

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Apple Inc.,

Petitioner,

- vs. -

Togail Technologies Ltd.,

Patent Owner.

U.S. Patent No. 10,791,502

DECLARATION OF CRAIG BISHOP

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I. INTRODUCTION

I, Craig Bishop, declare as follows:

1. I have been retained as an independent expert witness on behalf of Apple Inc. related to *Inter Partes* Review (“IPR”) of U.S. Patent No. 10,791,502 (“the ’502 patent”).
2. I am being compensated for my work in this matter at my accustomed 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. In the preparation of this declaration I have reviewed Exhibits Ex.1007, Ex.1008, Ex.1012, and Ex.1013, each of which is a type of material that experts in my field would reasonably rely upon when forming their opinions.
4. In forming the opinions expressed within this declaration, I have considered:
 - 1) The exhibits listed above; and
 - 2) My own academic background, knowledge, and professional experiences in the field of wireless communications and 3GPP standards-development, as described below.
5. Although 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 has been submitted as Ex.1006. 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 when available, and proposing changes as necessary to ensure input 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 GSM/GPRS, UMTS, and LTE/EPS systems. Initially, I participated in ETSI Special Mobile Group (SMG) committees SMG1, SMG2, SMG4, SMG5, SMG9 and relevant UMTS related sub-committees until 1999, working on the air interface radio access network protocols, service, and terminal aspects of UMTS and GSM/GPRS. I was specifically involved in the ETSI SMG2 meetings leading up to selection of WCDMA as the radio access technology for the Frequency Division Duplex 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 TSG meetings held in December 1998, and I began attending Working Group (WG) meetings in 1999. I mainly attended Radio Access Network (RAN) WG1, RAN WG2, Services & System Aspects (SA) WG1, Terminals (T) WG2, and other Working Groups and Technical Specification Group (TSG) plenary meetings covering similar technical

aspects as in my previous work in ETSI. As examples, RAN WG1 was, and is, a Working Group responsible for the specification of the physical layer of the latest wireless cellular standards, and RAN WG2 was, and is, a Working Group responsible for signaling protocol layers 2 and 3 residing just above the physical layer. 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 contributions, typically all of the meeting's 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 engineer 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 project, 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 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, and 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 2006 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.

16. My company Bishop Communications Ltd is a member of ETSI, and as part of various projects undertaken, I have continued to regularly access the 3GPP and ETSI document servers, and to keep abreast of 3GPP and ETSI document handling practices.

17. Through my extensive work on 3GPP standardization issues, I have become very familiar with 3GPP's practices relating to making final specifications, draft standards, and standards-related contributions publicly available.

18. For the purposes of my analysis in this declaration, I have been informed by counsel that a person of ordinary skill in the art ("POSITA") in the field of the '502 Patent in the 2017 timeframe, would include someone who had a Bachelor's degree in electrical engineering, computer engineering, computer science, or equivalent training, and at least 2 - 3 years of technical experience working in the field of cellular telecommunication, including experience designing

or implementing 4G / 5G networks. Moreover, I recognize that additional education may substitute for some of the experience, and experience may substitute for educational background.

III. PUBLIC AVAILABILITY OF 3GPP STANDARDS PROPOSALS AND TDOCS

19. Based on my years of experience working in various capacities on 3GPP standards issues, I am familiar with the regular business practices of the 3rd Generation Partnership Project (“3GPP”) relating to technical documents including how 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). Ex.1101 at 238. At that time, various standards organizations agreed to cooperate to produce a complete set of globally applicable Technical Specifications for the next 3G standard that would then be transposed into standards by regional standardizations bodies.

21. 3GPP is a partnership between organizational partners, market representation partners, and individual members such as companies. Ex.1106 at 4-8

(3GPP Working Procedures, 2000). By January 2000, there were 284 companies participating as members of 3GPP. Ex.1101, 241. And by 2017, there were 583 members. Ex.1112, 10.

22. 3GPP produces technical standards 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. Beginning in 1998 and continuing through today, POSITAs were tracking the developments of the latest 3GPP specifications and reports to ensure that the standards being developed were in line with the technologies being developed by their employers, and vice-versa. It is my opinion that a POSITA in cellular communications would have to be familiar with 3GPP and the specification-related documents in order to properly perform their job. Indeed, even from the early days of 3GPP, textbooks and articles about cellular communications commonly directed readers to the 3GPP website for information regarding standards development. Ex.1101, 246; Ex.1107, 37. As a POSITA in cellular communications myself by 1999, I would regularly visit and refer others to the 3GPP website for the latest developments in 3G and have continued to do so since that time for the evolution and subsequent generations of mobile communications systems.

23. My personal experience at Samsung confirms 3GPP's prominence as

the preeminent mobile communications specifications setting body even from shortly after its inauguration when engineers and managers at Samsung responsible for developing 3G modem software (but not attending 3GPP meetings) would regularly ask me about which release(s) or version(s) of given 3GPP specifications they should be developing their products. By June 2017, its preeminence had long since been secured and there were 5 billion subscribers to systems employing the GSM family of technologies specified by 3GPP. *E.g.*, Ex.1111, Ex.1110.

b. 3GPP's Policy of Making Documents Public

24. 3GPP's policy has always been to make 3GPP documents available to the public. Because the purpose of 3GPP was worldwide adoption of a common standard, no restrictions on distribution or discussion were placed on 3GPP documents, but rather the dissemination and sharing of 3GPP documents was specifically encouraged and necessary for creating an industry-wide standard. Ex.1108, 8 ("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

