

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner

v.

ASUS TECHNOLOGY LICENSING INC.,
Patent Owner.

Patent No. 10,187,878 to Lin et al.

IPR Case No.: IPR2024-00614

**PETITION FOR *INTER PARTES* REVIEW OF
CLAIMS 1-28 OF U.S. PATENT 10,187,878 UNDER
35 U.S.C. §§ 311-319 AND 37 C.F.R. §§ 42.100 ET SEQ.**

DECLARATION OF CRAIG BISHOP

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I. INTRODUCTION

I, Craig Bishop, declare the following:

1. I have been retained as an independent expert witness on behalf of Samsung Electronics Co., Ltd. (“Petitioner”), related to the *Inter Partes* Review (“IPR”) of U.S. Patent No. 10,187,878 (“the ’878 patent”).

2. I am being compensated for my work in this matter at my normal consulting hourly rate. I am also being reimbursed for reasonable and customary expenses associated with my work and testimony in this investigation. My compensation is not contingent on the results of my study, the substance of my opinions, or the outcome of this matter.

3. I have no financial interest in the ’878 patent and have had no contact with the named inventors of said patent. Neither have I reviewed the ’878 patent in detail, nor do I have any personal interest in the outcome of this IPR.

4. In forming the opinions expressed in this declaration, I have considered the reference materials cited herein and my own academic background and professional experiences as outlined below.

5. Whilst I have attempted to organize the information presented in this declaration into helpful sections and/or divisions, my opinions are supported by the information in the declaration in its entirety.

II. QUALIFICATIONS

6. My complete qualifications and professional experience are described in my *curriculum vitae*, a copy of which is attached as **Appendix 1**.¹ The following is a summary of my relevant qualifications and professional experience.

7. I earned my Bachelor of Electronic Engineering degree with Honors from Polytechnic of Central London in 1989. In 2005, I earned my MSC in Computer Science with Distinction from the University of Kent.

8. After graduating with my first degree, I worked as an operations engineer at the British Broadcasting Corporation (BBC) for 4 years, then as a civil servant at the UK Radiocommunications Agency until 1996, during which time I became involved in telecommunications standardization in the European Telecommunication Standards Institute (“ETSI”), working in particular in Technical Committee Radio Equipment and Systems (TC RES2) concerned with the standardization of Private Mobile Radio (PMR). From 1994 through 1996, I acted as Rapporteur for voice and data related PMR standards ETS 300 113, ETS 300 219 and ETS 300 390. I participated as the only TC RES2 delegate on behalf of the UK Radiocommunications Agency, generating proposals in support of UK administration and business requirements, downloading and reviewing other meeting input documents, and proposing changes as necessary to ensure input

¹ I understand the appendices referenced herein are being filed as Exhibit 1025 in IPR2024-00614.

documents and the resulting specifications were in line with said requirements.

9. In 1996, I joined Samsung Electronic Research Institute as a Senior Standards Engineer where I worked for 16 years, eventually becoming Director of Standards and Industry Affairs in 2011. My work at Samsung mainly focused on the standardization of Global System for Mobile Communications (GSM)/ General Packet Radio Service (GPRS), Universal Mobile Telecommunications System (UMTS), the IP Multimedia subsystem (IMS), and Long-Term Evolution (LTE)/ Evolved Packet System (EPS) systems. Initially, I participated in ETSI Special Mobile Group (SMG) committees SMG1, SMG2, SMG4, SMG5, and SMG9, and relevant UMTS related sub-committees working on the air interface radio access network protocols, service, and terminal aspects of UMTS and GSM/GPRS until 1999. In particular, I was a participant in the ETSI SMG2 meetings leading up to selection of Wideband Code Division Multiple Access (WCDMA) as the radio access technology for the Frequency Division Duplex (FDD) mode of UMTS.

10. Beginning in 1998, I worked as a Principal Standards Engineer on the 3rd Generation Partnership Project (3GPP) on UMTS. I have been involved with 3GPP since its inception. I attended the inaugural 3GPP Technical Specification Group (TSG) meetings held in December 1998, and I began attending Working Group (WG) meetings in 1999. Specifically, I was a regular participant in Radio Access Network (RAN) WG1, Services & System Aspects (SA) WG1, Terminals

(T) WG2, but I also attended TSG RAN and T plenary meetings and sometimes other Working Groups and covering similar technical aspects as in my previous work in ETSI. As an example, RAN WG1 was, and is, a Working Group responsible for the specification of the physical layer of the radio Interfaces for UE including physical layer procedures. As part of this work, I would prepare meeting contributions in support of Samsung's research and development activities. Also, by way of preparation for each meeting, I would download all contributions and review those of interest to Samsung, and where necessary, prepare additional input to the meeting based on said review.

11. Beginning in 2000, I acted as project manager and then as system engineering manager at Samsung, providing technical requirements for the team working on Samsung's UMTS modem development. This involved scrutiny of ongoing standardization work, particularly in RAN WG1, RAN WG2, and TSG Core Network (CN) WG1, from which I would download, and assess the impact of, contributions on Samsung's development projects, ensuring that Samsung's development team was kept informed about the latest developments as layers 2 and 3 of the UMTS standard were stabilized.

12. During this period, in addition to authoring and presenting technical contributions for the 3GPP standard, and producing technical requirements for the radio modem, I acted as Rapporteur for 3GPP Technical Reports covering User

Equipment (“UE”) capability requirements (3GPP TR 21.904) from 1999–2000, and the Evolution of the 3GPP System (3GPP TR 21.902) in 2003 (the first Study Item to consider the 3GPP system beyond UMTS towards LTE/EPS).

13. In 2005, I became Head of Advanced Technologies, Standards and Regulation (ATSR) at Samsung. In addition to my managerial duties which included responsibility for standards, research, and regulatory engineers including three standards engineers who were regularly attending 3GPP RAN WG2 and Core Network and Terminals (CT) WG1 Working Groups, I personally continued to work on 3GPP standardization issues. From 2005 until 2008, I regularly attended and participated in SA WG2 meetings, mainly focusing on IP Multimedia Subsystem (IMS) including voice over IMS but also looking at wider Evolved Packet System (EPS) related issues. From 2008 until 2011, I regularly attended and participated in SA WG1 meetings. I also attended SA plenary meetings from 2008 until I left Samsung in 2013. As well as generating contributions in support of Samsung’s research and development as preparation for each meeting, I would download and review documents from other 3GPP members, identifying those of interest to Samsung and, where necessary, preparing additional contributions on behalf of Samsung. The work required a sound working knowledge of the broader 3GPP system to ensure effective management of the ATSR team, effective participation in meeting discussions, expert assessment of third-party standards contributions, and

provision of implementation guidance to Samsung developers.

14. From 2005 until I stopped attending SA WG1 meetings in 2011, I authored and presented over 100 contributions to SA WG2 and SA WG1 meetings at 3GPP and appeared as an author/co-author on 18 patent applications related to User Equipment operation in the IMS and the 3GPP Core Network.

15. In 2011, I became Director of Standards and Industry Affairs at Samsung, and in November of that year I was elected to the Board of ETSI on which I served for a term of 3 years until November 2014. In this position I gained further perspective on the organisation, management, and activities of ETSI and its Technical Committees and Partnership Projects including 3GPP.

16. Since leaving Samsung in January 2013, I have formed my own consulting company which is a member of ETSI, and as part of various projects undertaken, I have continued to regularly access the ETSI and 3GPP document servers, and to keep abreast of ETSI and 3GPP document handling and publication practices.

17. Through my extensive work in ETSI and on 3GPP standardization issues over the years, I have become very familiar with ETSI and 3GPP practices for when and how the technical standards (including revisions thereto) and other standards-related contributions are made publicly available, including in the 1999-2011 timeframe when I was attending or monitoring various 3GPP Working Groups

including RAN WG1 and RAN WG2.

18. For purposes of my analysis in this declaration, I have been informed that a person of ordinary skill in the art (“POSITA”) in the field of the ’878 patent at the time of the alleged invention of the ’878 patent would have had a bachelor’s degree in electrical engineering, familiarity with the relevant 3GPP standards as of this time, and two years of experience working in a field involving wireless communications. This definition is approximate, and more education may substitute for industry experience or vice versa.

III. PUBLIC AVAILABILITY OF 3GPP STANDARDS PROPOSALS AND OTHER DOCUMENTS

19. Based on my years of experience working in various capacities in 3GPP and on 3GPP standards issues, I am familiar with the regular business practices of the 3rd Generation Partnership Project (3GPP) relating to technical documents including specifications, draft standards and proposals, and standards-related technical contributions, as well as the business practices through which 3GPP makes these documents public.

A. Prominence and Purpose of 3GPP

20. 3GPP was inaugurated in December 1998 to produce Technical Specifications and Technical Reports for the Universal Mobile Telecommunications System (UMTS), a 3G Mobile System based on evolved GSM core networks and a

new radio access network known as UTRA (UMTS Terrestrial Radio Access). **Appendix 2** at 2, 3 (“[3GPP] Partnership Project Description”); **Appendix 3** at 1; **Appendix 4** at 5. At that time, various standards organisations agreed to cooperate to produce a “complete set of globally applicable Technical Specifications” that would then be transposed into standards by the relevant standardization bodies (also known as Organizational Partners). **Appendix 2** at 3, 5 (“[3GPP] Partnership Project Description”). 3GPP “attracted a very strong commitment from organisations and companies around the world, reflecting the truly global nature of the project”. **Appendix 4** at 7.

21. 3GPP is a global initiative partnership made up of Organizational Partners, Market Representation Partners, and Individual Members. **Appendix 5** at 8, 9; **Appendix 2** at 10. Today, 3GPP unites seven telecommunications standard development organisations (“Organizational Partners”) from around the world: the Association of Radio Industries and Businesses (ARIB) and the Telecommunication Technology Committee (TTC) from Japan, the China Communications Standards Association (CCSA) from China, the Telecommunications Standards Development Society, India (TSDSI) from India, the Telecommunications Technology Association (TTA) from Korea, the European Telecommunications Standards Institute (ETSI), and the Alliance for Telecommunications Industry Solutions (ATIS) from the United States. These Organizational Partners are regional standards

organisations that have the authority to define, publish, and set standards for their respective regions. **Appendix 2** at 12. 3GPP also includes “Market Representation Partners” that represent various industry perspectives and offer market advice. **Appendix 5** at 9 (3GPP Working Procedures, “Market Representation Partnership”); **Appendix 2** at 14; **Appendix 4** at 5. Additionally, 3GPP includes individual member companies (“Individual Members”) that participate in 3GPP through their membership in a 3GPP Organizational Partner. **Appendix 5** at 9 (3GPP Working Procedures, “Individual Membership”); **Appendix 6** at 5 (textbook including a chart showing 3GPP structure at the time of publication); **Appendix 8** at 9, 10. As an example of how prominent 3GPP was and remains in the industry, there were 284 participating Individual Members in 2007 and 450 by 2015. **Appendix 7** at 7 (3GPP Project Coordination Group document showing 3GPP membership numbers to 2015). There were 781 individual members as of February 2024. **Appendix 9.**

22. As noted in paragraph 20, a primary goal of 3GPP is to provide an environment to produce technical specifications and technical reports that define and standardize technologies covering cellular telecommunications networks, including User Equipment or Mobile Device (UE) technologies, Radio Access Network (RAN) technologies, Core Network (CN) technologies, and service and system capabilities such as work on codecs, security and quality of service. The

specifications also provide hooks for interworking with non-3GPP networks including but not limited to Wi-Fi networks.

23. Given the prominence of 3GPP in the wireless communication industry, beginning in 1999 and continuing through today, interested POSITAs were tracking the developments of the latest 3GPP specifications and reports to ensure timely development of products and services by their companies that were consistent with the standards being developed. In other words, it is my opinion that a POSITA would have to be familiar with 3GPP and with the specification-related documents produced as part of the 3GPP process in order to properly perform his or her job. Without access to and knowledge of the 3GPP documentation, including for example the substantive contents of 3GPP technical specifications, an engineer could not develop products that were interoperable with the worldwide 3G, 4G (and later 5G) standards. Because 3GPP documents were an important aspect of a POSITA's professional experience, textbooks and articles about cellular communications commonly directed readers to the 3GPP website for information regarding standards development. **Appendix 4** at 9 (directing readers to the 3GPP website at the conclusion of the chapter on the success of 3GPP in the standards development process). As a POSITA myself, I would regularly visit the 3GPP website for the latest developments in 3G standards setting and refer colleagues involved in the development of 3G devices to the 3GPP website as a valuable reference.

24. My personal experience at Samsung confirms 3GPP's prominence in the wireless industry. For example, engineers and managers at Samsung who were responsible for implementing 3GPP compliant modem software (and who were not attending 3GPP meetings or involved with development of the 3GPP standard in any direct way) would often enquire as to which version of a given 3GPP specification they should be developing. Further, between 2000 and 2004, part of my role at Samsung involved advising software engineers implementing the 3GPP standard on the correct interpretation of the specifications and ensuring that they were made aware of any changes and proposals made during the 3GPP standards development process that would impact their work. I also for a time maintained an internal company database that tracked 3GPP approved changes, to help the software engineers at Samsung implementing the 3GPP standard more readily stay informed as to changes that would impact their work. The database also included links to relevant 3GPP documents so that engineers could access the documents directly. In short, the technical output of 3GPP was well known at Samsung, even for engineers who were not directly involved with elaborating the 3GPP system or contributing to the 3GPP standard process.

