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BEFORE THE PATENT TRIAL AND APPEAL BOARD

AT&T SERVICES INC., T-MOBILE USA, INC., CELLCO PARTNERSHIP
D/B/A VERIZON WIRELESS, ERICSSON INC. AND NOKIA OF AMERICA
CORPORATION,
Petitioners,

v.

ASUS TECHNOLOGY LICENSING INC.,
Patent Owner.

Case IPR2024-00997
U.S. Patent No. 10,798,754

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 10,798,754**

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PETITIONERS' EXHIBIT LIST

Exhibit No.	Description
1001	U.S. Patent No. 10,798,754 (“’754 Patent”)
1002	Prosecution History of U.S. Patent No. 10,798,754 (“’754 File History”)
1003	Declaration of Dr. Mark Mahon, Ph.D. (“Mahon Declaration”)
1004	Curriculum Vitae of Dr. Mark Mahon
1005	CATT, “Discussion on QoS Mapping,” TSG-RAN Working Group 2 Meeting #98 (2017) (“R2-1704250”)
1006	CATT, “NR SDAPP Header Format,” TSG-RAN Working Group 2 Meeting #NR (2017) (“R2-1706381”)
1007	“Technical Specification Group Radio Access Network; NR; NR and NG-RAN Overall Description,” 3GPP TS 38.300 v0.4.1 (June 2017) (“3GPP TS 38.300”)
1008	Declaration of Craig Bishop
1009	June 21, 2022 Interim Procedure for Discretionary Denials in AIA Post-grant Proceedings with Parallel District Court Litigation
1010	Docket Control Order (Dkt. 52) in <i>ASUS Technology Licensing Inc. v. AT&T Inc.</i> , No. 2:23-CV-486 (E.D. Tex. Feb. 16, 2024)
1011	Order (Dkt. 13) in <i>Innovative Sonic Limited et al v. AT&T Inc. et al</i> , No. 2:23-cv-00489 (E.D. Tex. Feb. 9, 2024)

Petitioners AT&T Services Inc., T-Mobile USA, Inc., Cellco Partnership d/b/a Verizon Wireless, Ericsson, Inc., and Nokia of America Corporation (collectively, “Petitioners”) request *Inter Partes* Review (“IPR”) of claims 1–10 (“the Challenged Claims”) of the ’754 patent, asserted to be owned by ASUS Technology Licensing Inc. (“Patent Owner”). Petitioners respectfully request that the Challenged Claims be found unpatentable.

I. Introduction

The Challenged Claims are drawn to nothing more than a known method/apparatus for establishing a default configuration for certain network communications from a mobile device to a base station. The purportedly novel feature of the claimed invention is “transmitting a first RRC (Radio Resource Control) message with a DRB (Data Radio Bearer) configuration to a UE (User Equipment) for establishing a default DRB for a PDU (Protocol Data Unit) session,” where the “DRB configuration includes a QFI (QoS [(“Quality of Service”)] Flow Id) configuration used to indicate whether a QFI field is present or not in uplink for the default DRB and the QFI configuration is always set to a value indicating the QFI field is present in uplink for the default DRB.” Ex-1001, Claim 1. But this basic default setting was well known in the prior art.

For example, engineers working for the China Academy of Telecommunications Technology (“CATT”) provided a technical proposal regarding Quality of Service mapping that teaches a method for transmitting certain information related to a basic default setting for handling Quality of Service flows (“R2-1704250” or “250”). Ex-1005. In addition, engineers working for CATT also created a proposal disclosing a header including the specific Quality of Service information in the claimed invention, including where the DRB configuration includes a QFI (QoS Flow Id) configuration used to indicate whether a QFI field is present or not in uplink for the default DRB and the QFI configuration is always set to a value indicating the QFI field is present in uplink for the default DRB (“R2-1706381” or “381”). Ex-1006.

Accordingly, as detailed below, R2-1704250 and R2-1706381 render obvious each of the Challenged Claims, either together or in combination with other well-known prior art.

II. Grounds for Standing

Pursuant to 37 C.F.R. § 42.104(a), Petitioners certify that the ’754 Patent is available for *inter partes* review (“IPR”), and that they are not barred or estopped from requesting IPR of the Challenged Claims on the grounds identified in this petition. Neither Petitioners, nor any party in privity with Petitioners: (i) have filed a civil action challenging the validity of claims of the ’754 Patent; (ii) have been

served a complaint alleging infringement of the '754 Patent more than one year prior to the present date; or (iii) are estopped from challenging the claims on the grounds identified in the petition. The Challenged Claims of the '754 Patent also have not been the subject of a prior IPR or a finally concluded district court litigation.

III. Overview of the Challenge

A. Claims for Which Review Is Requested (37 C.F.R. § 42.104(b)(1))

Petitioners request the review and cancelation of claims 1–10 of the '754 Patent.

B. Statutory Grounds of Challenge (37 C.F.R. § 42.104(b)(2))

Ground 1: the Challenged Claims are invalid under 35 U.S.C. § 103 based on R2-1704250 (Ex-1005) in view of R2-1706381 (Ex-1006).

Ground 2: the Challenged Claims are invalid under 35 U.S.C. § 103 based on 3GPP TS 38.300 (Ex-1007) in view of R2-1706381 (Ex-1006).

Petitioners' full statement of the reasons for the relief requested is set forth below and in the supporting declaration of Dr. Mark Mahon (Ex-1003) and Craig Bishop (Ex-1008).

C. The Asserted References Are Prior Art to the '754 Patent

The '754 Patent claims priority to Provisional United States Patent Application No. 62/536,163, which was filed on July 24, 2017. *See* Ex-1001 at

Cover. For purposes of this petition, Petitioners assume that July 24, 2017 is the priority date for the '754 Patent.

Petitioners' first ground for invalidity is based on R2-1704250 in view of R2-1706381 and Petitioners' second ground for invalidity combines R2-1706381 with a Technical Specification ("3GPP TS 38.300") published by the Third Generation Partnership Project ("3GPP"). As explained in detail by Craig Bishop (*see generally* Ex-1008), 3GPP technical documents, including R2-1704250, R2-1706381, and 3GPP TS 38.300, are publically accessible as of the date they were uploaded to 3GPP's FTP server. Ex-1008, ¶¶19-53. Indeed, at least one PTAB panel has found that this is true of all 3GPP documents:

TR 33.821 and TS 23.401,¹ *like all 3GPP documents*, were generated with intent to distribute them to interested members of the telecommunications industry. They were uploaded to 3GPP's FTP server without restriction or expectation of confidentiality, and were indefinitely maintained there. They have been available

¹ Like 3GPP TS 38.300, "TS 23.401" is a type of 3GPP document called a technical specification (TS) that was prepared and published by 3GPP. *See, e.g.*, <https://www.3gpp.org/specifications>; *see also* Ex-1008, ¶¶29-40 (describing various categories of documents published by 3GPP as part of standard development, including technical reports and specifications).

for downloading (copying) from the FTP server since being uploaded, and can be shared with others without restriction.

Under such circumstances, the documents are publicly accessible.

Samsung Elecs. Co., Ltd. v. Huawei Techs. Co., Ltd., IPR2017-01487, Paper 45 (Final Written Decision), 2018 WL 6519544, *5 (P.T.A.B. Dec. 10, 2018).

R2-1704250 was uploaded to 3GPP's file server on May 6, 2017. Ex-1008, ¶¶54-58. As a result, R2-1704250 became a "printed publication" under AIA 35 U.S.C. §§ 102(a)(1) on May 6, 2017. *See, e.g., Samsung Elecs. Co.*, 2018 WL 6519544, *3–5 (concluding that technical reports and specifications uploaded to 3GPP's file server before a challenged patent's priority date qualify as prior art under 35 U.S.C. § 102). R2-1704250 thus qualifies as prior art to the '754 Patent at least under AIA 35 U.S.C. §§ 102(a)(1).

R2-1706381 was uploaded to 3GPP's file server on June 17, 2017. Ex-1008, ¶¶59-63. As a result, R2-1706381 became a "printed publication" under AIA 35 U.S.C. §§ 102(a)(1) on June 17, 2017. *See, e.g., Samsung Elecs. Co.*, 2018 WL 6519544, *3–5 (concluding that technical reports and specifications uploaded to 3GPP's file server before a challenged patent's priority date qualify as prior art under 35 U.S.C. § 102). R2-1706381 thus qualifies as prior art to the '754 Patent at least under AIA 35 U.S.C. §§ 102(a)(1).

3GPP TS 38.300 was uploaded to 3GPP's file server on June 12, 2017. Ex-1008, ¶¶64-68. As a result, 3GPP TS 38.300 became a "printed publication" under AIA 35 U.S.C. §§ 102(a)(1) on June 12, 2017. *See, e.g., Samsung Elecs. Co.*, 2018 WL 6519544, *3–5 (concluding that technical reports and specifications uploaded to 3GPP's file server before a challenged patent's priority date qualify as prior art under 35 U.S.C. § 102). 3GPP TS 38.300 thus qualifies as prior art to the '754 Patent at least under AIA 35 U.S.C. §§ 102(a)(1).

IV. Overview of the '754 Patent

A. Background of the '754 Patent

The '754 Patent is titled "Method And Apparatus For Serving Quality Of Service (QoS) Flow In A Wireless Communication System." Ex-1001, Cover Page. The '754 Patent's "Background" section explains that, at the time of the invention, an allegedly "new radio technology for the next generation (e.g., 5G) is currently being discussed by the 3GPP standards organization." *Id.*, 1:34-38. The '754 Patent discloses a method and apparatus for a network node, including "the network node transmitting a first message with a DRB (Data Radio Bearer) configuration to a UE (User Equipment) for establishing a default DRB for a PDU (Packet Data Unit) session, wherein the DRB configuration includes a QFI (QoS Flow Id) configuration used to indicate whether a QFI field is present or not in uplink for the default DRB and the QFI configuration is always set to a value indicating the QFI field is present

in uplink for the default DRB.” *Id.*, Abstract. The network node establishes “the default DRB with a presence of the QFI field in uplink. The method also includes the network node receiving a SDAP (Service Data Adaptation Protocol) PDU with the QFI field via the default DRB from the UE.” *Id.*

B. Communications Networks and the '754 Patent

Figure 2 of the '754 Patent, shown below, discloses a generic communications system that provides a basic overview of how information, for example a QFI, is transmitted and received. Figure 2 includes “a transmitter system 210 (also known as the access network) and a receiver system 250 (also known as access terminal (AT) or user equipment (UE)) in a MIMO system 200. At the transmitter system 210, traffic data for a number of data streams is provided from a data source 212 to a transmit (TX) data processor 214.” *Id.*, 3:34-40. At receiver system 250, the transmitted modulated signals are received from transmitter system 210 and processed. *Id.*, 4:5-43.