25. Within 3GPP, responsibility for producing specifications has always been delegated to Technical Specification Groups (TSGs). Ex.1106, 11. At its inception, 3GPP was divided into four Technical Specification Groups (TSGs), each covering a particular category of technology, one such TSG being the Radio

Access Network (RAN). POSITAs will be aware of the division of work by subject matter among the TSGs and among the Working Groups (WGs) within each TSG. Ex.1102, 175–76; Ex.1103, 46 (Figure 4.3 showing division of work by subject matter among RAN WGs in 2001). In the 2017-2018 timeframe, there remained three Technical Specifications Groups each comprising a number of Working Groups (WGs). Ex.1109. Each WG also focusses on particular subject matter, and the majority of the standards-development work is conducted at the WG level in regular (approximately bi-monthly) meetings. Ex.1101, 243. In addition, particularly at times when major new technologies are being defined, ad hoc meetings are sometimes held that focus only on those technologies, *e.g.*, LTE, 5G New Radio (“5G NR” or just “NR”). A description of each Working Group’s technology area can be found on the Working Group home pages on the 3GPP website. *See, e.g.*, Ex.1116 (RAN WG2 Homepage). For example, RAN WG2 (also called “RAN2” or “R2”) was and remains “in charge of the Radio Interface architecture and protocols (MAC, RLC, PDCP)” including “the specification of the Radio Resource Control (RRC) protocol.” Ex.1116, 1.

26. The Working Groups meet regularly. The attendees (also called “delegates”) at these meetings are engineers representing telecommunications companies from around the world, including Nokia, Samsung, AT&T, Ericsson, Qualcomm, and Huawei among others. Ex.1115. RAN Working Group 2 meetings

often had around 300 delegates in attendance in 2017 - 2018. Ex.1115, (listing 295 delegate participants at RAN WG2 Meeting #101). The vast majority of these delegates were and would have represented POSITAs.

27. Although attendance at 3GPP meetings was generally limited to 3GPP members, the public, including POSITAs, would have been made aware of Working Group meeting dates and times as well as the technical documents it produced on 3GPP's website. Ex.1116 (archived RAN WG2 page having links to meeting information, email exploder lists, and technical documents); Ex.1114 (3GPP Calendar page). Interested POSITAs would have been well aware of the meeting information pages for each TSG Working Group in 2017 - 2018.

d. 3GPP Documents – TDocs

28. 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 are produced. As relevant to this case, the 3GPP process involves the consideration of temporary documents or "TDocs," which are also referred to as proposals, contributions, or change requests. TDocs result in the production of technical specifications.

29. Prior to each Working Group meeting, members of the Working Group prepare TDocs to *e.g.*, identify, discuss, and/or propose a new feature or change(s) to an existing feature or to identify a technical issue for discussion.

POSITAs will know that TDocs can be a helpful source of technical information regarding the 3GPP specifications. Ex.1102, 175 (textbook explaining that “[o]ne way to find a more detailed description of the specific methodology or parameter in the specification is to go through the contribution papers (called technical documents, or tdocs) that 3GPP uploads on their meeting website”).

30. Each TDoc is assigned a TDoc number, according to a standard format set by 3GPP.¹ As described in the 3GPP Working Procedures from 2016, the numbering system followed the format xminnnzzzz. Ex.1113,19-20. This is the same format that has been in use since 1999. Within the format, “x” referred to the relevant TSG. For example, “R” was used for TSG RAN. Likewise, “m” referred to the relevant Working Group. Ex.1113, 20. A document for RAN WG2 would therefore begin with “R2.” Ex.1113, 20. The two digits “nn” represented the year (*e.g.*, 17), and the digits “zzzz” represented the unique document number². Ex.1113, 20.

31. 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

¹ Some documents other than technical contributions (such as meeting reports) were also assigned TDoc numbers, for ease of reference.

² In 1999 there were three ‘z’ digits, increasing to four in 2000. A fifth ‘z’ digit was added by RAN Working Group 2 from 2017 to cater for the increasing number of TDocs being submitted each year.

3GPP website for public viewing prior to the relevant Working Group meeting listed on the TDoc, although some TDocs, including those created during meetings, were uploaded during or after the meeting. Ex.1108, 9. Specifically, “TDoc numbers start to be allocated some weeks before a 3GPP meeting, and the authors then create [the TDocs] and they or the group’s secretary *uploads them to the public file server as soon as possible.*” Ex.1108, 9 (emphasis added). The documents were uploaded to the public file repository in an area allocated to the particular Working Group. Ex.1116 (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 is the process that POSITAs have known to be in place for decades which has been in place since I began attending Working Group meetings in 1999.

e. Distribution over the 3GPP Listserv

32. An important means of distributing draft specifications and other information to 3GPP members, interested POSITAs, and interested members of the public was through the 3GPP email listservs (also referred to as the “email exploder” or “email reflector”). All TSGs and Working Groups, including TSG RAN, RAN WG1, and RAN WG2, have listservs corresponding to their groups. Each listserv acts as an email alias that distributes emails and email attachments sent to that alias to every person subscribed to that listserv.

33. Subscribing to a listserv was simple and was open to any member of the public—not just 3GPP members. Ex.1146. The email listservs were featured prominently on 3GPP’s Specification Groups page and could be accessed via the “Email Lists” link. Ex.1145. That link would take a user to a page providing instructions to subscribe to and access the list of ETSI email listservs including those for 3GPP. Ex.1146. It is my opinion that the 3GPP email listservs were well known among persons interested in following or participating in the development of wireless cellular standards. Ex.1101, 240 (textbook noting that “[g]iven that 3GPP has participants from all over the world, the use of the Internet, email exploders [*i.e.*, listservs] and other such facilities have proved invaluable for distributing and sharing information, working drafts and so on”); Ex.1105, Section 5 (“The vast majority of the technical discussions and decision making in both IETF and 3GPP is done over mailing lists. ... It is recommended that interested individuals subscribe to and participate in these lists.”).