B. 3GPP's Policy of Making Documents Public

25. 3GPP's policy was to make 3GPP documents available to the public, including to interested POSITAs. The free availability of 3GPP documents to any

interested member of the public was widely recognized in the industry. As an example of the prominence of 3GPP and its place in the wireless standards industry, I note that textbooks directed readers to the 3GPP website for information about relevant standards. For example, **Appendix 6** at 6, 9 (“The latest specifications can be obtained from 3GPP [9]”, “[9] <http://www.3gpp.org>”); **Appendix 8** at 10 (“3GPP TSs and TRs are publicly available at the 3GPP web site at either of the following URIs: <http://www.3gpp.org/specs/specs.htm> <http://www.3gpp.org/ftp/Specs/archive/>”). Because the purpose of 3GPP was worldwide adoption of a common standard, no restrictions on distribution or discussion were placed on 3GPP documents. **Appendix 10** at 9 (“No password is needed to access any information on the 3GPP Web site, all information is openly published”).

C. 3GPP Structure and Standards Development Process

26. Within 3GPP, responsibility for producing specifications was delegated to the Technical Specification Groups (TSGs). **Appendix 5** at 13 (3GPP Working Procedures, “TSG tasks”). At its inception, 3GPP was divided into four Technical Specification Groups (TSGs), each covering a particular category of technology. **Appendix 2** at 31 (3GPP Partnership Project Description); **Appendix 6** at 5, 6 (textbook listing four TSGs and noting the subsequent addition of a fifth TSG); **Appendix 4** at 6, 11, 12. Each TSG is further divided into a number of Working

Groups (WGs). **Appendix 8** at 8, 9; **Appendix 4** at 6; see also **Appendix 5** at 13 (3GPP Working Procedures). Two of the TSGs from 1999 are still in existence in 2024: TSG Radio Access Networks (RAN) and TSG Service & Systems Aspects (SA). The activities of two other TSGs, TSG Core Networks (CN) and TSG Terminals (T), were amalgamated under Core Network and Terminals (CT) following the closure of TSG T in 2005, with responsibility for terminal test specifications being moved to a RAN working group (RAN WG5). The fifth TSG, GSM EDGE Radio Access Networks (GERAN), was responsible for evolution of the GSM radio technology from 2000 until that TSG closed in 2016 and its work was transferred to a RAN working group (RAN WG6) which was itself closed in July 2020.

27. The TSGs held quarterly plenary meetings where members' contributions, draft specifications/reports, and other documents that had been agreed upon by the Working Groups were presented for discussion and approval. **Appendix 5** at 23 (3GPP Working Procedures, "Deliverable types," stating that Technical Specifications and Technical Reports are "drawn up by the TSGs" and are approved by TSGs); **Appendix 8** at 9 ("3GPP Deliverables"). Once a Technical Specification was or Change Requests creating a new version of a Technical Specification were, formally approved by TSG plenary, the latest version of said Technical Specification would be created by the Mobile Competence Centre (MCC) and uploaded to the file

server. **Appendix 10** at 6; **Appendix 11** at 1. In that way, the conclusion of 3GPP TSG plenary meetings serves as notice that new versions of specifications incorporating Change Requests approved by the TSG meeting will shortly be made available on the public 3GPP server.

28. As part of the standards development process, delegates could submit contributions on behalf of the Individual Members. Members had an incentive to stay updated on 3GPP developments because those members usually wanted to contribute to the standard and make suggestions as to what technology and/or features should (or should not) be included. Delegates also attended 3GPP meetings to keep their employers abreast of developments related to the standards that would ultimately apply to those members and the products those members (*e.g.*, companies) produced. 3GPP members around the world and the interested POSITAs employed by them would have been motivated to stay up to date regarding 3GPP technology evolution to ensure their research and development programmes remained relevant to the systems being specified and that their products were compliant with the published 3GPP specifications. In light of this need to follow the standards development process, delegates often distributed 3GPP-related documents far beyond the attendees at 3GPP meetings. This was certainly my experience at Samsung.

D. 3GPP Documents

1. Technical Specifications and Reports

29. The technical specifications and reports developed by 3GPP were, and still are, driven by the technical contributions of 3GPP members. As part of that development process, various types of documents were produced. The 3GPP process involved the consideration of temporary documents (“TDocs,” also referred to as “contributions,”), many of which constituted technical proposals for how the system should be implemented and were adopted as the basis for parts of the technical specifications.

30. As I noted in paragraphs 22 and 23, a primary purpose of 3GPP is to prepare, approve, and maintain globally applicable Technical Specifications and Technical Reports. **Appendix 5** at 7 (3GPP Working Procedures, “Purpose”). A “Technical Specification,” as defined by 3GPP, is “[a] 3GPP output document containing normative provisions approved by a Technical Specification Group”. **Appendix 5** at 28. 3GPP would (and still does) periodically freeze a complete set of standards (referred to as a “Release”), and each set would include many new specifications. **Appendix 10** at 7. 3GPP would also make publicly available draft specifications that would usually be included as part of the next Release once approved.

31. It was widely known that Technical Specifications (and Technical Reports) were publicly available on 3GPP’s website. It was also well known that the

latest version of a given specification that was under change control would be made available following each TSG Plenary meeting responsible for that specification, and that TSG Plenary meetings usually occur four times per year. **Appendix 10** at 7; **Appendix 11** at 1.

32. Latest and previous versions of technical specifications could be easily accessed from the 3GPP website. The specifications page provided direct links to the specifications area in the 3GPP website's file repository. **Appendix 11** at 1. In the 2007 to 2017 timeframe, the specifications page listed the specifications by the date of the approval of the latest versions reflecting the TSG plenary meeting date. *E.g.*, **Appendix 11** at 1.

33. Additionally, the 3GPP specifications followed a clear numbering scheme to help the public, including interested POSITAs, identify the subject matter of each specification. **Appendix 12** at 1. As described on the 3GPP Numbering Scheme webpage, all 3G and GSM specifications had a specification number of 4 or 5 digits, where the first two digits defined the series. **Appendix 12** at 1. The Numbering Scheme webpage included a table showing the subject matter corresponding to each series. **Appendix 12** at 1. For example, the "36 series" focused on Evolved UTRA (LTE) aspects. **Appendix 12** at 1. I note that one of the TDocs referenced in this Declaration proposed a change to a 36 series specification focussing on the Medium Access Control protocol of the release 12 3GPP standard.

An interested POSITA could narrow down the relevant specifications based on whether the specification applied to only evolved UTRA, to 3G, to GSM, or to GSM, 3G and evolved UTRA. (GSM only specifications were transferred from ETSI to 3GPP in July 2000.) For a specification in the 21–35 series, this could be determined based on the third digit of the specification number, where a “0” would indicate that the specification applied to both systems. **Appendix 12** at 1. Specifications outside the 21–37 series in 2014² applied only to GSM systems. **Appendix 12** at 1.

34. The specifications were stored on the 3GPP website’s file repository as zipped files, where the filenames followed the structure: SM[-P[-Q]]-V.zip. This format corresponded to the numbering scheme discussed in paragraph 33. “S” represented the series number; “M” represented the mantissa (the part after the series number); “P” represented an optional part number; “Q” represented an optional sub-part number; and “V” represented the version number (without the separating dots). **Appendix 12** at 2.

35. The Working Groups would create incremental versions of the draft specifications (*e.g.*, V0.2.1, V1.0.0, V1.1.0, etc.). These versions were made available on the 3GPP website’s file repository which is accessible from the 3GPP specifications page. The version numbering scheme for Technical Specifications and

² 38 series specifications were introduced from Release 15 covering 5G New Radio aspects

Technical Reports was standardized by 3GPP. The version number included three fields: the major version field, the technical version field, and the editorial version field. **Appendix 13** at 2. The major version field reflects the stage of the specification, with “0” representing an immature draft and a value of “3” or greater representing a specification that has been approved by the relevant TSG and thus had been moved to change control. **Appendix 13** at 2. The technical version field begins at zero and is incremented every time a technical change is made to the specification (either as part of the drafting process or as part of an approved change request). **Appendix 13** at 2. The editorial version field begins at zero and is incremented each time a non-technical change is made to the specification (*e.g.*, to fix a typo or formatting issue). **Appendix 13** at 2.

36. I understand that the alleged invention in the '878 patent relates to cellular telecommunications networks, and more particularly to methods, systems, and computer program products for handling, or assisting in handling, the transmission of uplink control information in such networks. Any POSITA interested in methods, systems, and computer program products for handling, or assisting in handling, the transmission of uplink control information in such networks would have been monitoring 3GPP's activities in this area and would probably have been already participating as a full or associate member or observer in the standard development process or would have at least known that information

regarding the proposed revisions to the technical specifications under discussion were available through 3GPP.

2. 3GPP TDocs

37. As mentioned in paragraph 29, the technical specifications and reports developed by 3GPP were and are driven by the technical contributions of 3GPP member companies. As part of that development process, various types of documents were produced and submitted. As relevant to this case, the 3GPP process involved the consideration of temporary documents or “TDocs,” which are also referred to as proposals, contributions, or change requests. The agreement of proposals submitted as TDocs results in the production of technical specifications.

38. Prior to each Working Group meeting, members of the Working Group would prepare TDocs to identify, discuss, and/or propose a new feature or change(s) to an existing feature or to identify a technical issue for discussion. Interested POSITAs would have known that TDocs could be a helpful source of technical information regarding the 3GPP specifications.

39. Each TDoc was assigned a TDoc number, according to a standard format set by 3GPP.³ As described in the 3GPP Working Procedures, the numbering system followed the format xminnnzzzz. **Appendix 5** at 20. This general naming

³ Documents other than technical contributions (such as meeting reports) were also assigned TDoc numbers for ease of reference.

convention has been in use since at least 1999 with only minor variations. Within that format, “x” referred to the relevant TSG. For example, “R” was used for TSG RAN. Likewise, “m” referred to the relevant Working Group. **Appendix 5** at 20. A document for RAN WG2 would therefore begin with “R2”. The two digits “nn” represented the year (*e.g.*, 15), and the digits “zzzz” represented the unique document number. This document number was used as the TDoc’s filename.

40. Each TDoc would include in its header the meeting at which the contributor intended the TDoc to be discussed. Most TDocs were uploaded to the 3GPP website for public viewing prior to the relevant Working Group meeting listed on the TDoc, although some TDocs including those created at meetings, were uploaded during or after the meeting. **Appendix 10** at 10. The documents were uploaded to the public file repository in an area allocated to the particular Working Group. **Appendix 14** at 2 (RAN WG2 homepage with link to WG2’s “Meeting Documents”). Immediately upon upload, any member of the public could download and access the TDocs and other documents offered for discussion. This process has been in place since I began attending Working Group meetings in 1999.

E. The 3GPP Website’s Public File Repository

41. All TDocs, technical reports, and technical specifications were also freely available to interested member of the public through the public file repository accessible via the 3GPP website. Interested members of the public would have been

well aware of 3GPP and of the 3GPP website. 3GPP documents were accessible to any member of the public through the 3GPP website without providing any login credentials or other exclusive access criteria.

42. It is my recollection that, during the 2007 to 2017 timeframe, any interested member of the public could locate relevant documents of interest on the 3GPP website using reasonable diligence based on the website's indexing scheme or the TDoc's naming convention. The documents on the 3GPP website were (and remain) organized according to the relevant Working Groups within 3GPP (each of which focused on particular subject matter) and then further organized based on the meetings of those groups. POSITAs would have known which Working Groups focused on particular subject matter.

43. An interested member of the public could locate documents of interest by first navigating a web browser to the 3GPP website (www.3gpp.org/home.htm). In the 2007 - 2017 timeframe, to locate documents from the 3GPP home page, a user could have clicked "Specification Groups"⁴ **Appendix 15**. The corresponding webpages contained links to the 3GPP's public file repository (*e.g.*, through the "Meeting documents" of a Working Group page). **Appendix 14**. Instead of accessing the 3GPP file repository from the 3GPP website home page, a user could

⁴ Or "Technical Bodies" prior to December 2008

have also accessed the file repository through the web address www.3gpp.org/ftp or directly using ftp client software connected to [ftp.3gpp.org](ftp://ftp.3gpp.org). A POSITA was also able to search for relevant documents using keywords on the search facility on the 3GPP website from at least 2000, and from 2015 using the 3GPP search portal (<https://portal.3gpp.org/#/>), where an interested person could search for documents by title and source, among other things.

