-Compliant Products with distinct and separate hardware and/or software components especially made or especially adapted to practice the invention claimed in the ’456 Patent. That hardware and/or software is a material part of the invention. That hardware and/or software is not a staple article or commodity of commerce because it is specifically designed to perform the claimed functionality. Any other use of that hardware and/or software would be unusual, far-fetched, illusory, impractical, occasional, aberrant, or experimental.

75. Therefore, upon information and belief, Tesla is making, using, offering to sell, and/or selling in the United States, and/or importing into the United States, without authority, a component of a patented machine, manufacture, combination or composition, or a material or an apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in infringement of a patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use.

76. As explained above, Tesla had actual notice of the ’456 Patent prior to this lawsuit being filed and had knowledge of the infringing nature of its activities. Nevertheless, Tesla continued its infringing activities.

77. Instead of taking a FRAND license to Conversant’s patent portfolio, Tesla continues, in bad faith, to directly and indirectly infringe Conversant’s patents, including the

'456 Patent by making, using, offering for sale and selling infringing Tesla Standard-Compliant Products, and inducing and contributing to the infringement of others.

78. Therefore, upon information and belief, Tesla's infringement of the '456 Patent's claims, including at least Claim 7, has been and continues to be willful entitling Conversant to increased damages pursuant to 35 U.S.C. § 284 and to attorneys' fees and costs incurred in prosecuting this action pursuant to 35 U.S.C. § 285.

79. Tesla's acts of infringement have caused damages to Conversant, and Conversant is entitled to recover from Tesla the damages sustained by Conversant as a result of Tesla's wrongful acts in an amount to be determined at trial.

COUNT 2—INFRINGEMENT OF THE '697 PATENT

80. Conversant incorporates by reference the allegations set forth in Paragraphs 1–79 of this Complaint as though fully set forth herein.

81. In violation of 35 U.S.C. § 271(a), Tesla is and has been directly infringing one or more of the '697 Patent's claims, including at least Claim 1, by making, using, offering to sell, and/or selling in the United States, and/or importing into the United States, without authority, products that support 3G and/or 4G/LTE connectivity, including without limitation the Tesla Standard-Compliant Products as defined above. Each of the Tesla Standard-Compliant Products comprises hardware and software components that together practice every element of one or more claims of the '697 Patent, including at least Claim 1. These components include those hardware and software components that enable the set of wireless cellular communications functionalities known as 3G and/or 4G/LTE and implement 3G and/or 4G/LTE in compliance with the requirements of the technical standards applicable to mobile communications, including the technical standards promulgated by 3GPP and various subsequent releases and versions thereof.

These components enable the Tesla Standard-Compliant Products to perform 3G and/or 4G/LTE communications functionality.

82. It is necessary to practice one or more of the claims of the ’697 Patent to comply with the requirements of certain standards applicable to mobile communications. For example, it is necessary to practice at least Claim 1 from the ’697 Patent to comply with certain 3G and/or 4G/LTE standards.

83. The Tesla Standard-Compliant Products comply with the applicable standards covered by the claims of the ’697 Patent.

84. The Tesla Standard-Compliant Products are capable of performing, and when used do in fact perform, the method of Claim 1 of the ’697 Patent.

85. The applicable standards covered by the claims of the ’697 Patent describe, at least, performing the method of Claim 1 of the ’697 Patent.

86. By way of example, Claim 1 of the ’697 Patent requires a method including the step of “transmitting , by a user equipment to a network access node , in a time and frequency resource allocated for preamble transmission, and in one of a plurality of uplink component carriers selected by the user equipment , a random access request.”

87. The applicable standards covered by the claims of the ’697 Patent, including but not limited to 3GPP TS 36.300 V11.4.0 (2012-12), describe a method including the step of transmitting , by a user equipment to a network access node , in a time and frequency resource

allocated for preamble transmission, and in one of a plurality of uplink component carriers selected by the user equipment , a random access request:

7 RRC

. . . .

7.5 Carrier Aggregation

When CA is configured, the UE only has one RRC connection with the network. At RRC connection establishment/re-establishment/handover, one serving cell provides the NAS mobility information (e.g. TAI), and at RRC connection re-establishment/handover, one serving cell provides the security input. This cell is referred to as the Primary Cell (PCell). In the downlink, the carrier corresponding to the PCell is the Downlink Primary Component Carrier (DL PCC) while in the uplink it is the Uplink Primary Component Carrier (UL PCC).

Depending on UE capabilities, Secondary Cells (SCells) can be configured to form together with the PCell a set of serving cells. In the downlink, the carrier corresponding to an SCell is a Downlink Secondary Component Carrier (DL SCC) while in the uplink it is an Uplink Secondary Component Carrier (UL SCC).

The configured set of serving cells for a UE therefore always consists of one PCell and one or more SCells:

- For each SCell the usage of uplink resources by the UE in addition to the downlink ones is configurable (the number of DL SCCs configured is therefore always larger than or equal to the number of UL SCCs and no SCell can be configured for usage of uplink resources only);
- From a UE viewpoint, each uplink resource only belongs to one serving cell;
- The number of serving cells that can be configured depends on the aggregation capability of the UE (see subclause 5.5);
- PCell can only be changed with handover procedure (i.e. with security key change and RACH procedure);
- PCell is used for transmission of PUCCH;
- Unlike SCells, PCell cannot be de-activated (see subclause 11.2);
- Re-establishment is triggered when PCell experiences RLF, not when SCells experience RLF;
- NAS information is taken from PCell.

. . . .

10 Mobility

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10.1.5 Random Access Procedure

The random access procedure is characterized by:

- Common procedure for FDD and TDD;
- One procedure irrespective of cell size and the number of serving cells when CA is configured;

The random access procedure is performed for the following events related to the PCell:

- Initial access from RRC_IDLE;
- RRC Connection Re-establishment procedure;
- Handover;
- DL data arrival during RRC_CONNECTED requiring random access procedure;
- E.g. when UL synchronisation status is “non-synchronised”;
- UL data arrival during RRC_CONNECTED requiring random access procedure;
- E.g. when UL synchronisation status is "non-synchronised" or there are no PUCCH resources for SR available.
- For positioning purpose during RRC_CONNECTED requiring random access procedure;
- E.g. when timing advance is needed for UE positioning;

The random access procedure is also performed on a SCell to establish time alignment for the corresponding sTAG.

. . . .

10.1.5.2 Non-contention based random access procedure

The non-contention based random access procedure is outlined on Figure 10.1.5.2-1 below:

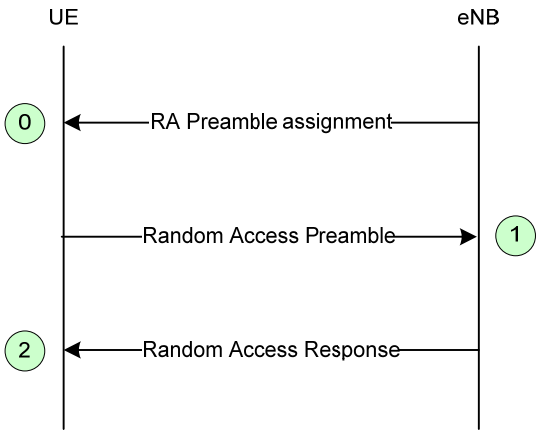

Figure 10.1.5.2-1: Non-contention based Random Access Procedure

The three steps of the non-contention based random access procedures are:

0) Random Access Preamble assignment via dedicated signalling in DL:

- eNB assigns to UE a non-contention Random Access Preamble (a Random Access Preamble not within the set sent in broadcast signalling).
- Signalled via:
  - HO command generated by target eNB and sent via source eNB for handover;
  - PDCCH in case of DL data arrival or positioning;
  - PDCCH for initial UL time alignment for a sTAG.

1) Random Access Preamble on RACH in uplink:

- UE transmits the assigned non-contention Random Access Preamble.

2) Random Access Response on DL-SCH:

- Semi-synchronous (within a flexible window of which the size is two or more TTIs) with message 1;
- No HARQ;
- Addressed to RA-RNTI on PDCCH;

- Conveys at least:
  - Timing Alignment information and initial UL grant for handover;
  - Timing Alignment information for DL data arrival;
  - RA-preamble identifier.
  - Intended for one or multiple UEs in one DL-SCH message.

> When performing non-contention based random access on the PCell while CA is configured, the Random Access Preamble assignment via PDCCH of step 0, step 1 and 2 of the non-contention based random access procedure occur on the PCell. In order to establish timing advance for a sTAG, the eNB may initiate a non-contention based random access procedure with a PDCCH order (step 0) that is sent on a scheduling cell of activated SCell of the sTAG. Preamble transmission (step 1) is on the indicated SCell and Random Access Response (step 2) takes place on PCell.