34. There were hundreds of subscribers (and often over a thousand) to the RAN WG1 and RAN WG2 listservs. Ex.1144. The people that subscribed were typically engineers, such as me, but also technology strategists and technical managers. The subscriber list typically included at least all those persons who planned to attend an upcoming meeting where a TDoc may be discussed. The typical practice among people who were to attend an upcoming meeting was to use

the WG's listserv to review and discuss opinions about the ideas conveyed in TDocs. The email listserv for RAN WG2 provided an efficient way for contributors to quickly and efficiently disseminate their views. The number of subscribers for a particular WG listserv usually far exceeded the number of people attending those WG meetings. For example, 295 delegates attended RAN WG2 Meeting #101, whereas the RAN WG2 email list had around 1000 subscribers between 2012 and 2021. *See, e.g.,* Ex.1144, Ex.1143.

35. No confidentiality limitations or restrictions on further dissemination were placed on documents distributed via the listservs. Ex.1108, 9 (“This distribution on the group’s email exploder is important, because once that happens, *the document is effectively in the public domain*, since membership of the exploder is open to all and is (almost) unpoliced.”) (emphasis added). This has been the practice and understanding since I became involved with 3GPP in 1998-1999. The listservs were also used to distribute information about upcoming TSG or WG meetings, such as invitations, draft agenda and draft reports for each meeting. *E.g.,* Ex.1142 (listserv emailed invitation to RAN2 meeting #101); Ex.1141 (listserv emailed draft agenda for RAN2 meeting #101); Ex.1140 (listserv email attaching draft report from RAN2 meeting #101).

36. The listserv emails were (and remain) archived in a public online archive (available at <http://list.etsi.org/scripts/wa.exe?INDEX>). In my experience,

this archive has existed and been accessible to POSITAs since the email lists were created in 1998. Ex.1104 (archived copy of 1998 email). Each archived email contains a computer-generated date stamp indicating when the email was sent and thereby when any attached document became publicly disclosed through distribution to listserv subscribers. The listserv archives are text searchable, and include advanced searching features. For example, and without limitation, the archives can be searched using keywords, quoted phrases, and terms and connectors (e.g., “and,” “or,” and “and not”). The archives have been text searchable since at least 2002.

f. The 3GPP Website’s Public File Repository

37. All TDocs, technical reports, and technical specifications have also always been freely available to interested POSITAs (and to any interested member of the public) through the public file repository accessible via the 3GPP website. POSITAs 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.

38. It is my opinion that, during the relevant 2017 - 2018 timeframe, POSITAs could and did 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.

39. An interested POSITA (or any member of the public) could locate documents of interest by first navigating a web browser to the 3GPP website (www.3gpp.org/home.htm). For example, in the 2017 - 2018 timeframe, to locate documents from the 3GPP home page, a user could have clicked “Specification Group” and then the link to the Working Group of their choice, e.g., RAN WG2. Ex.1109; Ex.1116. The accessed page contained links to the 3GPP’s public file repository. Ex.1139. By way of an alternative to navigating to the 3GPP file repository from the 3GPP website, a user could have accessed the file repository directly through the web address www.3gpp.org/ftp. Ex.1138, or using dedicated FTP client software connecting to [ftp.3gpp.org](ftp://ftp.3gpp.org).

40. The top two levels of indexing within the file repository are 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:

www.3gpp.org - /FTP/

[\[To Parent Directory.\]](#)

11/13/2017 12:09 PM	<dir> Email_Discussions
7/7/2017 9:16 AM	<dir> Inbox
5/22/2017 9:28 AM	<dir> Information
9/26/2012 4:03 PM	<dir> Invitation
11/8/2016 2:18 PM	<dir> Joint_Meetings
11/28/2017 5:07 AM	<dir> Meetings_3GPP_SYNC
12/15/2017 7:25 AM	<dir> Op
1/4/2018 1:44 PM	<dir> PCG
12/21/2017 4:25 PM	<dir> Specs
1/25/2018 10:01 PM	<dir> TdocListDefault
11/4/2008 6:53 PM	<dir> tsg_cn
2/17/2015 9:49 AM	<dir> tsg_ct
2/10/2016 2:55 PM	<dir> tsg_geran
1/23/2018 1:34 PM	<dir> tsg_ran
9/17/2014 11:00 AM	<dir> tsg_sa
11/4/2008 9:08 PM	<dir> tsg_t
11/7/2014 4:28 PM	<dir> webExtensions
10/13/2017 1:16 PM	<dir> workshop

Ex.1138. 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:

www.3gpp.org - /ftp/tsg_ran/

[\[To Parent Directory\]](#)

7/19/2017 12:52 PM	<dir> AHG1_ITU_Coord
1/18/2018 4:27 PM	<dir> TSG_RAN
1/23/2018 1:37 AM	<dir> WG1_RL1
1/21/2018 6:38 PM	<dir> WG2_RL2
1/23/2018 10:16 PM	<dir> WG3_Iu
1/22/2018 3:23 AM	<dir> WG4_Radio
1/26/2018 3:04 PM	<dir> WG5_Test_ex-T1
1/26/2018 1:26 PM	<dir> WG6_legacyRAN
11/4/2008 8:08 PM	<dir> WGs_LongTermEvolution

Ex.1137. For example, if the individual were interested in the Radio Interface architecture and protocols (MAC, RLC, PDCP), the specification of the Radio Resource Control protocol, the strategies of Radio Resource Management and the services provided by the physical layer to the upper layers, the individual would know to choose the folder for WG2. Ex.1139.