44. The top two levels of indexing within the file repository were thus based wholly on subject matter, as reflected by the division of subject matter among the various TSGs and Working Groups. Specifically, an individual would select the relevant TSG covering the subject matter of interest. **Appendix 16.**

45. If the individual were interested in the radio access aspects of 3GPP, they would click “tsg_ran”. From there, the individual would click on the particular RAN Working Group covering the subject matter of interest. **Appendix 17.**

46. For example, if the individual were interested in the Radio Interface physical layer, the individual would know to choose the folder for WG2. Once a user is in the relevant Working Group folder (RAN WG2 in this example), an individual would see a list of all meetings held by RAN WG2. **Appendix 18.**

47. As shown, a folder existed for each meeting. For example, “TSGR2_91” corresponded to TSG RAN WG2 Meeting #91, and the timestamp associated with the meeting #91 directory indicates it was last updated on 23 August

2015. **Appendix 18** at 3.

48. A POSITA would know which meeting(s) would have covered particular subject matter based on the working groups area of responsibility (*e.g.* for RAN WG2 - **Appendix 14**), and from publicly available meeting agendas. *E.g.*, **Appendix 19** (see link to agenda for RAN WG2 Meeting #91). Many POSITAs received a link to the meeting agenda directly via the 3GPP Working Group email reflector lists. **Appendix 20**. Further, an individual could ascertain what subject matter was addressed at each meeting by reviewing the report issued after each meeting, stored in the Report directory and also linked in, or attached to, an email sent via the group's email reflector. **Appendix 19; Appendix 21**.

49. In my experience, whilst the servers used for 3GPP file repository and many of its directories have been updated since 1999, and directories may as a result have later dates associated with them (*e.g.*, reflecting the last time they were modified in some way or their contents were updated), the original upload date for files including specifications has always been preserved, providing a true and accurate indication of their earliest availability for download.

50. Once an individual navigated to the desired meeting folder, for example "TSGR2_91" the individual could then select the "Docs" folder to view the documents associated with that meeting. The documents within this folder were listed by TDoc number, and interested members of the public would have known to

review the meeting report for each meeting to determine what topics were discussed at that meeting. *E.g.*, **Appendix 22**.

51. Many TDocs were uploaded to the public file server for public viewing prior to the relevant meeting (although some TDocs, particularly those created during meetings, were submitted during or soon after the meetings). Throughout and since my participation in 3GPP, it was always recommended that delegates attending a meeting download the relevant set of documents from the 3GPP file repository onto their personal computers prior to each meeting. Given that any interested member of the public could and was likely to subscribe to the Working Group listserv, it would have been simple to locate the location of relevant TDocs on the 3GPP server based on the information sent out over the listserv.

52. 3GPP's public file repository provides a reliable mechanism for identifying the date and time a document was uploaded to the website and then available to download for public viewing. When a document is uploaded, the file server automatically assigns the document a time stamp—*i.e.*, an accurate and automatically computer-generated electronic record of when the document was uploaded—as part of the regular business practices of 3GPP. **Appendix 10** at 10 (3GPP FAQs). This has always been the practice regarding uploading documents to the 3GPP file repository, and my personal experience confirms that the time stamps have always been a reliable way to determine when a file was uploaded to the 3GPP

website and immediately available for public download.

53. Following each 3GPP meeting, the secretary would usually distribute the meeting minutes via the corresponding email list with a request for comments. *E.g.*, **Appendix 21**. Said email would effectively therefore inform subscribers that the meeting had taken place, would inform subscribers of the documents that had been treated (or not), and in the event that the meeting was a TSG plenary meeting, serve as notice that new versions of specifications incorporating Change Requests approved by the TSG meeting, would shortly be made available on the 3GPP public server. Further, an interested member of the public following a certain topic would have known to check said report for related contributions as the reports always included a list of all TDocs submitted, indexed by contribution title, TDoc number, source, and agenda item (*e.g.*, Annex B of the report of RAN2 #91, **Appendix 22**).

IV. 3GPP EXHIBITS

A. Ex-1005 (“Huawei-374”): R2-153374, TSG-RAN Working Group 2 Meeting #91; Agenda Item 7.11: Uplink latency reduction for synchronized UEs

54. R2-153374 is a technical contribution submitted to 3GPP TSG RAN WG2, meeting #91 in Beijing, PR China, which was held between August 24 – 28, 2015. It follows the general naming format (“xminnnzzzz”) described in paragraph 39. Accordingly, “R2” indicates that the contribution was submitted to RAN WG2, “15” indicates the year (2015) that this technical contribution was submitted, and

“3374” is the unique number that was assigned to this contribution document. It is titled “Uplink latency reduction for synchronized UEs”.

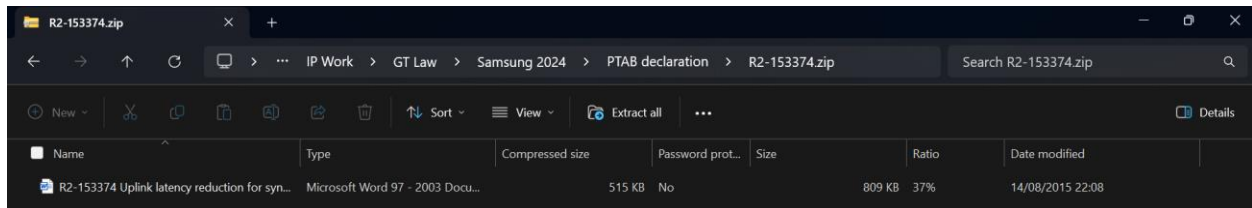
55. As I mention in paragraph 41 above, meeting documents are, and were in the 2007 to 2017 timeframe, made publicly available on the 3GPP public file server from where an interested member of the public exercising reasonable diligence could freely access them. To confirm the availability of R2-153374 on the 3GPP document server in the 2015 timeframe, I navigated to the 3GPP website at <http://www.3gpp.org>, selected “3GPP Groups” from the drop down menu, and then selected the “RAN2 – Radio Layer 2 and Radio Layer 3 Radio Resource Control” from the 3GPP Groups page, and the “Meeting documents” link to access the public file server where documents for the TSG-RAN Working Group 2 are stored, and from where I navigated to the documents for RAN WG2 #91. A true and correct copy of the relevant portion of the Documents directory listing produced by the file server website is provided below and in **Appendix 23** at 11.

 R2-153373.zip	2015/08/14 16:41	119,7 KB
 R2-153374.zip	2015/08/14 16:41	514,8 KB
 R2-153375.zip	2015/08/14 16:41	73,6 KB

Available at: https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_91/Docs/

56. The Docs directory index stated that R2-153374 was uploaded on

“2015/08/14”. I selected the link for “R2-153374.zip” and downloaded a zip file of the same name. The zip file contained a Microsoft Word document, “R2-153374 Uplink latency reduction for synchronized UEs.doc”, with a date stamp of “14/08/2015” (European date format) the same date that the zip file was uploaded.



57. A true and correct copy of the document within the zip file (R2-153374 Uplink latency reduction for synchronized UEs.doc) is provided as Ex-1005. Based on my experience, I understand that these date stamps mean that R2-153374.zip was uploaded to 3GPP’s publicly available website on August 14, 2015, prior to the RAN WG2 #91 meeting, and that any member of the public could have downloaded the zip file, extracted the Word document enclosed, and viewed the contents of said document without restriction on August 14, 2015 and thereafter. The draft report from RAN WG2 #91, itself first made available on September 25, 2015 (**Appendix 21**), confirms the availability of R2-153374 at the meeting, as does the TDoc list for that meeting. (**Appendix 22** at 78; **Appendix 22** Annex B). I have no reason to believe that either the date stamp or the report from RAN WG2 #91 are inaccurate. I have therefore determined that R2-153374 was publicly available on the file server no later than August 14, 2015.

58. Based on the information above, it is my opinion that R2-153374 titled “Uplink latency reduction for synchronized UEs” and provided as Ex-1005 was publicly available to download from the 3GPP file server no later than August 14, 2015 and could have been distributed thereafter without restriction. Further, it was publicly available at the 3GPP TSG RAN WG2 #91 meeting held in Beijing, PR China from August 24-28, 2015.

B. Ex-1006 (“Huawei-192”): R2-154192, TSG-RAN Working Group 2 Meeting #91bis; Agenda Item 7.10.1: Further analysis on uplink transmission skipping

59. R2-154192 is a technical contribution submitted to 3GPP TSG RAN WG2, meeting #91bis in Malmo, Sweden, which was held between October 5-9, 2015. It follows the general naming format (“xminnzzz”) described in paragraph 39. Accordingly, “R2” indicates that the contribution was submitted to RAN WG2, “15” indicates the year (2015) that this technical contribution was submitted, and “4192” is the unique number that was assigned to this contribution document. It is titled “Further analysis on uplink transmission skipping”.

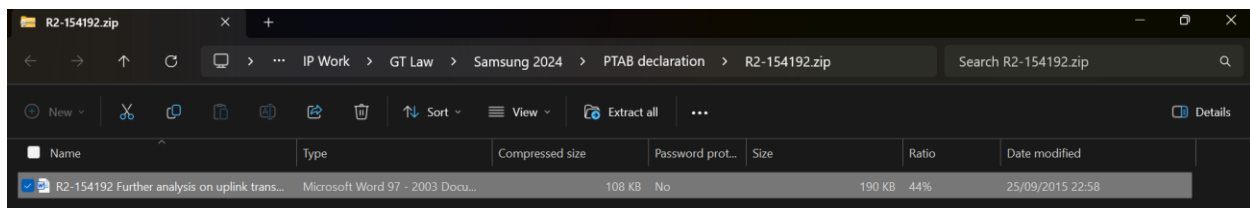
60. As I mention in paragraph 41 above, meeting documents are, and were in the 2007 - 2015 timeframe, made publicly available on the 3GPP public file server from where an interested member of the public exercising reasonable diligence could freely access them. To confirm the availability of R2-154192 on the 3GPP document server in the 2015 timeframe, I navigated to the 3GPP website at

<http://www.3gpp.org>, selected “3GPP Groups” from the drop down menu, and then selected the “RAN2 – Radio Layer 2 and Radio Layer 3 Radio Resource Control” from the 3GPP Groups page, and the “Meeting documents” link to access the public file server where documents for the TSG-RAN Working Group 2 are stored, and from where I navigated to the documents for RAN WG2 #91bis. A true and correct copy of the relevant portion of the Documents directory listing produced by the file server website is provided below and in **Appendix 24** at 6.

	R2-154191.zip	2015/09/26 4:02	92,8 KB
	R2-154192.zip	2015/09/26 4:02	108,1 KB
	R2-154193.zip	2015/09/26 4:02	119,7 KB

Available at: https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_91bis/Docs/

61. The Docs directory index stated that R2-154192 was uploaded on “2015/09/26”. I selected the link for “R2-154192.zip” and downloaded a zip file of the same name. The zip file contained a Microsoft Word document, “R2-154192 Further analysis on uplink transmission skipping.doc”, with a date stamp of “25/09/2015” (European date format) the day before the zip file was uploaded.



62. A true and correct copy of the document within the zip file (R2-154192

Uplink latency reduction for synchronized UEs.doc) is provided as Ex-1006. Based on my experience, I understand that these date stamps mean that R2-154192.zip was uploaded to 3GPP's publicly available website on September 26, 2015, prior to the RAN WG2 #91bis meeting, and that any member of the public could have downloaded the zip file, extracted the Word document enclosed, and viewed the contents of said document without restriction on September 26, 2015 and thereafter. The draft report from RAN WG2 #91bis, first made available on November 6, 2015 (**Appendix 25**), confirms the availability of R2-154192 at the meeting, as does the TDoc list for that meeting. (**Appendix 26** at 65, 154; **Appendix 26** Annex B). I have no reason to believe that either the date stamp or the report from RAN WG2 #91bis are inaccurate. I have therefore determined that R2-154192 was publicly available on the file server no later than September 26, 2015.

63. Based on the information above, it is my opinion that R2-154192 titled "Further analysis on uplink transmission skipping" and provided as Ex-1006 was publicly available to download from the 3GPP file server no later than September 26, 2015 and could have been distributed thereafter without restriction. Further, it was publicly available at the 3GPP TSG RAN WG2 #91bis meeting held in Malmo, Sweden from October 5-9, 2015.

C. Ex-1007 ("Samsung-332"): R2-153332, TSG-RAN Working Group 2 Meeting #91; Agenda Item 7.11: Skipping uplink transmission with no data to transmit

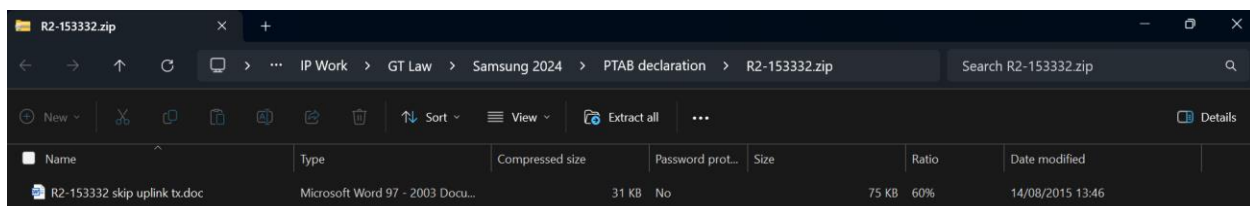
64. R2-153332 is a technical contribution submitted to 3GPP TSG RAN WG2, meeting #91 in Beijing, PR China, which was held between August 24 – 28, 2015. It follows the general naming format (“xminnnzzzz”) described in paragraph 39. Accordingly, “R2” indicates that the contribution was submitted to RAN WG2, “15” indicates the year (2015) that this technical contribution was submitted, and “3332” is the unique number that was assigned to this contribution document. It is titled “Skipping uplink transmission with no data to transmit”.