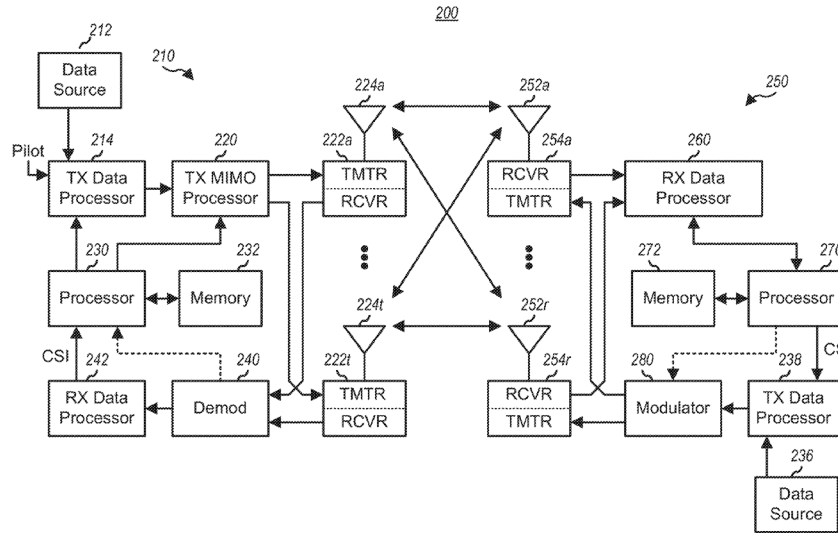


FIG. 2

Ex-1001, Fig. 2.

The communications system disclosed in Figure 2 enables communication between transmitter system 210 and receiver system 250. Ex-1003, ¶¶46-48. To enable communication, a processor 270 in receiver system 250 periodically determines which pre-coding matrix to use and formulates a reverse link message comprising a matrix index portion and a rank value portion. Ex-1001, 4:5-43. “The reverse link message may comprise various types of information regarding the communication link and/or the received data stream.” *Id.*, 4:29-30. At transmitter system 210, the modulated signals from receiver system 250 are received and

processed to extract the reserve link message transmitted by the receiver system 250.

Id., 4:31-43. Processor 230 then processes the extracted message. *Id.*

C. 5G and the '754 Patent

Figure 5 of the '754 Patent, shown below, discloses the 5G standalone network architecture, which requires the deployment of a 5G core network ("5GC") connected to the next-generation radio access network ("NG-RAN"). Ex-1001, 5:21-43; Ex-1003, ¶¶50-54. For each User Equipment ("UE"), the 5G core network establishes at least one Packet Data Unit ("PDU") Session, and for each PDU Session, the network node or NB establishes at least one Data Radio Bearer ("DRB"). Ex-1001, 5:25-27. "The NG-NG-RAN maps packets belonging to different PDU sessions to different DRBs. Hence, the NG-RAN establishes at least one default DRB for each PDU Session indicated by 5GC upon PDU Session establishment." Ex-1001, 5:27-31.

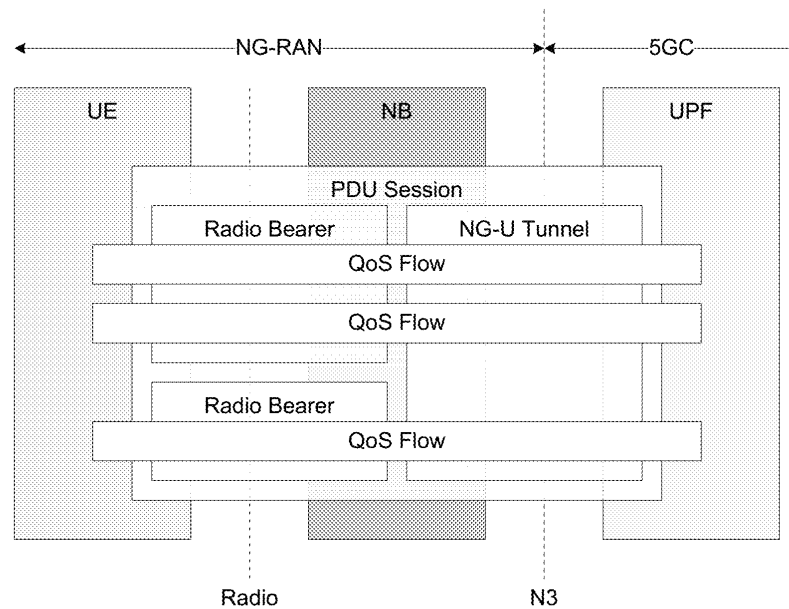


FIG. 5 (PRIOR ART)

Ex-1001, Fig. 5.

As shown above in Figure 5, NG-RAN and 5GC ensure quality of service (e.g. reliability and target delay) by mapping packets to appropriate QoS Flows and DRBs. Ex-1001, 5:38-40. Quality of Service (QoS) is a method for optimizing service and traffic flow by controlling such factors as packet loss, bit rate, throughput, transmission delay, availability, jitter, etc. Ex-1003, ¶¶51-54. QoS Flows separate traffic into unique flows which receive differing treatment based on the nature of the traffic. Ex-1001, 7:4-20. For example, one QoS flow may handle video traffic, while another QoS flow may handle website-browsing traffic. A QoS Flow ID (“QFI”) is used to identify a QoS flow in the 5G system. *Id.* User Plane

traffic with the same QFI within a PDU session receives the same traffic forwarding treatment (e.g. scheduling, admission threshold). Ex-1003, ¶¶51-54. The QFI is carried in a packet header. *Id.*

SDAP (“Service Data Adaption Protocol”) is a 5G sublayer used for mapping QoS Flows to DRBs for both downlink and uplink packets. Ex-1001, 5:10-20. QoS Flows may be mapped to a DRB either by explicit reconfiguration from the node or by what is called “Reflective Mapping,” in which a UE that receives a new QoS Flow in the downlink will reflectively map the new QoS Flow to the same DRB in the uplink. *Id.*, 5:52-67. SDAP headers for Data PDUs contain a QFI for that PDU, *id.*, 25:11-49, and uplink PDUs without QFI are assigned to the default DRB. *Id.*, 6:6-9, 44-51; *see also* Ex-1003, ¶¶52-54.

D. The ’754 Patent and Multiple QoS Flows

The ’754 Patent discloses that packet loss can occur when a UE initiates a second QoS Flow and there is no pre-configured mapping of the second QoS Flow to a DRB. Ex-1001, 23:35-54. The new, second QoS Flow will be mapped to the default DRB. *Id.* If the default DRB does not require QFI in uplink, the node will not be aware of the second QoS Flow and its Data PDUs will be discarded. *Id.* The ’754 Patent describes the situation as follows:

The UE initiates a new UL QoS flow (the second UL QoS flow) e.g. based on pre-configured QoS parameters. If there is no mapping of the QFI to a

DRB in the AS [(“Access Stratum”)] mapping table for this PDU session, the second UL QoS flow will be mapped to a default DRB of the PDU session. In case there is already an ongoing UL QoS flow (the first UL QoS flow) mapped to this default DRB and the default DRB is not configured with presence of SDAP header for UL currently, the gNB would not be aware of the second UL QoS flow when receiving UL SDAP PDUs corresponding to the second UL QoS flow from the UE. In this situation, the target QoS of the second UL QoS flow would not be satisfied because gNB would not set up a new DRB for the second QoS flow or map the second QoS flow to an existing DRB according to QoS parameters of the second QoS flow. Besides, the IP packets included in those SDAP PDUs of the second UL QoS flow would not be distinguished by the core network (e.g. UPF) because the packet filter corresponds to the first UL QoS flow. As a result, the IP packets would be discarded, which causes data missing and resources waste.

Ex-1001, 23:35-54.

E. The '754 Patent's Default Message

The '754 Patent purportedly addresses this issue by transmitting a simple message that includes a QFI configuration indicating that the QFI field is always present in uplink for the default DRB. Ex-1001, 25:11-49, 27:1-22. Figure 12 of the '754 Patent, shown below, discloses that in step 1205, the network node “transmits a first message with a DRB configuration to a UE for establishing a default DRB for a PDU session, where the DRB configuration includes a QFI configuration used to

indicate whether a QFI field is present or not in uplink for the default DRB and the QFI configuration is always set to a value indicating the QFI field is present in uplink for the default DRB.” *Id.*, 27:2-9. “In step 1210, the network node establishes the default DRB with a presence of the QFI field in uplink,” and in step 1215, “the network node receives a SDAP PDU with the QFI field via the default DRB from the UE.” *Id.*, 27:13-19.

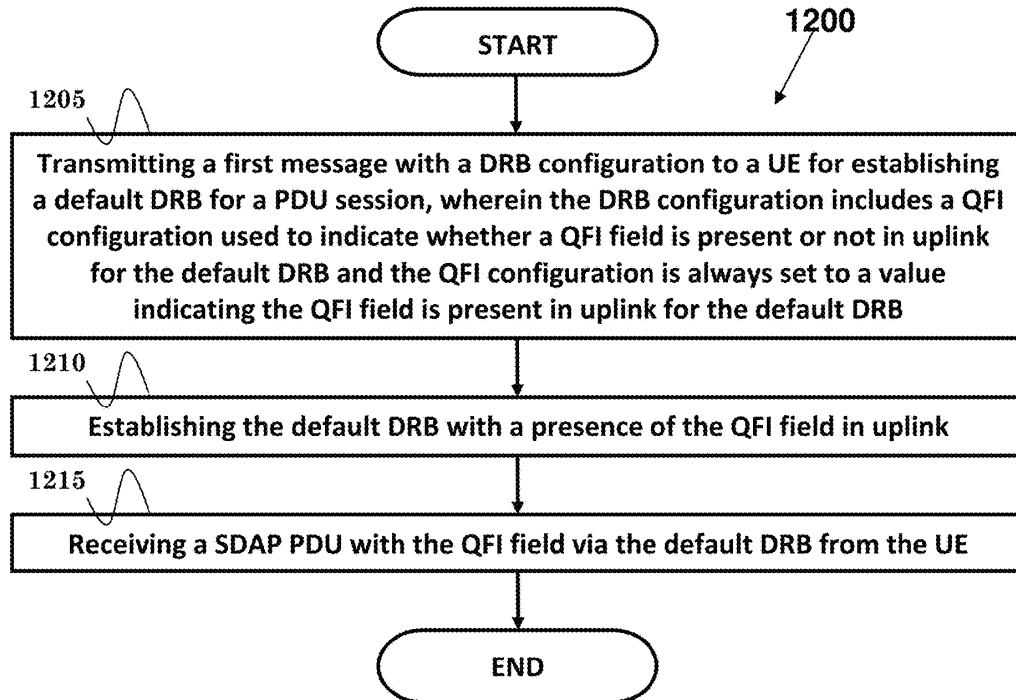


FIG. 12

Ex-1001, Fig. 12.

F. Representative Claim of the '754 Patent

Claim 1 of the '754 Patent is reproduced below.

[1P] A method of a network node, comprising:

[1A] transmitting a first RRC (Radio Resource Control) message with a DRB (Data Radio Bearer) configuration to a UE (User Equipment) for establishing a default DRB for a PDU (Protocol Data Unit) session, wherein the DRB configuration includes a QFI (QoS Flow Id) configuration used to indicate whether a QFI field is present or not in uplink for the default DRB and the QFI configuration is always set to a value indicating the QFI field is present in uplink for the default DRB;

[1B] establishing the default DRB with a presence of the QFI field in uplink; and

[1C] receiving a SDAP (Service Data Adaptation Protocol) PDU with the QFI field via the default DRB from the UE.