41. 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:

www.3gpp.org - /ftp/tsg_ran/WG2_RL2/

[\[To Parent Directory\]](#)

2/8/2011 10:34 AM	<dir> Invitation
12/18/2017 3:24 PM	<dir> Org
11/4/2008 7:35 PM	<dir> Outgoing Liaisons
4/30/2004 1:00 PM	95515 R2_1999.zip
12/21/2000 7:03 PM	120168 R2_2000.zip
1/4/2002 6:12 PM	137260 R2_2001.zip
1/21/2003 2:07 PM	160005 R2_2002.zip
11/24/2003 10:08 AM	124992 R2_2003.zip
12/1/2004 9:45 AM	141308 R2_2004.zip
11/14/2005 12:57 PM	175578 R2_2005.zip
2/2/2009 8:12 AM	1077609 R2_2008.zip
1/7/2012 2:26 AM	1446267 R2_2009.zip
1/7/2012 2:27 AM	1255434 R2_2010.zip
2/14/2012 12:07 AM	1217064 R2_2011.zip
3/17/2013 10:32 PM	1138815 R2_2012.zip
2/19/2014 8:15 PM	863709 R2_2013.zip
8/11/2015 9:19 AM	446259 R2_2014.zip
2/9/2016 10:03 AM	522185 R2_2015.zip
9/5/2016 8:35 AM	<dir> R2 TSs TRs early versions
1/8/2018 12:58 AM	<dir> Specifications
11/4/2008 7:35 PM	<dir> TSGR2_01
11/4/2008 7:35 PM	<dir> TSGR2_02
11/4/2008 7:35 PM	<dir> TSGR2_03
11/4/2008 7:35 PM	<dir> TSGR2_04
11/4/2008 7:35 PM	<dir> TSGR2_05
11/4/2008 7:36 PM	<dir> TSGR2_06
11/4/2008 7:36 PM	<dir> TSGR2_07
1/21/2018 6:37 PM	<dir> TSGR2_08
11/4/2008 7:36 PM	<dir> TSGR2_09
11/4/2008 7:36 PM	<dir> TSGR2_10
12/2/2017 7:06 AM	<dir> TSGR2_100
9/14/2017 10:31 AM	<dir> TSGR2_101

Ex.1139. As shown, a folder existed for each meeting. For example,

“TSGR2_101” corresponds to TSG RAN WG2 Meeting #101, and the timestamp associated with the meeting #101 directory indicates that as of January 27, 2018 (the date of the archive in Ex.1139), it had last been updated on September 14,

2017. Ex.1139.

42. A POSITA would know which meeting(s) would have covered particular subject matter based on the publicly available meeting agendas. *E.g.*, Ex.1136 (proposed agenda for RAN WG2 Meeting #101). Many POSITAs would have received the meeting agendas directly via the WG listservs Ex.1141. The meeting agendas were usually stored on the 3GPP website server within the agenda folder for each meeting. Ex.1135 (RAN WG2 Meeting #101 Folder). Further, A POSITA could ascertain what subject matter was addressed at each meeting by reviewing the draft or approved report issued after each meeting. *E.g.*, Ex.1130 (draft report of RAN WG2 Meeting #101). Such reports were also included within each meeting folder:



[www.3gpp.org / ftp / tsg_ran / WG2_RL2 / TSGR2_101](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_101)

sort by name/desc	sort by date/desc	sort by size/desc
 Agenda	2018/02/24 18:17	
 Docs	2018/05/16 8:33	
 Invitation	2017/10/17 19:57	
 LSin	2018/03/02 17:52	
 LSout	2018/04/09 9:33	
 Report	2018/04/24 10:15	
 Tdoclists	2018/03/02 17:53	

Ex.1135.

In my experience, whilst the servers used for 3GPP file repository and many of its directories have been updated since 1999, the original upload date for files including specifications has always been preserved, providing a true and accurate indication of their earliest availability for download.

43. Once an individual navigated to the desired meeting folder, for example “TSGR2_101,” 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 POSITAs would have known to review the summary meeting report for each meeting, as well as the email listserv, to determine what topics were discussed at that meeting. Ex.1134; Ex.1140; Ex.1133 (list of TDocs submitted to RAN WG2 #101); Ex.1133 (ftp directory listing for RAN WG2 #101 TDocs list). It was common knowledge that a list of TDocs existed and that it could be used to identify relevant TDocs. In the TDocs list, each TDoc was listed by TDoc number, title (reflecting subject matter), source (*i.e.*, the party who contributed the TDoc), as well as the agenda item that TDoc related to and other parameters. Ex.1132. For example, the end of meeting (“eom”) TDocs list for from RAN WG2 Meeting #101 indicates that some 2405 documents were submitted for that meeting. Thus, a POSITA could narrow the set of relevant TDocs to those of interest based on the categorization of the TDoc by agenda item. It was also well

known to POSITAs that a list of TDocs for a particular Working Group meeting was accessible via on the 3GPP website.

44. Many TDocs were uploaded to the public file server for public viewing prior to the relevant meeting (although some TDocs were submitted during or soon after the meetings). Throughout 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. Ex.1108, 8 (3GPP FAQs, advising this). It was well known that the TDocs for an upcoming meeting would be stored on an associated directory on the 3GPP server. Given that any member of the public, including interested POSITAs, could and were likely to subscribe to a relevant Working Group listserv, it would have been simple to locate the location of relevant TDocs on the 3GPP file server based on well-known 3GPP practice and information sent out over the listserv.