65. As I mention in paragraph 41 above, meeting documents are, and were in the 2007 to 2015 timeframe, made publicly available on the 3GPP public file server from where an interested member of the public exercising reasonable diligence could freely access them. To confirm the availability of R2-153332 on the 3GPP document server in the 2015 timeframe, I navigated to the 3GPP website at <http://www.3gpp.org>, selected “3GPP Groups” from the drop down menu, and then selected the “RAN2 – Radio Layer 2 and Radio Layer 3 Radio Resource Control” from the 3GPP Groups page, and the “Meeting documents” link to access the public file server where documents for the TSG-RAN Working Group 2 are stored, and from where I navigated to the documents for RAN WG2 #91. A true and correct copy of the relevant portion of the Documents directory listing produced by the file server website is provided below and in **Appendix 23** at 10.

 R2-153331.zip	2015/08/14 6:11	88,1 KB
 R2-153332.zip	2015/08/14 6:11	30,4 KB
 R2-153333.zip	2015/08/14 6:11	21,5 KB
 R2-153334.zip	2015/08/14 6:11	26,3 KB

Available at: https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_91/Docs/

66. The Docs directory index stated that R2-153332 was uploaded on “2015/08/14”. I selected the link for “R2-153332.zip” and downloaded a zip file of the same name. The zip file contained a Microsoft Word document, “R2-153332 Skip uplink tx.doc”, with a date stamp of “14/08/2015” (European date format) the same date that the zip file was uploaded.



67. A true and correct copy of the document within the zip file (R2-153332 Uplink latency reduction for synchronized UEs.doc) is provided as Ex-1007. Based on my experience, I understand that these date stamps mean that R2-153332.zip was uploaded to 3GPP’s publicly available website on August 14, 2015, prior to the RAN WG2 #91 meeting, and that any member of the public could have downloaded the zip file, extracted the Word document enclosed, and viewed the contents of said document without restriction on August 14, 2015 and thereafter. The draft report

from RAN WG2 #91, itself first made available on September 25, 2015 (**Appendix 21**), confirms the availability of R2-153332 at the meeting where it was presented and discussed, as does the TDoc list for that meeting. (**Appendix 22** at 77; **Appendix 22 Annex B**). I have no reason to believe that either the date stamp or the report from RAN WG2 #91 are inaccurate. I have therefore determined that R2-153332 was publicly available on the file server no later than August 14, 2015.

68. Based on the information above, it is my opinion that R2-153332 titled “Skipping uplink transmission with no data to transmit” and provided as Ex-1007 was publicly available to download from the 3GPP file server no later than August 14, 2015 and could have been distributed thereafter without restriction. Further, it was publicly available at the 3GPP TSG RAN WG2 #91 meeting held in Beijing, PR China from August 24-28, 2015.

D. Ex-1008 (“Samsung-333”): R2-153333, TSG-RAN Working Group 2 Meeting #91; Agenda Item 7.11: Skipping uplink transmission with no data to transmit

69. R2-153333 is a draft Change Request submitted to 3GPP TSG RAN WG2, meeting #91 in Beijing, PR China, which was held between August 24 – 28, 2015. It follows the general naming format (“xminnzzzz”) described in paragraph 39. Accordingly, “R2” indicates that the contribution was submitted to RAN WG2, “15” indicates the year (2015) that this technical contribution was submitted, and “3333” is the unique number that was assigned to this contribution document. It is

titled “Skipping uplink transmission with no data to transmit”.

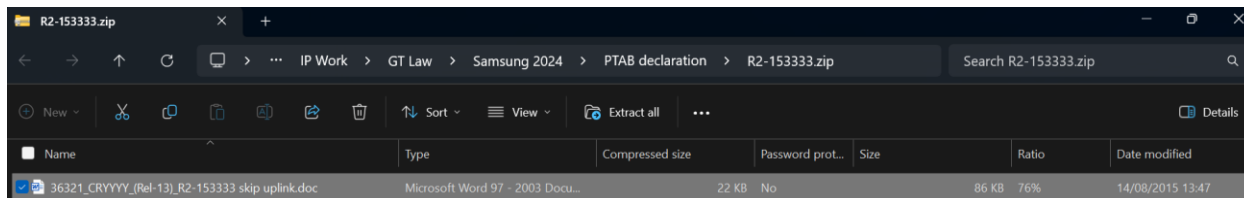
70. As I mention in paragraph 41 above, meeting documents are, and were in the 2007 to 2015 timeframe, made publicly available on the 3GPP public file server from where an interested member of the public exercising reasonable diligence could freely access them. To confirm the availability of R2-153333 on the 3GPP document server in the 2015 timeframe, I navigated to the 3GPP website at <http://www.3gpp.org>, selected “3GPP Groups” from the drop down menu, and then selected the “RAN2 – Radio Layer 2 and Radio Layer 3 Radio Resource Control” from the 3GPP Groups page, and the “Meeting documents” link to access the public file server where documents for the TSG-RAN Working Group 2 are stored, and from where I navigated to the documents for RAN WG2 #91. A true and correct copy of the relevant portion of the Documents directory listing produced by the file server website is provided below and in **Appendix 23** at 10.

 R2-153331.zip	2015/08/14 6:11	88,1 KB
 R2-153332.zip	2015/08/14 6:11	30,4 KB
 R2-153333.zip	2015/08/14 6:11	21,5 KB
 R2-153334.zip	2015/08/14 6:11	26,3 KB

Available at: https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_91/Docs/

71. The Docs directory index stated that R2-153333 was uploaded on “2015/08/14”. I selected the link for “R2-153333.zip” and downloaded a zip file of

the same name. The zip file contained a Microsoft Word document, “36321_CRYYYY_(Rel-13)_R2-153333 skip uplink.doc”, with a date stamp of “14/08/2015” (European date format) the same date that the zip file was uploaded.



72. A true and correct copy of the document within the zip file (R2-153333 Uplink latency reduction for synchronized UEs.doc) is provided as Ex-1008. Based on my experience, I understand that these date stamps mean that R2-153333.zip was uploaded to 3GPP’s publicly available website on August 14, 2015, prior to the RAN WG2 #91 meeting, and that any member of the public could have downloaded the zip file, extracted the Word document enclosed, and viewed the contents of said document without restriction on August 14, 2015 and thereafter. The draft report from RAN WG2 #91, itself first made available on September 25, 2015 (**Appendix 21**), confirms the availability of R2-153333 at the meeting, as does the TDoc list for that meeting. (**Appendix 22** at 78; **Appendix 22** Annex B). I have no reason to believe that either the date stamp or the report from RAN WG2 #91 are inaccurate. I have therefore determined that R2-153333 was publicly available on the file server no later than August 14, 2015.

73. Based on the information above, it is my opinion that R2-153333 titled

“Skipping uplink transmission with no data to transmit” and provided as Ex-1008 was publicly available to download from the 3GPP file server no later than August 14, 2015 and could have been distributed thereafter without restriction. Further, it was publicly available at the 3GPP TSG RAN WG2 #91 meeting held in Beijing, PR China from August 24-28, 2015.

E. Ex-1009 (“36.212”): 3GPP TS 36.212 V13.0.0 (2015-12) 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding (Release 13)

74. 3GPP TS 36.212 v13.0.0 is a Technical Specification titled “3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding (Release 13)”. Ex-1009.

75. The date on the face of the specification (“2015-12”) corresponds to the year (2015) and month (December) that this version of the specification was approved by 3GPP TSG RAN and made publicly available.

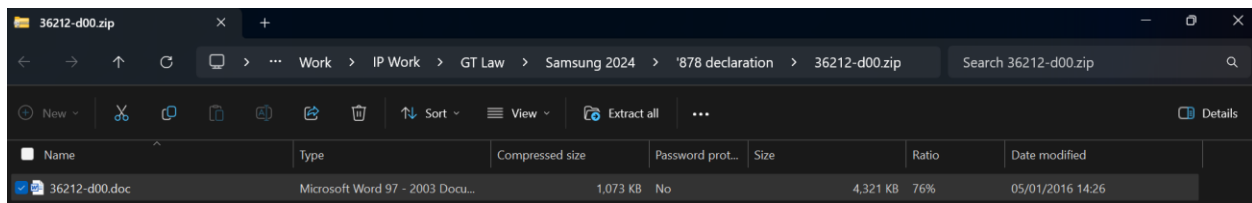
76. 3GPP TS 36.212 v13.0.0 being an approved version of the Release 13 specification on E-UTRA multiplexing and channel coding was created by TSG RAN #70 held December 7-10, 2015. An interested member of the public would know that the latest version of an approved specification or report would be available following the plenary meeting responsible for that specification (in this case TSG

RAN) in accordance with 3GPP standard practice as described in paragraphs 31 and 53. The approval of the TS 36.212 v13.0.0 is confirmed by the approval of the Change Requests to TS 36.212 v12.7.0 documented in the draft meeting report from TSG RAN #70 (**Appendix 35** at 174).

77. The 3GPP file server is and always has been open to all and free from restriction such as username or password. By way of example of how an interested member of the public could access the TS 36.212 v13.0.0 technical specification from the 3GPP website, I accessed the file server by going to the 3GPP website at <http://www.3gpp.org/>, selected “Specifications & Technologies” from the menu bar, and then selected “Specifications by series” from the dropdown menu. I then selected the “36 Series” link to access the public file server where the specifications are stored. I then searched for “36.212” in the specification number search bar, and for the TS 36.212 specification selected the eyeglasses icon that says “See details” when a cursor is placed on it. From there, I selected “Click to see all versions of this specification,” which took me to the archive housing all versions of TS 36.212 found at the following URL: https://www.3gpp.org/ftp/Specs/archive/36_series/36.212. A true and correct copy of the relevant portion of the directory listing produced by the file server website is provided below and in **Appendix 36** at 2.

	36212-c91.zip	2018/01/20 8:35	979,2 KB
	36212-d00.zip	2016/01/05 13:28	1073 KB
	36212-d10.zip	2016/03/29 21:22	1090 KB

78. The archive directory index stated that TS 36.212 v13.0.0 was uploaded on “2016/01/05”. Selecting the link for “36212-d00.zip”, I downloaded a zip file of the same name. The zip file contained a Microsoft Word document titled “36212-d00.doc” with a date stamp of “05/01/2016” (European date format). An excerpt of the zip file directory is provided below.



79. I have confirmed that the document “36212-d00.doc” is TS 36.212 v13.0.0. A true and correct copy of the Microsoft Word document titled “36212-d00.doc” is the TS 36.212 v13.0.0 that is provided in EX-1009.

80. Based on my experience, I understand these date stamps to mean that 36212-d00.zip was uploaded to 3GPP’s publicly available website on January 05, 2016, and that an interested member of the public could have downloaded the zip file, extracted the Word document enclosed, viewed the contents of the Word document, and further disseminated said document without restriction on January

05, 2016 and thereafter.

F. Ex-1010 (“36.213”) 3GPP TS 36.213 V12.5.0 (2015-03) 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures (Release 12)

81. 3GPP TS 36.213 v12.5.0 is a Technical Specification titled “3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures (Release 12)”. Ex-1010.

82. The date on the face of the specification (“2015-03”) corresponds to the year (2015) and month (March) that this version of the specification was approved by 3GPP TSG RAN, and made publicly available.

83. 3GPP TS 36.213 v12.5.0 being an approved version of the Release 12 specification on E-UTRA physical layer procedures was created by TSG RAN #67 held March 9-12, 2015. An interested member of the public would know that the latest version of an approved specification or report would be available following the plenary meeting responsible for that specification (in this case TSG RAN) in accordance with 3GPP standard practice as described in paragraphs 31 and 53. The approval of the TS 36.213 v12.5.0 is confirmed by the approval of the Change Requests to TS 36.213 v12.4.0 documented in the draft meeting report from TSG RAN #67 (**Appendix 37** at 116) which was distributed via the TSG RAN email list

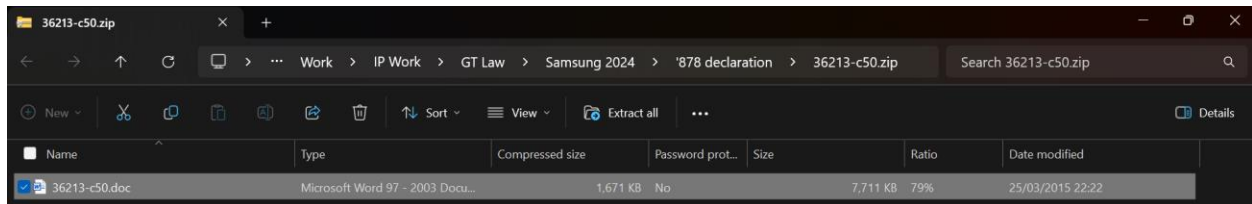
on June 1, 2015 (**Appendix 38**).