Ex-1001, Claim 1.

G. Prosecution History of the '754 Patent

The '754 Patent issued from an application that was filed on July 24, 2018. In the Notice of Allowance, the Examiner offered the following reason for allowing Claims 1 and 6 of the '754 Patent.

The prior art of record, considered individually or in combination, fails to fairly show or suggest the claimed network node (claim 6) and method (claim 1), comprising, among other limitations, the novel and unobvious limitations as “transmitting a first Radio Resource Control ‘RRC’ message with a Data Radio Bearer ‘DRB’ configuration to a User Equipment ‘UE’ for establishing a default DRB for a Packet Data Unit ‘PDU’ session, wherein the DRB configuration includes a QoS Flow Id ‘QFI’

configuration used to indicate whether a QFI field is present or not in uplink for the default DRB and the QFI configuration is always set to a value indicating the QFI field is present in uplink for the default DRB . . . via the default DRB from the UE.

Ex-1002, 38. Importantly, there is no evidence that the Examiner was aware of the prior art identified in this petition. And, as explained in detail below, the prior art discussed in this petition disclose and suggest precisely what the Examiner found lacking in the prior art.

V. Claim Construction

As explained in 83 Fed. Reg. 51341 (Oct. 11, 2018), the Board construes the Challenged Claims according to the standard as set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). Petitioners believe that, for the purposes of this proceeding and the analysis presented herein, no claim term requires express construction. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999). Accordingly, this petition analyzes the Challenged Claims consistent with the ordinary and customary meaning as would be understood by one of ordinary skill in the art in light of the specification. *Phillips*, 415 F.3d at 1314–17.

VI. Person of Ordinary Skill in the Art

A person of ordinary skill in the art (“POSITA”) in the field of the ’754 patent at the time of the alleged invention of the ’754 patent would have had the equivalent of an undergraduate degree in Electrical Engineering, Computer Science, or

Computer Engineering, familiarity with the relevant 3GPP standards as of this time, and at least two years of experience in design, development, and/or testing of cellular networks. Ex-1003, ¶¶43-44. This definition is approximate, and more education may substitute for industry experience or vice versa. *Id.*

VII. Reasons For the Relief Requested Under 37 C.F.R. §§ 42.22(A)(2) and 42.104(B)(4)

A. The Scope and Content of the Prior Art

1. Technology Background

Presented below is a short description of certain relevant technical concepts as they were known in the art before the priority date of the '754 Patent.

2. R2-1704250 (Ex-1005)

R2-1704250 is a technical proposal published on May 6, 2017 regarding Quality of Service mapping that teaches a method for transmitting certain information related to a default setting for handling Quality of Service flows. Ex-1005. The proposal “discusses how to manage the mapping between QoS flow and DRB and how to carry QFI information in UL and DL” between a UE and a node. *Id.*, 1; *see also* Ex-1003, ¶¶57-58.² The proposal, like the claimed invention,

² In wireless networks, “DL” or “downlink” refers to signals transmitted from a base station to a mobile device, while “UL” or “uplink” refers to signals transmitted from a mobile device to a base station. Ex-1003, ¶57-58.

specifically provides a method for a network node, where the node transmits a first RRC message with a DRB configuration to a UE. Ex-1005, 2.

The proposal also discloses establishing a default DRB for a PDU session. *Id.* Further, the proposal discloses establishing the default DRB with a presence of the QFI field in uplink and receiving SDAP PDU with the QFI field via the default DRB from the UE. *Id.* (“So the default DRB shall be configured to always include QFI in SDAP header at least in UL.”). Thus, it was a standard practice in the prior art to the ’754 Patent to transmit specific default information discussed in the ’754 Patent between a node and a UE to enhance QoS. Ex-1003, ¶¶57-58.

3. R2-1706381 (Ex-1006)

R2-1706381 is a technical proposal published on June 17, 2017 disclosing a header containing the specific Quality of Service information in the claimed invention, including where the DRB configuration includes a QFI configuration used to indicate whether a QFI field is present or not in uplink for the default DRB and the QFI configuration is always set to a value indicating the QFI field is present in uplink for the default DRB. Ex-1006; *see also* Ex-1003, ¶¶59-60. The proposal discusses “the detailed formats of SDAP data PDU and QFI presence.” Ex-1006, 1.

The proposal specifically provides that the DRB configuration transmitted from the node to the UE includes a QFI configuration used to indicate whether a QFI field is present or not in uplink for the default DRB. *Id.*, 1 (“It is proposed to support

explicit UL QFI presence indicator in RRC signaling and allow carrying UL QFI even in 1-to-1 mapping.”). In the proposal, a QFI presence indicator is included in an RRC message such that the QFI is included in uplink packets even when there is only a single QoS flow mapped to a single default DRB (“1-to-1 mapping”). *Id.* Further, the proposal confirms that the transmitted QFI configuration is always set to a value indicating the QFI field is present in uplink for the default DRB. *Id.*, 1 (“UL PDU should always carry QFI (QoS Flow Indicator) information either by explicit header field or by implicit configuration with 1-to-1 mapping.”). These concepts were well-known in the prior art before the claimed invention. Ex-1003, ¶¶59-60.

4. 3GPP TS 38.300 (Ex-1007)

Before July 24, 2017, procedures for transmitting and receiving specific QoS information between a node and a UE for network communications were well known. Ex-1003, ¶61. For example, 3GPP TS 38.300 is a Technical Specification that was publicly available on June 12, 2017, and that provides an “overall description of the NG-RAN and focuses on the radio interface protocol architecture of NR connected to 5GC.” Ex-1007, 7. The specification discusses “QFI to DRB mapping with RRC signaling” between a UE and a node. *Id.*, 50-51; Ex-1003, ¶61. The specification, like the claimed invention, specifically provides a method for a network node, where the node transmits a first RRC message with a DRB

configuration to a UE. Ex-1007, 38-40, 50-53. The specification also discloses establishing a default DRB for a PDU session. *Id.* Further, the specification discloses establishing the default DRB with a presence of the QFI field in uplink and receiving SDAP PDU with the QFI field via the default DRB from the UE. *Id.*

B. Ground 1: The Challenged Claims Are Obvious in View of R2-1704250 Combined with R2-1706831

1. Element 1P: A method of a network node, comprising:

To the extent that the preamble is limiting, R2-1704250 discloses a method of a network node. Ex-1003, ¶¶63-64. For example, R2-1704250 “discusses how to manage the mapping between QoS flow and DRB and how to carry QFI information in UL and DL” between a UE and a network node. Ex-1005, 1. R2-1704250 specifically states that the “gNB” or network node “should always be aware of UL QFI” and provides that the SDAP header can carry the QFI. Ex-1005, 1; Ex-1003, ¶64. “[T]he number of QoS flow(s) over default bearer is dynamically changed and out of the control of gNB. So the default DRB shall be configured to always include QFI in SDAP header at least in UL.” Ex-1005, 2. Thus, R2-1704250 discloses the preamble of Claim 1 of the ’754 Patent.

2. **Element 1A:** transmitting a first RRC (Radio Resource Control) message with a DRB (Data Radio Bearer) configuration to a UE (User Equipment) for establishing a default DRB for a PDU (Protocol Data Unit) session, wherein the DRB configuration includes a QFI (QoS Flow Id) configuration used to indicate whether a QFI field is present or not in uplink for the default DRB and the QFI configuration is always set to a value indicating the QFI field is present in uplink for the default DRB;

The combination of R2-1704250 and R2-1706831 renders obvious claim element 1A of the '754 Patent. Ex-1003, ¶¶65-73. To start, R2-1704250 discloses “transmitting a first RRC (Radio Resource Control) message with a DRB (Data Radio Bearer) configuration to a UE (User Equipment) for establishing a default DRB for a PDU (Protocol Data Unit) session.” Ex-1003, ¶¶65-66. Specifically, R2-1704250 describes “Default DRB handling” and states that “the mapping association is configured to the UE by RRC,” where the node transmits an RRC message with a DRB configuration to the UE for establishing a default DRB for a PDU. Ex-1005, 2. The default DRB is established such that the “UE shall map the UL packet in the default bearer, which means that the number of QoS flow(s) over default bearer is dynamically changed and out of the control of gNB. So the default DRB shall be configured to always include QFI in SDAP header at least in UL.” *Id.* The default DRB is established for a PDU session. Ex-1005, 1-2 (“New AS layer PDU is PDCP SDU” and “all SDAP PDUs may carry QFI field no matter 1-to-1 mapping or m-to-1 mapping”); *see also* Ex-1003, ¶¶65-66. The mapping discussed in R2-1704250

means that either a single QoS flow is mapped to a single default DRB (“1-to-1 mapping”) or multiple QoS flows are mapped to a single DRB (“m-to-1 mapping”). Ex-1005, 1.

To the extent that R2-1704250 fails to teach “wherein the DRB configuration includes a QFI (QoS Flow Id) configuration used to indicate whether a QFI field is present or not in uplink for the default DRB and the QFI configuration is always set to a value indicating the QFI field is present in uplink for the default DRB,” the combination of R2-1704250 with R2-1706381 nevertheless renders this limitation obvious to a POSITA. Ex-1003, ¶¶66-73.

R2-1706381 teaches “the detailed formats of SDAP data PDU and QFI presence.” Ex-1006, 1. The proposal explains that using PDUs with and without the QFI field brings complexity and confusion for SDAP layer processing:

For UL SDAP, if there is 1-to-1 mapping between QoS flow and DRB, it can be not marked with QFI in principle. Network can derive the QFI from DRB tunnel. But the issue of mapping reconfiguration caused by QoS flow addition and deletion arises, where PDUs without QFI field and PDUs with QFI field may be mixed in buffers and in the air. It brings extra complexity and confusion for SDAP layer processing.

Ex-1006, 1. The proposal then describes a solution to this problem such that the “network configures UE always carrying QFI from the beginning of DRB establishment, even in 1-to-1 mapping period. This can avoid re-organization of

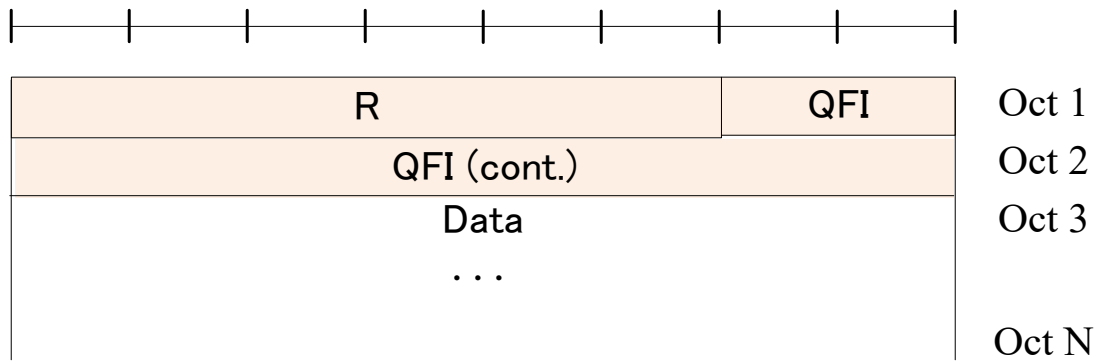
PDU and other re-establishment operation triggered by mapping relationship reconfiguration.” *Id.*; *see also* Ex-1003, ¶¶66-73.