45. 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. Indeed, “the time stamp of the Zip file can be relied upon to indicate when the upload occurred.”

Ex.1108, 9 (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.

IV. Ex.1007, R2-1801795 (“OPPO”)

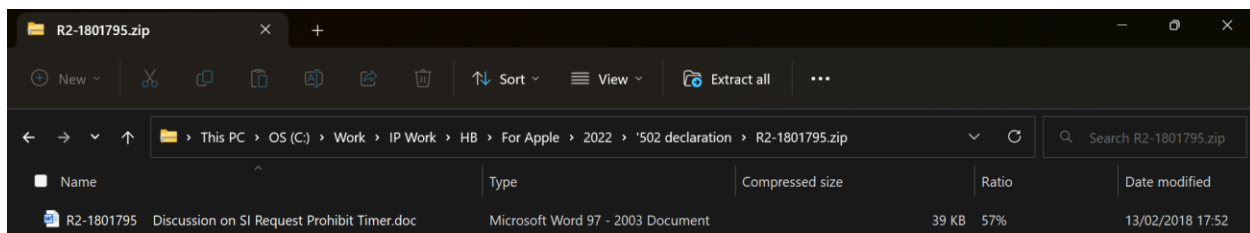
46. 3GPP R2-1801795 is a RAN WG2 TDoc titled “Discussion on SI Request Prohibit Timer” submitted by OPPO. Ex.1007, 1. The document, hereinafter referred to as “OPPO,” indicates that it was submitted to the “3GPP TSG-RAN WG2#101” meeting that took place “26th February – 2nd March 2018.” Ex.1007, 1. The document number is reflected on the first page of the document. Ex.1007, 1. To obtain this document, I directed a web browser to the URL https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_101/Docs/zip. Ex.1134. I selected the link for “R2-1801795.zip” and downloaded a zip file of the same name. Ex.1134, 3. The zip file contained a Microsoft Word document, titled “R2-1801795 Discussion on SI Request Prohibit Timer.doc.” A true and correct copy of the Word document within the zip file (R2-1801795 Discussion on SI Request Prohibit Timer.doc) is the exhibit that is provided as Ex.1007.

47. R2-1801795.zip was uploaded to and available for download from 3GPP’s public file repository on the 3GPP website as of February 13, 2018, as evidenced by the upload date corresponding to that file:

 R2-1801793.zip	2018/02/13 10:18	24,4 KB
 R2-1801794.zip	2018/02/14 13:44	34,7 KB
 R2-1801795.zip	2018/02/13 10:19	39 KB
 R2-1801796.zip	2018/02/12 8:02	64,2 KB
 R2-1801797.zip	2018/02/12 8:02	22,6 KB

Ex.1134, 3.

48. The Word document “R2-1801795 Discussion on SI Request Prohibit Timer.doc” that was contained in R2-1801795.zip, has a last modified date of 13/02/2018 (European date format), as shown in the screenshot below.



Ex.1128.

49. An interested POSITA would have been capable of navigating to relevant 3GPP documents on the 3GPP website using reasonable diligence. On and after Feb 13, 2018, a user could access 3GPP’s public file repository through the “Meeting documents” link on the relevant RAN WG2 home page. Ex.1116. As described in paragraph 31, the Working Group home pages could be accessed from the 3GPP home page by selecting “Specification Groups,” which would take the user to the Specification Groups page showing the TSG structure organized by

subject matter. Ex.1129. A user could then select “RAN WG2,” which would access the RAN WG2 home page, from where meeting documents could be directly accessed. Ex.1116. An interested POSITA would have known which TSG working group to focus on based on the subject matter they were interested in.

50. Additionally, a POSITA navigating the 3GPP website would have been directed to OPPO by accessing the TDoc list for RAN WG2 #101 which was itself available from March 2, 2018. Ex.1133. Based on my personal experience of accessing the 3GPP website during the relevant timeframe, it was well known to POSITAs that a TDoc list was maintained for each meeting on the FTP server, and POSITAs knew to reference the TDoc list to identify relevant technical documents. The end of meeting tdoc list for RAN WG2 #101 lists OPPO along with its document title “Discussion on SI Request Prohibit Timer.” And agenda item. Ex.1132.

51. The upload time stamp indicates that R2-1801795.zip was uploaded to 3GPP’s publicly available website on February 13, 2018, and that any member of the public could have downloaded the zip file, extracted the Word document enclosed, and viewed the contents of the Word document without restriction on February 13, 2018 and anytime thereafter. Based on my personal knowledge and experience, this time stamp accurately reflects the date the document was uploaded to the 3GPP public file repository and available to the public for download, and I

have no reason to believe this particular time stamp is inaccurate. I have determined that Ex.1007 was available for any member of the public to download from the 3GPP website no later than February 13, 2018.

52. The draft report for RAN WG2 #101 lists R2-1801795 (OPPO) under agenda item 10.4.1.6.6 which covers “On demand System Information”, being the subject matter to which R2-1801795 pertains. The fact that the draft report from RAN WG2 #101, which was itself distributed on March 23, 2018, mentions R2-1801795 (OPPO), further supports the accuracy of the February 13, 2018 upload date on the 3GPP website. 3GPP documents were and remain freely available and were not burdened by any confidentiality requirements or restrictions on further dissemination.

53. It is my opinion, therefore, that by February 13, 2018, an interested POSITA using reasonable diligence could have located OPPO on the 3GPP website, downloaded the reference without providing any credentials, and disseminated the reference to others without restriction.

