

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NETAPP, INC.,
Petitioner

v.

PROVEN NETWORKS, LLC,
Patent Owner.

U.S. PATENT NO. 8,687,573

Case No. IPR2022-00644

DECLARATION OF FRIEDHELM RODERMUND
IN SUPPORT OF A PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 8,687,573

TABLE OF CONTENTS

	Page
I. INTRODUCTION AND ENGAGEMENT	1
II. BACKGROUND AND QUALIFICATIONS.....	3
III. SUMMARY OF MY OPINIONS	8
IV. PUBLICATION OF 3GPP SPECIFICATIONS AND RELATED DOCUMENTS	9
A. General Practices.....	9
B. Specific Documents	21
1. TS 23.107 V3.5.0	21
2. TS 23.203 V7.2.0	29
3. TS 23.401 V1.0.0	38
4. TS 36.300 V8.0.0	47
V. AVAILABILITY FOR CROSS-EXAMINATION	55
A. Right To Supplement	55
B. Signature	55

I, Friedhelm Rodermund, do hereby declare as follows:

I. INTRODUCTION AND ENGAGEMENT

1. I have been retained in this matter by the Petitioner to provide testimony regarding the standard business practices of 3rd Generation Partnership Project (“3GPP”) for record keeping and publishing technical specifications, change request proposals, reports, and other documents developed during the course of standards activities carried out by 3GPP and the European Telecommunications Standards Institute (“ETSI”).

2. I have been asked to provide my opinions regarding the authenticity and dates of public accessibility of the following 3GPP documents:

- Version 3.5.0 of technical specification 3GPP TS 23.107 (“Technical Specification Group Services and System Aspects; QoS Concept and Architecture (Release 1999)”) (hereinafter “TS 23.107 v3.5.0”) (Ex. 1006)
- Version 7.2.0 of technical specification 3GPP TS 23.203 (“Technical Specification Group Services and System Aspects; Policy and charging control architecture (Release 7)”) (hereinafter “TS 23.203 v7.2.0”) (Ex. 1008)

- Version 1.0.0 of technical specification 3GPP TS 23.401 (“Technical Specification Group Services and System Aspects; GPRS enhancements for E-UTRAN access (Release 8)”) (hereinafter “TS 23.401 v1.0.0”) (Ex. 1007)
- Version 8.0.0 of technical specification 3GPP TS 36.300 (“Technical Specification Group (TSG) Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2 (Release 8)”) (hereinafter “TS 36.300 v8.0.0”, Ex. 1009)

3. As an ETSI Project Manager and Secretary, from June 1998 to December 2004, I have personal knowledge of 3GPP’s standard business and records keeping practices. I continued following 3GPP’s work ever since. Thus, based on my experience, personal knowledge, and review of 3GPP’s business records, I am able to testify regarding the authenticity of certain documents published by 3GPP and the timing of their publication.

4. I am also knowledgeable about document management practices and the usage of email reflectors in 3GPP TSG SA WG2. This is due to the fact that all 3GPP working groups used the same document repository on ftp.3gpp.org and all working groups use the same email exploder tool. Thus, I’m able to testify regarding the availability and authenticity of any 3GPP documents.

5. I am being compensated for my time spent on this matter at my usual rate of €450 per hour. My fee is not contingent on the outcome of this or any matter, or on the content of any of the testimony I give in this declaration. I have no financial interest in the Petitioner.

6. I have been informed that Proven Networks, LLC (“Proven Networks” or “Patent Owner”) alleges ownership. Proven Networks is the current assignee of U.S. Patent No. 8,687,573 (“the ’573 Patent”) (Ex. 1001). I have no financial interest in the Patent Owner or the ’573 patent.

II. BACKGROUND AND QUALIFICATIONS

7. I have more than 20 years of experience working with standards development organizations including 3GPP, ETSI, and the Open Mobile Alliance (“OMA”). I have particular experience with the development of standards related to cellular telecommunications, including the standards for the Universal Mobile Telecommunications System (“UMTS”), Long Term Evolution (“LTE”), and 5G, which are all standards developed by the 3GPP.

8. I attended the University of Technology Aachen in Aachen, Germany, where I performed graduate studies in Electrical Engineering with a focus on telecommunications technologies (“Dipl.-Ing. TH” degree). I also attended the University of Technology Trondheim in Trondheim, Norway, and completed my

Diploma thesis, “Design of a dual processor computer for digital signal processing in power electronics,” in 1993.

9. From December 1993 to June 1998, I worked at Mannesmann Mobilfunk as a System Engineer and Project Manager in Quality Assurance and Technical Standards. One of my responsibilities was to ensure by managing and performing related test activities that cellular network equipment was compatible with the Global System for Mobile Communications (“GSM”) standard developed by ETSI. During that time, I also started working as a standards delegate. I attended my first ETSI meeting in 1996 (although I was already following ETSI developments from 1992 during my studies).

10. From June 1998 to December 2004, I worked at ETSI as a project manager for various ETSI Special Mobile Group (“SMG”) and 3GPP working groups. First, I served as a secretary of SMG4 “Data Services” and SMG8 “Base Stations Testing.” Then, as a project manager with the ETSI Mobile Competence Center (“MCC”), I supported establishing 3GPP as the new international standards development organization for cellular telecommunications. One of my roles was acting as Secretary for 3GPP’s Technical Specifications Group Terminals, Working Group (“T2”), the group which played a leading role in the creation of standards for Multimedia such as the Multimedia Messaging Service (“MMS”).

11. Later, I was a secretary of the highest-level Technical Specifications Group Terminals which was besides other things responsible for the development of test specifications including tests for the radio interface.

12. I edited all technical specifications produced by my working groups and presented results to the parent body for approval. I attended all meetings (apart from some sub-working group meetings) and was also responsible for compiling meeting reports, for handling all the meeting documents, and managing the work plan. It was also my role to guide the groups and to advise the chairmen regarding 3GPP working methods and procedures including document handling, and to make sure delegates were aware of their company's obligations under the 3GPP Intellectual Property Rights policy.

13. As part of my responsibilities at ETSI, I acted as a 3GPP custodian of records by personally managing 3GPP's public File Transfer Protocol (ftp) folders, which I used to make publicly accessible various 3GPP documents, including versions of 3GPP specifications, technical reports, liaison statements, change requests, contributions, agendas, meeting reports, and other 3GPP documents from my working groups. I am also knowledgeable about document management practices used in other working groups and within 3GPP in general with regard to making documents publicly accessible through the same public ftp server of 3GPP.

14. Since I left ETSI as a staff member in 2005, I have been continuously involved in standardization activities, including with OMA, ETSI, and 3GPP. Since 2017, I also have been attending the ETSI Intellectual Property Rights (“IPR”) Special Committee, which is responsible for the maintenance of the ETSI IPR Policy.

15. After I left ETSI, I worked from January 2005 to October 2014 at Vodafone, first as a Project Manager for Mobile Broadcast Standards, and then as Vice Chairman of the Device Management working group of the Open Mobile Alliance, and then as a Senior Standards Strategist, all with responsibilities as described on my curriculum vitae. At Vodafone, I was deeply involved in standards work with ETSI and 3GPP and other standards setting organizations, including as a delegate to 3GPP SA1 “Services.” As part of my responsibilities, I attended selected 3GPP meetings, submitted documents to 3GPP, used 3GPP resources (including 3GPP’s ftp server) extensively, and remained knowledgeable about 3GPP policies and procedures with regard to document management and public accessibility. I was also involved in the creation of patents, defense activities related to patent litigations, and patent evaluation, mostly in the context of standards development.

16. Since leaving Vodafone in 2014, I have performed consulting work regarding Internet of Things (IoT) and Machine to Machine (M2M) technology and standards, first at Friedhelm Rodermund Consulting and then as the Founder and

Ex. 1020 - Declaration of Friedhelm Rodermund

Director of IOTECC GmbH. In connection with my work, I regularly deal with standards such as OMA's Lightweight M2M (LwM2M) and 3GPP's LTE, Narrowband IoT (NB-IoT) and 5G standards. And I have extensively used 3GPP resources and have remained knowledgeable about 3GPP policies and procedures with regard to document management and public accessibility.

17. I also provide consulting services related to patents, in particular around 3GPP Standard Essential Patents ("SEPs"), and I have worked as an expert witness on a number of occasions. I continue to closely follow the maintenance of the ETSI IPR Policy as a delegate to the ETSI IPR Special Committee. Furthermore, I am conducting a seminar on SEPs and the Internet of Things at the Technical University of Ilmenau, Germany.

18. At the time of writing this declaration, I am following – including attending selected meetings – the following standards committees: ETSI oneM2M, ETSI IPR Special Committee, OMA, and 3GPP.

19. A copy of my curriculum vitae, which includes a detailed description of my experience and education, is attached as Appendix A. A list of litigation matters on which I have worked over the last five years is also included in my curriculum vitae.

III. SUMMARY OF MY OPINIONS

20. It is my opinion that TS 23.107 v3.5.0 (Ex. 1006) is a technical specification published by 3GPP and would have been publicly accessible through ftp.3gpp.org as of December 22, 2000.

21. It is my opinion that TS 23.203 v7.2.0 (Ex. 1008) is a technical specification published by 3GPP and would have been publicly accessible through ftp.3gpp.org as of March 15, 2007.

22. It is my opinion that TS 23.401 v1.0.0 (Ex. 1007) is a technical specification published by 3GPP and would have been publicly accessible through ftp.3gpp.org as of June 13, 2007.

23. It is my opinion that TS 36.300 v8.0.0 (Ex. 1009) is a technical specification published by 3GPP and would have been publicly accessible through ftp.3gpp.org as of April 6, 2007.

IV. PUBLICATION OF 3GPP SPECIFICATIONS AND RELATED DOCUMENTS

A. General Practices

24. Unless otherwise noted, the following is an accurate description of 3GPP general practices from 1998 to the present, regardless of whether I use the present or past tense to describe those practices.

25. 3GPP was established in 1998 by a group of telecommunications standard development organizations from Japan, Korea, China, Europe, and the United States to jointly develop worldwide standards for mobile telecommunications. Today, 3GPP consists of seven partners: Association of Radio Industries and Businesses, Japan (“ARIB”), Alliance for Telecommunications Industry Solutions, USA (“ATIS”), China Communications Standards Association (“CCSA”), European Telecommunications Standards Institute (“ETSI”), Telecommunications Standards Development Society, India (“TSDSI”), Telecommunications Technology Association, Korea (“TTA”), and Telecommunication Technology Committee, Japan (“TTC”). In addition to being one of the founding partners, ETSI hosts the Mobile Competence Centre (“MCC”), which provides administrative and technical support for the day-to-day work of 3GPP. Furthermore, ETSI manages 3GPP’s IT services such as the 3GPP website, ftp server, and email exploders.

26. 3GPP is the world's leading organization for developing and maintaining cellular telecommunications standards, which it has done since its foundation in 1998. As noted above and in my curriculum vitae, I began working for 3GPP, as part of my work at ETSI, the European-based organizational partner of 3GPP.

27. In the ordinary course of its regularly conducted business activities, and pursuant to its standard business practices, 3GPP publishes technical specifications, proposals, reports, and other documents related to the development of cellular telecommunications standards. Such documents are published for the purposes of discussion and establishment of industry standards for cellular telecommunications. This has been 3GPP's ordinary course of business since when I began working at ETSI in 1998.

28. In the ordinary course of 3GPP's regularly conducted business activities, and pursuant to its standard business practices, all draft technical specifications, proposals, reports, and other temporary documents to be discussed or considered in relation to 3GPP's telecommunications standards activities were, and continue to be, assigned a temporary document number and made publicly available, including on the ftp server associated with the 3GPP website, currently residing at ftp.3gpp.org. Such documents are referred to as "T-docs." Final versions of the

technical specifications also were, and continue to be, publicly available from that same ftp server.

29. The names and the structure of 3GPP working groups, as of today, can be found at <https://www.3gpp.org/specifications-groups> (reproduced below):

Project Co-ordination Group (PCG)		
TSG RAN Radio Access Network	TSG SA Service & System Aspects	TSG CT Core Network & Terminals
RAN WG1 Radio Layer 1 (Physical layer)	SA WG1 Services	CT WG1 User Equipment - Core Network protocols
RAN WG2 Radio layer 2 and Radio layer 3 Radio Resource Control	SA WG2 System Architecture and Services	CT WG3 Interworking with External Networks & Policy and Charging Control
RAN WG3 UTRAN/E-UTRAN/NG-RAN architecture and related network interfaces	SA WG3 Security and Privacy	CT WG4 Core Network Protocols
RAN WG4 Radio Performance and Protocol Aspects	SA WG4 Multimedia Codecs, Systems and Services	CT WG6 Smart Card Application Aspects
RAN WG5 Mobile Terminal Conformance Testing	SA WG5 Management, Orchestration and Charging	
	SA WG6 Application Enablement and Critical Communication Applications	
RAN AH1 RAN ad hoc group on ITU-R		

30. Each Technical Specification Group (TSG) or Working Group adopts a structured numbering system for the documents associated with their meetings,

and those systems typically follow a consistent numbering system as shown in the following example: xminnzzzz. The numbering system normally comprises five logical elements: (1) x: a single letter corresponding to the TSG; wherein in 2007/2008 x was one of R (Radio Access Network), C (Core and Terminals), S (Service and System Aspects), or G (GSM/EDGE Radio Access Network); (2) m: a single character corresponding to the Working Group identity (typically 1, 2, 3, etc.) or, in the case of the TSG itself, the letter “P”; (3) i: normally the hyphen character “-”; (4) nn: the calendar year of the meeting to which the document was submitted; and (5) zzzz: a running number.