To effect this solution, the proposal specifically discloses that “the DRB configuration includes a QFI (QoS Flow Id) configuration used to indicate whether a QFI field is present or not in uplink for the default DRB,” as required by claim element 1A. Ex-1006, 1 (“It is proposed to support explicit UL QFI presence indicator in RRC signaling and allow carrying UL QFI even in 1-to-1 mapping.”); *see also* Ex-1003, ¶¶67-73. The QFI configuration is included in the DRB configuration in the RRC message, where the RRC message communicated from the node to the UE includes an “explicit UL QFI presence indicator in RRC signaling” that allows “carrying UL QFI even in 1-to-1 mapping.” Ex-1006, 1.

The proposal also discloses that “the QFI configuration is always set to a value indicating the QFI field is present in uplink for the default DRB,” as required by element 1A. *Id.*, 1 (“UL PDU should always carry QFI (QoS Flow Indicator) information either by explicit header field or by implicit configuration with 1-to-1 mapping.”); *see also* Ex-1003, ¶¶67-73. The proposal describes a situation where, “when PDU session establishes, there is only one QoS flow in a DRB. Later some other QoS flow(s) activation or arrival, mapping relationship between QoS flow(s) and that DRB can be changed from 1-to-1 to many-to-1 mapping. In this case, it is an easy way that network configures UE *always* carrying QFI from the beginning of

DRB establishment, even in 1-to-1 mapping period.” Ex-1006, 1 (emphasis added).

Figure 2 of the proposal, shown below, discloses the UL PDU with QFI:



Ex-1006, Figure 1.

In view of R2-1706381’s disclosure of a QFI configuration used to indicate whether a QFI field is present or not in uplink for the default DRB and that the QFI configuration is always set to a value indicating the QFI field is present, a POSITA would have found it obvious in to use this configuration in the proposal described by R2-1704250. Ex-1003, ¶¶69-73. R2-1704250 specifically contemplates the use of QFI configuration information when it states that, “[w]hether SDAP header includes QFI field or not is explicitly configured by network and even in 1-to-1 mapping case the QFI field may be also present to avoid complexity caused by reconfiguration between 1-to-1 and m-to-1 mapping.” Ex-1005, 2. Accordingly, to reduce complexity and confusion, a POSITA would have been motivated to combine the proposal regarding default DRB handling in R2-1704250 with the specific QFI

configuration and setting described in R2-1706381. Ex-1003, ¶¶69-73. A skilled artisan would have found it obvious to practice the proposed combination by adding the claimed QFI configuration to the expressly disclosed method for default DRB handling in R2-1704250. Ex-1003, ¶70.

A POSITA would have understood that a major benefit of R2-1706381's system is that the claimed QFI configuration permits mapping of multiple QoS flows to DRBs with no packet loss and less complexity. Ex-1006, 1-2; Ex-1003, ¶71. A POSITA would have understood that this same benefit could be realized in R2-1704250's system. Ex-1003, ¶¶71-73. As a result, to the extent R2-1704250 does not disclose the approach already, a POSITA would have been motivated to improve upon R2-1704250's method by including a QFI configuration used to map QoS flows to DRBs with no packet loss and less complexity. Ex-1003, ¶¶71-73. This would minimize packet loss and simplify the process for mapping QoS flows to DRBs.

In addition to being motivated to pursue the proposed combination, a POSITA would have had a reasonable expectation of success in “meet[ing] the limitations of the claimed invention.” *Intelligent Bio-Systems, Inc. v. Illumina Cambridge, Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016). R2-1704250 itself teaches the need for simplification of QoS flow mapping. Ex-1005, 1-2. “[T]o avoid complexity caused by reconfiguration between 1-to-1 and m-to-1 mapping,” R2-1704250 generally

discloses using QFI information for QoS flow and DRB mapping. *Id.* Especially given R2-1706381's disclosures, a POSITA would have known that it was possible for R2-1704250 to employ a QFI configuration that was always set to a value indicating the QFI field is present in uplink for the default DRB. Ex-1003, ¶72.

Claim element 1A of the '754 Patent is therefore obvious in view of R2-1704250 combined with R2-1706381.

3. **Element 1B:** establishing the default DRB with a presence of the QFI field in uplink; and

R2-1704250 discloses claim element 1B of the '754 Patent. *See* Ex-1003, ¶74. R2-1704250 discloses “establishing the default DRB with a presence of the QFI field in uplink.” *Id.* The proposal states that “the default DRB shall be configured to always include QFI in SDAP header at least in UL.” Ex-1005, 2. Further, “the UE shall map the UL packet in the default bearer, which means that the number of QoS flow(s) over default bearer is dynamically changed and out of the control of gNB.” Ex-1005, 2. Thus, R2-1704250 teaches establishing the default DRB with a presence of the QFI field in uplink. Ex-1003, ¶74; *see also supra* § VII(B)(2).

4. **Element 1C:** receiving a SDAP (Service Data Adaptation Protocol) PDU with the QFI field via the default DRB from the UE.

R2-1704250 discloses claim element 1C of the '754 Patent. *See* Ex-1003, ¶75. R2-1704250 discloses “receiving a SDAP (Service Data Adaptation Protocol) PDU

with the QFI field via the default DRB from the UE.” *Id.* The proposal states that “the UE shall map the UL packet in the default bearer, which means that the number of QoS flow(s) over default bearer is dynamically changed and out of the control of gNB.” Ex-1005, 2. Further, “the default DRB shall be configured to always include QFI in SDAP header at least in UL.” *Id.* As a result, the node will receive a SDAP PDU with the QFI field present via the default DRB from the UE. Ex-1003, ¶75. Thus, R2-1704250 teaches receiving a SDAP PDU with the QFI field via the default DRB from the UE. Ex-1003, ¶75; *see also supra* § VII(B)(3).

5. **Claim 2:** The method of claim 1, wherein the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field.

The combination of R2-1704250 and R2-1706831 renders obvious Claim 2 of the '754 Patent. Ex-1003, ¶¶76-81. To start, as discussed above, Claim 1 of the '754 Patent is obvious in view of R2-1704250 combined with R2-1706381. Further, to the extent that R2-1704250 fails to teach “wherein the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field,” as required by Claim 2, the combination of R2-1704250 with R2-1706381 nevertheless renders this limitation obvious to a POSITA. Ex-1003, ¶¶76-81.

R2-1706381 discloses that “the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field,” as required by claim 2. Ex-1003, ¶¶77-80. The proposal teaches “the detailed formats of SDAP data PDU and QFI presence,” Ex-1006, 1, and the proposal explains that using PDUs with and without the QFI field brings complexity and confusion for SDAP layer processing. Ex-1006, 1. The proposal then describes a solution to this problem such that the “network configures UE *always* carrying QFI from the beginning of DRB establishment, even in 1-to-1 mapping period.” *Id.* (emphasis added); *see also* Ex-1003. ¶77. In addition, the proposal states that “UL PDU should *always* carry QFI (QoS Flow Indicator) information.” Ex-1006, 1 (emphasis added). Because R2-1706381 discloses that the network configures the UE to always carry QFI, a POSITA would understand from this disclosure that the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field, as required by Claim 2. Ex-1003, ¶¶77-81.

In view of R2-1706381’s disclosure that the QFI configuration is *always* set to a value indicating the QFI field is present, a POSITA would have found it obvious to use this configuration in the proposal described by R2-1704250 to arrive at the claimed invention of Claim 2. Ex-1003, ¶¶78-81. R2-1704250 specifically contemplates the use of QFI configuration information when it states that,

“[w]hether SDAP header includes QFI field or not is explicitly configured by network and even in 1-to-1 mapping case the QFI field may be also present to avoid complexity caused by reconfiguration between 1-to-1 and m-to-1 mapping.” Ex-1005, 2. Accordingly, to reduce complexity and confusion, a POSITA would have been motivated to combine the proposal regarding default DRB handling in R2-1704250 with the specific QFI configuration and setting described in R2-1706381 to arrive at the claimed invention of Claim 2. Ex-1003, ¶¶78-81. A skilled artisan would have found it obvious to practice the proposed combination by adding the claimed QFI configuration to the expressly disclosed method for default DRB handling in R2-1704250. Ex-1003, ¶78.

A POSITA would have understood that a major benefit of R2-1706381’s system is that the consistent use of the claimed QFI configuration permits mapping of multiple QoS flows to DRBs with no packet loss and less complexity because QFI is always present. Ex-1006 at 1-2; Ex-1003, ¶79. A POSITA would have understood that this same benefit could be realized in R2-1704250’s system. Ex-1003, ¶79. As a result, to the extent R2-1704250 does not disclose the approach already, a POSITA would have been motivated to improve upon R2-1704250’s method by including a QFI configuration used to map QoS flows to DRBs with no packet loss and less complexity. Ex-1003, ¶¶79-81.

In addition to being motivated to pursue the proposed combination, a POSITA would have had a reasonable expectation of success in combining the proposals to arrive at the claimed invention of Claim 2. Ex-1003, ¶¶80-81. R2-1704250 itself teaches the need for simplification of QoS flow mapping. Ex-1005, 1-2. Especially given R2-1706381's disclosures, a POSITA would have known that it was possible for R2-1704250 to employ a QFI configuration such that the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field. Ex-1003, ¶80.

Claim 2 of the '754 Patent is therefore obvious in view of R2-1704250 combined with R2-1706381.

6. **Claim 3:** The method of claim 1, wherein a header in the SDAP PDU includes at least the QFI field.

The combination of R2-1704250 and R2-1706831 renders obvious Claim 3 of the '754 Patent. Ex-1003, ¶¶82-83. To start, as discussed above, Claim 1 of the '754 Patent is obvious in view of R2-1704250 combined with R2-1706381. Further, R2-1704250 discloses wherein a header in the SDAP PDU includes at least the QFI field, as required by Claim 3. Ex-1003, ¶¶82-83. R2-1704250 discloses that "all SDAP PDUs may carry QFI field no matter 1-to-1 mapping or m-to-1 mapping." Ex-1005, 2; Ex-1003, ¶¶82-83. The header in the SDAP PDU includes the QFI field: "[T]he number of QoS flow(s) over default bearer is dynamically changed and out

of the control of gNB. So the default DRB shall be configured to always include QFI in SDAP header at least in UL.” Ex-1005, 2. Further, “[t]he default DRB shall be configured to always include QFI in SDAP header at least in UL.” *Id.* As a result, R2-1704250 discloses wherein a header in the SDAP PDU includes at least the QFI field, as required by Claim 3. Ex-1003, ¶¶82-83.

Claim 3 of the ’754 Patent is therefore obvious in view of R2-1704250 combined with R2-1706381.

7. **Claim 4:** The method of claim 1, wherein the network node transmits an IP (Internet Protocol) packet included in the SDAP PDU to a core network.