84. The 3GPP file server is and always has been open to all and free from restriction such as username or password. By way of example of how an interested member of the public could access the TS 36.213 v12.5.0 technical specification from the 3GPP website, I accessed the file server by going to the 3GPP website at <http://www.3gpp.org/>, selected “Specifications & Technologies” from the menu bar, and then selected “Specifications by series” from the dropdown menu. I then selected the “36 Series” link to access the public file server where the specifications are stored. I then searched for “36.213” in the specification number search bar, and for the TS 36.213 specification selected the eyeglasses icon that says “See details” when a cursor is placed on it. From there, I selected “Click to see all versions of this specification,” which took me to the archive housing all versions of TS 36.213 found at the following URL: https://www.3gpp.org/ftp/Specs/archive/36_series/36.213. A true and correct copy of the relevant portion of the directory listing produced by the file server website is provided below and in **Appendix 39** at 3.

 36213-c40.zip	2015/01/07 7:14	1820,9 KB
 36213-c50.zip	2015/03/25 21:24	1671 KB
 36213-c60.zip	2015/07/03 4:34	1801,1 KB

85. The archive directory index stated that TS 36.213 v12.5.0 was uploaded

on “2015/03/25”. Selecting the link for “36213-c50.zip”, I downloaded a zip file of the same name. The zip file contained a Microsoft Word document titled “36213-c50.doc” with a date stamp of “25/03/2015” (European date format). An excerpt of the zip file directory is provided below.



86. I have confirmed that the document “36213-c50.doc” is TS 36.213 v12.5.0. A true and correct copy of the Microsoft Word document titled “36213-c50.doc” is the TS 36.213 v12.5.0 that is provided in EX-1010.

87. Based on my experience, I understand these date stamps to mean that 36213-c50.zip was uploaded to 3GPP’s publicly available website on March 25, 2015, and that an interested member of the public could have downloaded the zip file, extracted the Word document enclosed, viewed the contents of the Word document, and further disseminated said document without restriction on March 25, 2015 and thereafter.

G. Ex-1013: R1-073322, TSG-RAN Working Group 1 Meeting #50; Agenda Item 7.2.4: UL physical channel for CQI report

88. R1-073322 is a technical contribution submitted to 3GPP TSG RAN WG1, meeting #50 in Athens, Greece, which was held between August 20 – 24,

2007. It follows the general naming format (“xminnnzzzz”) described in paragraph 39. Accordingly, “R1” indicates that the contribution was submitted to RAN WG1, “07” indicates the year (2007) that this technical contribution was submitted, and “3322” is the unique number that was assigned to this contribution document. It is titled “UL physical channel for CQI report”.

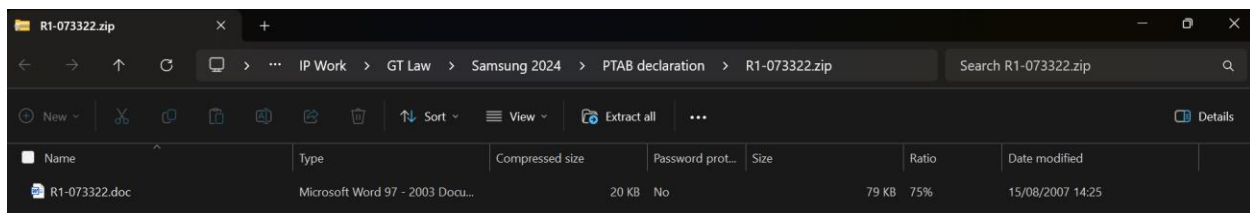
89. As I mention in paragraph 41 above, meeting documents are, and were in the 2007 to 2017 timeframe, made publicly available on the 3GPP public file server from where an interested member of the public exercising reasonable diligence could freely access them. To confirm the availability of R1-073322 on the 3GPP document server in the 2007 timeframe, I navigated to the 3GPP website at <http://www.3gpp.org>, selected “3GPP Groups” from the drop down menu, and then selected the “RAN1 – Radio Layer 1 (Physical Layer)” from the 3GPP Groups page, and the “Documents area” link to access the public file server where documents for the TSG-RAN Working Group 1 are stored, and from where I navigated to the documents for RAN WG1 #50. A true and correct copy of the relevant portion of the Documents directory listing produced by the file server website is provided below

and in **Appendix 27** at 3.

 R1-073321.zip	2007/08/15 13:10	44,7 KB
 R1-073322.zip	2007/08/15 13:10	19,8 KB
 R1-073323.zip	2007/08/15 13:10	115,6 KB

Available at: https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_50/Docs/

90. The Docs directory index stated that R1-073322 was uploaded on “2007/08/15”. I selected the link for “R1-073322.zip” and downloaded a zip file of the same name. The zip file contained a Microsoft Word document, “R1-073322.doc”, with a date stamp of “15/08/2007” (European date format) the same date that the zip file was uploaded.



91. A true and correct copy of the document within the zip file (R1-073322.doc) is provided as Ex-1013. Based on my experience, I understand that these date stamps mean that R1-073322.zip was uploaded to 3GPP’s publicly available website on August 15, 2007, prior to the RAN WG1 #50 meeting, and that any member of the public could have downloaded the zip file, extracted the Word document enclosed, and viewed the contents of said document without restriction on August 15, 2007 and thereafter. In addition, as was still the convention in RAN WG1

in 2007, R1-073322 was directly distributed to subscribers to the RAN WG1 email reflector on August 15, 2007. **Appendix 28.** The draft report from RAN WG1 #50, itself first made available on August 29, 2007 (**Appendix 29**), confirms the availability of R1-073322 at the meeting, as does the TDoc list for that meeting. (**Appendix 30** at 32; **Appendix 30** Annex E). I have no reason to believe that either the date stamp, the archived email or the report from RAN WG1 #50 are inaccurate. I have therefore determined that R2-073322 was publicly available on the file server no later than August 15, 2007.

92. Based on the information above, it is my opinion that R1-073322 titled “UL physical channel for CQI report” and provided as Ex-1013 was publicly available to download from the 3GPP file server and from an email sent to the RAN WG1 email reflector no later than August 15, 2007, and could have been distributed thereafter without restriction. Further, it was publicly available at the 3GPP TSG RAN WG1 #50 meeting held in Athens, Greece from August 20-24, 2007.

**H. Ex-1014: R1-073858, TSG-RAN Working Group 1 Meeting #50;
Agenda Item 7.2.4: Way forward for CQI reporting**

93. R1-073858 is a technical contribution submitted to 3GPP TSG RAN WG1, meeting #50 in Athens, Greece, which was held between August 20 – 24, 2007. It follows the general naming format (“xminnzzzz”) described in paragraph 39. Accordingly, “R1” indicates that the contribution was submitted to RAN WG1,

“07” indicates the year (2007) that this technical contribution was submitted, and “3858” is the unique number that was assigned to this contribution document. It is titled “Way forward for CQI reporting”.

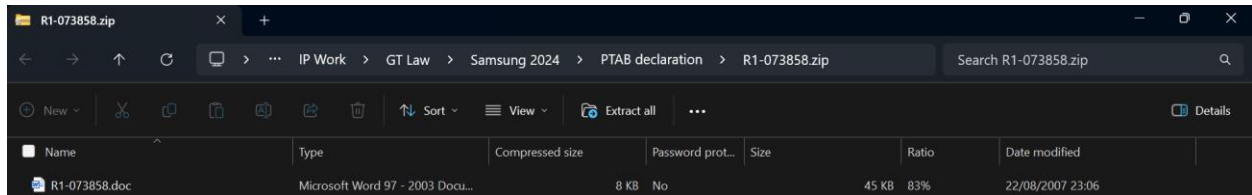
94. As I mention in paragraph 41 above, meeting documents are, and were in the 2007 to 2017 timeframe, made publicly available on the 3GPP public file server from where an interested member of the public exercising reasonable diligence could freely access them. To confirm the availability of R1-073858 on the 3GPP document server in the 2007 timeframe, I navigated to the 3GPP website at <http://www.3gpp.org>, selected “3GPP Groups” from the drop down menu, and then selected the “RAN1 – Radio Layer 1 (Physical Layer)” from the 3GPP Groups page, and the “Documents area” link to access the public file server where documents for the TSG-RAN Working Group 1 are stored, and from where I navigated to the documents for RAN WG1 #50. A true and correct copy of the relevant portion of the Documents directory listing produced by the file server website is provided below

and in **Appendix 27** at 18.

 R1-073857.zip	2007/08/29 8:36	65,6 KB
 R1-073858.zip	2007/08/29 8:36	7,9 KB
 R1-073859.zip	2007/08/29 8:36	24,1 KB

Available at: https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_50/Docs/

95. The Docs directory index stated that R1-073858 was uploaded on “2007/08/29”. I selected the link for “R1-073858.zip” and downloaded a zip file of the same name. The zip file contained a Microsoft Word document, “R1-073858.doc”, with a date stamp of “22/08/2007” (European date format) one week before it was uploaded.



96. A true and correct copy of the document within the zip file (R1-073858.doc) is provided as Ex-1014. Based on my experience, I understand that these date stamps mean that R1-073858.zip was uploaded to 3GPP’s publicly available website on August 29, 2007, following the RAN WG1 #50 meeting, and that any member of the public could have downloaded the zip file, extracted the Word document enclosed, and viewed the contents of said document without restriction on August 29, 2007 and thereafter. R1-073322 was not directly distributed to subscribers to the RAN WG1 email reflector as it had been created and agreed at the RAN1 #50 meeting. The draft report from RAN WG1 #50, itself first made available on August 29, 2007 (**Appendix 29**), confirms the availability of R1-073858 at the meeting where it was presented and agreed, as does the TDoc list for that meeting. (**Appendix 30** at 49; **Appendix 30** Annex E). I have no reason to

believe that either the date stamp or the report from RAN WG1 #50 are inaccurate. I have therefore determined that R1-073858 was publicly available on the file server no later than August 29, 2007.

97. Based on the information above, it is my opinion that R1-073858 titled “Way forward for CQI reporting” and provided as Ex-1014 was publicly available to download from the 3GPP file server no later than August 29, 2007, and could have been distributed thereafter without restriction. Further, it was publicly available at the 3GPP TSG RAN WG1 #50 meeting held in Athens, Greece from August 20-24, 2007.

I. Ex-1015: R1-074383, TSG-RAN Working Group 1 Meeting #50bis; Agenda Item 7.2.4: Proposed way forward for CQI reporting

98. R1-074383 is a technical contribution submitted to 3GPP TSG RAN WG1, meeting #50bis in Shanghai, PR China, which was held between October 8-12, 2007. It follows the general naming format (“xminnnzzzz”) described in paragraph 39. Accordingly, “R1” indicates that the contribution was submitted to RAN WG1, “07” indicates the year (2007) that this technical contribution was submitted, and “4383” is the unique number that was assigned to this contribution document. It is titled “Proposed way forward for CQI reporting”.

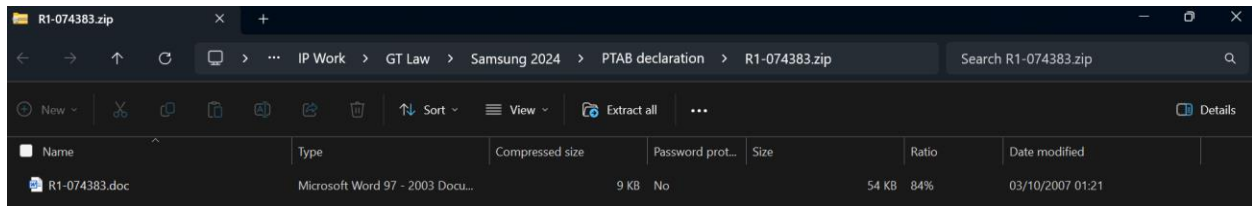
99. As I mention in paragraph 42 above, meeting documents are, and were in the 2007 to 2017 timeframe, made publicly available on the 3GPP public file

server from where an interested member of the public exercising reasonable diligence could freely access them. To confirm the availability of R1-074383 on the 3GPP document server in the 2007 timeframe, I navigated to the 3GPP website at <http://www.3gpp.org>, selected “3GPP Groups” from the drop down menu, and then selected the “RAN1 – Radio Layer 1 (Physical Layer)” from the 3GPP Groups page, and the “Documents area” link to access the public file server where documents for the TSG-RAN Working Group 1 are stored, and from where I navigated to the documents for RAN WG1 #50bis. A true and correct copy of the relevant portion of the Documents directory listing produced by the file server website is provided below and in **Appendix 31** at 14.