31. In the ordinary course of 3GPP’s regularly conducted business activities, and pursuant to its standard business practices, from December 1998 onwards, 3GPP published all of its T-docs and all final versions of its technical specifications on its ftp server, which has always been easily and publicly accessible from its website and currently resides at [ftp.3gpp.org](ftp://ftp.3gpp.org).

32. As early as December 1998, 3GPP’s ftp server was freely accessible to the general public with no login, password, or membership requirement.

33. By 1999, at least 100 companies were members of 3GPP (719 companies by December 2020), ranging from Bosch to Ericsson to Nokia to Samsung and generally including those interested in the discussion, creation, and adoption of cellular telecommunications standards, including UMTS. Each of these

companies typically delegated multiple individuals to regularly participate in 3GPP meetings. Further, pursuant to 3GPP's standard business practices, 3GPP working groups sent emails notifying these individuals as soon as new or additional documents had been uploaded to 3GPP's ftp server. Thus, not only did the general public have access to the documents on the ftp server, but some of the most interested members of the public—those working to develop standards for cellular telecommunication or working to implement the standards—were personally informed of their availability by email. Based on my experience with 3GPP and the telecommunications industry, I would expect any person implementing a cellular network or device, e.g., a UMTS network, to consult the corresponding specifications on the 3GPP ftp server, as well as other related documents. The whole purpose of 3GPP creating and making these specifications available was so that engineers and other individuals would have ready access to them when developing and implementing cellular networks and devices.

34. By June 1999, 3GPP's ftp server was well-known to persons in the cellular telecommunications industry as a source of public information regarding industry standards and technological advances.

35. 3GPP specifications bear a specification number consisting of four or five digits, e.g., 09.02 or 29.002. The first two digits define the specification series which are defined to group the different aspects of the 3GPP system into, e.g.,

Ex. 1020 - Declaration of Friedhelm Rodermund

requirements, service aspects, radio aspects codecs, security aspects, and test specifications. The series digits are followed by two additional digits for the 01 to 13 series or three further digits for the 21 to 55 series. The subjects of the individual specification series are explained on 3GPP's website at <https://www.3gpp.org/specifications/specification-numbering>, and reproduced below. Following a link for a series (e.g., "23 series" link) leads to a 3GPP web page providing access to all specifications in a series, as shown by the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund

Subject of specification series	3G and beyond / GSM (R99 and later)	GSM only (Rel-4 and later)	GSM only (before Rel-4)
General information (long defunct)			00 series
Requirements	21 series	41 series	01 series
Service aspects ("stage 1")	22 series	42 series	02 series
Technical realization ("stage 2")	23 series	43 series	03 series
Signalling protocols ("stage 3") - user equipment to network	24 series	44 series	04 series
Radio aspects	25 series	45 series	05 series
CODECs	26 series	46 series	06 series
Data	27 series	47 series (none exists)	07 series
Signalling protocols ("stage 3") -(RSS-CN) and OAM&P and Charging (overflow from 32.- range)	28 series	48 series	08 series
Signalling protocols ("stage 3") - intra-fixed-network	29 series	49 series	09 series
Programme management	30 series	50 series	10 series
Subscriber Identity Module (SIM / USIM), IC Cards. Test specs.	31 series	51 series	11 series
OAM&P and Charging	32 series	52 series	12 series
Access requirements and test specifications		13 series (1)	13 series (1)
Security aspects	33 series	(2)	(2)
UE and (U)SIM test specifications	34 series	(2)	11 series
Security algorithms (3)	35 series	55 series	(4)
LTE (Evolved UTRA), LTE-Advanced, LTE-Advanced Pro radio technology	36 series	-	-
Multiple radio access technology aspects	37 series	-	-
Radio technology beyond LTE	38 series	-	-

Ex. 1020 - Declaration of Friedhelm Rodermund



The screenshot shows the 3GPP Portal website. At the top, there are logos for 3GPP and Portal. Below the logos, there is a navigation bar with links: Home, Directory, Browse FTP, and Help. A message states: "This site is 3GPP working area. Log in to access full features. For general information go to the public site www.3gpp.org".

Below the navigation bar, there is a search form with the following fields:

- Title/Specification number: [Text input]
- Series: [Dropdown menu showing "23. Technical realization"]
- Type: [Radio buttons for "Technical Specification (TS)", "Technical Report (TR)", "Technical Specification (TS)", "Technical Report (TR)"]
- Release: [Dropdown menu showing "All releases"]
- Publication: [Radio buttons for "Internal", "For Publication"]
- Technology: [Radio buttons for "2G", "3G", "4G", "5G"]
- Status: [Radio buttons for "Draft", "Under change control", "Withdrawn before change control", "Withdrawn under change control"]

A "Search" button is located at the bottom right of the search form.

Below the search form, there is a table titled "Data page" showing a list of specifications. The table has columns: Specification Number, Title, Status, and Primary Responsible Group. The table lists specifications from 23.002 to 23.072, including titles like "Network architecture", "Numbering, addressing and identification", "Registration procedures", "Organization of subscriber data", "Handover procedures", "GSM Public Land Mobile Network (PLMN) Connection Types", "Technical realization of Supplementary Services", "Location management procedures", "Support of Dual Tone Multi-Frequency (DTMF) signaling", "Technical realization of Operator Determined Barring (ODB)", "Subscriber data management: Stage 2", "Basic call handling: Technical realization", "General UITS architecture", "Functions related to Mobile Station (MS) in idle mode and group release mode", "3G Security: Fraud Information Gathering System (FIS)", "Universal Geographical Area Description (GAD)", "High Speed Circuit Switched Data (HSCSD): Stage 2", "Immediate Service Termination (IST): Stage 2", "Alphabets and language-specific information", "Interface Protocols for the connection of Short Message Service Centers (SMSCs) to Short Message Entities (SMEs)", "Technical realization of the Short Message Service (SMS)", "Technical realization of Cell Broadcast Service (CBS)", "Compression algorithm for text messaging services", "Support of Voicemail", "Support of Texter", "Technical Realization of Facsimile Group 3 Service - transparent", "Technical realization of facsimile Group 3 service - non-transparent", "Security mechanisms for the (USIM) application toolkit: Stage 2", "Tandem Free Operation (TFO): Service description: Stage 2", "Shared Interworking Functions (SIWF): Stage 2", "Mobile Execution Environment (MEE): Functional description: Stage 2", "UITS Network principles", "General Packet Radio Service (GPRS): Service description: Stage 2", "Support of Mobile Number Portability (MNP): Technical realization: Stage 2", "Enhanced Multi-Level Precedence and Pre-emption Service (eMLPP): Stage 2", "Voice Broadcast service (VBS): Stage 2", "Routing of calls between Public Data Networks (PDN) and the GSM Public Land Mobile Network (PLMN)", "Location Services (LCS): Functional description: Stage 2", "Call Deflection (CD) supplementary service: Stage 2".

At the bottom of the table, there is a footer: "©3GPP 2021. All rights reserved - 3GPP v1.7.0 - 2022-01-20".

36. As one example of a series, the LTE radio standard is covered in the “36 series” and is further subdivided into separate sections or specifications. The LTE radio specification series starts at TS 36.101 and ends at TR 36.978. Excluding withdrawn specifications, the LTE standard consists of more than 250 specifications. Each specification can span from a few pages to hundreds of pages. One full version of the LTE standard is massive, spanning tens of thousands of pages.

37. In the ordinary course of 3GPP’s regularly conducted business activities, and pursuant to its standard business practices, T-docs are usually uploaded to 3GPP’s ftp server and website before the meeting where they are to be discussed. Documents created or revised during the course of a meeting are normally

uploaded at the latest during the week following the meeting (e.g., the meeting report of the meeting is usually published for review during the week following the meeting).

38. In the ordinary course of 3GPP's regularly conducted business activities, and pursuant to its standard business practices, 3GPP maintains archives that include different versions of the specifications, as well as email communications to its membership, including emails announcing the uploading of new or additional documents to 3GPP's ftp server. These archives are created at the time the emails are initially sent.

39. At least as early as July 1999, all of 3GPP's email archives, including the dedicated email lists for the 3GPP TSG SA WG2 (System Architecture and Services) were freely accessible to the general public with no login, password, or membership requirement. E.g., the screenshot below represents the subscription page of the 3GPP TSG SA WG2 email list from the year 2005 demonstrating that this webpage was publicly available and that only email address and name had to be entered to join the email list, like it is today. Alternatively, everyone interested was able to obtain a LISTSERV password for managing subscriptions interactively without email confirmations.

web.archive.org

Join or Leave the 3GPP_TSG_SA_WG2 List

http://list.etsi.org/scripts/wa.exe?SUBED1=3gpp_tsg_sa_wg2&A=1

2 captures
06 Nov 2005 - 08 Nov 2005

NOV 08 2005

Join or Leave the 3GPP_TSG_SA_WG2 List

This screen allows you to join or leave the 3GPP_TSG_SA_WG2 list. To confirm your identity and prevent third parties from subscribing you to a list against your will, an e-mail message with a confirmation code will be sent to the address you specify in the form. Simply wait for this message to arrive, then follow the instructions to confirm the operation.

Alternatively, you can [login with your LISTSERV password](#) (if you have one) and update your subscription interactively, without e-mail confirmation.

Your E-Mail Address:

Your Name:

Subscription Type:

☒ Regular [NODIGEST]
☐ Digest (traditional) [NOMIME DIGEST]
☐ Digest (MIME format) [NOHTML MIME DIGEST]
☐ Digest (HTML format) [HTML DIGEST]
☐ Index (traditional) [NOHTML INDEX]
☐ Index (HTML format) [HTML INDEX]

Mail Header Style:

☒ Normal LISTSERV-style header [FULLHDR]
☐ LISTSERV-style, with list name in subject [SUBJECTHDR]
☐ LISTSERV-style, short [SHORTHDR]
☐ "Dual" (second header in mail body) [DUALHDR]
☐ sendmail-style [IETFHDR]

Acknowledgements:

☐ No acknowledgements [NOACK NOREPRO]
☐ Short message confirming receipt [ACK NOREPRO]
☐ Receive copy of own postings [NOACK REPRO]
☒ [Special or obsolete setting]

Miscellaneous:

☐ Mail delivery disabled temporarily [NOMAIL]
☐ Address concealed from REVIEW listing [CONCEAL]

40. Each of 3GPP's member companies typically assigned one or more individuals to regularly participate in these email lists. Thus, not only did the general public have access to the emails in 3GPP's email archives, but some of the most interested members of the public—those working to develop standards for cellular telecommunication—personally received copies of such emails through their participation in the email lists.

41. By June 1999, 3GPP's email archives were well-known to persons in the cellular telecommunications industry as a source of public information and of

technical specifications, proposals, meeting announcements, technical discussions and reports regarding industry standards and technological advances.

42. Based on my experience with 3GPP and the telecommunications industry, I would expect a person interested in the development of cellular standards, e.g., UMTS or LTE, to consult the emails archives of the working groups and TSGs that person is interested in, and/or, to be subscribed to the corresponding email reflectors to receive any email notifications in real-time.

43. 3GPP specifications almost always are duplicated in at least two and sometime more locations on the ftp server. One location corresponds to a “snapshot” of the specifications corresponding to a particular plenary meeting cycle—for instance, the 2018-12 snapshot contains a snapshot of numerous specifications after the December 2018 3GPP plenary meetings. The second location is an “archive” that contains all versions over time for a given specification. While 3GPP aims to upload the updated specifications to both locations at the same time, occasionally there may be a small difference in the upload date, and thus the date stamp, for the same specification uploaded to the two locations. Additionally, specifications which are not yet approved (so called “draft” specifications) are presented as T-docs at working group and at plenary meetings (as soon as the working group decides to submit the specification to the plenary meeting for information or approval). In many cases, the T-docs are also distributed on the email exploder of the working group prior to the

meeting, making the T-docs available to all those subscribed to the email distribution list.

44. The timestamp on 3GPP's ftp server shows the date when the document was uploaded the last time. Thus, the timestamp shows the latest possible date the document became publicly available and accessible on 3GPP's ftp server. The given document might have been available earlier and the original timestamp might have been overwritten because the document was uploaded again. According to my experience, this is something which happened quite frequently. Thus, the ftp timestamp is reliable as the latest possible upload date but one cannot determine whether it represents the first upload of a document to the ftp server.