(3GPP TS 36.300 V11.4.0 (2012-12), at 56, 58–59, 61, 72, 74–75.)

88. In addition, the applicable standards covered by the claims of the ’697 Patent, including but not limited to 3GPP TS 36.211 V11.2.0 (2013-02), describe a method including the step of transmitting , by a user equipment to a network access node , in a time and frequency resource allocated for preamble transmission, and in one of a plurality of uplink component carriers selected by the user equipment , a random access request:

> **5 Uplink**
>
> . . . .

5.7 Physical random access channel

5.7.1 Time and frequency structure

The physical layer random access preamble, illustrated in Figure 5.7.1-1, consists of a cyclic prefix of length and a sequence part of length . The parameter values are listed in Table 5.7.1-1 and depend on the frame structure and the random access configuration. Higher layers control the preamble format.

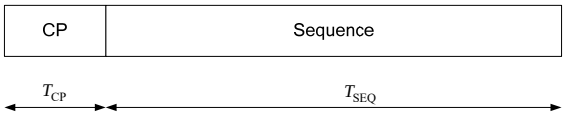

Figure 5.7.1-1: Random access preamble format.

Table 5.7.1-1: Random access preamble parameters.

Preamble format	T_{CP}	T_{SEQ}
0	$3168 \cdot T_s$	$24576 \cdot T_s$
1	$21024 \cdot T_s$	$24576 \cdot T_s$
2	$6240 \cdot T_s$	$2 \cdot 24576 \cdot T_s$
3	$21024 \cdot T_s$	$2 \cdot 24576 \cdot T_s$
4*	$448 \cdot T_s$	$4096 \cdot T_s$

* Frame structure type 2 and special subframe configurations with UpPTS lengths 4384 T_s and 5120 T_s only.

The transmission of a random access preamble, if triggered by the MAC layer, is restricted to certain time and frequency resources. These resources are enumerated in increasing order of the subframe number within the radio frame and the physical resource blocks in the frequency domain such that index 0 correspond to the lowest numbered physical resource block and subframe within the radio frame. PRACH resources within the radio frame are indicated by a PRACH Resource Index, where the indexing is in the order of appearance in Table 5.7.1-2 and Table 5.7.1-4.

(3GPP TS 36.211 V11.2.0 (2013-02), at 12, 41.)

89. In addition, the applicable standards covered by the claims of the ’697 Patent, including but not limited to 3GPP TS 36.213 V11.1.0 (2012-12), describe a method including the step of transmitting , by a user equipment to a network access node , in a time and frequency

resource allocated for preamble transmission, and in one of a plurality of uplink component carriers selected by the user equipment , a random access request:

> **6 Random access procedure**
>
> . . . .
>
> **6.1 Physical non-synchronized random access procedure**
>
> From the physical layer perspective, the L1 random access procedure encompasses the transmission of random access preamble and random access response. The remaining messages are scheduled for transmission by the higher layer on the shared data channel and are not considered part of the L1 random access procedure. A random access channel occupies 6 resource blocks in a subframe or set of consecutive subframes reserved for random access preamble transmissions. The eNodeB is not prohibited from scheduling data in the resource blocks reserved for random access channel preamble transmission.

(3GPP TS 36.213 V11.1.0 (2012-12), at 23–24.)

90. In addition, the applicable standards covered by the claims of the ’697 Patent, including but not limited to 3GPP TS 36.321 V11.1.0 (2012-12), describe a method including the step of transmitting , by a user equipment to a network access node , in a time and frequency resource allocated for preamble transmission, and in one of a plurality of uplink component carriers selected by the user equipment , a random access request:

> **3 Definitions and abbreviations**
>
> **3.1 Definitions**
>
> . . . .
>
> **RA-RNTI**: The Random Access RNTI is used on the PDCCH when Random Access Response messages are transmitted. It unambiguously identifies which time-frequency resource was utilized by the UE to transmit the Random Access preamble.
>
> . . . .

5 MAC procedures

5.1 Random Access procedure

5.1.1 Random Access Procedure initialization

The Random Access procedure described in this subclause is initiated by a PDCCH order or by the MAC sublayer itself. Random Access procedure on an SCell shall only be initiated by a PDCCH order. If a UE receives a PDCCH transmission consistent with a PDCCH order [5] masked with its C-RNTI, and for a specific Serving Cell, the UE shall initiate a Random Access procedure on this Serving Cell. For Random Access on the PCell a PDCCH order or RRC optionally indicate the ra-PreambleIndex and the ra-PRACH-MaskIndex; and for Random Access on an SCell, the PDCCH order indicates the ra-PreambleIndex with a value different from 000000 and the ra-PRACH-MaskIndex. For the pTAG preamble transmission on PRACH and reception of a PDCCH order are only supported for PCell.

. . . .

5.1.3 Random Access Preamble transmission

The random-access procedure shall be performed as follows:

- set PREAMBLE_RECEIVED_TARGET_POWER to *preambleInitialReceivedTargetPower* + DELTA_PREAMBLE + (PREAMBLE_TRANSMISSION_COUNTER – 1) * *powerRampingStep*;

- instruct the physical layer to transmit a preamble using the selected PRACH, corresponding RA-RNTI, preamble index and PREAMBLE_RECEIVED_TARGET_POWER.

(3GPP TS 36.321 V11.1.0 (2012-12), at 6–7, 13, 15.)

91. The method of Claim 1 of the ’697 Patent requires the step of “receiving a random access response that is aggregated with other random access responses for other user equipments in a time and frequency resource of a single downlink component carrier.”

92. The applicable standards covered by the claims of the ’697 Patent, including but not limited to 3GPP TS 36.321 V11.1.0 (2012-12), describe the step of receiving a random access

response that is aggregated with other random access responses for other user equipments in a time and frequency resource of a single downlink component carrier:

3 Definitions and abbreviations

3.1 Definitions

. . . .

RA-RNTI: The Random Access RNTI is used on the PDCCH when Random Access Response messages are transmitted. It unambiguously identifies which time-frequency resource was utilized by the UE to transmit the Random Access preamble.

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5 MAC procedures

5.1 Random Access procedure

. . . .

5.1.4 Random Access Response reception

Once the Random Access Preamble is transmitted and regardless of the possible occurrence of a measurement gap, the UE shall monitor the PDCCH of the PCell for Random Access Response(s) identified by the RA-RNTI defined below, in the RA Response window which starts at the subframe that contains the end of the preamble transmission [7] plus three subframes and has length *ra-ResponseWindowSize* subframes. The RA-RNTI associated with the PRACH in which the Random Access Preamble is transmitted, is computed as:

$$\text{RA-RNTI} = 1 + t\_id + 10 * f\_id$$

Where t_id is the index of the first subframe of the specified PRACH ($0 \leq t\_id < 10$), and f_id is the index of the specified PRACH within that subframe, in ascending order of frequency domain ($0 \leq f\_id < 6$). The UE may stop monitoring for Random Access Response(s) after successful reception of a Random Access Response containing Random Access Preamble identifiers that matches the transmitted Random Access Preamble.

. . . .

6 Protocol Data Units, formats and parameters

6.1 Protocol Data Units

. . . .

6.1.5 MAC PDU (Random Access Response)

A MAC PDU consists of a MAC header and zero or more MAC Random Access Responses (MAC RAR) and optionally padding as described in figure 6.1.5-4.

The MAC header is of variable size.

A MAC PDU header consists of one or more MAC PDU subheaders; each subheader corresponding to a MAC RAR except for the Backoff Indicator subheader. If included, the Backoff Indicator subheader is only included once and is the first subheader included within the MAC PDU header.

. . . .

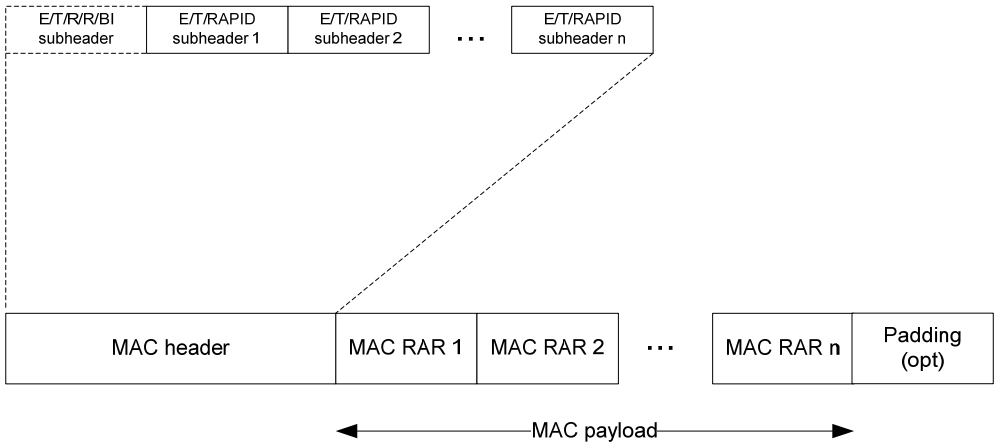

Figure 6.1.5-4: Example of MAC PDU consisting of a MAC header and MAC RARs

(3GPP TS 36.321 V11.1.0 (2012-12), at 6–7, 13, 15, 35, 43-44.)