V. Ex.1108, R2-1802094 (“Vivo”)

54. 3GPP R2-1802094 is a RAN WG2 TDoc titled “Remaining issues of on demand SI” and submitted by Vivo. Ex.1108, 1. The document, hereinafter referred to as “Vivo,” indicates that it was submitted to the “3GPP TSG-RAN WG2#101” meeting that took place “26th February – 2nd March 2018.” Ex.1108,

1. The document number is reflected on the first page of the document. Ex.1108, 1, as is an indication that the document was a resubmission of R2-1800875 (Vivo), which was submitted to the RAN WG2 NR ad hoc meeting of January 22 – 26, 2018. To obtain this document, I directed a web browser to the URL https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_101/Docs/zip. Ex.1134. I selected the link for “R2-1802094.zip” and downloaded a zip file of the same name. Ex.1134, 12. The zip file contained a Microsoft Word document, titled “R2-1802094 Remaining issues of on demand SI.doc.” A true and correct copy of the Word document within the zip file (R2-1802094 Remaining issues of on demand SI.doc) is the exhibit that is provided as EX.1008.

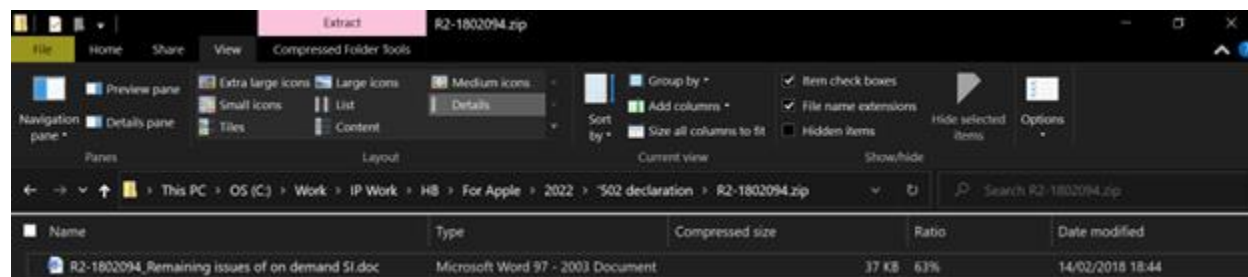
55. R2-1802094.zip was uploaded to and available for download from 3GPP’s public file repository on the 3GPP website as of February 14, 2018, as evidenced by the upload date corresponding to that file:

 R2-1802092.zip	2018/02/14 12:03	31,6 KB
 R2-1802093.zip	2018/02/14 12:03	34,8 KB
 R2-1802094.zip	2018/02/14 12:03	36,6 KB
 R2-1802095.zip	2018/02/14 12:03	33,4 KB
 R2-1802096.zip	2018/02/15 6:11	42 KB

Ex.1134, 12.

56. The Word document “R2-1802094 Remaining issues of on demand

SI.doc” that was contained in R2-1802094.zip, has a last modified date of 14/02/2018 (European date format), as shown in the screenshot below.



Ex.1127.

57. An interested POSITA would have been capable of navigating to relevant 3GPP documents on the 3GPP website using reasonable diligence. On and after Feb 14, 2018, a user could access 3GPP’s public file repository through the “Meeting documents” link on the relevant RAN WG2 home page. Ex.1116. As described in paragraph 31, the Working Group home pages could be accessed from the 3GPP home page by selecting “Specification Groups,” which would take the user to the Specification Groups page showing the TSG structure organized by subject matter. Ex.1129. A user could then select “RAN WG2,” which would access the RAN WG2 home page, from where meeting documents could be directly accessed. Ex.1116, 1. An interested POSITA would have known which TSG working group to focus on based on the subject matter they were interested in.

58. Additionally, a POSITA navigating the 3GPP website would have been directed to R2-1802094 (Vivo) by accessing the TDoc list for RAN WG2

#101 the end of meeting version of which was available from March 2, 2018.

Ex.1133. Based on my personal experience of accessing the 3GPP website during the relevant timeframe, it was well known to POSITAs that a TDoc list was maintained for each meeting on the 3GPP file server, and POSITAs knew to refer to the TDoc list to identify relevant technical documents. The end of meeting tdoc list for RAN WG2 #101 has a listing for R2-1802094 along with its document title “Remaining issues of on demand SI.” And agenda item. Ex.1132.

59. The upload time stamp indicates that R2-1802094.zip was uploaded to 3GPP’s publicly available website on February 14, 2018, and that any member of the public could have downloaded the zip file, extracted the Word document enclosed, and viewed the contents of the Word document without restriction on February 14, 2018 and anytime thereafter. Based on my personal knowledge and experience, this time stamp accurately reflects the date the document was uploaded to the 3GPP public file repository and available to the public for download, and I have no reason to believe this particular time stamp is inaccurate. I have determined that Ex.1108 was available for any member of the public to download from the 3GPP website no later than February 14, 2018.

60. The draft report for RAN WG2 #101 mentions R2-1802094 (Vivo) under agenda item 10.4.1.6.6 which covers “On demand System Information”, being the subject matter to which Vivo pertains. The fact that the draft report from

RAN WG2 #101, which was itself distributed on March 23, 2018, mentions R2-1802094 (Vivo), further supports the accuracy of the February 14, 2018 upload date on the 3GPP website. 3GPP documents were and remain freely available and were not burdened by any confidentiality requirements or restrictions on further dissemination.