The combination of R2-1704250 and R2-1706831 renders obvious Claim 4 of the ’754 Patent. Ex-1003, ¶¶84-85. To start, as discussed above, Claim 1 of the ’754 Patent is obvious in view of R2-1704250 combined with R2-1706381. Further, R2-1704250 discloses that the network node transmits an IP (Internet Protocol) packet included in the SDAP PDU to a core network, as required by Claim 4. Ex-1003, ¶¶84-85. R2-1704250 discloses using VoIP, or Voice over Internet Protocol, as a service that uses IP packets included in SDAP PDUs to transmit information back and forth between a node and a core network. Ex-1005, 2; Ex-1003, ¶¶84-85. As a result, R2-1704250 discloses that the network node transmits an IP (Internet Protocol) packet included in the SDAP PDU to a core network, as required by Claim 4. Ex-1003, ¶¶84-85.

Claim 4 of the '754 Patent is therefore obvious in view of R2-1704250 combined with R2-1706381.

8. **Claim 5:** The method of claim 1, wherein the network node is a base station (or gNB).

The combination of R2-1704250 and R2-1706831 renders obvious Claim 5 of the '754 Patent. Ex-1003, ¶¶86-87. To start, as discussed above, Claim 1 of the '754 Patent is obvious in view of R2-1704250 combined with R2-1706381. Further, R2-1704250 discloses wherein the network node is a base station (or gNB), as required by Claim 5. Ex-1003, ¶¶86-87. R2-1704250 discloses that the network node is a “gNB” and “should always be aware of UL QFI.” Ex-1005, 2; Ex-1003, ¶¶86-87. Further, the “default DRB shall be configured to always include QFI in SDAP header at least in UL” such that the number of “QoS flow(s) over default bearer is dynamically changed and out of the control of gNB.” Ex-1005, 2. As a result, R2-1704250 discloses wherein the network node is a base station (or gNB), as required by Claim 5. Ex-1003, ¶¶86-87.

Claim 5 of the '754 Patent is therefore obvious in view of R2-1704250 combined with R2-1706381.

9. **Element 6P:** A network node, comprising:

See Element 1[P], *supra* § VII(B)(1).

10. **Element 6A:** a control circuit; a processor installed in the control circuit; and a memory installed in the control circuit and operatively coupled to the processor; wherein the processor is configured to execute a program code stored in the memory to:

R2-1704250 discloses that the network node comprises a control circuit; a processor installed in the control circuit; and a memory installed in the control circuit and operatively coupled to the processor; wherein the processor is configured to execute a program code stored in the memory to perform certain steps. Ex-1003, ¶89. For example, R2-1704250 “discusses how to manage the mapping between QoS flow and DRB and how to carry QFI information in UL and DL” between a UE and a network node. Ex-1005, 1. R2-1704250 specifically states that the network node is a “gNB” or gNodeB, Ex-1005, 2, which is a base station or node that a POSITA would understand includes a control circuit, a processor installed in the control circuit, and a memory installed in the control circuit and operatively coupled to the processor, wherein the processor is configured to execute a program code stored in the memory to perform certain steps. Ex-1003, ¶89. R2-1704250 also discloses that “the number of QoS flow(s) over default bearer is dynamically changed and out of the control of gNB.” Ex-1005, 2. This indicates that the gNB includes a control circuit with a processor and memory, where the processor can execute program code stored in memory. Ex-1003, ¶89. Thus, R2-1704250 discloses claim element 6A of the '754 Patent.

11. **Element 6B:** transmit a first RRC (Radio Resource Control) message with a DRB (Data Radio Bearer) configuration to a UE (User Equipment) for establishing a default DRB for a PDU (Protocol Data Unit) session, wherein the DRB configuration includes a QFI (QoS Flow Id) configuration used to indicate whether a QFI field is present or not in uplink for the default DRB and the QFI configuration is always set to a value indicating the QFI field is present in uplink for the default DRB;

See Element 1A, supra § VII(B)(2).

12. **Element 6C:** establish the default DRB with a presence of the QFI field in uplink; and

See Element 1B, supra § VII(B)(3).

13. **Element 6D:** receive a SDAP (Service Data Adaptation Protocol) PDU with the QFI field via the default DRB from the UE.

See Element 1C, supra § VII(B)(4).

14. **Claim 7:** The network node of claim 6, wherein the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field.

See Claim 2, supra § VII(B)(5).

15. **Claim 8:** The network node of claim 6, wherein a header in the SDAP PDU includes at least the QFI field.

See Claim 3, supra § VII(B)(6).

16. **Claim 9:** The network node of claim 6, wherein the network node transmits an IP (Internet Protocol) packet included in the SDAP PDU to a core network.

See Claim 4, supra § VII(B)(7).

17. **Claim 10:** The network node of claim 6, wherein the network node is a base station (or gNB).

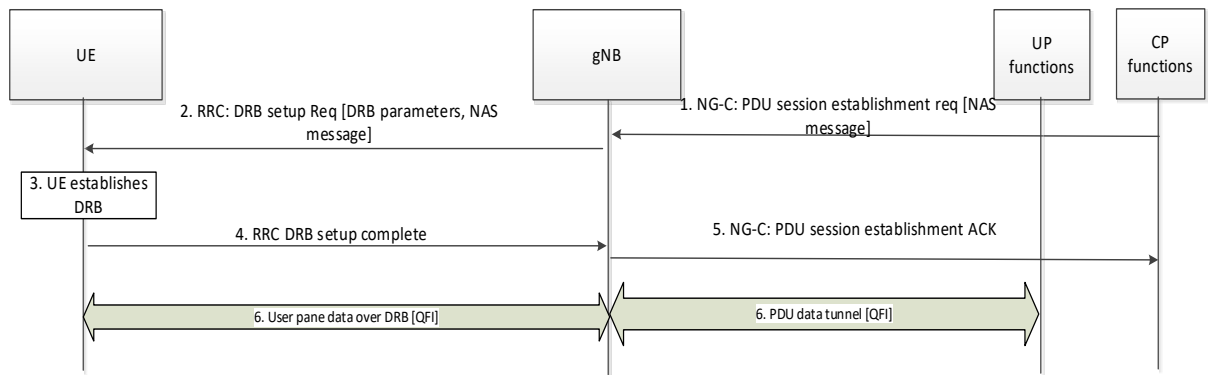
See Claim 5, supra § VII(B)(8).

C. Ground 2: The Challenged Claims Are Obvious in View of 3GPP TS 38.300 Combined with R2-1706381

Petitioners' second ground for invalidity demonstrates that 3GPP TS 38.300 in view of R2-1706381 additionally renders obvious the Challenged Claims.

1. **Element 1P:** A method of a network node, comprising:

To the extent that the preamble is limiting, 3GPP TS 38.300 discloses a method of a network node. Ex-1003, ¶¶97-98. 3GPP TS 38.300 teaches a method of a network node, or gNB, where the network node transmits and receives messages to enable network communications. Ex-1007, 38-40, 49-53. For example, as shown in Figure A.1-1 reproduced below, the gNB “sends a DRB set up Request message to the UE including DRB parameters,” and “Data is sent over the PDU session to gNB and then over the DRB to the UE. The data packets may optionally include a QoS marking (same as or corresponding to QFI) in the SDAP header.” *Id.*, 49. Thus, 3GPP TS 38.300 discloses the preamble of Claim 1 of the '754 Patent.



Ex-1007, Fig. A.1-1; *see also id.*, Figs. A.2-6.1.

2. **Element 1A:** transmitting a first RRC (Radio Resource Control) message with a DRB (Data Radio Bearer) configuration to a UE (User Equipment) for establishing a default DRB for a PDU (Protocol Data Unit) session, wherein the DRB configuration includes a QFI (QoS Flow Id) configuration used to indicate whether a QFI field is present or not in uplink for the default DRB and the QFI configuration is always set to a value indicating the QFI field is present in uplink for the default DRB;

The combination of 3GPP TS 38.300 and R2-1706831 renders obvious claim element 1A of the '754 Patent. Ex-1003, ¶¶99-107. To start, 3GPP TS 38.300 discloses “transmitting a first RRC (Radio Resource Control) message with a DRB (Data Radio Bearer) configuration to a UE (User Equipment) for establishing a default DRB for a PDU (Protocol Data Unit) session.” Ex-1003, ¶¶99-104. Specifically, 3GPP TS 38.300 discloses that “the NG-RAN may configure by RRC an uplink ‘QoS Flow to DRB mapping,’” where the gNB transmits an RRC message with a DRB configuration to the UE for establishing a default DRB for a PDU. Ex-1007, 39, 49-53; Figs. A.1-6.1. As shown in Figure A.1.1, the “gNB sends a DRB

set up Request message,” which is the RRC message shown in the figure, “to the UE including DRB parameters and the NAS message.” *Id.*, 49. The “UE establishes at least default DRB associated with the new PDU session. It creates the QFI to DRB mapping.” *Id.*, *see also* Ex-1003, ¶¶99-101.

To the extent that 3GPP TS 38.300 fails to teach “wherein the DRB configuration includes a QFI (QoS Flow Id) configuration used to indicate whether a QFI field is present or not in uplink for the default DRB and the QFI configuration is always set to a value indicating the QFI field is present in uplink for the default DRB,” the combination of 3GPP TS 38.300 with R2-1706381 nevertheless renders this limitation obvious to a POSITA. Ex-1003, ¶¶100-107.

R2-1706381 teaches “the detailed formats of SDAP data PDU and QFI presence.” Ex-1006, 1. The proposal explains that using PDUs with and without the QFI field brings complexity and confusion for SDAP layer processing:

For UL SDAP, if there is 1-to-1 mapping between QoS flow and DRB, it can be not marked with QFI in principle. Network can derive the QFI from DRB tunnel. But the issue of mapping reconfiguration caused by QoS flow addition and deletion arises, where PDUs without QFI field and PDUs with QFI field may be mixed in buffers and in the air. It brings extra complexity and confusion for SDAP layer processing.

Ex-1006, 1. The proposal then describes a solution to this problem such that the “network configures UE always carrying QFI from the beginning of DRB

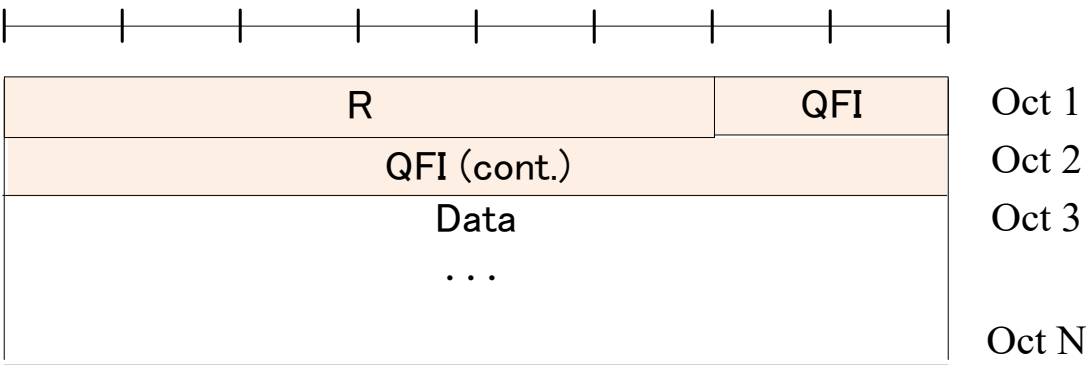
establishment, even in 1-to-1 mapping period. This can avoid re-organization of PDUs and other re-establishment operation triggered by mapping relationship reconfiguration.” *Id.*; *see also* Ex-1003, ¶¶100-107.