93. In addition, the applicable standards covered by the claims of the '697 Patent, including but not limited to 3GPP TS 36.300 V11.4.0 (2012-12), describe the step of receiving a

random access response that is aggregated with other random access responses for other user equipments in a time and frequency resource of a single downlink component carrier:

10 Mobility

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10.1 Intra E-UTRAN

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10.1.5 Random Access Procedure

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10.1.5.2 Non-contention based random access procedure

The non-contention based random access procedure is outlined on Figure 10.1.5.2-1 below:

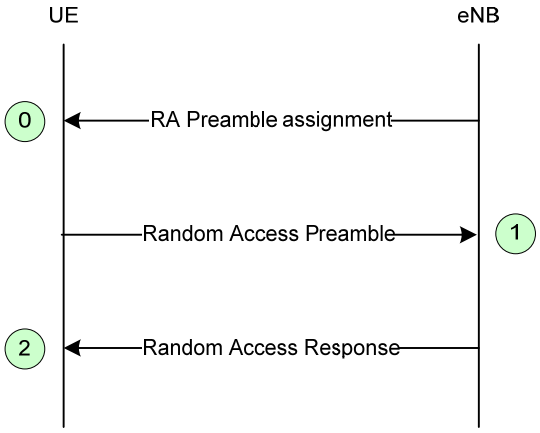

Figure 10.1.5.2-1: Non-contention based Random Access Procedure

The three steps of the non-contention based random access procedures are:

0) Random Access Preamble assignment via dedicated signalling in DL:

- eNB assigns to UE a non-contention Random Access Preamble (a Random Access Preamble not within the set sent in broadcast signalling).
- Signalled via:
  - HO command generated by target eNB and sent via source eNB for handover;
  - PDCCH in case of DL data arrival or positioning;
  - PDCCH for initial UL time alignment for a sTAG.

1) Random Access Preamble on RACH in uplink:

- UE transmits the assigned non-contention Random Access Preamble.

2) Random Access Response on DL-SCH:

- Semi-synchronous (within a flexible window of which the size is two or more TTIs) with message 1;
- No HARQ;
- Addressed to RA-RNTI on PDCCH;
- Conveys at least:
  - Timing Alignment information and initial UL grant for handover;
  - Timing Alignment information for DL data arrival;
  - RA-preamble identifier.
  - Intended for one or multiple UEs in one DL-SCH message.

When performing non-contention based random access on the PCell while CA is configured, the Random Access Preamble assignment via PDCCH of step 0, step 1 and 2 of the non-contention based random access procedure occur on the PCell. In order to establish timing advance for a sTAG, the eNB may initiate a non-contention based random access procedure with a PDCCH order (step 0) that is sent on a scheduling cell of activated SCell of the sTAG. Preamble transmission (step 1) is on the indicated SCell and Random Access Response (step 2) takes place on PCell.

(3GPP TS 36.300 V11.4.0 (2012-12), at 61–62, 72, 74–75.)

94. In addition, the applicable standards covered by the claims of the '697 Patent, including but not limited to 3GPP TS 36.213 V11.1.0 (2012-12), describe the step of receiving a random access response that is aggregated with other random access responses for other user equipments in a time and frequency resource of a single downlink component carrier:

> **6 Random access procedure**
>
> . . . .
>
> **6.1 Physical non-synchronized random access procedure**
>
> From the physical layer perspective, the L1 random access procedure encompasses the transmission of random access preamble and random access response. The remaining messages are scheduled for transmission by the higher layer on the shared data channel and are not considered part of the L1 random access procedure. A random access channel occupies 6 resource blocks in a subframe or set of consecutive subframes reserved for random access preamble transmissions. The eNodeB is not prohibited from scheduling data in the resource blocks reserved for random access channel preamble transmission.

(3GPP TS 36.213 V11.1.0 (2012-12), at 23–24.)

95. The method of Claim 1 of the '697 Patent requires the step of "wherein the aggregated random access response comprises responses to a plurality of random access requests from individual ones of a plurality of user equipments."

96. The applicable standards covered by the claims of the '697 Patent, including but not limited to 3GPP TS 36.300 V11.4.0 (2012 12), describe the step of wherein the aggregated random access response comprises responses to a plurality of random access requests from individual ones of a plurality of user equipments:

> **10 Mobility**
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> . . . .
>
> **10.1 Intra E-UTRAN**
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> . . . .

10.1.5 Random Access Procedure

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10.1.5.2 Non-contention based random access procedure

The non-contention based random access procedure is outlined on Figure 10.1.5.2-1 below:

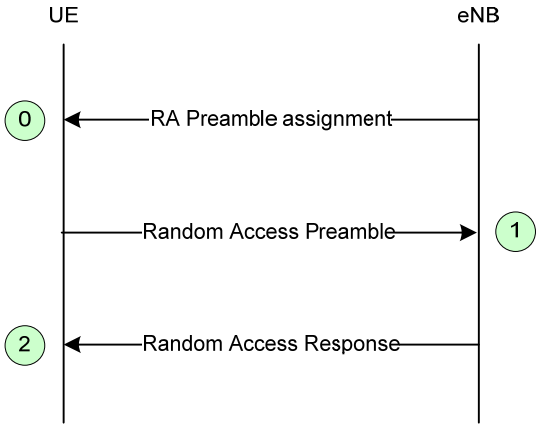

Figure 10.1.5.2-1: Non-contention based Random Access Procedure

The three steps of the non-contention based random access procedures are:

0) Random Access Preamble assignment via dedicated signalling in DL:

- eNB assigns to UE a non-contention Random Access Preamble (a Random Access Preamble not within the set sent in broadcast signalling).
- Signalled via:
  - HO command generated by target eNB and sent via source eNB for handover;
  - PDCCH in case of DL data arrival or positioning;
  - PDCCH for initial UL time alignment for a sTAG.

1) Random Access Preamble on RACH in uplink:

- UE transmits the assigned non-contention Random Access Preamble.

2) Random Access Response on DL-SCH:

- Semi-synchronous (within a flexible window of which the size is two or more TTIs) with message 1;

- No HARQ;
- Addressed to RA-RNTI on PDCCH;
- Conveys at least:
  - Timing Alignment information and initial UL grant for handover;
  - Timing Alignment information for DL data arrival;
  - RA-preamble identifier.
  - Intended for one or multiple UEs in one DL-SCH message.

When performing non-contention based random access on the PCell while CA is configured, the Random Access Preamble assignment via PDCCH of step 0, step 1 and 2 of the non-contention based random access procedure occur on the PCell. In order to establish timing advance for a sTAG, the eNB may initiate a non-contention based random access procedure with a PDCCH order (step 0) that is sent on a scheduling cell of activated SCell of the sTAG. Preamble transmission (step 1) is on the indicated SCell and Random Access Response (step 2) takes place on PCell.

(3GPP TS 36.300 V11.4.0 (2012-12), at 61–62, 72, 74–75.)

97. In addition, the applicable standards covered by the claims of the ’697 Patent, including but not limited to 3GPP TS 36.321 V11.1.0 (2012-12), describe the step of wherein the aggregated random access response comprises responses to a plurality of random access requests from individual ones of a plurality of user equipments:

6 Protocol Data Units, formats and parameters

6.1 Protocol Data Units

. . . .

6.1.5 MAC PDU (Random Access Response)

A MAC PDU consists of a MAC header and zero or more MAC Random Access Responses (MAC RAR) and optionally padding as described in figure 6.1.5-4.

The MAC header is of variable size.

A MAC PDU header consists of one or more MAC PDU subheaders; each subheader corresponding to a MAC RAR except for the Backoff Indicator subheader. If included, the Backoff Indicator subheader is only included once and is the first subheader included within the MAC PDU header.

. . . .