61. It is my opinion, therefore, that by February 14, 2018, an interested POSITA using reasonable diligence could have located Vivo on the 3GPP website, downloaded the reference without providing any credentials, and disseminated the reference to others without restriction.

VI. Ex.1012, R2-1800041 (“Asustek”)

62. 3GPP R2-1800041 (Asustek) is a RAN WG2 TDoc titled “Discussion on On-demand system information request in NR” Ex.1012, 1. The document indicates that it was submitted to the “3GPP TSG-RAN WG2 Meeting #Ad-hoc1801” meeting that took place “22nd – 26th January 2018.” Ex.1012, 1. The document number is reflected on the first page of the document. Ex.1012, 1, as is an indication that the document was a resubmission of R2-1712214 which was submitted to the RAN WG2 #100 meeting of November 27 – December 1, 2017). To obtain this document, I directed a web browser to the URL https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_AHs/2018_01_NR/Docs. Ex.1131. I selected the link for “R2-1800041.zip” and downloaded a zip file of the

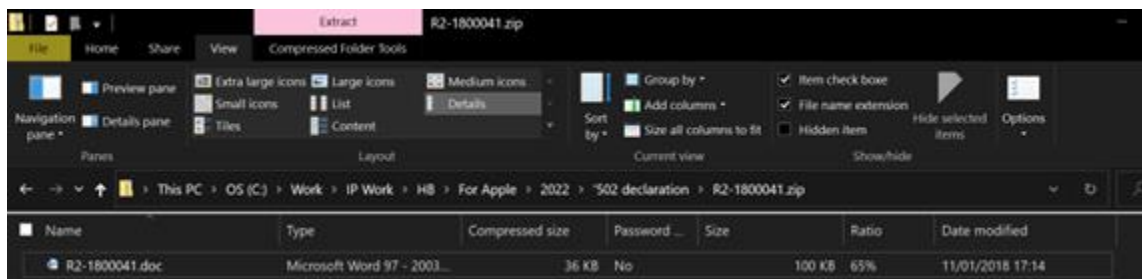
same name. Ex.1131, 2. The zip file contained a Microsoft Word document, titled “R2-1800041.doc.” A true and correct copy of the Word document within the zip file (R2-1800041.doc) is the exhibit that is provided as Ex.1012.

63. R2-1800041.zip was uploaded to and available for download from 3GPP’s public file repository on the 3GPP website as of January 12, 2018, as evidenced by the upload date corresponding to that file:

 R2-1800038.zip	2018/01/08 0:36	9,2 KB
 R2-1800039.zip	2018/01/08 0:36	19 KB
 R2-1800041.zip	2018/01/12 1:55	35,9 KB
 R2-1800042.zip	2018/01/12 1:55	40,2 KB
 R2-1800043.zip	2018/01/12 1:55	111,4 KB

Ex.1131, 2.

64. The Word document “R2-1800041.doc” that was contained in R2-1800041.zip, has a last modified date of 11/01/2018 (European date format), as shown in the screenshot below.



Ex.1126.

65. An interested POSITA would have been capable of navigating to

relevant 3GPP documents on the 3GPP website using reasonable diligence. On and after January 12, 2018, a user could access 3GPP's public file repository through the "Meeting documents" link on the relevant RAN WG2 home page. Ex.1116. As described in paragraph 31, the Working Group home pages could be accessed from the 3GPP home page by selecting "Specification Groups," which would take the user to the Specification Groups page showing the TSG structure organized by subject matter. Ex.1129. A user could then select "RAN WG2," which would access the RAN WG2 home page, from where meeting documents could be directly accessed. Ex.1116, 1. An interested POSITA would have known which TSG working group to focus on based on the subject matter they were interested in.

66. Additionally, a POSITA navigating the 3GPP website would have been directed to Asustek by accessing the TDoc list for RAN WG2 AH_1801 the end of meeting version of which was available from January 27, 2018. Ex.1125. Based on my personal experience of accessing the 3GPP website during the relevant timeframe, it was well known to POSITAs that a TDoc list was maintained for each meeting on the 3GPP file server, and POSITAs knew to refer to the TDoc list to identify relevant technical documents. The end of meeting tdoc list for RAN WG2 AH_1801 has a listing for R2-1800041 along with its document title "Discussion on On-demand system information request in NR" And agenda

item. Ex.1124, 2.

67. The upload time stamp indicates that R2-1800041.zip was uploaded to 3GPP's publicly available website on January 12, 2018, and that any member of the public could have downloaded the zip file, extracted the Word document enclosed, and viewed the contents of the Word document without restriction on January 12, 2018 and anytime thereafter. Based on my personal knowledge and experience, this time stamp accurately reflects the date the document was uploaded to the 3GPP public file repository and available to the public for download, and I have no reason to believe this particular time stamp is inaccurate. I have determined that Ex.1012 was available for any member of the public to download from the 3GPP website no later than January 12, 2018.

68. The report for RAN WG2 AH_1801 mentions R2-1800041 under agenda item 10.4.1.6.5 which covers "On demand System Information", being the subject matter to which R2-1800041 pertains. Ex.1123. The fact that the report from RAN WG2 AH_1801, which was itself was available on the from February 27, 2018 (Ex.1117), mentions Asustek/R2-1800041, further supports the accuracy of the January 12, 2017 upload date on the 3GPP website. 3GPP documents were and remain freely available and were not burdened by any confidentiality requirements or restrictions on further dissemination.

69. It is my opinion, therefore, that by January 12, 2018, an interested

POSITA using reasonable diligence could have located R2-1800041 on the 3GPP website, downloaded the reference without providing any credentials, and disseminated the reference to others without restriction.