 R1-074382.zip	2007/10/03 7:25	23,7 KB
 R1-074383.zip	2007/10/03 7:25	8,8 KB
 R1-074384.zip	2007/10/02 19:22	58,9 KB

Available at: https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_50b/Docs/

100. The Docs directory index stated that R1-074383 was uploaded on “2007/10/03”. I selected the link for “R1-074383.zip” and downloaded a zip file of the same name. The zip file contained a Microsoft Word document, “R1-074383.doc”, with a date stamp of “03/10/2007” (European date format) the same date that the zip file was uploaded.



101. A true and correct copy of the document within the zip file (R1-074383.doc) is provided as Ex-1015. Based on my experience, I understand that these date stamps mean that R1-074383.zip was uploaded to 3GPP's publicly available website on October 3, 2007, prior to the RAN WG1 #50bis meeting, and that any member of the public could have downloaded the zip file, extracted the Word document enclosed, and viewed the contents of said document without restriction on October 3, 2007 and thereafter. In addition, as was still the convention in RAN WG1 in 2007, R1-074383 was directly distributed to subscribers to the RAN WG1 email reflector on October 3, 2007. **Appendix 32.** The report from RAN WG1 #50b, the first draft of which was made available on October 15, 2007 (**Appendix 33**), confirms the availability of R1-074383 at the meeting where it was presented, discussed, and revised to R1-074453, as does the TDoc list for that meeting. (**Appendix 34** at 43; **Appendix 34** Annex E). I have no reason to believe that either the date stamp, the archived email or the report from RAN WG1 #50bis are inaccurate. I have therefore determined that R1-074383 was publicly available on the file server no later than October 3, 2007.

102. Based on the information above, it is my opinion that R1-074383 titled

“Proposed way forward for CQI reporting” and provided as Ex-1015 was publicly available to download from the 3GPP file server and from an email sent to the RAN WG1 email reflector no later than October 3, 2007, and could have been distributed thereafter without restriction. Further, it was publicly available at the 3GPP TSG RAN WG1 #50bis meeting held in Shanghai, PR China from October 8-12, 2007.

J. Ex-1016: RP-150465, *New SI proposal: Study on Latency reduction techniques for LTE*

103. RP-150465 is a proposed Study Item submitted to 3GPP TSG RAN, meeting #67 in Shanghai, China, which was held between March 9-12, 2015. It follows the general naming format (“xminzzzz”) described in paragraph 39. Accordingly, “RP” indicates that the contribution was submitted to TSG RAN, “15” indicates the year (2015) that this technical contribution was submitted, and “0465” is the unique number that was assigned to this contribution document. It is titled “New SI proposal: Study on Latency reduction techniques for LTE”.

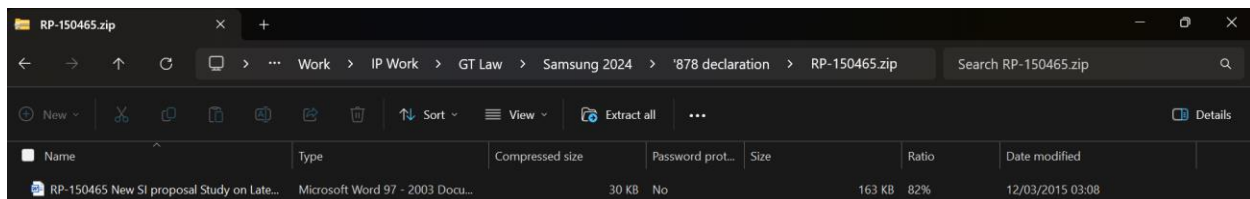
104. As I mention in paragraph 41 above, meeting documents are, and were in the 2007 to 2017 timeframe, made publicly available on the 3GPP public file server from where an interested member of the public exercising reasonable diligence could freely access them. To confirm the availability of RP-150465 on the 3GPP document server in the 2015 timeframe, I navigated to the 3GPP website at <http://www.3gpp.org>, selected “3GPP Groups” from the drop down menu, and then

selected the “Radio Access Networks (RAN)” from the 3GPP Groups page, and the “Documents area” link to access the public file server where documents for the TSG-RAN are stored, and from where I navigated to the documents for RAN #67. A true and correct copy of the relevant portion of the Documents directory listing produced by the file server website is provided below and in **Appendix 40** at 14.

 RP-150463.zip	2015/03/12 16:13	27,3 KB
 RP-150465.zip	2015/03/12 16:13	30,1 KB
 RP-150466.zip	2015/03/12 16:13	31,5 KB

Available at: https://www.3gpp.org/ftp/tsg_ran/tsg_ran/TSGR_67/Docs/

105. The Docs directory index stated that RP-150465 was uploaded on “2015/03/12”. I selected the link for “RP-150465.zip” and downloaded a zip file of the same name. The zip file contained a Microsoft Word document, “RP-150465 New SI proposal Study on Latency reduction techniques for LTE.doc”, with a date stamp of “12/03/2015” (European date format) the same date that the zip file was uploaded.



106. A true and correct copy of the document within the zip file (RP-150465

New SI proposal Study on Latency reduction techniques for LTE.doc) is provided as Ex-1016. Based on my experience, I understand that these date stamps mean that RP-150465.zip was uploaded to 3GPP's publicly available website on March 12, 2015, prior to the TSG RAN #67 meeting, and that any member of the public could have downloaded the zip file, extracted the Word document enclosed, and viewed the contents of said document without restriction on March 12, 2015 and thereafter. A draft report from TSG RAN #67, made available on June 1, 2015 (**Appendix 38**), confirms the availability of RP-150465 at the meeting, as does the TDoc list for that meeting. (**Appendix 37** at 9, 73; **Appendix 37** Annex B) I have no reason to believe that either the date stamp or the report from TSG RAN #67 are inaccurate. I have therefore determined that RP-150465 was publicly available on the file server no later than March 12, 2015.

107. Based on the information above, it is my opinion that RP-150465 titled "New SI proposal: Study on Latency reduction techniques for LTE" and provided as Ex-1016 was publicly available to download from the 3GPP file server no later than March 12, 2015 and could have been distributed thereafter without restriction. Further, it was publicly available at the 3GPP TSG RAN #67 meeting held in Shanghai, China from March 9-12, 2015.

K. Ex-1017: RP-150310, *Motivation for new SI: Study on Latency reduction techniques for LTE*

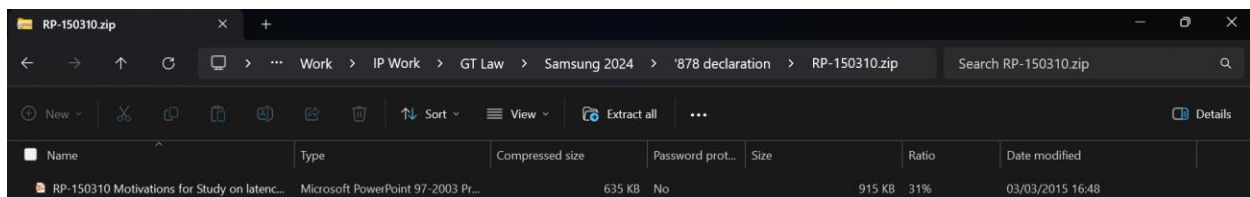
108. RP-150310 is a technical contribution submitted to 3GPP TSG RAN, meeting #67 in Shanghai, China, which was held between March 9-12, 2015. It follows the general naming format (“xminnnzzzz”) described in paragraph 39. Accordingly, “RP” indicates that the contribution was submitted to TSG RAN, “15” indicates the year (2015) that this technical contribution was submitted, and “0310” is the unique number that was assigned to this contribution document. It is titled “Motivation for new SI: Study on Latency reduction techniques for LTE”.

109. As I mention in paragraph 41 above, meeting documents are, and were in the 2007 to 2017 timeframe, made publicly available on the 3GPP public file server from where an interested member of the public exercising reasonable diligence could freely access them. To confirm the availability of RP-150310 on the 3GPP document server in the 2015 timeframe, I navigated to the 3GPP website at <http://www.3gpp.org>, selected “3GPP Groups” from the drop down menu, and then selected the “Radio Access Networks (RAN)” from the 3GPP Groups page, and the “Documents area” link to access the public file server where documents for the TSG-RAN are stored, and from where I navigated to the documents for RAN #67. A true and correct copy of the relevant portion of the Documents directory listing produced by the file server website is provided below and in **Appendix 40** at 9.

 RP-150309.zip	2015/03/03 15:56	27,9 KB
 RP-150310.zip	2015/03/03 14:51	635 KB
 RP-150311.zip	2015/03/03 15:50	25,7 KB

Available at: https://www.3gpp.org/ftp/tsg_ran/tsg_ran/TSGR_67/Docs/

110. The Docs directory index stated that RP-150310 was uploaded on “2015/03/03”. I selected the link for “RP-150310.zip” and downloaded a zip file of the same name. The zip file contained a Microsoft PowerPoint document, “RP-150310 Motivations for Study on latency reduction techniques.ppt”, with a date stamp of “03/03/2015” (European date format) the same date that the zip file was uploaded.



111. A true and correct copy of the document within the zip file (RP-150310 Motivations for Study on latency reduction techniques.ppt) is provided as Ex-1017. Based on my experience, I understand that these date stamps mean that RP-150310.zip was uploaded to 3GPP’s publicly available website on March 03, 2015, prior to the TSG RAN #67 meeting, and that any member of the public could have downloaded the zip file, extracted the PowerPoint document enclosed, and viewed the contents of said document without restriction on March 03, 2015 and thereafter.

A draft report from TSG RAN #67 made available on June 1, 2015 (**Appendix 38**), confirms the availability of RP-150310 at the meeting, as does the TDoc list for that meeting. (**Appendix 37** at 73, 112, 124; **Appendix 37** Annex B) I have no reason to believe that either the date stamp, the archived email or the report from TSG RAN #67 are inaccurate. I have therefore determined that RP-150310 was publicly available on the file server no later than March 03, 2015.

112. Based on the information above, it is my opinion that RP-150310 titled “Motivation for new SI: Study on Latency reduction techniques for LTE” and provided as Ex-1017 was publicly available to download from the 3GPP file server no later than March 03, 2015 and could have been distributed thereafter without restriction. Further, it was publicly available at the 3GPP TSG RAN #67 meeting held in Shanghai, China from March 9-12, 2015.

L. Ex-1018: 3GPP TS 36.321 V12.5.0 (2015-03) 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification (Release 12)

113. 3GPP TS 36.321 v12.5.0 is a Technical Specification titled “3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification (Release 12)”. Ex-1018.

114. The date on the face of the specification (“2015-03”) corresponds to the

year (2015) and month (March) that this version of the specification was approved by 3GPP TSG RAN and made publicly available.

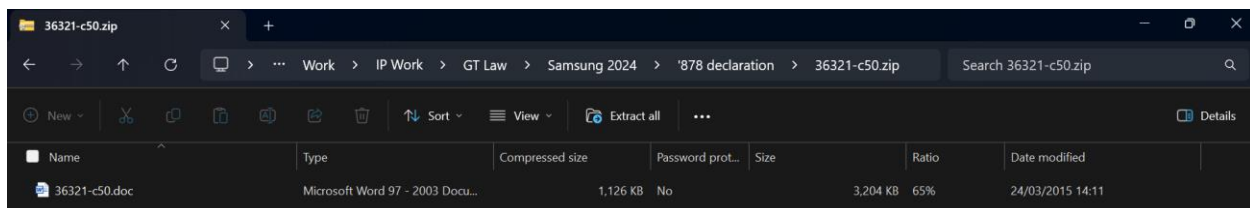
115. 3GPP TS 36.321 v12.5.0 being an approved version of the Release 12 specification on E-UTRA MAC protocol specification was created by TSG RAN #67 held March 9-12, 2015. An interested member of the public would know that the latest version of an approved specification or report would be available following the plenary meeting responsible for that specification (in this case TSG RAN) in accordance with 3GPP standard practice as described in paragraphs 31 and 53. The approval of the TS 36.321 v12.5.0 is confirmed by the approval of the Change Requests to TS 36.321 v12.4.0 documented in the draft meeting report from TSG RAN #67 (**Appendix 37** at 117) which was distributed via the TSG RAN email list on June 1, 2015 (**Appendix 38**).

116. The 3GPP file server is and always has been open to all and free from restriction such as username or password. By way of example of how an interested member of the public could access the TS 36.321 v12.5.0 technical specification from the 3GPP website, I accessed the file server by going to the 3GPP website at <http://www.3gpp.org/>, selected “Specifications & Technologies” from the menu bar, and then selected “Specifications by series” from the dropdown menu. I then selected the “36 Series” link to access the public file server where the specifications are stored. I then searched for “36.321” in the specification number search bar, and

for the TS 36.321 specification selected the eyeglasses icon that says “See details” when a cursor is placed on it. From there, I selected “Click to see all versions of this specification,” which took me to the archive housing all versions of TS 36.321 found at the following URL: https://www.3gpp.org/ftp/Specs/archive/36_series/36.321. A true and correct copy of the relevant portion of the directory listing produced by the file server website is provided below and in **Appendix 41** at 2.