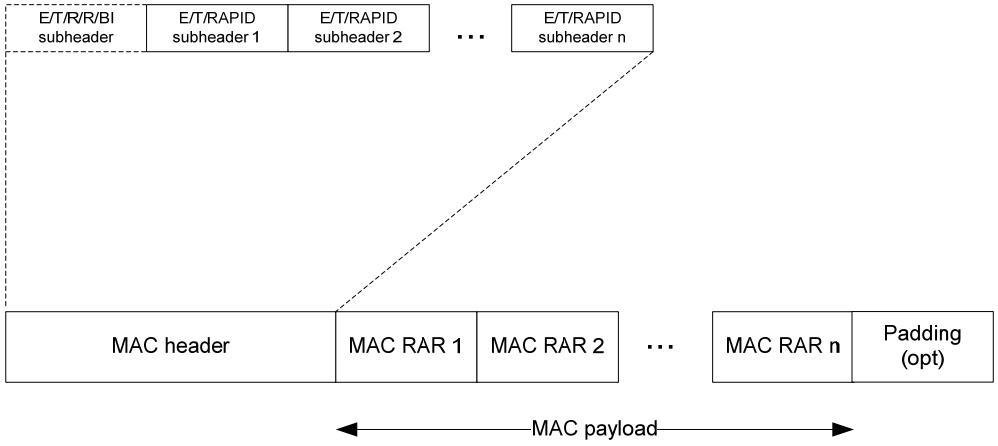

Figure 6.1.5-4: Example of MAC PDU consisting of a MAC header and MAC RARs

(3GPP TS 36.321 V11.1.0 (2012-12), at 35, 43-44.)

98. Upon information and belief, the Tesla Standard-Compliant Products comply or have complied with the applicable standards covered by the claims of the '697 Patent, including without limitation 3G and/or 4G/LTE, and therefore infringe the '697 Patent, including at least Claim 1.

99. The Tesla Standard-Compliant Products have complied, and continue to comply, with 3GPP TS 36.300 V11.4.0 (2012-12).

100. The Tesla Standard-Compliant Products have complied, and continue to comply, with 3GPP TS 36.211 V11.2.0 (2013-02).

101. The Tesla Standard-Compliant Products have complied, and continue to comply, with 3GPP TS 36.321 V11.1.0 (2012-12).

102. The Tesla Standard-Compliant Products have complied, and continue to comply, with 3GPP TS 36.213 V11.1.0 (2012-12).

103. Tesla is infringing claims of the '697 Patent, including at least Claim 1, literally and/or pursuant to the doctrine of equivalents.

104. In violation of 35 U.S.C. § 271(b), Tesla is and has been infringing one or more of the '697 Patent's claims, including at least Claim 1, indirectly by inducing the infringement of the '697 Patent's claims by third parties, including without limitation manufacturers, resellers, and/or users of Tesla's Standard-Compliant Products, in this District, and elsewhere in the United States. Direct infringement is the result of activities performed by users of the Tesla Standard-Compliant Products in accordance with the claims of the '697 Patent.

105. Tesla's affirmative acts of selling the Tesla's Standard-Compliant Products, causing the Tesla Standard-Compliant Products to be manufactured and distributed, providing instructive materials and information concerning operation and use of the Tesla Standard-Compliant Products, and maintenance/service for such products, induced users of the Tesla Standard-Compliant Products to infringe the '697 Patent's claims by using the vehicles in their normal and customary way. By and through these acts, Tesla knowingly and specifically intends the users of the Tesla Standard-Compliant Products to infringe the '697 Patent's claims. Tesla (1) knows and knew of the '697 Patent since at least prior to the filing of this lawsuit, (2) performs affirmative acts that constitute induced infringement, and (3) knows or should know that those acts would induce actual infringement of one or more of the '697 Patent's claims by users of the Tesla Standard-Compliant Products.

106. In violation of 35 U.S.C. § 271(c), Tesla is and has been infringing one or more of the '697 Patent's claims, including at least Claim 1, indirectly by contributing to the infringement

of the ’697 Patent’s claims by third parties, including without limitation manufacturers, resellers, and/or users of the Tesla Standard-Compliant Products, in this District, and elsewhere in the United States. Direct infringement is the result of activities performed by manufacturers, resellers, and/or users in relation to the Tesla Standard-Compliant Products, including without limitation use of the Tesla Standard-Compliant Products.

107. Upon information and belief, Tesla at least installs, configures, and sells Tesla Standard-Compliant Products with distinct and separate hardware and/or software components especially made or especially adapted to practice the invention claimed in the ’697 Patent. That hardware and/or software is a material part of the invention. That hardware and/or software is not a staple article or commodity of commerce because it is specifically designed to perform the claimed functionality. Any other use of that hardware and/or software would be unusual, far-fetched, illusory, impractical, occasional, aberrant, or experimental.

108. Therefore, upon information and belief, Tesla is making, using, offering to sell, and/or selling in the United States, and/or importing into the United States, without authority, a component of a patented machine, manufacture, combination or composition, or a material or an apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in infringement of a patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use.

109. As explained above, Tesla had actual notice of the ’697 Patent prior to this lawsuit being filed and had knowledge of the infringing nature of its activities. Nevertheless, Tesla continued its infringing activities.

110. Instead of taking a FRAND license to Conversant’s patent portfolio, Tesla continues, in bad faith, to directly and indirectly infringe Conversant’s patents, including the

'697 Patent by making, using, offering for sale and selling infringing Tesla Standard-Compliant Products, and inducing and contributing to the infringement of others.

111. Therefore, upon information and belief, Tesla's infringement of the '697 Patent's claims, including at least Claim 1, has been and continues to be willful entitling Conversant to increased damages pursuant to 35 U.S.C. § 284 and to attorneys' fees and costs incurred in prosecuting this action pursuant to 35 U.S.C. § 285.

112. Tesla's acts of infringement have caused damages to Conversant, and Conversant is entitled to recover from Tesla the damages sustained by Conversant as a result of Tesla's wrongful acts in an amount to be determined at trial.

COUNT 3—INFRINGEMENT OF THE '797 PATENT

113. Conversant incorporates by reference the allegations set forth in Paragraphs 1–112 of this Complaint as though fully set forth herein.

114. In violation of 35 U.S.C. § 271(a), Tesla is and has been directly infringing one or more of the '797 Patent's claims, including at least Claim 3, by making, using, offering to sell, and/or selling in the United States, and/or importing into the United States, without authority, products that support 3G and/or 4G/LTE connectivity, including without limitation the Tesla Standard-Compliant Products as defined above. Each of the Tesla Standard-Compliant Products comprises hardware and software components that together practice every element of one or more claims of the '797 Patent, including at least Claim 3. These components include those hardware and software components that enable the set of wireless cellular communications functionalities known as 3G and/or 4G/LTE and implement 3G and/or 4G/LTE in compliance with the requirements of the technical standards applicable to mobile communications, including the technical standards promulgated by 3GPP and various subsequent releases and versions thereof.

These components enable the Tesla Standard-Compliant Products to perform 3G and/or 4G/LTE communications functionality.

115. It is necessary to practice one or more of the claims of the ’797 Patent to comply with the requirements of certain standards applicable to mobile communications. For example, it is necessary to practice at least Claim 3 from the ’797 Patent to comply with certain 3G and/or 4G/LTE standards.

116. The Tesla Standard-Compliant Products comply with the applicable standards covered by the claims of the ’797 Patent.

117. The Tesla Standard-Compliant Products are capable of performing, and when used do in fact perform, the method of Claim 3 of the ’797 Patent.

118. The applicable standards covered by the claims of the ’797 Patent describe, at least, performing the method of Claim 3 of the ’797 Patent.

119. By way of example, Claim 3 of the ’797 Patent requires a method including the step of “transmitting to a network access node, in a time and frequency resource allocated for preamble transmission, of one of a plurality of component carriers, a random access request.”

120. The applicable standards covered by the claims of the ’797 Patent, including but not limited to 3GPP TS 36.213 V11.1.0 (2012-12), describe a method including the step of

transmitting to a network access node, in a time and frequency resource allocated for preamble transmission, of one of a plurality of component carriers, a random access request:

> **6.1 Physical non-synchronized random access procedure**
>
> From the physical layer perspective, the L1 random access procedure encompasses the transmission of random access preamble and random access response. The remaining messages are scheduled for transmission by the higher layer on the shared data channel and are not considered part of the L1 random access procedure. A random access channel occupies 6 resource blocks in a subframe or set of consecutive subframes reserved for random access preamble transmissions. The eNodeB is not prohibited from scheduling data in the resource blocks reserved for random access channel preamble transmission.

(3GPP TS 36.213 V11.1.0 (2012-12), at 23–24.)