VII. Ex.1013, R2-1708072 (“Huawei”)

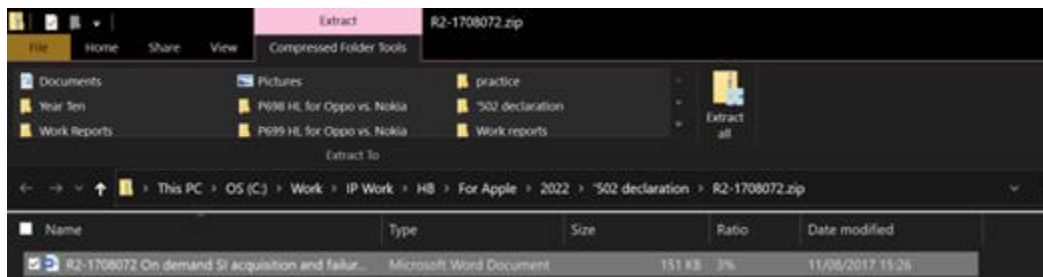
70. 3GPP R2-1708072 (Huawei) is a RAN WG2 TDoc titled “On demand SI acquisition and failure handling” Ex.1013, 1. The document indicates that it was submitted to the “3GPP TSG-RAN WG2 Meeting #99” meeting that took place “21 – 25 August, 2017” Ex.1013, 1. The document number is reflected on the first page of the document. Ex.1013, 1, as is an indication that the document was a revision of R2-1706786 which was submitted to the RAN WG2 AH_1706 meeting of June 27 – 29, 2017). To obtain this document, I directed a web browser to the URL https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_99/Docs. Ex.1122. I selected the link for “R2-1708072.zip” and downloaded a zip file of the same name. Ex.1122, 14. The zip file contained a Microsoft Word document, titled “R2-1708072 On demand SI acquisition and failure handling.docx.” A true and correct copy of the Word document within the zip file (R2-1708072.doc) is the exhibit that is provided as Ex.1013.

71. R2-1708072.zip was uploaded to and available for download from 3GPP’s public file repository on the 3GPP website as of August 12, 2017, as evidenced by the upload date corresponding to that file:

 R2-1708070.zip	2017/08/12 6:50	85,7 KB
 R2-1708071.zip	2017/08/12 6:50	46,8 KB
 R2-1708072.zip	2017/08/12 6:50	147 KB
 R2-1708073.zip	2017/08/12 6:50	195,6 KB
 R2-1708074.zip	2017/08/12 6:50	34,2 KB

Ex.1122, 14.

72. The Word document “R2-1708072 On demand SI acquisition and failure handling.docx” that was contained in R2-1708072.zip, has a last modified date of 11/08/2017 (European date format), as shown in the screenshot below.



Ex.1120.

73. An interested POSITA would have been capable of navigating to relevant 3GPP documents on the 3GPP website using reasonable diligence. On and after August 12, 2017, a user could access 3GPP’s public file repository through the “Meeting documents” link on the relevant RAN WG2 home page. Ex.1116. As described in paragraph 31, the Working Group home pages could be accessed from the 3GPP home page by selecting “Specification Groups,” which would take the user to the Specification Groups page showing the TSG structure organized by

subject matter. Ex.1129. A user could then select “RAN WG2,” which would access the RAN WG2 home page, from where meeting documents could be directly accessed. Ex.1116, 1. An interested POSITA would have known which TSG working group to focus on based on the subject matter they were interested in.

74. Additionally, a POSITA navigating the 3GPP website would have been directed to Huawei by accessing the TDoc list for RAN WG2 #99 the end of meeting version of which was available from August 27, 2017. Ex.1119. Based on my personal experience of accessing the 3GPP website during the relevant timeframe, it was well known to POSITAs that a TDoc list was maintained for each meeting on the 3GPP file server, and POSITAs knew to refer to the TDoc list to identify relevant technical documents. The end of meeting tdoc list for RAN WG2 #99 has a listing for R2-1708072 along with its document title “On demand SI acquisition and failure handling” and agenda item. Ex.1119, 10.

75. The upload time stamp indicates that R2-1708072.zip was uploaded to 3GPP’s publicly available website on August 12, 2017, and that any member of the public could have downloaded the zip file, extracted the Word document enclosed, and viewed the contents of the Word document without restriction on August 12, 2017 and anytime thereafter. Based on my personal knowledge and experience, this time stamp accurately reflects the date the document was uploaded to the

3GPP public file repository and available to the public for download, and I have no reason to believe this particular time stamp is inaccurate. I have determined that Ex.1013 was available for any member of the public to download from the 3GPP website no later than August 12, 2017.

76. The report for RAN WG2 #99 mentions Huawei/R2-1708072 under agenda item 10.4.1.5.5 which covers “On demand System Information”, being the subject matter to which Huawei pertains. Ex.1118, 203. The fact that the report from RAN WG2 #99, which was itself was available on the from October 18, 2017(Ex.1121), mentions R2-1708072, further supports the accuracy of the August 12, 2017 upload date on the 3GPP website. 3GPP documents were and remain freely available and were not burdened by any confidentiality requirements or restrictions on further dissemination.

77. It is my opinion, therefore, that by August 12, 2017, an interested POSITA using reasonable diligence could have located R2-1708072 on the 3GPP website, downloaded the reference without providing any credentials, and disseminated the reference to others without restriction.

VIII. DECLARATION

78. I declare that all statements made herein on my own knowledge are true, and further, that these statements were made with the knowledge that willful 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.

Date: March 02, 2023

Executed:  _____
Craig Bishop