To effect this solution, the proposal specifically discloses that “the DRB configuration includes a QFI (QoS Flow Id) configuration used to indicate whether a QFI field is present or not in uplink for the default DRB,” as required by claim element 1A. Ex-1006, 1 (“It is proposed to support explicit UL QFI presence indicator in RRC signaling and allow carrying UL QFI even in 1-to-1 mapping.”); *see also* Ex-1003, ¶¶101-107. The QFI configuration is included in the DRB configuration in the RRC message, where the RRC message communicated from the node to the UE includes an “explicit UL QFI presence indicator in RRC signaling” that allows “carrying UL QFI even in 1-to-1 mapping.” Ex-1006, 1.

The reference also discloses that “the QFI configuration is always set to a value indicating the QFI field is present in uplink for the default DRB,” as required by element 1A. *Id.*, 1 (“UL PDU should always carry QFI (QoS Flow Indicator) information either by explicit header field or by implicit configuration with 1-to-1 mapping.”); *see also* Ex-1003, ¶¶103-107. The reference describes a situation where, “when PDU session establishes, there is only one QoS flow in a DRB. Later some other QoS flow(s) activation or arrival, mapping relationship between QoS flow(s) and that DRB can be changed from 1-to-1 to many-to-1 mapping. In this case, it is

an easy way that network configures UE *always* carrying QFI from the beginning of DRB establishment, even in 1-to-1 mapping period.” Ex-1006, 1 (emphasis added).

Figure 2 of R2-1706381, shown below, discloses the UL PDU with QFI:



Id., Figure 2.

In view of R2-1706381’s disclosure of a QFI configuration used to indicate whether a QFI field is present or not in uplink for the default DRB and that the QFI configuration is always set to a value indicating the QFI field is present, a POSITA would have found it obvious in to use this configuration in the system described by 3GPP TS 38.300. Ex-1003, ¶¶104-106. 3GPP TS 38.300 specifically contemplates the use of QFI information when it states that, “[t]he data packets may optionally include a QoS marking (same as or corresponding to QFI) in the SDAP header.” Ex-1007, 49. Accordingly, to reduce complexity and confusion, a POSITA would have been motivated to combine the proposal regarding default DRB handling in 3GPP TS 38.300 with the specific QFI configuration and setting described in R2-1706381.

Ex-1003, ¶¶104-106. A skilled artisan would have found it obvious to practice the proposed combination by adding the claimed QFI configuration to the expressly disclosed method for default DRB handling in 3GPP TS 38.300. Ex-1003, ¶104.

A POSITA would have understood that a major benefit of R2-1706381's system is that the claimed QFI configuration permits mapping of multiple QoS flows to DRBs with no packet loss and less complexity. Ex-1006 at 1-2; Ex-1003, ¶¶105-107. A POSITA would have understood that this same benefit could be realized in 3GPP TS 38.300's system. Ex-1003, ¶105. As a result, to the extent 3GPP TS 38.300 does not disclose the approach already, a POSITA would have been motivated to improve upon 3GPP TS 38.300's method by including a QFI configuration used to map QoS flows to DRBs with no packet loss and less complexity. Ex-1003, ¶¶105-107. This would minimize packet loss and simplify the process for mapping QoS flows to DRBs. *Id.* To reduce complexity and confusion, a POSITA would have been motivated to combine the proposal regarding default DRB handling in 3GPP TS 38.300 with the specific QFI configuration and setting described in R2-1706381. *Id.*

In addition to being motivated to pursue the proposed combination, a POSITA would have had a reasonable expectation of success in “meet[ing] the limitations of the claimed invention.” *Intelligent Bio-Systems, Inc.*, 821 F.3d at 1367. 3GPP TS 38.300 itself teaches the need for QoS flow mapping. Ex-1007, 49-52. Especially given R2-1706381's disclosures, a POSITA would have known that it was possible

for 3GPP TS 38.300 to employ a QFI configuration that was always set to a value indicating the QFI field is present in uplink for the default DRB. Ex-1003, ¶106.

Claim element 1A of the '754 Patent is therefore obvious in view of 3GPP TS 38.300 combined with R2-1706381.

3. **Element 1B:** establishing the default DRB with a presence of the QFI field in uplink; and

3GPP TS 38.300 discloses claim element 1B of the '754 Patent. *See* Ex-1003, ¶108. 3GPP TS 38.300 discloses “establishing the default DRB with a presence of the QFI field in uplink.” *Id.* The specification states that, in step 2 of the disclosed method of the network node, the “gNB sends a DRB set up Request message to the UE including DRB parameters and the NAS message received at Step 1.” Ex-1007, 49. Further, the “UE establishes at least default DRB associated with the new PDU session. It creates the QFI to DRB mapping.” *Id.* After this, the “UE sends UL packets over the DRB, optionally including a QoS marking. If configured in step 2, UL data packets include a QoS marking (same as or corresponding to QFI) in the SDAP header.” *Id.* This disclosure confirms that the default DRB established by the network node has a presence of the QFI field in uplink. Ex-1003, ¶108. As a result, 3GPP TS 38.300 teaches establishing the default DRB with a presence of the QFI field in uplink. Ex-1003, ¶108; *see also supra* § VII(C)(2).

4. **Element 1C:** receiving a SDAP (Service Data Adaptation Protocol) PDU with the QFI field via the default DRB from the UE.

3GPP TS 38.300 discloses claim element 1C of the '754 Patent. *See* Ex-1003, ¶109. 3GPP TS 38.300 discloses “receiving a SDAP (Service Data Adaptation Protocol) PDU with the QFI field via the default DRB from the UE.” *Id.* The specification states that the “UE establishes at least default DRB associated with the new PDU session. It creates the QFI to DRB mapping.” Ex-1007, 49. Then, the “UE sends UL packets over the DRB, optionally including a QoS marking. If configured in step 2, UL data packets include a QoS marking (same as or corresponding to QFI) in the SDAP header.” *Id.* As a result, the node will receive a SDAP PDU with the QFI field present via the default DRB from the UE. Ex-1003, ¶109. Thus, 3GPP TS 38.300 teaches receiving a SDAP PDU with the QFI field via the default DRB from the UE. Ex-1003, ¶109; *see also supra* § VII(C)(3).

5. **Claim 2:** The method of claim 1, wherein the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field.

The combination of 3GPP TS 38.300 and R2-1706831 renders obvious Claim 2 of the '754 Patent. Ex-1003, ¶¶110-115. To start, as discussed above, Claim 1 of the '754 Patent is obvious in view of 3GPP TS 38.300 combined with R2-1706381. Further, to the extent that 3GPP TS 38.300 fails to teach “wherein the network node

is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field,” as required by Claim 2, the combination of 3GPP TS 38.300 with R2-1706381 nevertheless renders this limitation obvious to a POSITA. Ex-1003, ¶¶110-115.

R2-1706381 discloses that “the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field,” as required by claim 2. Ex-1003, ¶¶110-115. The proposal teaches “the detailed formats of SDAP data PDU and QFI presence,” Ex-1006, 1, and the proposal explains that using PDUs with and without the QFI field brings complexity and confusion for SDAP layer processing. Ex-1006, 1. The proposal then describes a solution to this problem such that the “network configures UE *always* carrying QFI from the beginning of DRB establishment, even in 1-to-1 mapping period.” *Id.* (emphasis added); *see also* Ex-1003, ¶111. In addition, the proposal states that “UL PDU should *always* carry QFI (QoS Flow Indicator) information.” Ex-1006, 1 (emphasis added). Because R2-1706381 discloses that the network configures the UE to always carry QFI, a POSITA would understand from this disclosure that the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field, as required by Claim 2. Ex-1003, ¶¶111-112.

In view of R2-1706381's disclosure that the QFI configuration is *always* set to a value indicating the QFI field is present, a POSITA would have found it obvious to use this configuration in the system described by 3GPP TS 38.300 to arrive at the claimed invention of Claim 2. Ex-1003, ¶¶112-115. 3GPP TS 38.300 specifically contemplates the use of QFI information when it states that, "[t]he data packets may optionally include a QoS marking (same as or corresponding to QFI) in the SDAP header." Ex-1007, 49. Accordingly, to reduce complexity and confusion, a POSITA would have been motivated to combine the proposal regarding default DRB handling in 3GPP TS 38.300 with the specific QFI configuration and setting described in R2-1706381 to arrive at the claimed invention of Claim 2. Ex-1003, ¶¶112-115. A skilled artisan would have found it obvious to practice the proposed combination by adding the claimed QFI configuration where the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field to the expressly disclosed method for default DRB handling in 3GPP TS 38.300. Ex-1003, ¶112.

A POSITA would have understood that a major benefit of R2-1706381's system is that the claimed QFI configuration always permits mapping of multiple QoS flows to DRBs with no packet loss and less complexity because QFI is always present. Ex-1006, 1-2; Ex-1003, ¶113. A POSITA would have understood that this same benefit could be realized in 3GPP TS 38.300's system. Ex-1003, ¶113. As a

result, to the extent 3GPP TS 38.300 does not disclose the approach already, a POSITA would have been motivated to improve upon 3GPP TS 38.300's method by including a QFI configuration used to map QoS flows to DRBs with no packet loss and less complexity. Ex-1003, ¶¶113-115.

In addition to being motivated to pursue the proposed combination, a POSITA would have had a reasonable expectation of success in combining the proposals to arrive at the claimed invention of Claim 2. Ex-1003, ¶¶114-115. 3GPP TS 38.300 itself teaches the need for QoS flow mapping. Ex-1007, 49-52. Especially given R2-1706381's disclosures, a POSITA would have known that it was equally possible for 3GPP TS 38.300 to employ a QFI configuration such that the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field. Ex-1003, ¶114.

Claim 2 of the '754 Patent is therefore obvious in view of 3GPP TS 38.300 combined with R2-1706381.

6. **Claim 3:** The method of claim 1, wherein a header in the SDAP PDU includes at least the QFI field.

The combination of 3GPP TS 38.300 and R2-1706831 renders obvious Claim 3 of the '754 Patent. Ex-1003, ¶¶116-117. To start, as discussed above, Claim 1 of the '754 Patent is obvious in view of 3GPP TS 38.300 combined with R2-1706381. Further, 3GPP TS 38.300 discloses wherein a header in the SDAP PDU includes at

least the QFI field, as required by Claim 3. Ex-1003, ¶¶116-117. The specification states that the “UE establishes at least default DRB associated with the new PDU session. It creates the QFI to DRB mapping.” Ex-1007, 49. Then, the “UE sends UL packets over the DRB, optionally including a QoS marking. If configured in step 2, UL data packets include a QoS marking (same as or corresponding to QFI) in the SDAP header.” *Id.* As a result, 3GPP TS 38.300 discloses wherein a header in the SDAP PDU includes at least the QFI field, as required by Claim 3. Ex-1003, ¶¶116-117.