121. In addition, the applicable standards covered by the claims of the '797 Patent, including but not limited to 3GPP TS 36.211 V11.1.0 (2012-12), describe the step of transmitting to a network access node, in a time and frequency resource allocated for preamble transmission, of one of a plurality of component carriers, a random access request:

> **5.7 Physical random access channel**
>
> **5.7.1 Time and frequency structure**
>
> The physical layer random access preamble, illustrated in Figure 5.7.1-1, consists of a cyclic prefix of length T_{CP} and a sequence part of length T_{SEQ}. The parameter values are listed in Table 5.7.1-1 and depend on the frame structure and the random access configuration. Higher layers control the preamble format.

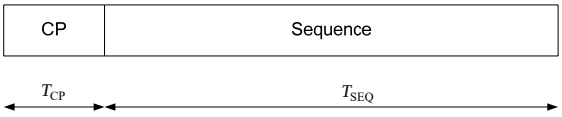

Figure 5.7.1-1: Random access preamble format.

(3GPP TS 36.211 V11.1.0 (2012-12), at 41.)

122. In addition, the applicable standards covered by the claims of the '797 Patent, including but not limited to 3GPP TS 36.300 V11.4.0 (2012-12), describe the step of transmitting

to a network access node, in a time and frequency resource allocated for preamble transmission, of one of a plurality of component carriers, a random access request:

> **7.5 Carrier Aggregation**
>
> . . . . In the downlink, the carrier corresponding to the PCell is the Downlink Primary Component Carrier (DL PCC) while in the uplink it is the Uplink Primary Component Carrier (UL PCC).
>
> Depending on UE capabilities, Secondary Cells (SCells) can be configured to form together with the PCell a set of serving cells. In the downlink, the carrier corresponding to an SCell is a Downlink Secondary Component Carrier (DL SCC) while in the uplink it is an Uplink Secondary Component Carrier (UL SCC).
>
> The configured set of serving cells for a UE therefore always consists of one PCell and one or more SCells:
>
> . . . .
>
> **10.1.5 Random Access Procedure**
>
> The random access procedure is characterized by:
>
> - Common procedure for FDD and TDD;
> - One procedure irrespective of cell size and the number of serving cells when CA is configured;
>
> The random access procedure is performed for the following events related to the PCell:
>
> . . . .
>
> The random access procedure is also performed on a SCell to establish time alignment for the corresponding sTAG.
>
> . . . .

10.1.5.2 Non-contention based random access procedure

. . . .

1) Random Access Preamble on RACH in uplink:

- UE transmits the assigned non-contention Random Access Preamble.

2) Random Access Response on DL-SCH:

- Semi-synchronous (within a flexible window of which the size is two or more TTIs) with message 1;
- No HARQ;
- Addressed to RA-RNTI on PDCCH;
- Conveys at least:
  - Timing Alignment information and initial UL grant for handover;
  - Timing Alignment information for DL data arrival;
  - RA-preamble identifier.
  - Intended for one or multiple UEs in one DL-SCH message.

When performing non-contention based random access on the PCell while CA is configured, the Random Access Preamble assignment via PDCCH of step 0, step 1 and 2 of the non-contention based random access procedure occur on the PCell. In order to establish timing advance for a sTAG, the eNB may initiate a non-contention based random access procedure with a PDCCH order (step 0) that is sent on a scheduling cell of activated SCell of the sTAG. Preamble transmission (step 1) is on the indicated SCell and Random Access Response (step 2) takes place on PCell.

(3GPP TS 36.300 V11.4.0 (2012-12), at 58, 72, 74–75.)

123. The method of Claim 3 of the ’797 Patent requires the step of “receiving a random access response that is aggregated with other random access responses in a time and frequency resource of a different component carrier.”

124. The applicable standards covered by the claims of the ’797 Patent, including but not limited to 3GPP TS 36.300 V11.4.0 (2012-12), describe the step of receiving a random access

response that is aggregated with other random access responses in a time and frequency resource of a different component carrier:

10.1.5 Random Access Procedure

The random access procedure is characterized by:

- Common procedure for FDD and TDD;
- One procedure irrespective of cell size and the number of serving cells when CA is configured;

The random access procedure is performed for the following events related to the PCell:

. . . .

The random access procedure is also performed on a SCell to establish time alignment for the corresponding sTAG.

. . . .

10.1.5.1 Contention based random access procedure

. . . .

The four steps of the contention based random access procedures are:

1) Random Access Preamble on RACH in uplink:

- There are two possible groups defined and one is optional. If both groups are configured the size of message 3 and the pathloss are used to determine which group a preamble is selected from. The group to which a preamble belongs provides an indication of the size of the message 3 and the radio conditions at the UE. The preamble group information along with the necessary thresholds are broadcast on system information.

2) Random Access Response generated by MAC on DL-SCH:

- Semi-synchronous (within a flexible window of which the size is one or more TTI) with message 1;
- No HARQ;
- Addressed to RA-RNTI on PDCCH;

- Conveys at least RA-preamble identifier, Timing Alignment information for the pTAG, initial UL grant and assignment of Temporary C-RNTI (which may or may not be made permanent upon Contention Resolution);

- Intended for a variable number of UEs in one DL-SCH message.

3) First scheduled UL transmission on UL-SCH:

. . . .

When CA is configured, the first three steps of the contention based random access procedures occur on the PCell while contention resolution (step 4) can be cross-scheduled by the PCell.

10.1.5.2 Non-contention based random access procedure

. . . .

1) Random Access Preamble on RACH in uplink:

- UE transmits the assigned non-contention Random Access Preamble.

2) Random Access Response on DL-SCH:

- Semi-synchronous (within a flexible window of which the size is two or more TTIs) with message 1;

- No HARQ;

- Addressed to RA-RNTI on PDCCH;

- Conveys at least:

    - Timing Alignment information and initial UL grant for handover;

    - Timing Alignment information for DL data arrival;

    - RA-preamble identifier.

    - Intended for one or multiple UEs in one DL-SCH message.

> When performing non-contention based random access on the PCell while CA is configured, the Random Access Preamble assignment via PDCCH of step 0, step 1 and 2 of the non-contention based random access procedure occur on the PCell. In order to establish timing advance for a sTAG, the eNB may initiate a non-contention based random access procedure with a PDCCH order (step 0) that is sent on a scheduling cell of activated SCell of the sTAG. Preamble transmission (step 1) is on the indicated SCell and Random Access Response (step 2) takes place on PCell.

(3GPP TS 36.300 V11.4.0 (2012-12), at 72–75.)

125. In addition, the applicable standards covered by the claims of the '797 Patent, including but not limited to 3GPP TS 36.321 V11.1.0 (2012-12), describe the step of receiving a random access response that is aggregated with other random access responses in a time and frequency resource of a different component carrier:

> **5.1.4 Random Access Response reception**
>
> Once the Random Access Preamble is transmitted and regardless of the possible occurrence of a measurement gap, the UE shall monitor the PDCCH of the PCell for Random Access Response(s) identified by the RA-RNTI defined below, in the RA Response window which starts at the subframe that contains the end of the preamble transmission [7] plus three subframes and has length *ra-ResponseWindowSize* subframes. The RA-RNTI associated with the PRACH in which the Random Access Preamble is transmitted, is computed as:
>
> $$RA\text{-}RNTI = 1 + t\_id + 10 * f\_id$$
>
> Where t_id is the index of the first subframe of the specified PRACH ($0 \leq t\_id < 10$), and f_id is the index of the specified PRACH within that subframe, in ascending order of frequency domain ($0 \leq f\_id < 6$). The UE may stop monitoring for Random Access Response(s) after successful reception of a Random Access Response containing Random Access Preamble identifiers that matches the transmitted Random Access Preamble.
>
> . . . .
>
> **6.1.5 MAC PDU (Random Access Response)**
>
> A MAC PDU consists of a MAC header and zero or more MAC Random Access Responses (MAC RAR) and optionally padding as described in figure 6.1.5-4.
>
> . . . .

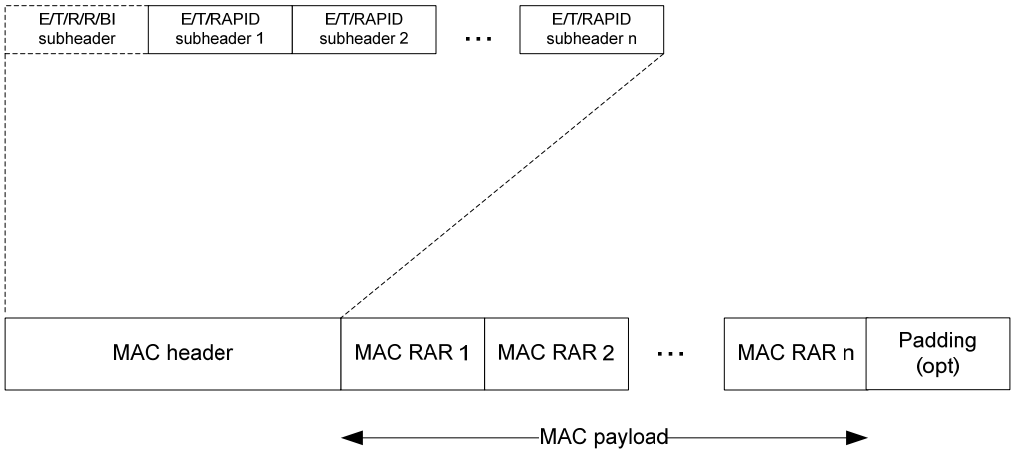

Figure 6.1.5-4: Example of MAC PDU consisting of a MAC header and MAC RARs

(3GPP TS 36.321 V11.1.0 (2012-12), at 15, 43–44.)