45. 3GPP's working practice to store their documents on its ftp server, as described above, has not changed over time. Starting from the first 3GPP meetings in 1998 until present, all WGs and plenary meetings are represented by dedicated meeting folders on the ftp server. These meeting folders include the documents discussed at the meetings. Both the folders and the documents are accessible to the public. Almost every week, a new meeting folder with the respective documents is added. In addition to the plenary and WG meeting folders, and some other folders, there is also the "Specs" folder, which holds all 3GPP specifications including the aforementioned "snapshot" and archive folders. Since the early days of 3GPP a new folder is added inside the "Specs" folder after each TSG plenary meeting to hold the

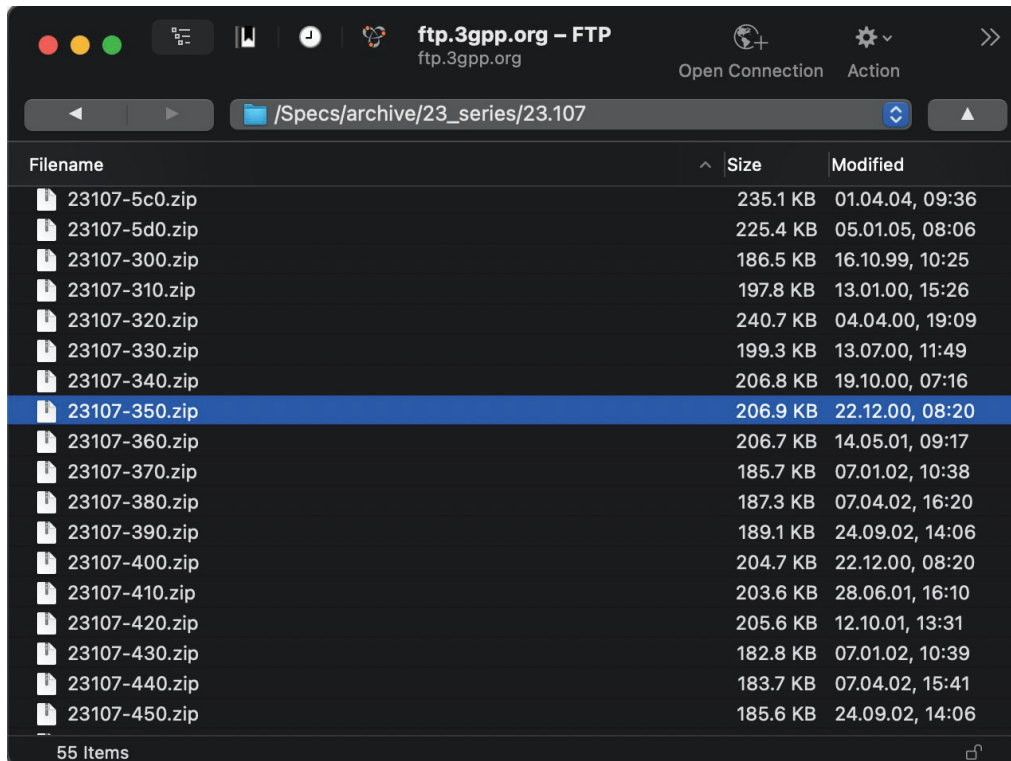
latest versions of specifications approved at those TSG plenary meetings. This is still 3GPP's working practice today; thus, this practice has not changed over time.

B. Specific Documents

1. TS 23.107 V3.5.0

46. Based on my personal knowledge and my review of 3GPP's business records, I recognize Ex. 1006 as a true and correct copy of version 3.5.0 of technical specification 3GPP TS 23.107 ("Technical Specification Group Services and System Aspects; QoS Concept and Architecture (Release 1999)"), which shows on its cover page "2000-12" as the year (2000) and month (December) during which this document was released by 3GPP. The document was published and freely available on 3GPP's ftp server by December 22, 2000. This is confirmed by the date stamp shown on the historic 3GPP ftp server for the corresponding downloadable file ("23107-350.zip"), as maintained by the Internet Archive at https://web.archive.org/web/20010428110355/http://www.3gpp.org/ftp/Specs/2000-12/R1999/23_series/. This information is also shown on the date stamp for the present-day listing of the same document on the 3GPP ftp server at https://www.3gpp.org/ftp/Specs/archive/23_series/23.107, as shown by the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund

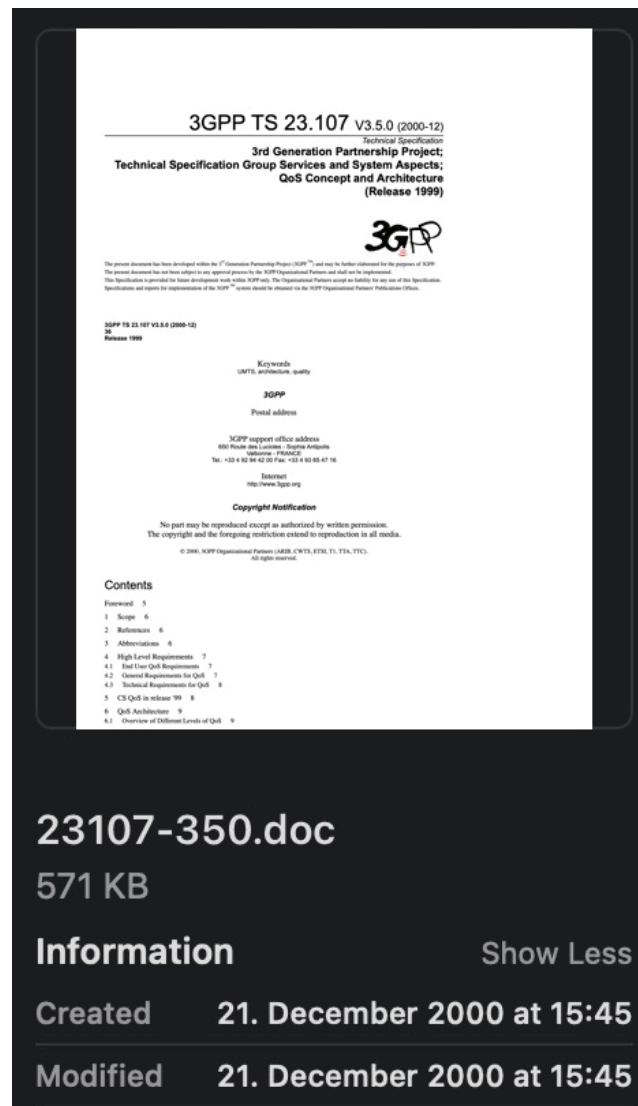


The screenshot shows an FTP client window titled "ftp.3gpp.org - FTP" with the address bar set to "/Specs/archive/23_series/23.107". The window displays a list of files with columns for "Filename", "Size", and "Modified". The file "23107-350.zip" is highlighted in blue. The list includes files from 23107-5c0.zip to 23107-450.zip. The status bar at the bottom indicates "55 Items".

Filename	Size	Modified
23107-5c0.zip	235.1 KB	01.04.04, 09:36
23107-5d0.zip	225.4 KB	05.01.05, 08:06
23107-300.zip	186.5 KB	16.10.99, 10:25
23107-310.zip	197.8 KB	13.01.00, 15:26
23107-320.zip	240.7 KB	04.04.00, 19:09
23107-330.zip	199.3 KB	13.07.00, 11:49
23107-340.zip	206.8 KB	19.10.00, 07:16
23107-350.zip	206.9 KB	22.12.00, 08:20
23107-360.zip	206.7 KB	14.05.01, 09:17
23107-370.zip	185.7 KB	07.01.02, 10:38
23107-380.zip	187.3 KB	07.04.02, 16:20
23107-390.zip	189.1 KB	24.09.02, 14:06
23107-400.zip	204.7 KB	22.12.00, 08:20
23107-410.zip	203.6 KB	28.06.01, 16:10
23107-420.zip	205.6 KB	12.10.01, 13:31
23107-430.zip	182.8 KB	07.01.02, 10:39
23107-440.zip	183.7 KB	07.04.02, 15:41
23107-450.zip	185.6 KB	24.09.02, 14:06

47. In addition, metadata information for the downloaded and extracted specification file states a last Modified date of “21. December 2000”, as shown in the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund

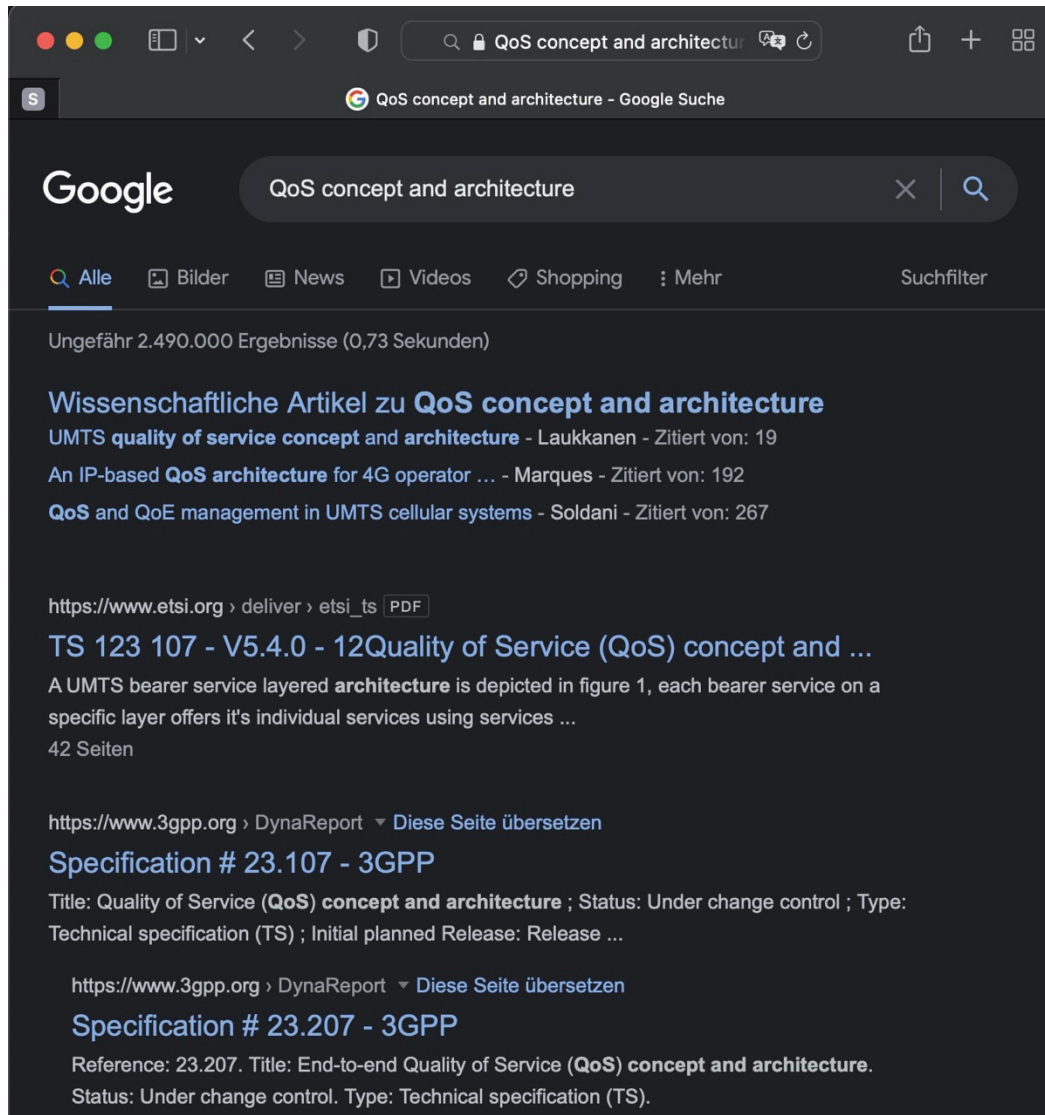


48. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, this information tells me that this document was available to all 3GPP members and the general public by December 22, 2000, at the latest.

49. I believe that a person without prior knowledge of 3GPP and/or the technical specification (TS) number would have been able to easily find the TS for download via internet search. For instance, a Google search for “QoS concept and

Ex. 1020 - Declaration of Friedhelm Rodermund

architecture” provides the TS number “23.107” as one of the top results as can be seen in the screenshot below:



50. Following the provided search result link “Specification # 23.107 – 3GPP” leads to a 3GPP web page offering under the tab “Versions” download links to all versions of TS 23.107 including version 3.5.0, as shown by the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund

portal.3gpp.org Specification # 23.107

3GPP Portal

General Versions Responsibility Related Specification #: 23.107

Release 4(Spec is UCC for this Release) Latest Remark:

Meetings	Version	Upload date	Comment
SA-#18	4.6.0	2003-01-10	
SA-#17	4.5.0	2002-09-24	
SA-#15	4.4.0	2002-04-07	
SA-#14	4.3.0	2002-01-07	
SA-#13	4.2.0	2001-10-12	
SA-#12	4.1.0	2001-06-29	
SA-#10	4.0.0	2000-12-22	

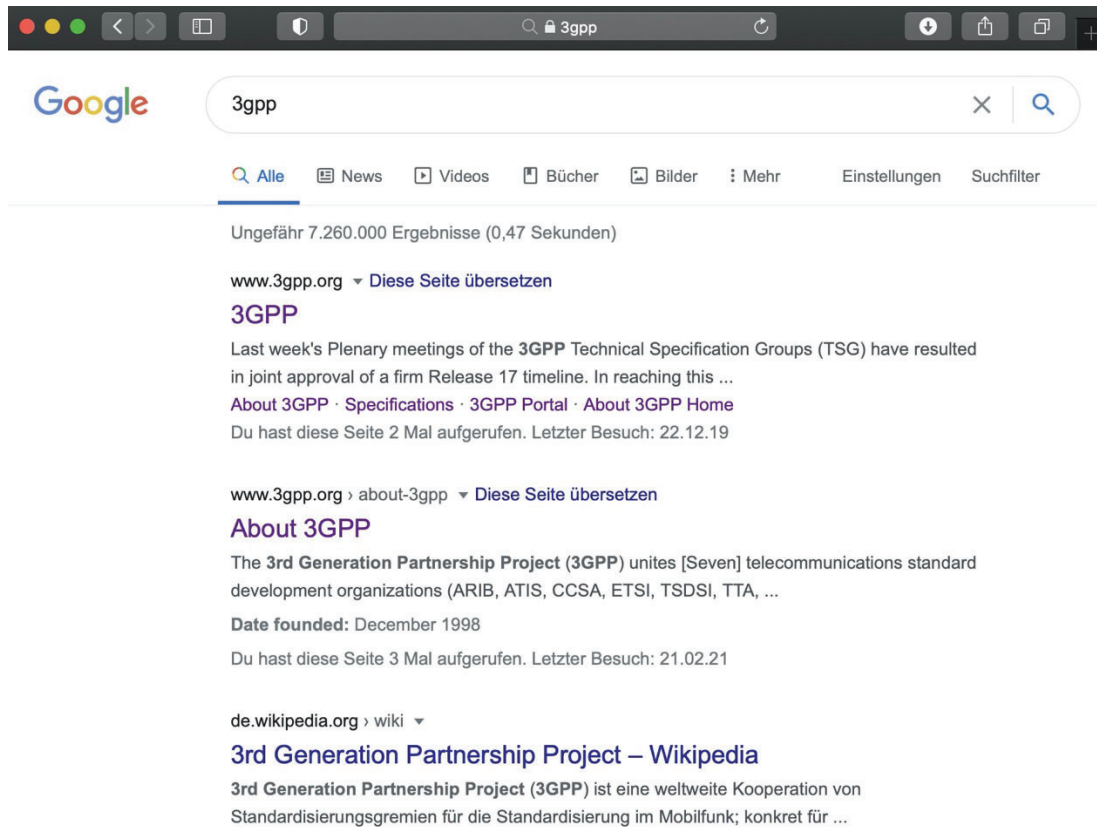
Release 1999(Spec is UCC for this Release) Latest Remark:

Meetings	Version	Upload date	Comment
SA-#17	3.9.0	2002-09-24	
SA-#15	3.8.0	2002-04-07	
SA-#14	3.7.0	2002-01-07	CR072r1 erroneously implement...
SA-#11	3.6.0	2001-05-14	
SA-#10	3.5.0	2000-12-22	
SA-#9	3.4.0	2000-10-19	
SA-#8	3.3.0	2000-06-28	

Exit

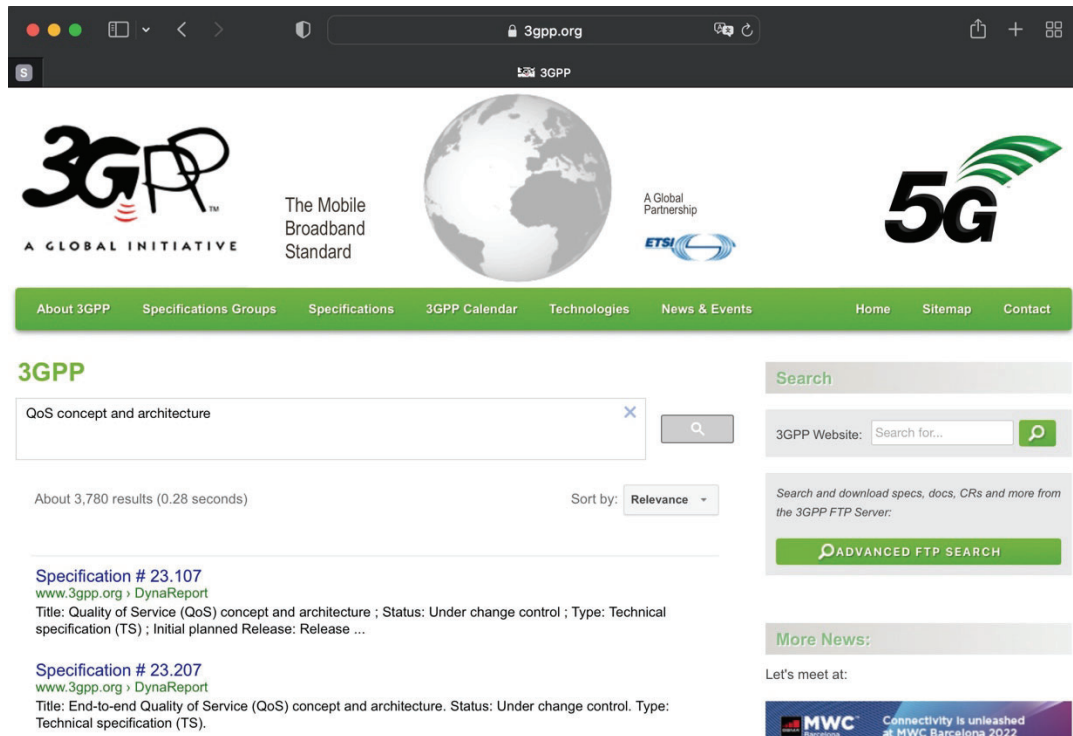
51. 3GPP is a very well-known standards development organization (“SDO”) as of today and certainly was already very well-known in 2007. A person aware of 3GPP could have found TS 23.107 v3.5.0 also via a different route. Searching for “3GPP” leads to the 3GPP website <http://www.3gpp.org>, as can be seen by the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund



52. Entering “QoS concept and architecture” into the search box of the 3GPP web site provides “Specification # 23.107” as one of the top results, as can be seen by the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund



53. Following the provided search result link on “Specification # 23.107” leads to the same 3GPP web page as mentioned in paragraph 50 offering under the tab “Versions” download links to all versions of TS 23.107 including version 3.5.0, as shown by the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund

portal.3gpp.org Specification # 23.107

3GPP Portal

General Versions Responsibility Related Specification #: 23.107

Release 4(Spec is UCC for this Release) Latest Remark:

Meetings	Version	Upload date	Comment
SA-#18	4.6.0	2003-01-10	
SA-#17	4.5.0	2002-09-24	
SA-#15	4.4.0	2002-04-07	
SA-#14	4.3.0	2002-01-07	
SA-#13	4.2.0	2001-10-12	
SA-#12	4.1.0	2001-06-29	
SA-#10	4.0.0	2000-12-22	

Release 1999(Spec is UCC for this Release) Latest Remark:

Meetings	Version	Upload date	Comment
SA-#17	3.9.0	2002-09-24	
SA-#15	3.8.0	2002-04-07	
SA-#14	3.7.0	2002-01-07	CR072r1 erroneously implement...
SA-#11	3.6.0	2001-05-14	
SA-#10	3.5.0	2000-12-22	
SA-#9	3.4.0	2000-10-19	
SA-#8	3.3.0	2000-06-28	

Exit

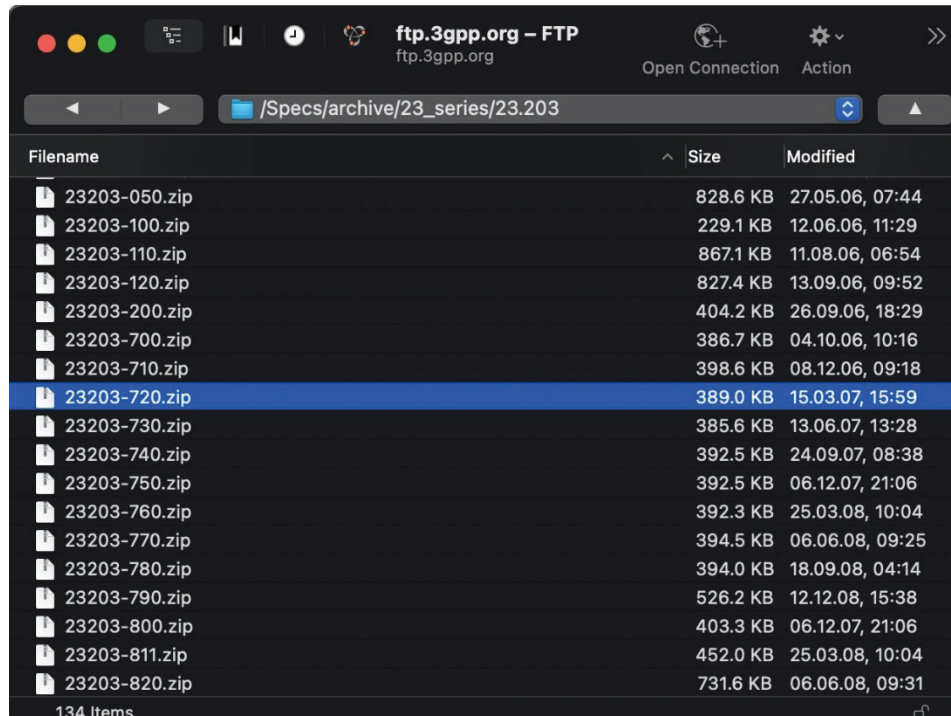
54. The above example searches illustrate that it is very easy for an interested member of the public without prior knowledge of the TS number and even without prior knowledge of 3GPP to locate any version of TS 23.107, including version 3.5.0, for download.

55. The above searches were performed at the time of writing this report. According to my personal experience, similar searches done in 2007 or around that timeframe would have similarly provided the path to download version 3.5.0 of TS 23.107.

2. TS 23.203 V7.2.0

56. Based on my personal knowledge and my review of 3GPP's business records, I recognize Ex. 1008 as a true and correct copy of version 7.2.0 of technical specification 3GPP TS 23.203 ("Technical Specification Group Services and System Aspects; Policy and charging control architecture (Release 7)"), which shows on its cover page "2007-03" as the year (2007) and month (March) during which this document was released by 3GPP. The document was published and freely available on 3GPP's ftp server by March 15, 2007. This is confirmed by the date stamp shown on the historic 3GPP ftp server for the corresponding downloadable file ("23203-720.zip"), as maintained by the Internet Archive at <https://web.archive.org/web/20070717075419/http://www.3gpp.org/ftp/Specs/archive/23%5Fseries/23.203/>. This information is also shown on the date stamp for the present-day listing of the same document on the 3GPP ftp server at https://www.3gpp.org/ftp/Specs/archive/23_series/23.203, as shown by the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund

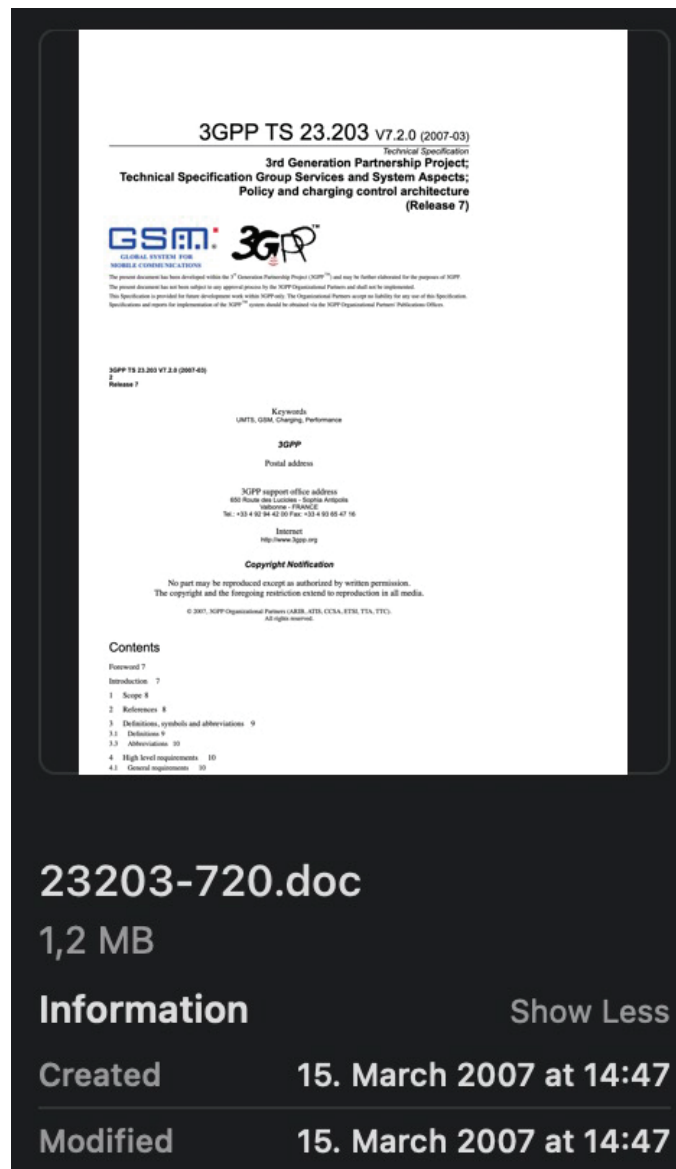


The screenshot shows an FTP client window titled "ftp.3gpp.org - FTP" with the address bar set to "/Specs/archive/23_series/23.203". The window displays a list of files with columns for "Filename", "Size", and "Modified". The file "23203-720.zip" is highlighted in blue. The list contains 14 items, with the last item being "23203-820.zip".