Claim 3 of the '754 Patent is therefore obvious in view of 3GPP TS 38.300 combined with R2-1706381.

7. **Claim 4:** The method of claim 1, wherein the network node transmits an IP (Internet Protocol) packet included in the SDAP PDU to a core network.

The combination of 3GPP TS 38.300 and R2-1706831 renders obvious Claim 4 of the '754 Patent. Ex-1003, ¶¶118-119. To start, as discussed above, Claim 1 of the '754 Patent is obvious in view of 3GPP TS 38.300 combined with R2-1706381. Further, 3GPP TS 38.300 discloses that the network node transmits an IP (Internet Protocol) packet included in the SDAP PDU to a core network, as required by Claim 4. Ex-1003, ¶¶118-119. 3GPP TS 38.300 discloses that the gNB transmits IP packets included in SDAP PDUs to a core network. Ex-1007, 21, Figure 6.6-1; Ex-1003, ¶¶118-119. The IP packets are included in the SDAP PDUs, as shown in Figure 6.6-

1. Ex-1007, 21. Further, 3GPP TS 38.300 discloses that the gNB transmits IP packets in SDAP PDUs to the UPF in the core network: “In the transport, IP layer point-to-point transmission is used to deliver the signaling PDUs.” Ex-1007, 11-12; *see also id.*, 38-40. As a result, 3GPP TS 38.300 discloses that the network node transmits an IP (Internet Protocol) packet included in the SDAP PDU to a core network, as required by Claim 4. Ex-1003, ¶¶118-119.

Claim 4 of the '754 Patent is therefore obvious in view of 3GPP TS 38.300 combined with R2-1706381.

8. **Claim 5:** The method of claim 1, wherein the network node is a base station (or gNB).

The combination of 3GPP TS 38.300 and R2-1706831 renders obvious Claim 5 of the '754 Patent. Ex-1003, ¶¶120-121. To start, as discussed above, Claim 1 of the '754 Patent is obvious in view of 3GPP TS 38.300 combined with R2-1706381. Further, 3GPP TS 38.300 discloses wherein the network node is a base station (or gNB), as required by Claim 5. Ex-1003, ¶¶120-121. 3GPP TS 38.300 discloses that the network node is a “gNB.” Ex-1007, 38-40, 49-53; Ex-1003, ¶¶120-121. This is shown, for example, in Figure A.1-1. Ex-1007, 49. As a result, 3GPP TS 38.300 discloses wherein the network node is a base station (or gNB), as required by Claim 5. Ex-1003, ¶¶120-121.

Claim 5 of the '754 Patent is therefore obvious in view of 3GPP TS 38.300 combined with R2-1706381.

9. **Element 6P:** A network node, comprising:

See Element 1[P], *supra* § VII(C)(1).

10. **Element 6A:** a control circuit; a processor installed in the control circuit; and a memory installed in the control circuit and operatively coupled to the processor; wherein the processor is configured to execute a program code stored in the memory to:

3GPP TS 38.300 discloses that the network node comprises a control circuit; a processor installed in the control circuit; and a memory installed in the control circuit and operatively coupled to the processor; wherein the processor is configured to execute a program code stored in the memory to perform certain steps. Ex-1003, ¶¶123-124. For example, 3GPP TS 38.300 discloses that the network node is a “gNB.” Ex-1007, 38-40, 49-53; Ex-1003, ¶¶123-124. This is shown, for example, in Figure A.1-1. Ex-1007, 49. A gNB is a base station or node that a POSITA would understand includes a control circuit, a processor installed in the control circuit, and a memory installed in the control circuit and operatively coupled to the processor, wherein the processor is configured to execute a program code stored in the memory to perform certain steps. Ex-1003, ¶¶123-124.

Thus, 3GPP TS 38.300 discloses claim element 6A of the '754 Patent.

11. **Element 6B:** transmit a first RRC (Radio Resource Control) message with a DRB (Data Radio Bearer) configuration to a UE (User Equipment) for establishing a default DRB for a PDU (Protocol Data Unit) session, wherein the DRB configuration includes a QFI (QoS Flow Id) configuration used to indicate whether a QFI field is present or not in uplink for the default DRB and the QFI configuration is always set to a value indicating the QFI field is present in uplink for the default DRB;

See Element 1A, supra § VII(C)(2).

12. **Element 6C:** establish the default DRB with a presence of the QFI field in uplink; and

See Element 1B, supra § VII(C)(3).

13. **Element 6D:** receive a SDAP (Service Data Adaptation Protocol) PDU with the QFI field via the default DRB from the UE.

See Element 1C, supra § VII(C)(4).

14. **Claim 7:** The network node of claim 6, wherein the network node is not allowed to transmit a second RRC message to the UE for reconfiguring the QFI configuration for the default DRB to no presence of the QFI field.

See Claim 2, supra § VII(C)(5).

15. **Claim 8:** The network node of claim 6, wherein a header in the SDAP PDU includes at least the QFI field.

See Claim 3, supra § VII(C)(6).

16. **Claim 9:** The network node of claim 6, wherein the network node transmits an IP (Internet Protocol) packet included in the SDAP PDU to a core network.

See Claim 4, supra § VII(C)(7).

17. **Claim 10:** The network node of claim 6, wherein the network node is a base station (or gNB).

See Claim 5, supra § VII(C)(8).

VIII. The Board Should Reach the Merits of This Petition

A. Institution is Proper Under § 325(a)

None of the *Becton, Dickinson* factors weigh in favor of discretionary denial under § 325(d). *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (P.T.A.B. Dec. 15, 2017) (precedential). R2-1704250, R2-1706381, and 3GPP TS 38.300 are new references that were not disclosed, cited, or considered during prosecution. This Petition thus does not present a situation in which “the same or substantially the same prior art or arguments previously were presented to the Office.” 35 U.S.C. § 325(d). The Board should, therefore, grant this Petition.

B. Institution is Proper Under § 314(a)

The factors in *General Plastic Industrial Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 (P.T.A.B. Sept. 6, 2017) favor institution. This is the first and only petition challenging any claims of the '754 Patent.

The factors set forth in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 6 (P.T.A.B. Mar. 20, 2020) (“*Fintiv*”) (precedential) also favor institution.

The **first factor** (stay) is neutral, because Petitioners have not yet moved for a stay. *See Hulu LLC v. SITO Mobile R&D IP, LLC et al.*, IPR2021-00298, Paper 11 at 10-11 (P.T.A.B. May 19, 2021).

The **second factor** (proximity) is neutral. As the Director’s Interim Guidance explains, “[t]he PTAB will weigh this factor against exercising discretion to deny institution under *Fintiv* if the median time-to trial is around the same time or after the projected statutory deadline for the PTAB’s final written decision.” Ex-1009, 9. The Interim Guidance further explains that “[w]here the parties rely on time-to-trial statistics, the PTAB will also consider additional supporting factors such as the number of cases before the judge in the parallel litigation” *Id.*

Jury selection is scheduled to begin on July 21, 2025. Ex-1010, 1. With this Petition filed in June 2024, a final written decision may be expected by December 2025, not long after the trial date. The Board has granted institution in cases where the final written decision issued a few months after the scheduled trial date when other factors favor institution. *See Hulu*, IPR2021-00298, Paper 11 at 11-18; *see also NetNut Ltd. v. Bright Data Ltd.*, IPR2021-01492, Paper 12 at 9-16 (P.T.A.B. Mar. 21, 2022) (instituting review with trial date six months before final written decision). Those same factors are present in this case. In the litigation, moreover, there are multiple defendants, and there will be separate trials. The cases are only consolidated for pretrial. *See* Ex-1011. It is reasonable to expect that all trials will not be complete

or through post-trial motion practice before the final written decision. In these circumstances, the Board treats this factor as neutral. *See CrowdStrike, Inc. v. Open Text Inc.*, IPR2023-00556, Paper 9 at 8 (P.T.A.B. Sept. 12, 2023).

The **third factor** (investment) weighs against denial. The district court litigation is in its early stages. Fact discovery is in its infancy and the parties have not engaged in expert discovery. Ex-1010, 3. The parties have not identified terms for claim construction. *Id.*, 5. Nor have there been any substantive orders in the case. The district court's investment is, therefore, minimal. *See PEAG LLC v. Varta Microbattery GmbH*, IPR2020-01214, Paper 8 at 17 (P.T.A.B. Jan. 6, 2021).

Petitioners diligently filed this Petition after they received Patent Owner's infringement contentions that confirmed Petitioners' technology is at the center of the district court litigation. The Board has recognized that "it is often reasonable for a petitioner to wait to file its petition until it learns which claims are being asserted against it in the parallel proceeding." *Fintiv*, IPR2020-00019, Paper 11 at 11. The Board has further found a petitioner acted diligently when filing its petition approximately four months after receiving the infringement contentions, which is the same timeframe here. *See Corning Optical Communications LLC v. Dali Wireless, Inc.*, IPR2021-00762, Paper 8 at 9-10 (P.T.A.B. Oct. 31, 2021); *see also Hulu*, IPR2021-00298, Paper 11 at 13-14; *Ericsson Inc. v. Koninklijke KPN N.V.*, IPR2022-00079, Paper 9, 10-11 (P.T.A.B. May 25, 2022) (finding petitioner "very

diligent” in filing two months after receiving infringement contentions); *Ericsson Inc. v. Koninklijke KPN N.V.*, IPR2022-00069, Paper 9, 11-12 (P.T.A.B. May 25, 2022) (same).

Petitioners’ diligence in filing and the district court’s minimal investment tips this factor strongly in favor of institution. *PEAG*, IPR2020-01214, Paper 8 at 17-18.

The **fourth factor** (overlap) also weighs against denial. Petitioners hereby stipulate that, if trial is instituted, Petitioners will not pursue this IPR’s Grounds in the district court litigation. This stipulation eliminates any risk of overlapping effort and results. The Board has confirmed that such a stipulation “mitigates any concerns of duplicative efforts between the district court and the Board, as well as concerns of potentially conflicting decisions.” See *VMWare, Inc. v. Intellectual Ventures I LLC*, IPR2020-00470, Paper 13 at 20 (P.T.A.B. Aug. 18, 2020) (“Thus, we find that this factor weighs in favor of not exercising discretion to deny institution under 35 U.S.C. § 314(a).”). “Instituting trial here serves overall system efficiency and integrity goals by not duplicating efforts and by resolving materially different patentability issues.” *Apple, Inc. v. SEVEN Networks, LLC*, IPR2020-00156, Paper 10 at 19 (P.T.A.B. June 15, 2020); see also *Sand Revolution II, LLC v. Continental Intermodal Group-Trucking LLC*, IPR2019-01393, Paper 24 at 12 (P.T.A.B. June 16, 2020). This factor, therefore, weighs against discretionary denial. *Corning Optical*, IPR2021-00762, Paper 8, 12.

The **fifth factor** (parties) favors institution. Petitioners are either parties to the district court litigations or have sought to intervene. And if Petitioners Ericsson and Nokia's motions to intervene are granted, a "holistic view" of the factors likewise favors institution. *See Verizon Business Network Services, Inc. v. Huawei Techs. Co.*, IPR2020-01141, Paper 12, 17 (P.T.A.B Jan. 14, 2021); *Samsung Elecs. Co Ltd., v Dynamics Inc.*, IPR2020-00505, Paper 11, 15 (P.T.A.B. Aug. 12, 2020).