126. The method of Claim 3 of the '797 Patent requires the step of "wherein the aggregated random access responses are for a first type of user equipment and for a second type of user equipment."

127. The applicable standards covered by the claims of the '797 Patent, including but not limited to 3GPP TS 36.300 V11.4.0 (2012-12), describe the step of wherein the aggregated random access responses are for a first type of user equipment and for a second type of user equipment:

> **7.5 Carrier Aggregation**
>
> . . . . In the downlink, the carrier corresponding to the PCell is the Downlink Primary Component Carrier (DL PCC) while in the uplink it is the Uplink Primary Component Carrier (UL PCC).
>
> Depending on UE capabilities, Secondary Cells (SCells) can be configured to form together with the PCell a set of serving cells. In the downlink, the carrier corresponding to an SCell is a Downlink Secondary Component Carrier (DL SCC) while in the uplink it is an Uplink Secondary Component Carrier (UL SCC).
>
> The configured set of serving cells for a UE therefore always consists of one PCell and one or more SCells:
>
> . . . .

10.1.5 Random Access Procedure

The random access procedure is characterized by:

- Common procedure for FDD and TDD;
- One procedure irrespective of cell size and the number of serving cells when CA is configured;

The random access procedure is performed for the following events related to the PCell:

(3GPP TS 36.300 V11.4.0 (2012-12), at 58, 72.)

128. The method of Claim 3 of the '797 Patent requires the step of "where there is at least one random access response for one of the second type of user equipment that is placed in a message at a location that need not be read by the first type of user equipment."

129. The applicable standards covered by the claims of the '797 Patent, including but not limited to 3GPP TS 36.321 V11.1.0 (2012-12), describe the step of where there is at least one random access response for one of the second type of user equipment that is placed in a message at a location that need not be read by the first type of user equipment:

***ra-PRACH-MaskIndex*:** Defines in which PRACHs within a system frame the UE can transmit a Random Access Preamble (see subclause 7.3).

. . . .

5 MAC procedures

5.1 Random Access procedure

5.1.1 Random Access Procedure initialization

The Random Access procedure described in this subclause is initiated by a PDCCH order or by the MAC sublayer itself. Random Access procedure on an SCell shall only be initiated by a PDCCH order. If a UE receives a PDCCH transmission consistent with a PDCCH order [5] masked with its C-RNTI, and for a specific Serving Cell, the UE shall initiate a Random Access procedure on this Serving Cell. For Random Access on the PCell a PDCCH order or RRC optionally indicate the *ra-PreambleIndex* and the *ra-PRACH-MaskIndex*; and for Random Access on an SCell, the PDCCH order indicates the *ra-PreambleIndex* with a value different

from 000000 and the *ra-PRACH-MaskIndex*. For the pTAG preamble transmission on PRACH and reception of a PDCCH order are only supported for PCell.

. . . .

5.1.2 Random Access Resource selection

The Random Access Resource selection procedure shall be performed as follows:

- If *ra-PreambleIndex* (Random Access Preamble) and *ra-PRACH-MaskIndex* (PRACH Mask Index) have been explicitly signalled and *ra-PreambleIndex* is not 000000:

- the Random Access Preamble and the PRACH Mask Index are those explicitly signalled.

. . . .

5.1.4 Random Access Response reception

Once the Random Access Preamble is transmitted and regardless of the possible occurrence of a measurement gap, the UE shall monitor the PDCCH of the PCell for Random Access Response(s) identified by the RA-RNTI defined below, in the RA Response window which starts at the subframe that contains the end of the preamble transmission [7] plus three subframes and has length *ra-ResponseWindowSize* subframes. The RA-RNTI associated with the PRACH in which the Random Access Preamble is transmitted, is computed as:

$$\text{RA-RNTI} = 1 + t\_id + 10 * f\_id$$

Where t_id is the index of the first subframe of the specified PRACH ($0 \leq t\_id < 10$), and f_id is the index of the specified PRACH within that subframe, in ascending order of frequency domain ($0 \leq f\_id < 6$). The UE may stop monitoring for Random Access Response(s) after successful reception of a Random Access Response containing Random Access Preamble identifiers that matches the transmitted Random Access Preamble.

. . . .

6.1.5 MAC PDU (Random Access Response)

A MAC PDU consists of a MAC header and zero or more MAC Random Access Responses (MAC RAR) and optionally padding as described in figure 6.1.5-4.

. . . .

A MAC PDU subheader consists of the three header fields E/T/RAPID (as described in figure 6.1.5-1) but for the Backoff Indicator subheader which consists of the five header field E/T/R/R/BI (as described in figure 6.1.5-2).

A MAC RAR consists of the four fields R/Timing Advance Command/UL Grant/Temporary C-RNTI (as described in figure 6.1.5-3).

. . . .

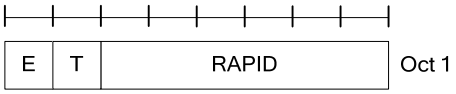

Figure 6.1.5-1: E/T/RAPID MAC subheader

. . . .

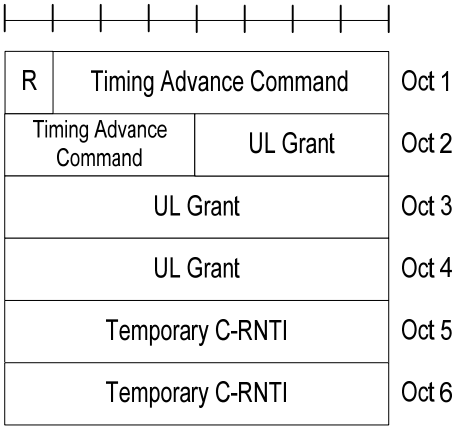

Figure 6.1.5-3: MAC RAR

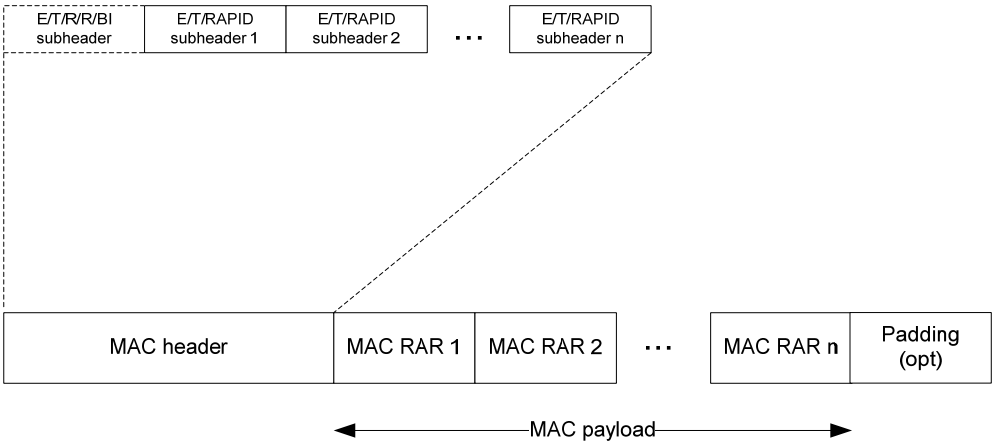

Figure 6.1.5-4: Example of MAC PDU consisting of a MAC header and MAC RARs

(3GPP TS 36.321 V11.1.0 (2012-12), at 7, 13–15, 43–44.)

130. In addition, the applicable standards covered by the claims of the '797 Patent, including but not limited to 3GPP TS 36.213 V11.8.0 (2014-09), describe the step of where there is at least one random access response for one of the second type of user equipment that is placed in a message at a location that need not be read by the first type of user equipment:

7.1 UE procedure for receiving the physical downlink shared channel

. . . .

If a UE is configured by higher layers to decode PDCCH with CRC scrambled by the RA-RNTI, the UE shall decode the PDCCH and the corresponding PDSCH according to any of the combinations defined in Table 7.1-3. The scrambling initialization of PDSCH corresponding to these PDCCHs is by RA-RNTI.