Filename	Size	Modified
23203-050.zip	828.6 KB	27.05.06, 07:44
23203-100.zip	229.1 KB	12.06.06, 11:29
23203-110.zip	867.1 KB	11.08.06, 06:54
23203-120.zip	827.4 KB	13.09.06, 09:52
23203-200.zip	404.2 KB	26.09.06, 18:29
23203-700.zip	386.7 KB	04.10.06, 10:16
23203-710.zip	398.6 KB	08.12.06, 09:18
23203-720.zip	389.0 KB	15.03.07, 15:59
23203-730.zip	385.6 KB	13.06.07, 13:28
23203-740.zip	392.5 KB	24.09.07, 08:38
23203-750.zip	392.5 KB	06.12.07, 21:06
23203-760.zip	392.3 KB	25.03.08, 10:04
23203-770.zip	394.5 KB	06.06.08, 09:25
23203-780.zip	394.0 KB	18.09.08, 04:14
23203-790.zip	526.2 KB	12.12.08, 15:38
23203-800.zip	403.3 KB	06.12.07, 21:06
23203-811.zip	452.0 KB	25.03.08, 10:04
23203-820.zip	731.6 KB	06.06.08, 09:31

134 Items

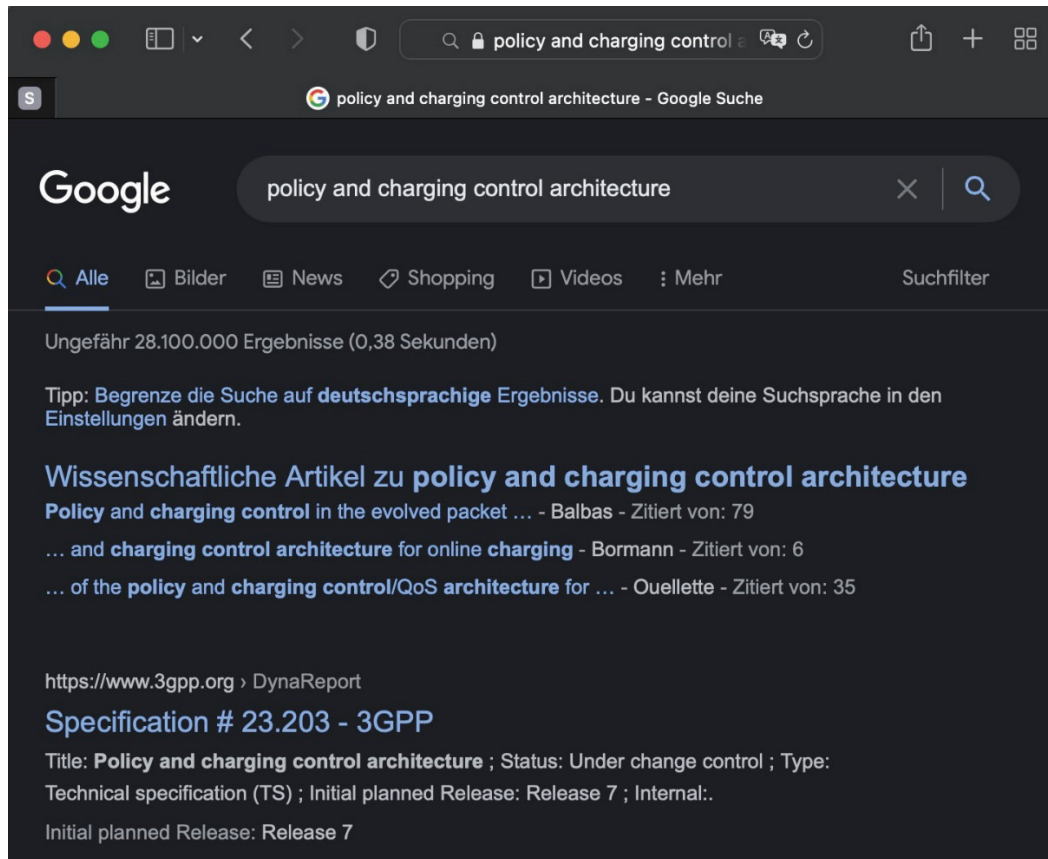
57. In addition, metadata information for the downloaded and extracted specification file states a last Modified date of “15. March 2007”, as shown in the screenshot below:



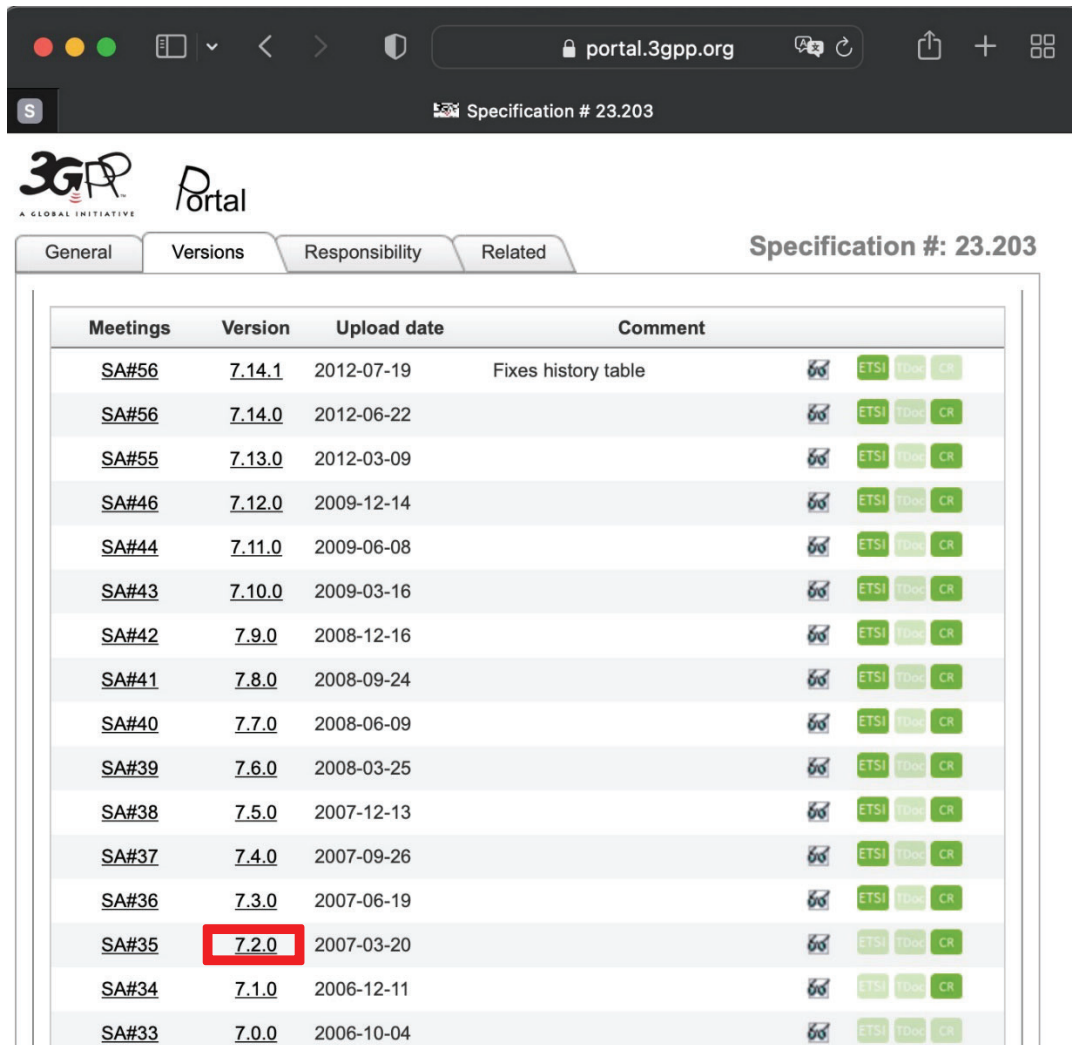
58. Furthermore, the availability of the document was announced by the SA WG2 secretary via the public 3GPP_TSG_SA_WG2 email exploder on March 15, 2007, as shown in Appendix B. By that time, the 3GPP_TSG_SA_WG2 email exploder had around 1000 subscribers as can be seen at the Internet Archive <https://web.archive.org/web/20070331221506/http://list.etsi.org/>.

59. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, this information tells me that this document was available to all 3GPP members and the general public by March 15, 2007, at the latest.

60. I believe that a person without prior knowledge of 3GPP and/or the technical specification (TS) number would have been able to easily find the TS for download via internet search. For instance, a Google search for "policy and charging control architecture" provides the TS number "23.203" as one of the top results as can be seen in the screenshot below:



61. Following the provided search result link “Specification # 23.203 – 3GPP” leads to a 3GPP web page offering under the tab “Versions” download links to all versions of TS 23.203 including version 7.2.0, as shown by the screenshot below:

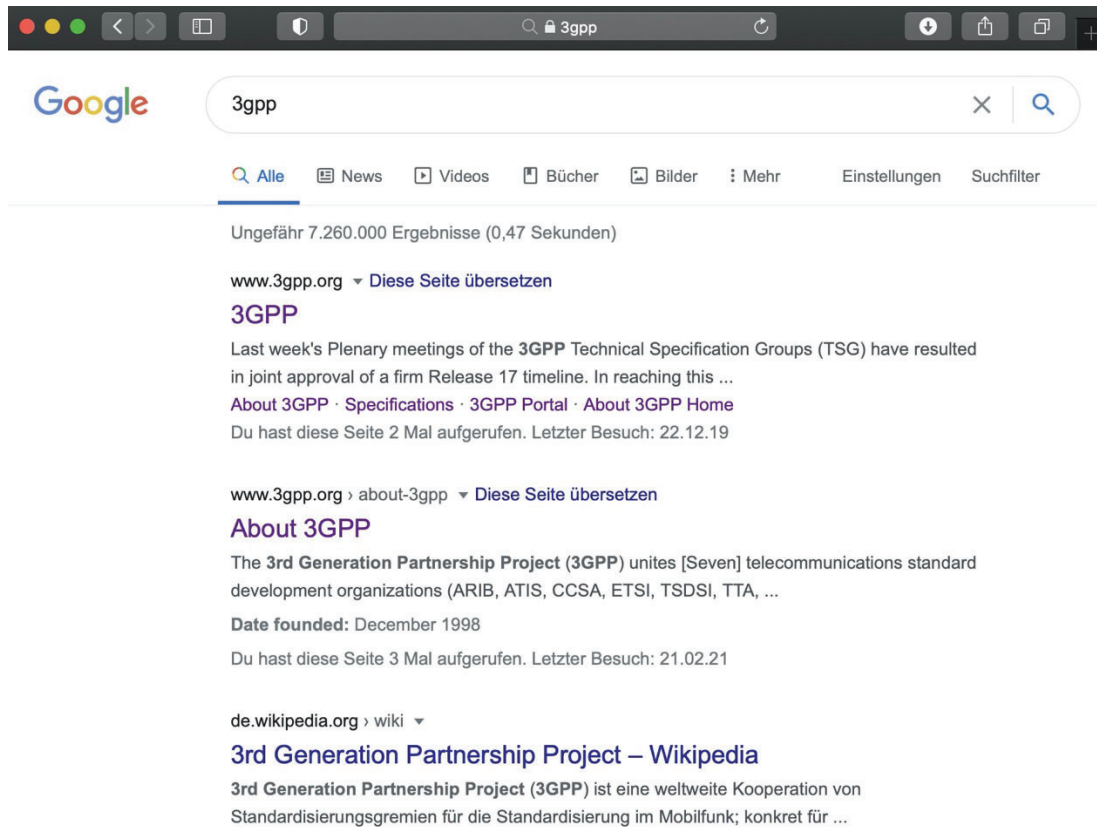


The screenshot shows the 3GPP Portal website for Specification # 23.203. The 'Versions' tab is selected, displaying a table of historical versions. The table has four columns: Meetings, Version, Upload date, and Comment. The 'Version' column contains links to the respective version pages. The version 7.2.0 is highlighted with a red box.

Meetings	Version	Upload date	Comment
SA#56	7.14.1	2012-07-19	Fixes history table
SA#56	7.14.0	2012-06-22	
SA#55	7.13.0	2012-03-09	
SA#46	7.12.0	2009-12-14	
SA#44	7.11.0	2009-06-08	
SA#43	7.10.0	2009-03-16	
SA#42	7.9.0	2008-12-16	
SA#41	7.8.0	2008-09-24	
SA#40	7.7.0	2008-06-09	
SA#39	7.6.0	2008-03-25	
SA#38	7.5.0	2007-12-13	
SA#37	7.4.0	2007-09-26	
SA#36	7.3.0	2007-06-19	
SA#35	7.2.0	2007-03-20	
SA#34	7.1.0	2006-12-11	
SA#33	7.0.0	2006-10-04	

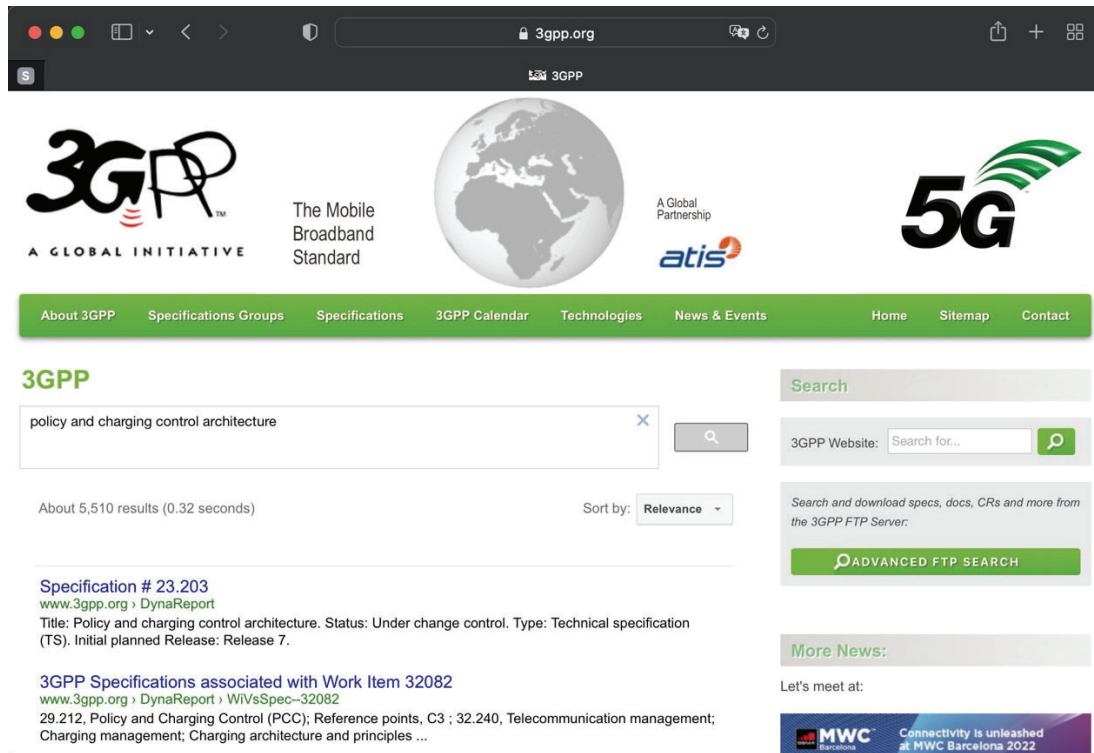
62. 3GPP is a very well-known SDO as of today and certainly was already very well-known in 2007. A person aware of 3GPP could have found TS 23.203 v7.2.0 also via a different route. Searching for “3GPP” leads to the 3GPP website <http://www.3gpp.org>, as can be seen by the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund

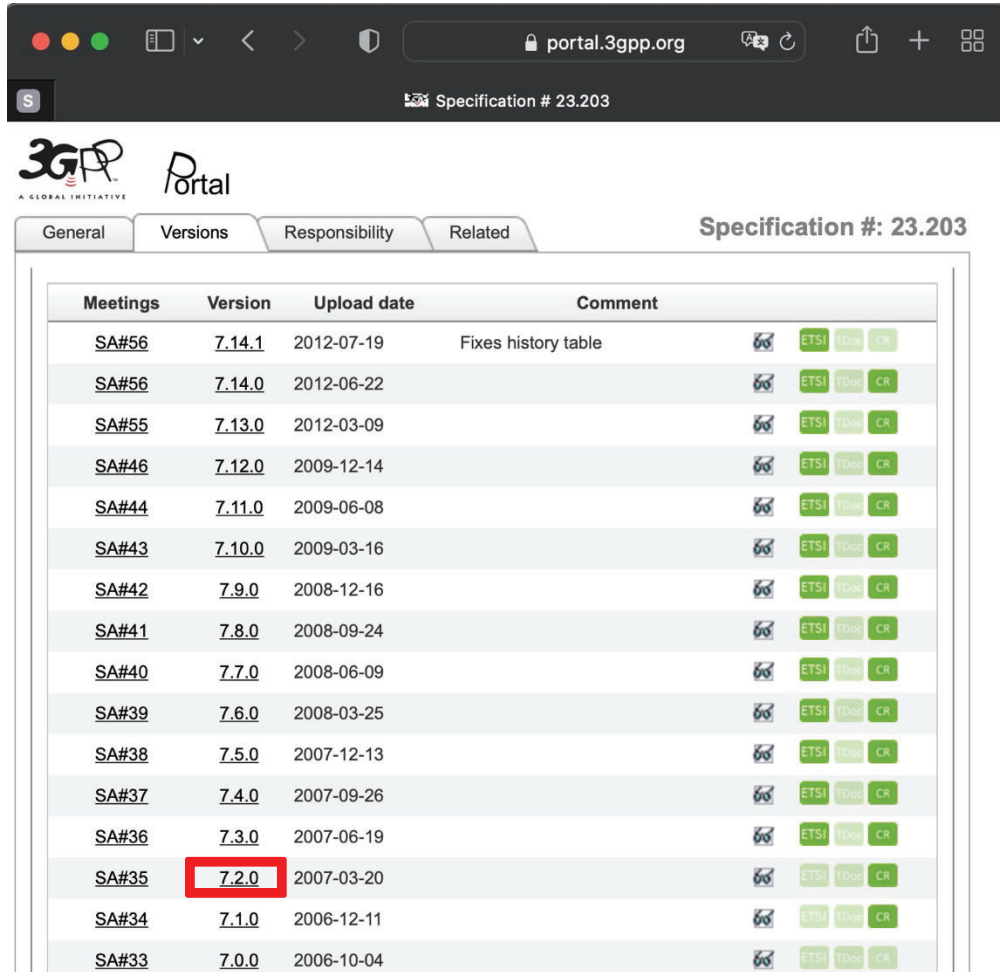


63. Entering “policy and charging control architecture” into the search box of the 3GPP web site provides “Specification # 23.203” as one of the top results, as can be seen by the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund



64. Following the provided search result link on “Specification # 23.203” leads to the same 3GPP web page as mentioned in paragraph 61 offering under the tab “Versions” download links to all versions of TS 23.203 including version 7.2.0, as shown by the screenshot below:



portal.3gpp.org Specification # 23.203

3GPP Portal

General Versions Responsibility Related Specification #: 23.203

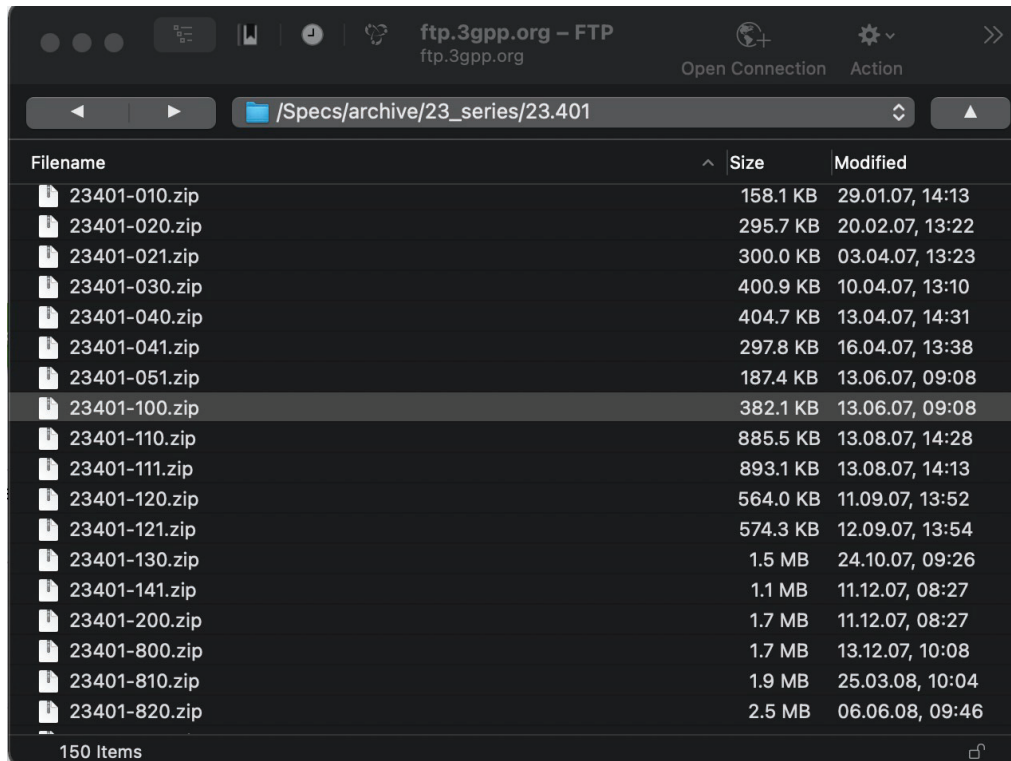
Meetings	Version	Upload date	Comment		ETSI	TDG	CR
SA#56	7.14.1	2012-07-19	Fixes history table				
SA#56	7.14.0	2012-06-22					
SA#55	7.13.0	2012-03-09					
SA#46	7.12.0	2009-12-14					
SA#44	7.11.0	2009-06-08					
SA#43	7.10.0	2009-03-16					
SA#42	7.9.0	2008-12-16					
SA#41	7.8.0	2008-09-24					
SA#40	7.7.0	2008-06-09					
SA#39	7.6.0	2008-03-25					
SA#38	7.5.0	2007-12-13					
SA#37	7.4.0	2007-09-26					
SA#36	7.3.0	2007-06-19					
SA#35	7.2.0	2007-03-20					
SA#34	7.1.0	2006-12-11					
SA#33	7.0.0	2006-10-04					

65. The above example searches illustrate that it is very easy for an interested member of the public without prior knowledge of the TS number and even without prior knowledge of 3GPP to locate any version of TS 23.203, including version 7.2.0, for download.

66. The above searches were performed at the time of writing this report. According to my personal experience, similar searches done in March 2007 or around that timeframe would have similarly provided the path to download version 7.2.0 of TS 23.203.

3. TS 23.401 V1.0.0

67. Based on my personal knowledge and my review of 3GPP's business records, I recognize Ex. 1007 as a true and correct copy of version 1.0.0 of technical specification 3GPP TS 23.401 ("Technical Specification Group Services and System Aspects; GPRS enhancements for E-UTRAN access (Release 8)"), which shows on its cover page "2007-05" as the year (2007) and month (May) during which this document was released by 3GPP. The document was published and freely available on 3GPP's ftp server by June 13, 2007. This is confirmed by the date stamp shown on the historic 3GPP ftp server for the corresponding downloadable file ("23401-100.zip"), as maintained by the Internet Archive at <https://web.archive.org/web/20071122091030/http://www.3gpp.org:80/ftp/Specs/archive/23%5Fseries/23.401/>. This information is also shown on the date stamp for the present-day listing of the same document on the 3GPP ftp server at https://www.3gpp.org/ftp/Specs/archive/23_series/23.401, as shown by the screenshot below:



The screenshot shows an FTP client window titled 'ftp.3gpp.org - FTP' with the address bar set to '/Specs/archive/23_series/23.401'. The window displays a list of files with columns for 'Filename', 'Size', and 'Modified'. The file '23401-100.zip' is highlighted. The status bar at the bottom indicates '150 Items'.

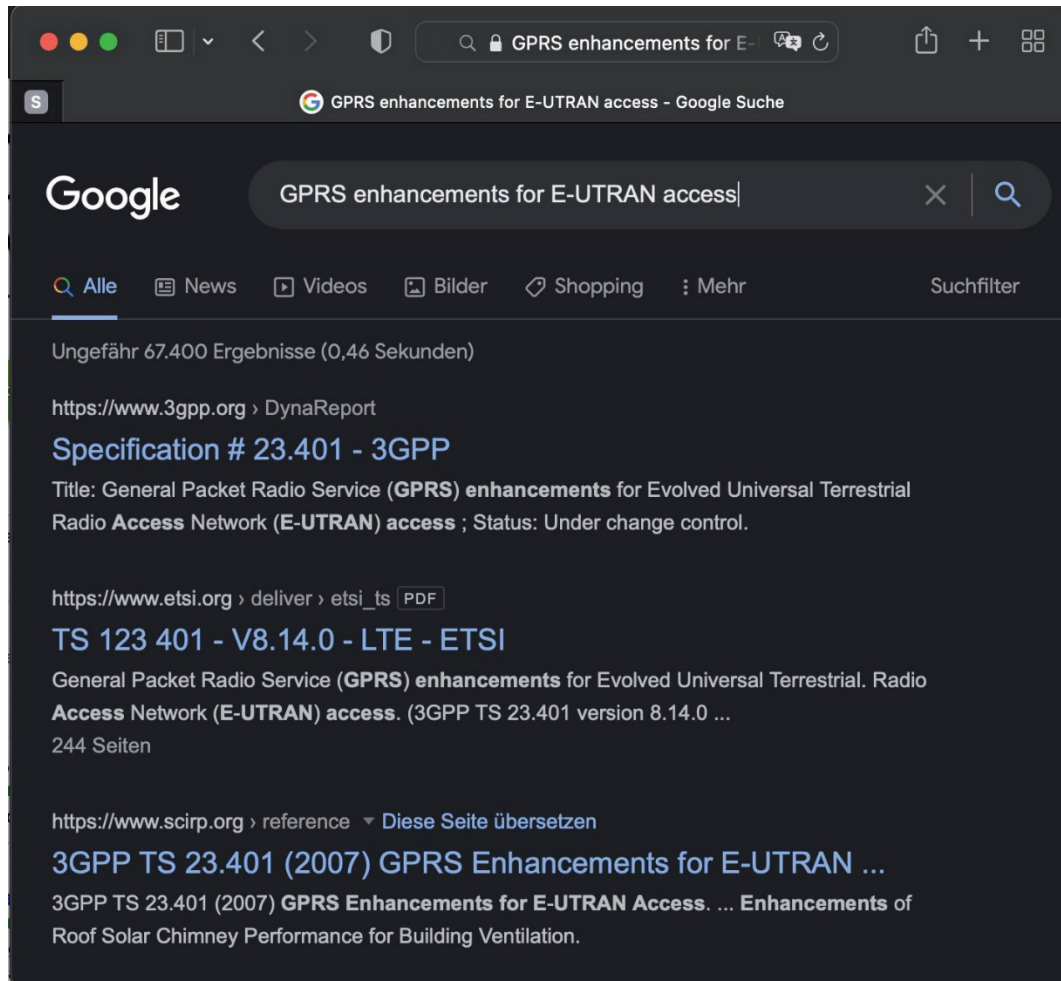
Filename	Size	Modified
23401-010.zip	158.1 KB	29.01.07, 14:13
23401-020.zip	295.7 KB	20.02.07, 13:22
23401-021.zip	300.0 KB	03.04.07, 13:23
23401-030.zip	400.9 KB	10.04.07, 13:10
23401-040.zip	404.7 KB	13.04.07, 14:31
23401-041.zip	297.8 KB	16.04.07, 13:38
23401-051.zip	187.4 KB	13.06.07, 09:08
23401-100.zip	382.1 KB	13.06.07, 09:08
23401-110.zip	885.5 KB	13.08.07, 14:28
23401-111.zip	893.1 KB	13.08.07, 14:13
23401-120.zip	564.0 KB	11.09.07, 13:52
23401-121.zip	574.3 KB	12.09.07, 13:54
23401-130.zip	1.5 MB	24.10.07, 09:26
23401-141.zip	1.1 MB	11.12.07, 08:27
23401-200.zip	1.7 MB	11.12.07, 08:27
23401-800.zip	1.7 MB	13.12.07, 10:08
23401-810.zip	1.9 MB	25.03.08, 10:04
23401-820.zip	2.5 MB	06.06.08, 09:46

68. In addition, metadata information for the downloaded and extracted specification file states a last Modified date of “29. May 2007”, as shown in the screenshot below:

The image is a screenshot of a document viewer displaying the cover page of a 3GPP technical specification. The document is titled "3GPP TS 23.401 V1.0.0 (2007-05)" and is a "Technical Specification" for the "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; GPRS enhancements for E-UTRAN access (Release 8)". It includes logos for GSM and 3GPP, a table of contents, and a copyright notice. Below the document viewer, a file information box shows the filename "23401-100.doc", size "749 KB", and creation/modification date "29. May 2007 at 11:24". A "Show Less" link is also present.

70. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, this information tells me that this document was available to all 3GPP members and the general public by June 13, 2007, at the latest.

71. I believe that a person without prior knowledge of 3GPP and/or the technical specification (TS) number would have been able to easily find the TS for download via internet search. For instance, a Google search for "GPRS enhancements for E-UTRAN access" provides the TS number "23.401" as one of the top results as can be seen in the screenshot below:



72. Following the provided search result link “Specification # 23.401 – 3GPP” leads to a 3GPP web page offering under the tab “Versions” download links to all versions of TS 23.401 including version 1.0.0, as shown by the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund

portal.3gpp.org

Specification # 23.401

3GPP Portal

General Versions Responsibility Related

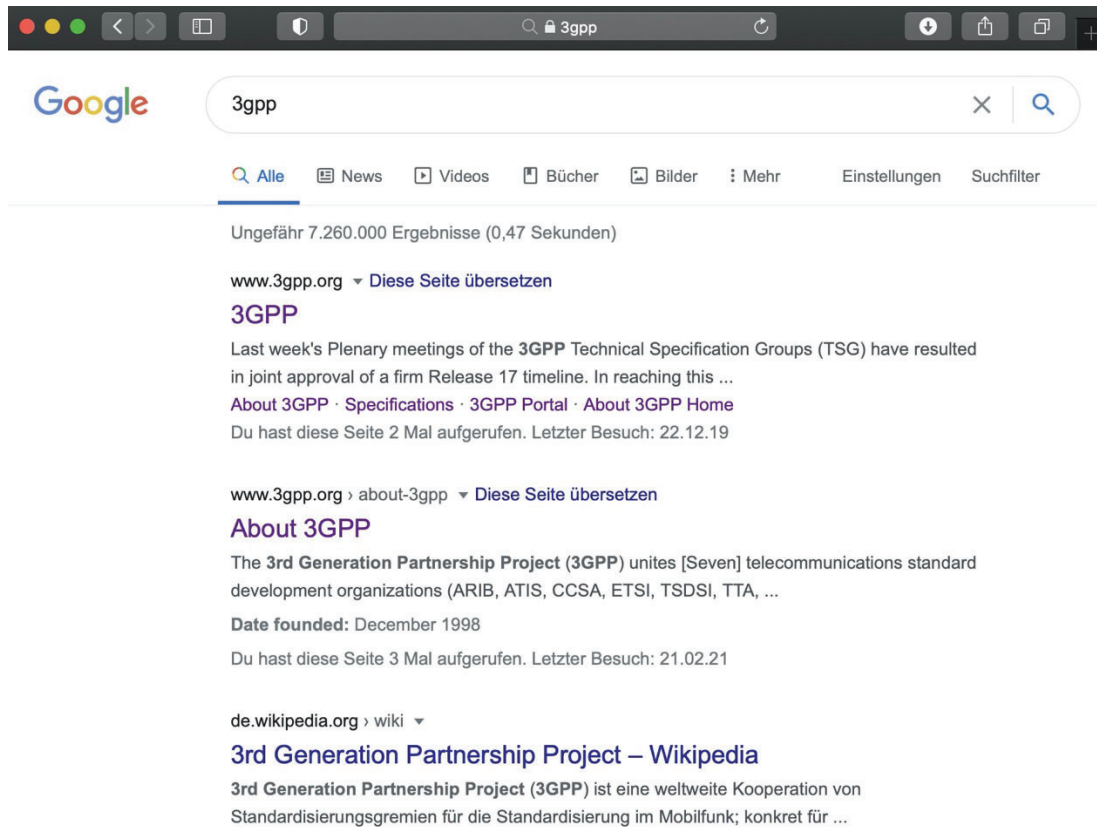
Specification #: 23.401

SA#	Version	Date	Related	ETSI	TDoc	CR
SA#40	8.2.0	2008-06-09				
SA#39	8.1.0	2008-03-25				
SA#38	8.0.0	2007-12-13				
SA#38	2.0.0	2007-12-11	SP-070828			
SA#38	1.4.1	2007-12-11	SP-070828			
-	1.3.0	2007-10-24				
SA#37	1.2.1	2007-09-24	SP-070551, CP-070654 @CP-37			
SA#37	1.2.0	2007-09-24				
-	1.1.1	2007-08-13				
-	1.1.0	2007-08-13	email circulation			
SA#36	1.0.0	2007-06-13	SP-070405			
SA#36	0.5.1	2007-06-13	SP-070405			
-	0.4.1	2007-04-16				
-	0.4.0	2007-04-13				
-	0.3.0	2007-04-11				
-	0.2.1	2007-04-03				
-	0.2.0	2007-02-20				
-	0.1.0	2007-01-29				
-	0.0.0	2006-12-22	"v2"			

Exit

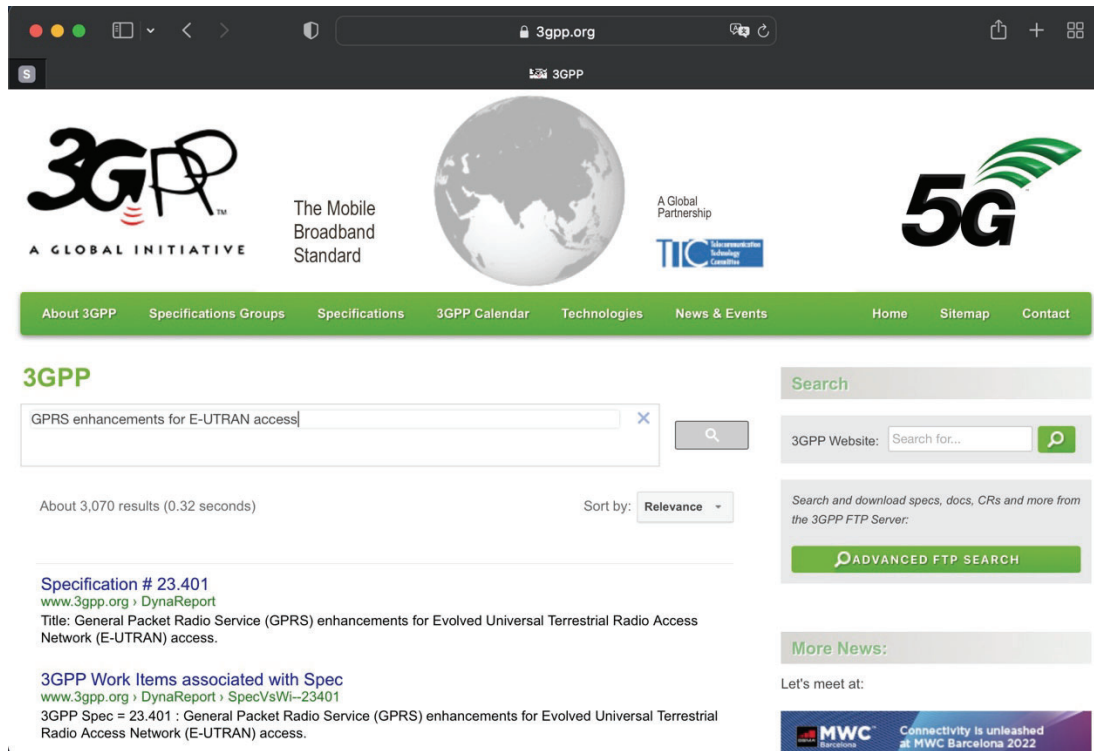
73. 3GPP is a very well-known SDO as of today and certainly was already very well-known in 2007. A person aware of 3GPP could have found TS 23.401 v1.0.0 also via a different route. Searching for “3GPP” leads to the 3GPP website <http://www.3gpp.org>, as can be seen by the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund



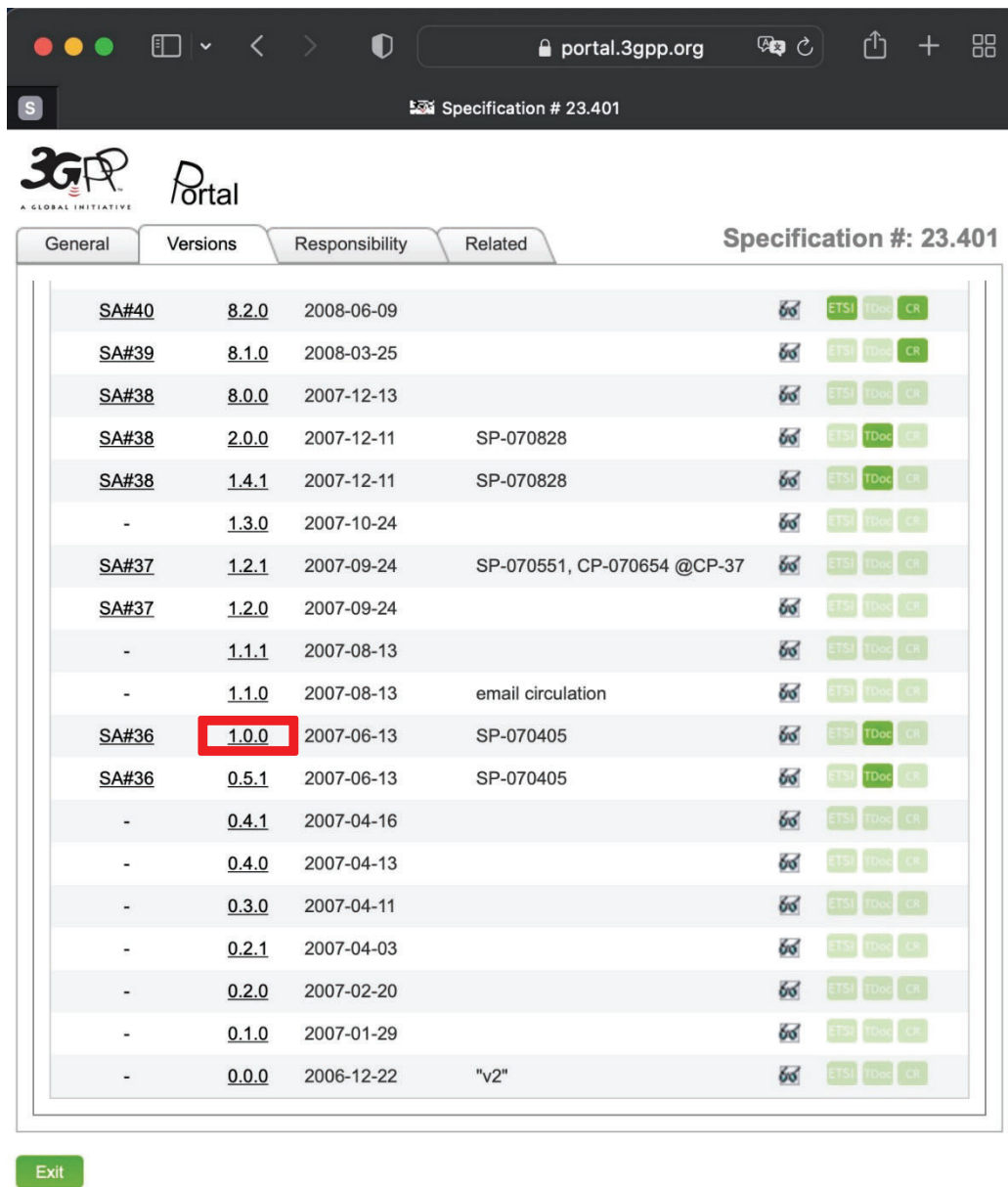
74. Entering “GPRS enhancements for E-UTRAN access” into the search box of the 3GPP web site provides “Specification # 23.401” as one of the top results, as can be seen by the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund



75. Following the provided search result link on “Specification # 23.401” leads to the same 3GPP web page as mentioned in paragraph 72 offering under the tab “Versions” download links to all versions of TS 23.401 including version 1.0.0, as shown by the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund



The screenshot shows the 3GPP Portal website at portal.3gpp.org. The page is titled "Specification # 23.401". The "Versions" tab is selected, displaying a table of specification versions. The version 1.0.0 is highlighted with a red box.

SA#	Version	Date	Related	ETSI	TDG	CR
SA#40	8.2.0	2008-06-09		ETSI	TDG	CR
SA#39	8.1.0	2008-03-25		ETSI	TDG	CR
SA#38	8.0.0	2007-12-13		ETSI	TDG	CR
SA#38	2.0.0	2007-12-11	SP-070828	ETSI	TDG	CR
SA#38	1.4.1	2007-12-11	SP-070828	ETSI	TDG	CR
-	1.3.0	2007-10-24		ETSI	TDG	CR
SA#37	1.2.1	2007-09-24	SP-070551, CP-070654 @CP-37	ETSI	TDG	CR
SA#37	1.2.0	2007-09-24		ETSI	TDG	CR
-	1.1.1	2007-08-13		ETSI	TDG	CR
-	1.1.0	2007-08-13	email circulation	ETSI	TDG	CR
SA#36	1.0.0	2007-06-13	SP-070405	ETSI	TDG	CR
SA#36	0.5.1	2007-06-13	SP-070405	ETSI	TDG	CR
-	0.4.1	2007-04-16		ETSI	TDG	CR
-	0.4.0	2007-04-13		ETSI	TDG	CR
-	0.3.0	2007-04-11		ETSI	TDG	CR
-	0.2.1	2007-04-03		ETSI	TDG	CR
-	0.2.0	2007-02-20		ETSI	TDG	CR
-	0.1.0	2007-01-29		ETSI	TDG	CR
-	0.0.0	2006-12-22	"v2"	ETSI	TDG	CR

Exit

76. The above example searches illustrate that it is very easy for an interested member of the public without prior knowledge of the TS number and even without prior knowledge of 3GPP to locate any version of TS 23.401, including version 1.0.0, for download.