	36321-c40.zip	2014/12/31 18:08	886,3 KB
	36321-c50.zip	2015/03/25 15:58	1125,2 KB
	36321-c60.zip	2015/06/30 22:42	1150,7 KB

117. The archive directory index stated that TS 36.321 v12.5.0 was uploaded on “2015/03/25”. Selecting the link for “36321-c50.zip”, I downloaded a zip file of the same name. The zip file contained a Microsoft Word document titled “36321-c50.doc” with a date stamp of “24/03/2015” (European date format). An excerpt of the zip file directory is provided below.



Name	Type	Compressed size	Password prot...	Size	Ratio	Date modified
36321-c50.doc	Microsoft Word 97 - 2003 Docu...	1,126 KB	No	3,204 KB	65%	24/03/2015 14:11

118. I have confirmed that the document “36321-c50.doc” is TS 36.321 v12.5.0. A true and correct copy of the Microsoft Word document titled “36321-

c50.doc” is the TS 36.321 v12.5.0 that is provided in EX-1018.

119. Based on my experience, I understand these date stamps to mean that 36321-c50.zip was uploaded to 3GPP’s publicly available website on March 25, 2015, and that an interested member of the public could have downloaded the zip file, extracted the Word document enclosed, viewed the contents of the Word document, and further disseminated said document without restriction on March 25, 2015 and thereafter.

M. Ex-1019: 3GPP TS 36.331 V12.5.0 (2015-03) 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification (Release 12)

120. 3GPP TS 36.331 v12.5.0 is a Technical Specification titled “3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification (Release 12)”. Ex-1019.

121. The date on the face of the specification (“2015-03”) corresponds to the year (2015) and month (March) that this version of the specification was approved by 3GPP TSG RAN and made publicly available.

122. 3GPP TS 36.331 v12.5.0 being an approved version of the Release 12 specification on E-UTRA RRC protocol specification was created by TSG RAN #67 held March 9-12, 2015. An interested member of the public would know that the

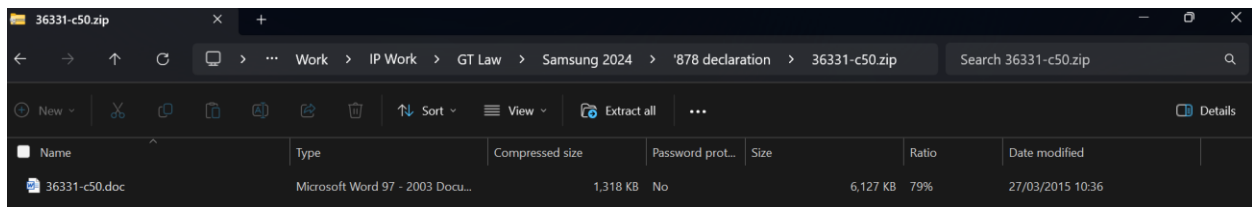
latest version of an approved specification or report would be available following the plenary meeting responsible for that specification (in this case TSG RAN) in accordance with 3GPP standard practice as described in paragraphs 31 and 53. The approval of the TS 36.331 v12.5.0 is confirmed by the approval of the Change Requests to TS 36.331 v12.4.1 documented in the draft meeting report from TSG RAN #67 (**Appendix 37** at 117) which was distributed via the TSG RAN email list on June 1, 2015 (**Appendix 38**).

123. The 3GPP file server is and always has been open to all and free from restriction such as username or password. By way of example of how an interested member of the public could access the TS 36.331 v12.5.0 technical specification from the 3GPP website, I accessed the file server by going to the 3GPP website at <http://www.3gpp.org/>, selected “Specifications & Technologies” from the menu bar, and then selected “Specifications by series” from the dropdown menu. I then selected the “36 Series” link to access the public file server where the specifications are stored. I then searched for “36.331” in the specification number search bar, and for the TS 36.331 specification selected the eyeglasses icon that says “See details” when a cursor is placed on it. From there, I selected “Click to see all versions of this specification,” which took me to the archive housing all versions of TS 36.331 found at the following URL: https://www.3gpp.org/ftp/Specs/archive/36_series/36.331. A true and correct copy of the relevant portion of the directory listing produced by the

file server website is provided below and in **Appendix 42** at 3.

	36331-c41.zip	2015/01/07 8:40	1248,2 KB
	36331-c50.zip	2015/03/27 9:37	1317,6 KB
	36331-c60.zip	2015/06/30 22:43	1350 KB

124. The archive directory index stated that TS 36.331 v12.5.0 was uploaded on “2015/03/27”. Selecting the link for “36331-c50.zip”, I downloaded a zip file of the same name. The zip file contained a Microsoft Word document titled “36331-c50.doc” with a date stamp of “27/03/2015” (European date format). An excerpt of the zip file directory is provided below.



Name	Type	Compressed size	Password prot...	Size	Ratio	Date modified
36331-c50.doc	Microsoft Word 97 - 2003 Docu...	1,318 KB	No	6,127 KB	79%	27/03/2015 10:36

125. I have confirmed that the document “36331-c50.doc” is TS 36.331 v12.5.0. A true and correct copy of the Microsoft Word document titled “36331-c50.doc” is the TS 36.331 v12.5.0 that is provided in EX-1019.

126. Based on my experience, I understand these date stamps to mean that 36331-c50.zip was uploaded to 3GPP’s publicly available website on March 27, 2015, and that an interested member of the public could have downloaded the zip file, extracted the Word document enclosed, viewed the contents of the Word

document, and further disseminated said document without restriction on March 27, 2015 and thereafter.

N. Ex-1020: 3GPP TR 36.881 V0.6.0 [R2-161964] (2016-02) 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Study on latency reduction techniques for LTE (Release 13)

127. 3GPP TR 36.881 V0.6.0 is a draft version of the Technical Report for the Study Item on latency reduction techniques for LTE. It was submitted to 3GPP TSG RAN WG2, meeting #93 in St Julian, Malta, which was held between February 15-19, 2016. The document follows the general naming format (“xminnnzzzz”) described in paragraph 39. Accordingly, “R2” indicates that the contribution was submitted to TSG RAN WG2, “16” indicates the year (2016) that this technical contribution was submitted, and “1964” is the unique number that was assigned to this contribution document. It is titled “Study on latency reduction techniques for LTE (Release 13)”.

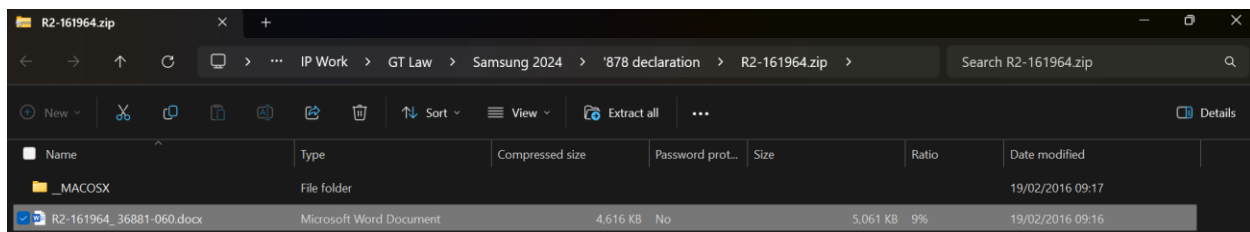
128. As I mention in paragraph 41 above, meeting documents are, and were in the 2007 to 2017 timeframe, made publicly available on the 3GPP public file server from where an interested member of the public exercising reasonable diligence could freely access them. To confirm the availability of RP-150465 on the 3GPP document server in the 2016 timeframe, I navigated to the 3GPP website at <http://www.3gpp.org>, selected “3GPP Groups” from the drop down menu, and then

selected the “RAN2 – Radio Layer 2 and Radio Layer 3 Radio Resource Control” from the 3GPP Groups page, and the “Meeting documents” link to access the public file server where documents for the TSG-RAN Working Group 2 are stored, and from where I navigated to the documents for RAN WG2 #93. A true and correct copy of the relevant portion of the Documents directory listing produced by the file server website is provided below and in **Appendix 43** at 28.

 R2-161963.zip	2016/02/19 13:28	4643,6 KB
 R2-161964.zip	2016/02/19 13:29	4616,3 KB
 R2-161965.zip	2016/02/23 9:29	31,1 KB

Available at: https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_93/Docs/

129. The Docs directory index stated that R2-161964 was uploaded on “2016/02/19”. I selected the link for “R2-161964.zip” and downloaded a zip file of the same name. The zip file contained a Microsoft Word document, “R2-161964_36881-060.doc”, with a date stamp of “19/02/2016” (European date format) the same date that the zip file was uploaded.



130. A true and correct copy of the document within the zip file (R2-

161964_36881-060.doc) is provided as Ex-1020. Based on my experience, I understand that these date stamps mean that R2-161964.zip was uploaded to 3GPP's publicly available website on February 19, 2016, at the end of the TSG RAN WG2 #93 meeting, and that any member of the public could have downloaded the zip file, extracted the Word document enclosed, and viewed the contents of said document without restriction on February 19, 2016 and thereafter. A draft report from TSG RAN WG2 #93, made available on April 7, 2016), confirms the availability of R2-161964 at the meeting, as does the TDoc list for that meeting. (**Appendix 44** at 67; **Appendix 44** Annex B). I have no reason to believe that either the date stamp or the report from TSG RAN WG2 #93 are inaccurate. I have therefore determined that R2-161964 was publicly available on the file server no later than February 19, 2016.

131. Based on the information above, it is my opinion that R2-161964 titled "Study on latency reduction techniques for LTE (Release 13)" and provided as Ex-1020 was publicly available to download from the 3GPP file server no later than February 19, 2016, and could have been distributed thereafter without restriction. Further, it was publicly available at the 3GPP TSG RAN WG2 #93 meeting held in St Julian, Malta from February 15-19, 2016.

O. Ex-1021: 3GPP TS 36.212 V13.6.0 (2017-06) 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding (Release 13)

132. 3GPP TS 36.212 v13.6.0 is a Technical Specification titled “3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding (Release 13)”. Ex-1021.

133. The date on the face of the specification (“2017-06”) corresponds to the year (2017) and month (June) that this version of the specification was approved by 3GPP TSG RAN and made publicly available.

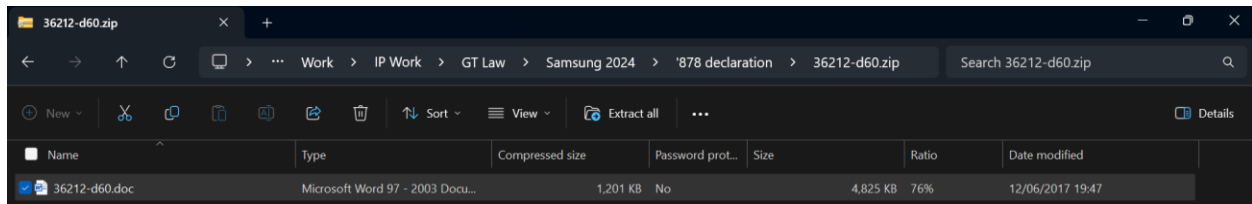
134. 3GPP TS 36.212 v13.6.0 being an approved version of the Release 13 specification on E-UTRA multiplexing and channel coding was created by TSG RAN #76 held June 5–8, 2017. An interested member of the public would know that the latest version of an approved specification or report would be available following the plenary meeting responsible for that specification (in this case TSG RAN) in accordance with 3GPP standard practice as described in paragraphs 31 and 53. The approval of the TS 36.212 v13.6.0 is confirmed by the approval of the Change Requests to TS 36.212 v13.5.0 documented in annexes B and E of the draft meeting report from TSG RAN #76 (**Appendix 45** annex B, annex E).

135. The 3GPP file server is and always has been open to all and free from restriction such as username or password. By way of example of how an interested member of the public could access the TS 36.212 v13.6.0 technical specification from the 3GPP website, I accessed the file server by going to the 3GPP website at

<http://www.3gpp.org/>, selected “Specifications & Technologies” from the menu bar, and then selected “Specifications by series” from the dropdown menu. I then selected the “36 Series” link to access the public file server where the specifications are stored. I then searched for “36.212” in the specification number search bar, and for the TS 36.212 specification selected the eyeglasses icon that says “See details” when a cursor is placed on it. From there, I selected “Click to see all versions of this specification,” which took me to the archive housing all versions of TS 36.212 found at the following URL: https://www.3gpp.org/ftp/Specs/archive/36_series/36.212. A true and correct copy of the relevant portion of the directory listing produced by the file server website is provided below and in **Appendix 36** at 2.

 36212-d50.zip	2017/03/23 11:55	1198,1 KB
 36212-d60.zip	2017/06/23 20:13	1200,7 KB
 36212-d70.zip	2018/01/05 13:33	1204,5 KB

136. The archive directory index stated that TS 36.212 v13.6.0 was uploaded on “2017/06/23”. Selecting the link for “36212-d60.zip”, I downloaded a zip file of the same name. The zip file contained a Microsoft Word document titled “36212-d60.doc” with a date stamp of “12/06/2017” (European date format). An excerpt of the zip file directory is provided below.