When RA-RNTI and either C-RNTI or SPS C-RNTI are assigned in the same subframe, the UE is not required to decode a PDSCH on the primary cell indicated by a PDCCH/EPDCCH with a CRC scrambled by C-RNTI or SPS C-RNTI.

Table 7.1-3: PDCCH and PDSCH configured by RA-RNTI

DCI format	Search Space	Transmission scheme of PDSCH corresponding to PDCCH
DCI format 1C	Common	If the number of PBCH antenna ports is one, Single-antenna port, port 0 is used (see subclause 7.1.1), otherwise Transmit diversity (see subclause 7.1.2)
DCI format 1A	Common	If the number of PBCH antenna ports is one, Single-antenna port, port 0 is used (see subclause 7.1.1), otherwise Transmit diversity (see subclause 7.1.2)

(3GPP TS 36.213 V11.8.0 (2014-09), at 29–30.)

131. In addition, the applicable standards covered by the claims of the '797 Patent, including but not limited to 3GPP TS 36.331 V11.2.0 (2012-12), describe the step of where there is at least one random access response for one of the second type of user equipment that is placed in a message at a location that need not be read by the first type of user equipment:

6.3 RRC information elements

. . . .

6.3.2 Radio resource control information elements

. . . .

PRACH-Config

The IE *PRACH-ConfigSIB* and IE *PRACH-Config* are used to specify the PRACH configuration in the system information and in the mobility control information, respectively.

***PRACH-Config* information elements**

```
-- ASN1START

PRACH-ConfigSIB ::=             SEQUENCE {
    rootSequenceIndex                   INTEGER (0..837),
    prach-ConfigInfo                    PRACH-ConfigInfo
}

PRACH-Config ::=                    SEQUENCE {
    rootSequenceIndex                   INTEGER (0..837),
    prach-ConfigInfo                    PRACH-ConfigInfo                    OPTIONAL    -- Need ON
}

PRACH-ConfigSCell-r10 ::=               SEQUENCE {
    prach-ConfigIndex-r10                   INTEGER (0..63)
}

PRACH-ConfigInfo ::=                SEQUENCE {
    prach-ConfigIndex                   INTEGER (0..63),
    highSpeedFlag                       BOOLEAN,
    zeroCorrelationZoneConfig           INTEGER (0..15),
    prach-FreqOffset                    INTEGER (0..94)
}

-- ASN1STOP
```

. . . .

RACH-ConfigDedicated

The IE *RACH-ConfigDedicated* is used to specify the dedicated random access parameters.

***RACH-ConfigDedicated* information element**

```
-- ASN1START

RACH-ConfigDedicated ::=        SEQUENCE {
    ra-PreambleIndex                    INTEGER (0..63),
    ra-PRACH-MaskIndex                  INTEGER (0..15)
}

-- ASN1STOP
```

(3GPP TS 36.331 V11.2.0 (2012-12), at 164, 181, 205, 212.)

132. In addition, the applicable standards covered by the claims of the '797 Patent, including but not limited to 3GPP TS 36.300 V12.8.0 (2015-12), describe the step of where there is at least one random access response for one of the second type of user equipment that is placed in a message at a location that need not be read by the first type of user equipment:

10.1.5.2 Non-contention based random access procedure

. . . .

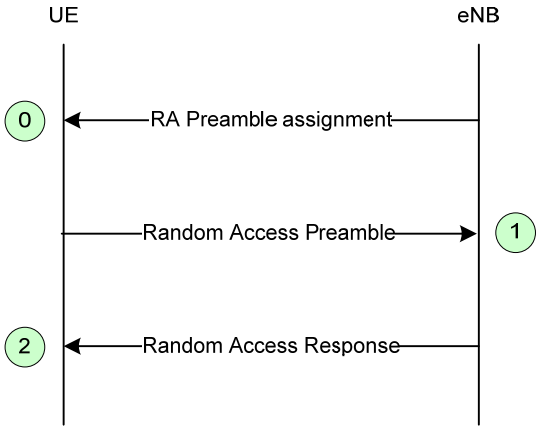

Figure 10.1.5.2-1: Non-contention based Random Access Procedure

The three steps of the non-contention based random access procedures are:

0) Random Access Preamble assignment via dedicated signalling in DL:

- eNB assigns to UE a non-contention Random Access Preamble (a Random Access Preamble not within the set sent in broadcast signalling).

- Signalled via:

    - HO command generated by target eNB and sent via source eNB for handover;

- PDCCH in case of DL data arrival or positioning;
- PDCCH for initial UL time alignment for a sTAG.

1) Random Access Preamble on RACH in uplink:

- UE transmits the assigned non-contention Random Access Preamble.

2) Random Access Response on DL-SCH:

. . . .

When performing non-contention based random access on the PCell while CA is configured, the Random Access Preamble assignment via PDCCH of step 0, step 1 and 2 of the non-contention based random access procedure occur on the PCell. In order to establish timing advance for a sTAG, the eNB may initiate a non-contention based random access procedure with a PDCCH order (step 0) that is sent on a scheduling cell of activated SCell of the sTAG. Preamble transmission (step 1) is on the indicated SCell and Random Access Response (step 2) takes place on PCell.

(3GPP TS 36.300 V12.8.0 (2015-12), at 97–98.)

133. In addition, the applicable standards covered by the claims of the ’797 Patent, including but not limited to 3GPP TS 36.211 V11.1.0 (2012-12), describe the step of where there is at least one random access response for one of the second type of user equipment that is placed in a message at a location that need not be read by the first type of user equipment:

5.7 Physical random access channel

5.7.1 Time and frequency structure

. . . .

Table 5.7.1-2: Frame structure type 1 random access configuration for preamble formats 0-3.

PRACH Configuration Index	Preamble Format	System frame number	Subframe number	PRACH Configuration Index	Preamble Format	System frame number	Subframe number
0	0	Even	1	32	2	Even	1
1	0	Even	4	33	2	Even	4
2	0	Even	7	34	2	Even	7
3	0	Any	1	35	2	Any	1
4	0	Any	4	36	2	Any	4
5	0	Any	7	37	2	Any	7
6	0	Any	1, 6	38	2	Any	1, 6
7	0	Any	2 ,7	39	2	Any	2 ,7
8	0	Any	3, 8	40	2	Any	3, 8
9	0	Any	1, 4, 7	41	2	Any	1, 4, 7
10	0	Any	2, 5, 8	42	2	Any	2, 5, 8
11	0	Any	3, 6, 9	43	2	Any	3, 6, 9
12	0	Any	0, 2, 4, 6, 8	44	2	Any	0, 2, 4, 6, 8

. . . .

(3GPP TS 36.211 V11.1.0 (2012-12), at 41–42.)

134. The method of Claim 3 of the ’797 Patent requires the step of “where the message comprises an indicator that is set for indicating that the message contains the at least one random access response for one of the second type of user equipment.”

135. The applicable standards covered by the claims of the ’797 Patent, including but not limited to 3GPP TS 36.321 V11.1.0 (2012-12), describe the step of where the message comprises an indicator that is set for indicating that the message contains the at least one random access response for one of the second type of user equipment:

> **6.1.5 MAC PDU (Random Access Response)**
>
> A MAC PDU consists of a MAC header and zero or more MAC Random Access Responses (MAC RAR) and optionally padding as described in figure 6.1.5-4.
>
> . . . .
>
> A MAC PDU subheader consists of the three header fields E/T/RAPID (as described in figure 6.1.5-1) but for the Backoff Indicator subheader which consists of the five header field E/T/R/R/BI (as described in figure 6.1.5-2).
>
> A MAC RAR consists of the four fields R/Timing Advance Command/UL Grant/Temporary C-RNTI (as described in figure 6.1.5-3).
>
> . . . .

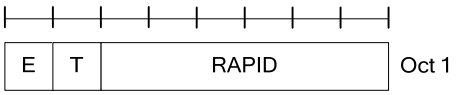

Figure 6.1.5-1: E/T/RAPID MAC subheader

. . . .