Even if the Board determines that the aforementioned factors favor denial, the Board should not discretionarily deny institution, because this Petition presents compelling merits (the **sixth factor**). *See CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 at 4-5 (P.T.A.B. Feb. 27, 2023) (precedential). This Petition presents compelling merits that lead to the conclusion that at least one claim is unpatentable, and the Board should grant institution. *See CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 24, 75 (P.T.A.B .Mar. 17, 2023).

Due to Petitioners' diligence, it would be premature at the time of this Petition to argue regarding the timing of respective milestones in the proceeding versus the litigation. Thus, if Patent Owner raises § 314(a) arguments in a Preliminary Response, Petitioners respectfully request the opportunity to reply before institution, to address, e.g., the expected schedules of the co-pending cases.

IX. Mandatory Notices

A. Real Parties-in-Interest

Pursuant to 37 C.F.R. § 42.8(b)(1), AT&T Enterprises, LLC,³ AT&T Mobility LLC, AT&T Mobility II LLC, AT&T Services Inc., Cellco Partnership d/b/a Verizon Wireless, Verizon Corporate Services Group, Inc., T-Mobile USA, Inc., Ericsson, Inc., Telefonaktiebolaget LM Ericsson, and Nokia of America Corporation⁴ are each a real-party-in-interest. No other parties have directed,

³ AT&T Corp. is a named defendant in the below identified related cases. AT&T Corp. has undergone a corporate transaction and is now merged and converted into AT&T Enterprises, LLC. Out of an abundance of caution, Petitioners are identifying AT&T Enterprises, LLC as a real party in interest in this IPR.

⁴ Out of an abundance of caution, Petitioners identify all current defendants in the below identified cases as potential real parties in interest only for the purpose of this proceeding and only to the extent that Patent Owner contends that these separate legal entities should be named real parties in interest in this IPR. Petitioners do so to avoid the potential expenditure of resources to resolve such a challenge. Petitioners also acknowledge that each petitioner has a number of affiliates. No unnamed entity is funding, controlling, or otherwise has an opportunity to control or direct this

funded, or controlled the filing of this IPR, and this IPR was not filed at the behest of any other party.

B. Related Matters

The following are a list of related matters: *ASUS Technology Licensing Inc. et al. v. AT&T Inc. et al.*, Case No. 2-23-cv-00486-JRG-RSP (E.D. Tex. 2023) (Lead Case); *ASUS Technology Licensing Inc. et al. v. T-Mobile USA, Inc.*, Case No. 2-23-cv-00487-JRG-RSP (E.D. Tex. 2023); *ASUS Technology Licensing Inc. et al. v. Verizon Communications Inc.*, Case No. 2-23-cv-00488-JRG-RSP (E.D. Tex. 2023); *Innovative Sonic Limited et al. v. AT&T Inc., et al.*, Case No. 2-23-cv-00489-JRG-RSP (E.D. Tex. 2023); *Innovative Sonic Limited et al. v. T-Mobile USA, Inc.*, Case No. 2-23-cv-00490-JRG-RSP (E.D. Tex. 2023); *Innovative Sonic Limited et al. v. Verizon Communications, Inc. et al.*, Case No. 2-23-cv-00491-JRG-RSP (E.D. Tex. 2023). To the best of Petitioners' knowledge, there are no other judicial or administrative matters that would after, or be affected by, a decision in this proceeding.

Petition or Petitioner's participation in any resulting IPR. Petitioners are also not aware of any affiliate that would be barred from filing this Petition under 35 U.S.C. § 315(e).

C. Lead and Back-Up Counsel

Petitioners identify lead and backup counsel below. A Power of Attorney for each Petitioner entity is filed currently herewith under 37 C.F.R. § 42.10(b). Patent Owner consents to electronic service by email at Celerity_IPRs@mckoolsmith.com.

Lead Counsel	Backup Counsel
Scott W. Hejny Reg. No. 45,882 shejny@mckoolsmith.com MCKOOL SMITH, P.C. 300 Crescent Court, Suite 1200 Dallas, TX 75201 Telephone: (214) 978-4000 Facsimile: (214) 978-4044	Nicholas Mathews Reg. No. 66,067 nmathews@mckoolsmith.com McKool Smith, P.C. 300 Crescent Court, Suite 1500 Dallas, Texas 75201 Telephone: 214-978-4000 Fax: 214-978-4044 Christian J. Hurt Reg. No. 63,659 churt@mckoolsmith.com McKool Smith, P.C. 300 Crescent Court, Suite 1500 Dallas, Texas 75201 Telephone: 214-978-4000 Fax: 214-978-4044 Stuart McCommas Reg. No. 71,834 smccommas@mckoolsmith.com MCKOOL SMITH, P.C. 1999 K St. NW, Suite 600 Washington, DC 20006 Telephone: (202) 370-8300 Facsimile: (202) 370-8344

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

A copy of this entire Petition, including all Exhibits and Powers of Attorney, is being served via email and FEDERAL EXPRESS, costs prepaid, to the address of the attorney or agent of record at the USPTO:

Blue Capital Law Firm, P.C.
650 Town Center Drive, Suite 1530
Costa Mesa, CA 92626

Petitioners are also serving Patent Owner's litigation counsel of record, as reflected below on the Certificate of Service. Petitioners consent to electronic service at the addresses provided above for lead and back-up counsel and at the following email address: Celerity_IPRs@mckoolsmith.com.

X. Fees

The Office is authorized to charge any fees due during this proceeding to Deposit Account No. DA-505723.

XI. Conclusion

For the grounds specified above, the Board should institute IPR of the Challenged Claims.

Respectfully submitted,

/Scott W. Hejny/

Scott W. Hejny

Reg. No. 45,882

shejny@mckoolsmith.com

MCKOOL SMITH, P.C.

300 Crescent Court, Suite 1200
Dallas, TX 75201
Telephone: (214) 978-4000
Facsimile: (214) 978-4044

Nicholas Mathews
Reg. No. 66,067
nmathews@mckoolsmith.com
McKool Smith, P.C.
300 Crescent Court, Suite 1500
Dallas, Texas 75201
Telephone: 214-978-4000
Fax: 214-978-4044

Christian J. Hurt
Reg. No. 63,659
churt@mckoolsmith.com
McKool Smith, P.C.
300 Crescent Court, Suite 1500
Dallas, Texas 75201
Telephone: 214-978-4000
Fax: 214-978-4044

Stuart McCommas
Reg. No. 71,834
smccommas@mckoolsmith.com
MCKOOL SMITH, P.C.
1999 K St. NW, Suite 600
Washington, DC 20006
Telephone: (202) 370-8300
Facsimile: (202) 370-8344

Attorneys for Petitioners

Dated: June 4, 2024

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. §42.24(a), Petitioners hereby certify that portions of the above-captioned PETITION FOR INTER PARTES REVIEW, in accordance with and reliance on the word count provided by the word processing system used to prepare this Petition, that the number of words in this paper is 12,567. Pursuant to 37 C.F.R. §42.24(a), this word count is in compliance and excludes the table of contents, table of authorities, mandatory notices under §42.8, certificate of service, certificate of word count, appendix of exhibits, and any claim listing. This word count was prepared using Microsoft Word.

Respectfully submitted,

McKool Smith P.C.

/Scott W. Hejny/

Scott W. Hejny

Reg. No. 45,882

shejny@mckoolsmith.com

MCKOOL SMITH, P.C.

300 Crescent Court, Suite 1200

Dallas, TX 75201

Telephone: (214) 978-4000

Facsimile: (214) 978-4044

Nicholas Mathews
Reg. No. 66,067
nmathews@mckoolsmith.com
McKool Smith, P.C.
300 Crescent Court, Suite 1500
Dallas, Texas 75201
Telephone: 214-978-4000
Fax: 214-978-4044

Christian J. Hurt
Reg. No. 63,659
churt@mckoolsmith.com
McKool Smith, P.C.
300 Crescent Court, Suite 1500
Dallas, Texas 75201
Telephone: 214-978-4000
Fax: 214-978-4044

Stuart McCommas
Reg. No. 71,834
smccommas@mckoolsmith.com
MCKOOL SMITH, P.C.
1999 K St. NW, Suite 600
Washington, DC 20006
Telephone: (202) 370-8300
Facsimile: (202) 370-8344

Attorneys for Petitioners

Dated: June 4, 2024

CERTIFICATE OF SERVICE

The undersigned hereby certifies that the above-captioned **PETITION FOR INTER PARTES REVIEW** is being served on counsel for patent owner via electronic mail and FEDERAL EXPRESS, costs prepaid, to the address of the attorney or agent of record at the USPTO: on June 4, 2024, in its entirety on the following counsel of record for Patent Owner:

Blue Capital Law Firm, P.C.
650 Town Center Drive, Suite 1530
Costa Mesa CA 92626
UNITED STATES

Andrew Chen
Sang Dang
Blue Capital Law Firm, P.C.
650 Town Center Drive, Suite 1530
Costa Mesa, CA 92626

Andrew Chen
achen@prosperalaw.com
Prospera Law, LLP
1901 Avenue of the Stars, Suite 480
Los Angeles, California 90067

Sang Dang
sdang@fortislaw.com
Fortis, LLP
650 Town Center Drive Suite 1530,
Costa Mesa, CA 92626

Jason Sheasby
California State Bar No. 205455
(pro hac vice to be filed)
jsheasby@irell.com
Hong (Annita) Zhong, PhD
California State Bar No. 266924
(pro hac vice to be filed)
hzhong@irell.com
Christopher Abernethy
California State Bar No. 275986
(pro hac vice to be filed)
cabernethy@irell.com
Tony Rowles
California State Bar No. 301209
(pro hac vice to be filed)
trowles@irell.com
IRELL & MANELLA LLP
1800 Avenue of the Stars, Suite 900
Los Angeles, CA 90067-4276
Tel: (310) 277-1010

Respectfully submitted,

McKool Smith P.C.

/Scott W. Hejny/
Scott W. Hejny
Reg. No. 45,882
shejny@mckoolsmith.com
MCKOOL SMITH, P.C.
300 Crescent Court, Suite 1200
Dallas, TX 75201
Telephone: (214) 978-4000
Facsimile: (214) 978-4044

Nicholas Mathews
Reg. No. 66,067
nmathews@mckoolsmith.com
McKool Smith, P.C.
300 Crescent Court, Suite 1500
Dallas, Texas 75201
Telephone: 214-978-4000
Fax: 214-978-4044

Christian J. Hurt
Reg. No. 63,659
churt@mckoolsmith.com
McKool Smith, P.C.
300 Crescent Court, Suite 1500
Dallas, Texas 75201
Telephone: 214-978-4000
Fax: 214-978-4044

Stuart McCommas
Reg. No. 71,834
smccommas@mckoolsmith.com
MCKOOL SMITH, P.C.
1999 K St. NW, Suite 600
Washington, DC 20006
Telephone: (202) 370-8300
Facsimile: (202) 370-8344

Attorneys for Petitioners

Dated: June 4, 2024