137. I have confirmed that the document “36212-d60.doc” is TS 36.212 v13.6.0. A true and correct copy of the Microsoft Word document titled “36212-d60.doc” is the TS 36.212 v13.6.0 that is provided in EX-1021.

138. Based on my experience, I understand these date stamps to mean that 36212-d60.zip was uploaded to 3GPP’s publicly available website on June 23, 2017, and that an interested member of the public could have downloaded the zip file, extracted the Word document enclosed, viewed the contents of the Word document, and further disseminated said document without restriction on June 23, 2017 and thereafter.

P. Ex-1022: 3GPP TS 36.213 V13.6.0 (2017-06) 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures (Release 13)

139. 3GPP TS 36.213 v13.6.0 is a Technical Specification titled “3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures (Release 13)”. Ex-1022.

140. The date on the face of the specification (“2017-06”) corresponds to the

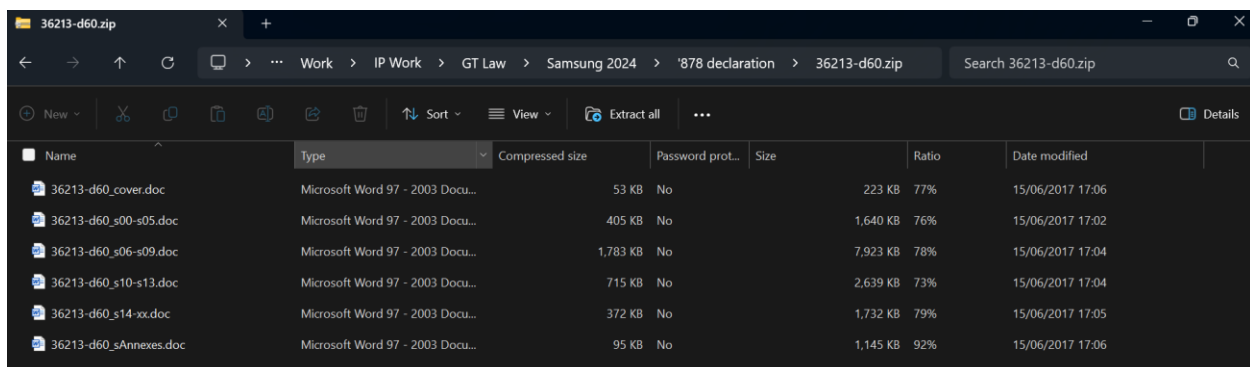
year (2017) and month (June) that this version of the specification was approved by 3GPP TSG RAN and made publicly available.

141. 3GPP TS 36.213 v13.6.0 being an approved version of the Release 13 specification on E-UTRA physical layer procedures was created by TSG RAN #76 held June 5–8, 2017. An interested member of the public would know that the latest version of an approved specification or report would be available following the plenary meeting responsible for that specification (in this case TSG RAN) in accordance with 3GPP standard practice as described in paragraphs 31 and 53. The approval of the TS 36.213 v13.6.0 is confirmed by the approval of the Change Requests to TS 36.213 v13.5.0 documented in annexes B and E of the meeting report from TSG RAN #76 (**Appendix 45** annex B, E). The 3GPP file server is and always has been open to all and free from restriction such as username or password. By way of example of how an interested member of the public could access the TS 36.213 v13.6.0 technical specification from the 3GPP website, I accessed the file server by going to the 3GPP website at <http://www.3gpp.org/>, selected “Specifications & Technologies” from the menu bar, and then selected “Specifications by series” from the dropdown menu. I then selected the “36 Series” link to access the public file server where the specifications are stored. I then searched for “36.213” in the specification number search bar, and for the TS 36.213 specification selected the eyeglasses icon that says “See details” when a cursor is placed on it. From there, I

selected “Click to see all versions of this specification,” which took me to the archive housing all versions of TS 36.213 found at the following URL: https://www.3gpp.org/ftp/Specs/archive/36_series/36.213. A true and correct copy of the relevant portion of the directory listing produced by the file server website is provided below and in **Appendix 39** at 3.

	36213-d50.zip	2017/03/23 11:57	3403,7 KB
	36213-d60.zip	2017/06/23 20:15	3420,7 KB
	36213-d70.zip	2017/09/26 19:58	3419,3 KB

142. The archive directory index stated that TS 36.213 v13.6.0 was uploaded on “2017/06/23”. Selecting the link for “36213-d60.zip”, I downloaded a zip file of the same name. The zip file contained six Microsoft Word documents, each with a title beginning with “36213-d60” and a date stamp of “15/06/2017” (European date format). An excerpt of the zip file directory is provided below.



Name	Type	Compressed size	Password prot...	Size	Ratio	Date modified
36213-d60_cover.doc	Microsoft Word 97 - 2003 Docu...	53 KB	No	223 KB	77%	15/06/2017 17:06
36213-d60_s00-s05.doc	Microsoft Word 97 - 2003 Docu...	405 KB	No	1,640 KB	76%	15/06/2017 17:02
36213-d60_s06-s09.doc	Microsoft Word 97 - 2003 Docu...	1,783 KB	No	7,923 KB	78%	15/06/2017 17:04
36213-d60_s10-s13.doc	Microsoft Word 97 - 2003 Docu...	715 KB	No	2,639 KB	73%	15/06/2017 17:04
36213-d60_s14-xx.doc	Microsoft Word 97 - 2003 Docu...	372 KB	No	1,732 KB	79%	15/06/2017 17:05
36213-d60_sAnnexes.doc	Microsoft Word 97 - 2003 Docu...	95 KB	No	1,145 KB	92%	15/06/2017 17:06

143. I have confirmed that the six documents with titles beginning with

“36213-d60” are TS 36.213 v13.6.0. A true and correct copy of the six Microsoft Word documents with titles beginning with “36213-d60” are the TS 36.213 v13.6.0 that is provided in EX-1022.

144. Based on my experience, I understand these date stamps to mean that 36213-d60.zip was uploaded to 3GPP’s publicly available website on June 23, 2017, and that an interested member of the public could have downloaded the zip file, extracted the Word document enclosed, viewed the contents of the Word document, and further disseminated said document without restriction on June 23, 2017 and thereafter.

Q. Ex-1023: 3GPP TS 36.321 V12.6.0 (2015-06) 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification (Release 12)

145. 3GPP TS 36.321 v12.6.0 is a Technical Specification titled “3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification (Release 12)”. Ex-1023.

146. The date on the face of the specification (“2015-06”) corresponds to the year (2015) and month (June) that this version of the specification was approved by 3GPP TSG RAN and made publicly available.

147. 3GPP TS 36.321 v12.6.0 being an approved version of the Release 12

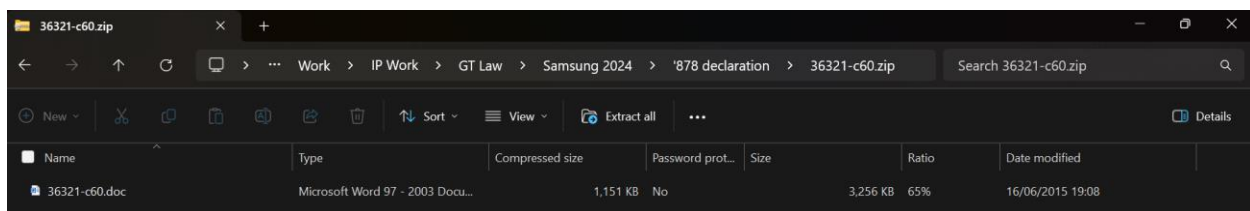
specification on E-UTRA MAC protocol specification was created by TSG RAN #68 held June 15-18, 2015. An interested member of the public would know that the latest version of an approved specification or report would be available following the plenary meeting responsible for that specification (in this case TSG RAN) in accordance with 3GPP standard practice as described in paragraphs 31 and 53. The approval of the TS 36.321 v12.6.0 is confirmed by the approval of the Change Request to TS 36.321 v12.5.0 documented in the draft meeting report from TSG RAN #68 (**Appendix 46** at 154) which was distributed via the TSG RAN email list on August 3, 2015 (**Appendix 47**).

148. The 3GPP file server is and always has been open to all and free from restriction such as username or password. By way of example of how an interested member of the public could access the TS 36.321 v12.6.0 technical specification from the 3GPP website, I accessed the file server by going to the 3GPP website at <http://www.3gpp.org/>, selected “Specifications & Technologies” from the menu bar, and then selected “Specifications by series” from the dropdown menu. I then selected the “36 Series” link to access the public file server where the specifications are stored. I then searched for “36.321” in the specification number search bar, and for the TS 36.321 specification selected the eyeglasses icon that says “See details” when a cursor is placed on it. From there, I selected “Click to see all versions of this specification,” which took me to the archive housing all versions of TS 36.321 found

at the following URL: https://www.3gpp.org/ftp/Specs/archive/36_series/36.321. A true and correct copy of the relevant portion of the directory listing produced by the file server website is provided below and in **Appendix 41** at 2.

 36321-c50.zip	2015/03/25 15:58	1125,2 KB
 36321-c60.zip	2015/06/30 22:42	1150,7 KB
 36321-c70.zip	2015/09/24 8:09	1139,6 KB

149. The archive directory index stated that TS 36.321 v12.6.0 was uploaded on “2015/06/30”. Selecting the link for “36321-c60.zip”, I downloaded a zip file of the same name. The zip file contained a Microsoft Word document titled “36321-c60.doc” with a date stamp of “16/06/2015” (European date format). An excerpt of the zip file directory is provided below.



Name	Type	Compressed size	Password prot...	Size	Ratio	Date modified
36321-c60.doc	Microsoft Word 97 - 2003 Docu...	1,151 KB	No	3,256 KB	65%	16/06/2015 19:08

150. I have confirmed that the document “36321-c60.doc” is TS 36.321 v12.6.0. A true and correct copy of the Microsoft Word document titled “36321-c60.doc” is the TS 36.321 v12.6.0 that is provided in EX-1023.

151. Based on my experience, I understand these date stamps to mean that 36321-c60.zip was uploaded to 3GPP’s publicly available website on June 30, 2015,

and that an interested member of the public could have downloaded the zip file, extracted the Word document enclosed, viewed the contents of the Word document, and further disseminated said document without restriction on June 30, 2015 and thereafter.

V. CONCLUSIONS

152. In conclusion, my opinions are as follows:

- Ex-1005 (R2-153374) was publicly available to download from the 3GPP file server no later than August 14, 2015;
- Ex-1006 (R2-154192) was publicly available to download from the 3GPP file server no later than September 26, 2015;
- Ex-1007 (R2-153332) was publicly available to download from the 3GPP file server no later than August 14, 2015;
- Ex-1008 (R2-153333) was publicly available to download from the 3GPP file server no later than August 14, 2015;
- Ex-1009 (3GPP TS 36.212 V13.0.0) was publicly available to download from the 3GPP file server no later than January 5, 2016;
- Ex-1010 (3GPP TS 36.213 V12.5.0) was publicly available to download from the 3GPP file server no later than March 25, 2015;
- Ex-1013 (R1-073322) was publicly available to download from the 3GPP file server and from an email sent to the RAN WG1 email reflector no later than August 15, 2007;
- Ex-1014 (R1-073858) was publicly available to download from the 3GPP file server no later than August 29, 2007;
- Ex-1015 (R1-074383) was publicly available to download from the 3GPP

file server and from an email sent to the RAN WG1 email reflector no later than October 3, 2007;

- Ex-1016 (RP-150465) was publicly available to download from the 3GPP file server no later than March 12, 2015;
- Ex-1017 (RP-150310) was publicly available to download from the 3GPP file server no later than March 3, 2015;
- Ex-1018 (3GPP TS 36.321 V12.5.0) was publicly available to download from the 3GPP file server no later than March 25, 2015;
- Ex-1019 (3GPP TS 36.331 V12.5.0) was publicly available to download from the 3GPP file server no later than March 27, 2015;
- Ex-1020 (3GPP TR 36.881 V0.6.0 [R2-161964]) was publicly available to download from the 3GPP file server no later than February 19, 2016;
- Ex-1021 (3GPP TS 36.212 V13.6.0) was publicly available to download from the 3GPP file server no later than no later than June 23, 2017;
- Ex-1022 (3GPP TS 36.213 V13.6.0) was publicly available to download from the 3GPP file server no later than June 23, 2017;
- Ex-1023 (3GPP TS 36.321 V12.6.0) was publicly available to download from the 3GPP file server no later than June 30, 2015.

153. Further, for each of the documents in the bulleted list above, a POSITA exercising reasonable diligence could have downloaded the corresponding zip file, extracted the document enclosed, viewed the contents of the document, and further disseminated said document without restriction as of the dates identified above.

154. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. I hereby declare that all statements

made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

March 7, 2024



Printed Name: Craig Bishop