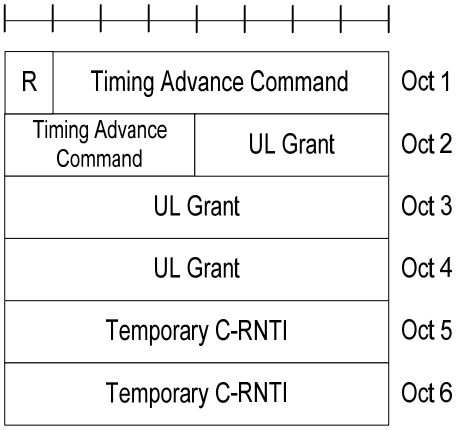

Figure 6.1.5-3: MAC RAR

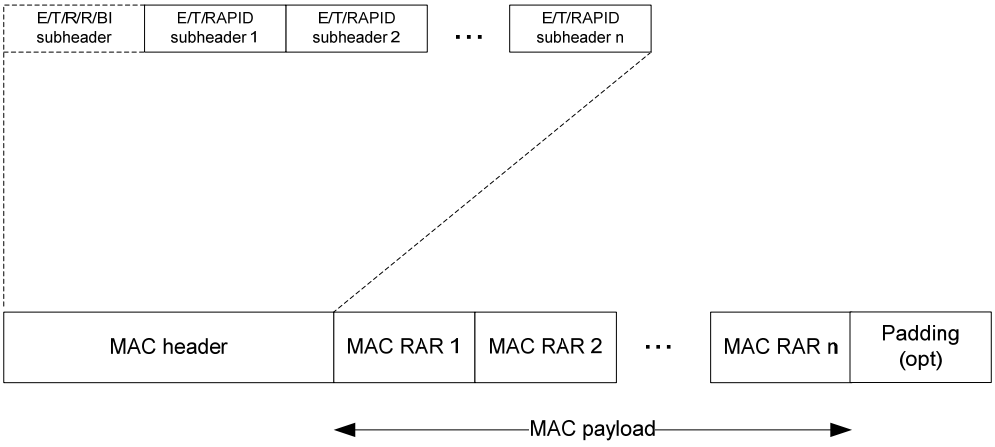

Figure 6.1.5-4: Example of MAC PDU consisting of a MAC header and MAC RARs

(3GPP TS 36.321 V11.1.0 (2012-12), at 43–44.)

136. Upon information and belief, the Tesla Standard-Compliant Products comply or have complied with the applicable standards covered by the claims of the ’797 Patent, including

without limitation 3G and/or 4G/LTE, and therefore infringe the ’797 Patent, including at least Claim 3.

137. The Tesla Standard-Compliant Products have complied, and continue to comply, with 3GPP TS 36.211 V11.1.0 (2012-12).

138. The Tesla Standard-Compliant Products have complied, and continue to comply, with 3GPP TS 36.213 V11.1.0 (2012-12).

139. The Tesla Standard-Compliant Products have complied, and continue to comply, with 3GPP TS 36.213 V11.8.0 (2014-09).

140. The Tesla Standard-Compliant Products have complied, and continue to comply, with 3GPP TS 36.300 V11.4.0 (2012-12).

141. The Tesla Standard-Compliant Products have complied, and continue to comply, with 3GPP TS 36.300 V12.8.0 (2015-12).

142. The Tesla Standard-Compliant Products have complied, and continue to comply, with 3GPP TS 36.321 V11.1.0 (2012-12).

143. The Tesla Standard-Compliant Products have complied, and continue to comply, with 3GPP TS 36.331 V11.2.0 (2012-12).

144. Tesla is infringing claims of the ’797 Patent, including at least Claim 3, literally and/or pursuant to the doctrine of equivalents.

145. In violation of 35 U.S.C. § 271(b), Tesla is and has been infringing one or more of the ’797 Patent’s claims, including at least Claim 3, indirectly by inducing the infringement of the ’797 Patent’s claims by third parties, including without limitation manufacturers, resellers, and/or users of Tesla’s Standard-Compliant Products, in this District, and elsewhere in the United States.

Direct infringement is the result of activities performed by users of the Tesla Standard-Compliant Products in accordance with the claims of the '797 Patent.

146. Tesla's affirmative acts of selling the Tesla's Standard-Compliant Products, causing the Tesla Standard-Compliant Products to be manufactured and distributed, providing instructive materials and information concerning operation and use of the Tesla Standard-Compliant Products, and maintenance/service for such products, induced users of the Tesla Standard-Compliant Products to infringe the '797 Patent's claims by using the vehicles in their normal and customary way. By and through these acts, Tesla knowingly and specifically intends the users of the Tesla Standard-Compliant Products to infringe the '797 Patent's claims. Tesla (1) knows and knew of the '797 Patent since at least prior to the filing of this lawsuit, (2) performs affirmative acts that constitute induced infringement, and (3) knows or should know that those acts would induce actual infringement of one or more of the '797 Patent's claims by users of the Tesla Standard-Compliant Products.

147. In violation of 35 U.S.C. § 271(c), Tesla is and has been infringing one or more of the '797 Patent's claims, including at least Claim 3, indirectly by contributing to the infringement of the '797 Patent's claims by third parties, including without limitation manufacturers, resellers, and/or users of the Tesla Standard-Compliant Products, in this District, and elsewhere in the United States. Direct infringement is the result of activities performed by manufacturers, resellers, and/or users in relation to the Tesla Standard-Compliant Products, including without limitation use of the Tesla Standard-Compliant Products.

148. Upon information and belief, Tesla at least installs, configures, and sells Tesla Standard-Compliant Products with distinct and separate hardware and/or software components especially made or especially adapted to practice the invention claimed in the '797 Patent. That

hardware and/or software is a material part of the invention. That hardware and/or software is not a staple article or commodity of commerce because it is specifically designed to perform the claimed functionality. Any other use of that hardware and/or software would be unusual, far-fetched, illusory, impractical, occasional, aberrant, or experimental.

149. Therefore, upon information and belief, Tesla is making, using, offering to sell, and/or selling in the United States, and/or importing into the United States, without authority, a component of a patented machine, manufacture, combination or composition, or a material or an apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in infringement of a patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use.

150. As explained above, Tesla had actual notice of the ’797 Patent prior to this lawsuit being filed and had knowledge of the infringing nature of its activities. Nevertheless, Tesla continued its infringing activities.

151. Instead of taking a FRAND license to Conversant’s patent portfolio, Tesla continues, in bad faith, to directly and indirectly infringe Conversant’s patents, including the ’797 Patent by making, using, offering for sale and selling infringing Tesla Standard-Compliant Products, and inducing and contributing to the infringement of others.

152. Therefore, upon information and belief, Tesla’s infringement of the ’797 Patent’s claims, including at least Claim 3, has been and continues to be willful entitling Conversant to increased damages pursuant to 35 U.S.C. § 284 and to attorneys’ fees and costs incurred in prosecuting this action pursuant to 35 U.S.C. § 285.

153. Tesla's acts of infringement have caused damages to Conversant, and Conversant is entitled to recover from Tesla the damages sustained by Conversant as a result of Tesla's wrongful acts in an amount to be determined at trial.

DAMAGES

154. Tesla's acts of infringement are and were committed intentionally, knowingly, and with callous disregard of Conversant's legitimate rights. Conversant is therefore entitled to and now seeks to recover exemplary damages in an amount not less than the maximum amount permitted by law.

155. As a result of Tesla's acts of infringement, Conversant has suffered actual and consequential damages. To the fullest extent permitted by law, Conversant seeks recovery of damages in an amount to compensate for Tesla's infringement. Conversant further seeks any other damages to which Conversant would be entitled to in law or in equity.

ATTORNEYS' FEES

156. Conversant is entitled to recover reasonable and necessary attorneys' fees under applicable law.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, Conversant demands a trial by jury on all issues so triable.

PRAYER FOR RELIEF

Conversant respectfully requests that the Court enter preliminary and final orders, declarations, and judgments against Tesla as are necessary to provide Conversant with the following relief:

a. A judgment that Tesla has infringed and/or is infringing one or more claims of the '456 Patent, literally or under the doctrine of equivalents, and directly or indirectly;

b. A judgment that Tesla's infringement of the '456 Patent has been willful;

c. A judgment that Tesla has infringed and/or is infringing one or more claims of the '697 Patent, literally or under the doctrine of equivalents, and directly or indirectly;

d. A judgment that Tesla's infringement of the '697 Patent has been willful;

e. A judgment that Tesla has infringed and/or is infringing one or more claims of the '797 Patent, literally or under the doctrine of equivalents, and directly or indirectly;

f. A judgment that Tesla's infringement of the '797 Patent has been willful;

g. An award for all damages arising out of Tesla's infringement, together with prejudgment and post-judgment interest, jointly and severally, in an amount according to proof, including without limitation attorneys' fees and litigation costs and expenses;

h. Any future compensation due to Conversant for Tesla's infringement (past, present or future) not specifically accounted for in a damages award (or other relief), and/or permanent injunctive relief;

i. An award of reasonable attorneys' fees as provided by 35 U.S.C. § 285 and enhanced damages as provided by 35 U.S.C. § 284; and

j. All further relief in law or in equity as the Court may deem just and proper.

Dated: May 7, 2020

Respectfully submitted,

/s/ Jamie H. McDole

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