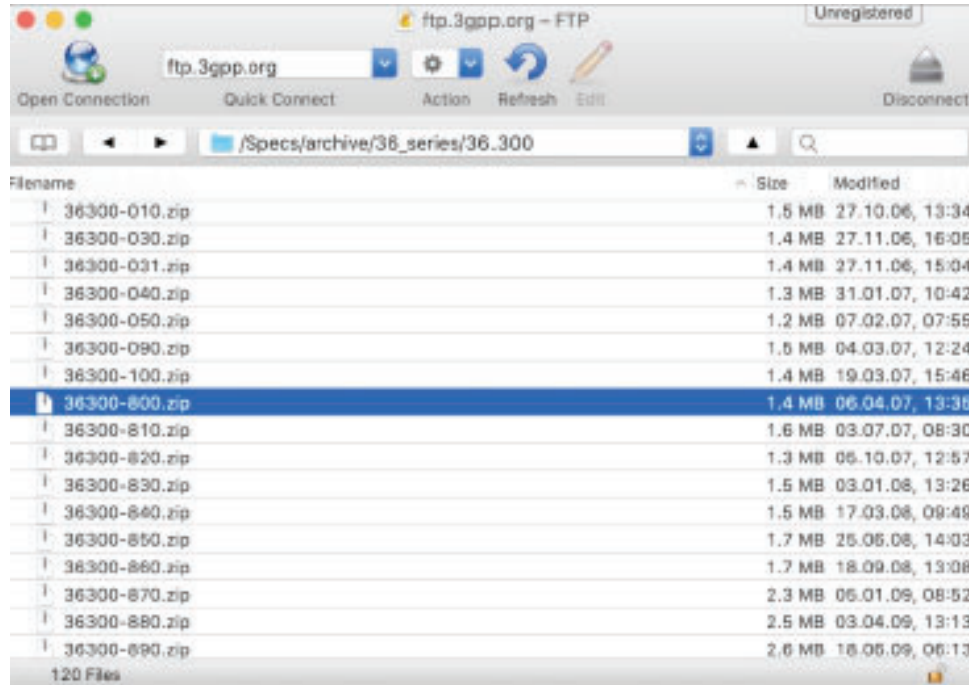
77. The above searches were performed at the time of writing this report. According to my personal experience, similar searches done in June 2007 or around that timeframe would have similarly provided the path to download version 1.0.0 of TS 23.401.

4. TS 36.300 V8.0.0

78. Based on my personal knowledge and my review of 3GPP's business records, I recognize Ex. 1009 as a true and correct copy of version 8.0.0 of technical specification 3GPP TS 36.300 ("Technical Specification Group (TSG) Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2 (Release 8)"), which shows on its cover page "2007-03" as the year (2007) and month (March) during which this document was approved by 3GPP. Shortly after its approval, the document was published and freely available on 3GPP's ftp server by April 6, 2007. This is confirmed by the date stamp shown on the historic 3GPP ftp server for the corresponding downloadable file ("36300-800.zip"), as maintained by the Internet Archive at <https://web.archive.org/web/20071115223743/http://www.3gpp.org:80/ftp/Specs/archive/36%5Fseries/36.300/>, as well as the date stamp for the present-day listing of the same document on the 3GPP ftp server at

Ex. 1020 - Declaration of Friedhelm Rodermund

https://www.3gpp.org/ftp/Specs/archive/36_series/36.300 as shown by the screen shot below:



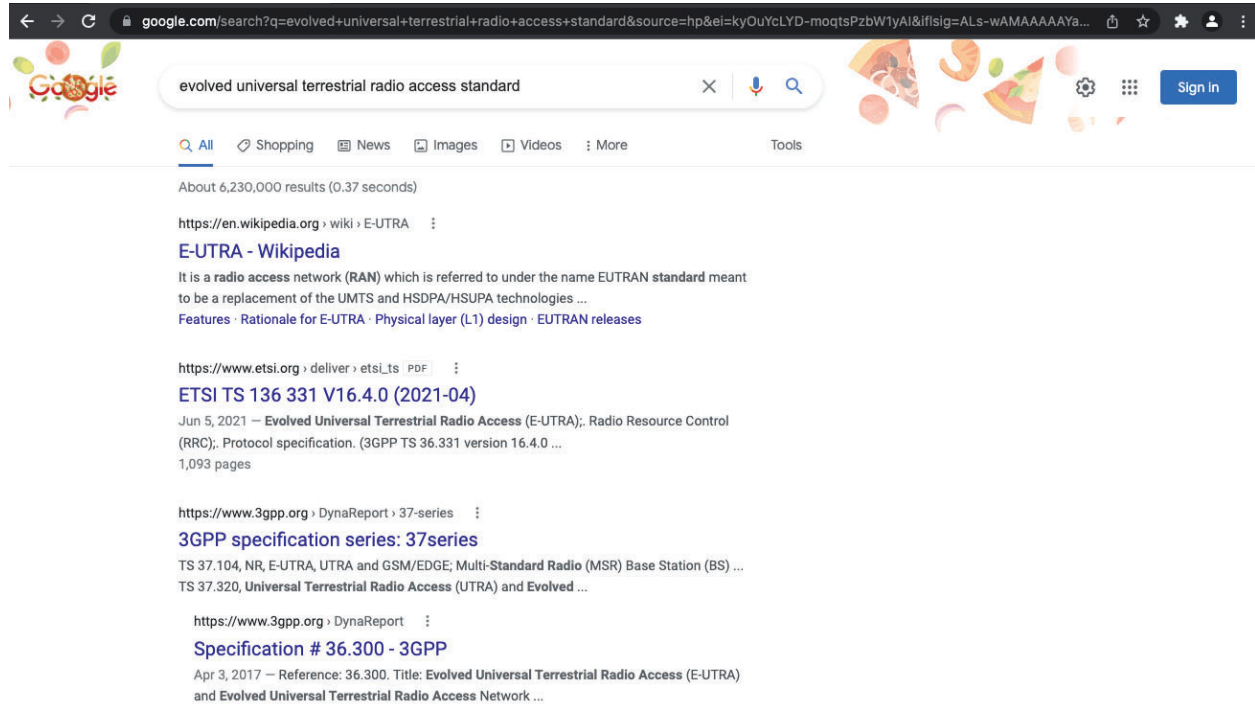
79. In addition, the information for the downloaded and extracted specification file states a last Modified date of “6. April 2007.” Here is a screen shot showing those file details:



80. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, this information tells me that this document was available to all 3GPP members and the general public by April 6, 2007, at the latest.

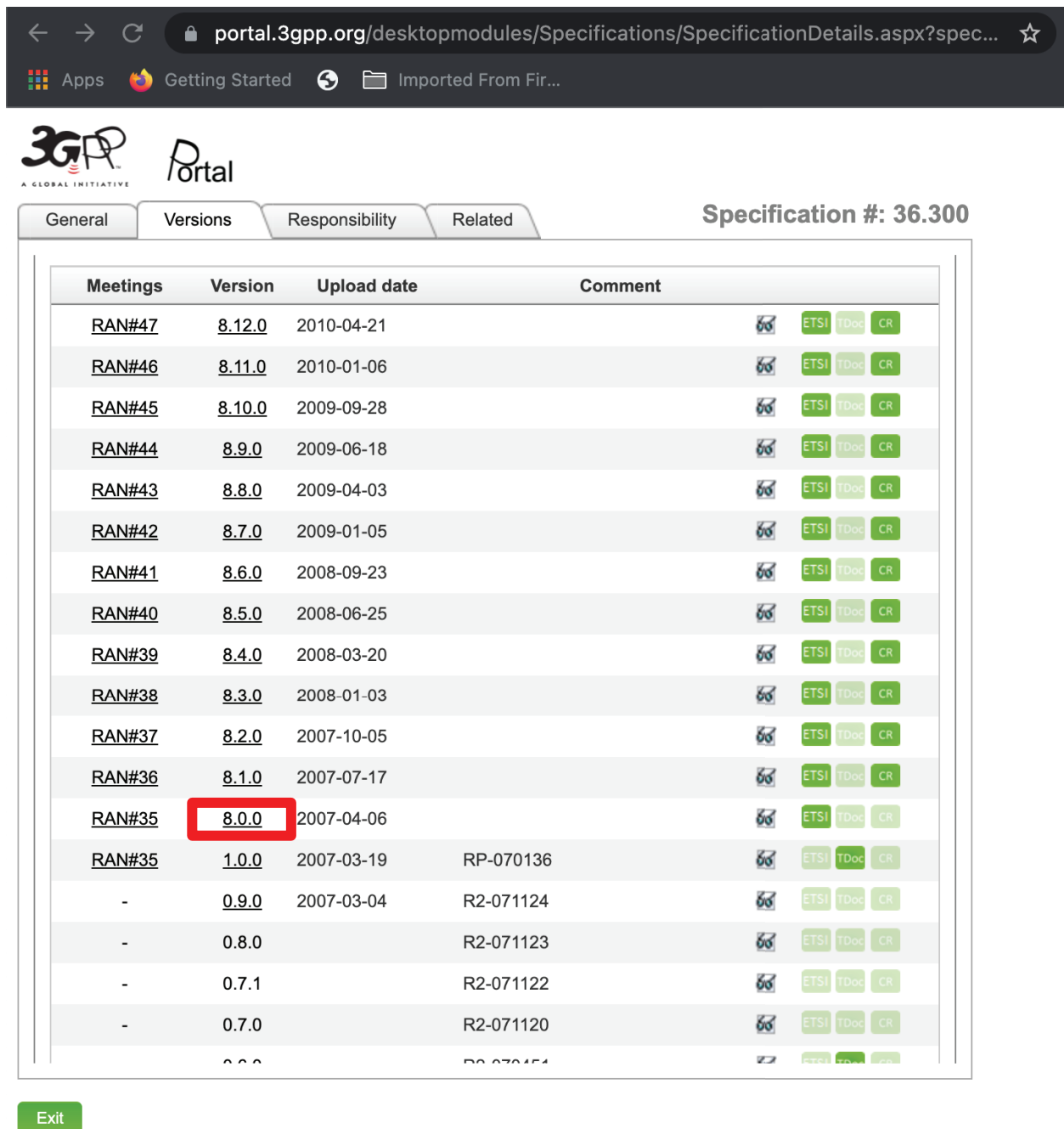
81. I believe that a person without prior knowledge of 3GPP and/or the technical specification (TS) number would have been able to easily find the TS for download via internet search. For instance, a Google search for "evolved universal terrestrial radio access standard" provides the TS number "36.300" as one of the top results as can be seen in the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund



82. Following the provided search result link “Specification # 36.300 – 3GPP” leads to a 3GPP web page offering under the tab “Versions” download links to all versions of TS 36.300 including version 8.0.0, as shown by the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund



portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?spec...

3GPP Portal

Specification #: 36.300

General Versions Responsibility Related

Meetings	Version	Upload date	Comment
RAN#47	8.12.0	2010-04-21	
RAN#46	8.11.0	2010-01-06	
RAN#45	8.10.0	2009-09-28	
RAN#44	8.9.0	2009-06-18	
RAN#43	8.8.0	2009-04-03	
RAN#42	8.7.0	2009-01-05	
RAN#41	8.6.0	2008-09-23	
RAN#40	8.5.0	2008-06-25	
RAN#39	8.4.0	2008-03-20	
RAN#38	8.3.0	2008-01-03	
RAN#37	8.2.0	2007-10-05	
RAN#36	8.1.0	2007-07-17	
RAN#35	8.0.0	2007-04-06	
RAN#35	1.0.0	2007-03-19	RP-070136
-	0.9.0	2007-03-04	R2-071124
-	0.8.0		R2-071123
-	0.7.1		R2-071122
-	0.7.0		R2-071120

Exit

83. 3GPP is a very well-known SDO as of today and certainly was already very well-known in 2007. A person aware of 3GPP could have found TS 36.300 v.8.0.0 also via a different route. Searching for “3GPP” leads to the 3GPP website <http://www.3gpp.org>, as can be seen by the screen shot below:

Ex. 1020 - Declaration of Friedhelm Rodermund

The screenshot shows a Google search for "3GPP". The search bar at the top contains "3GPP" and the Google logo is on the left. Below the search bar, there are tabs for "All", "News", "Books", "Videos", "Images", and "More". The search results show "About 8,190,000 results (0.53 seconds)". The first result is "https://www.3gpp.org" with the title "3GPP". The description says: "The '3GPP Summit' featured all three Technical Specification Group (TSG) Chairs and one Japanese leader from each group. After the presentations ...". Below the search results, there are several links: "About 3GPP", "Specifications", "Specification Numbering", "About 3GPP Home", "Releases", and "Specifications Home". To the right of the search results is a knowledge panel for "3GPP". The panel includes the 3GPP logo, a description of the organization, its founding date (December 1998), and its type of business (Standards organization). It also lists the Band, Location, and Chairman.

3GPP

Standards organization

3gpp.org

The 3rd Generation Partnership Project is an umbrella term for a number of standards organizations which develop protocols for mobile telecommunications.

[Wikipedia](#)

Abbreviation: 3GPP

Founded: December 1998

Type of business: Standards organization

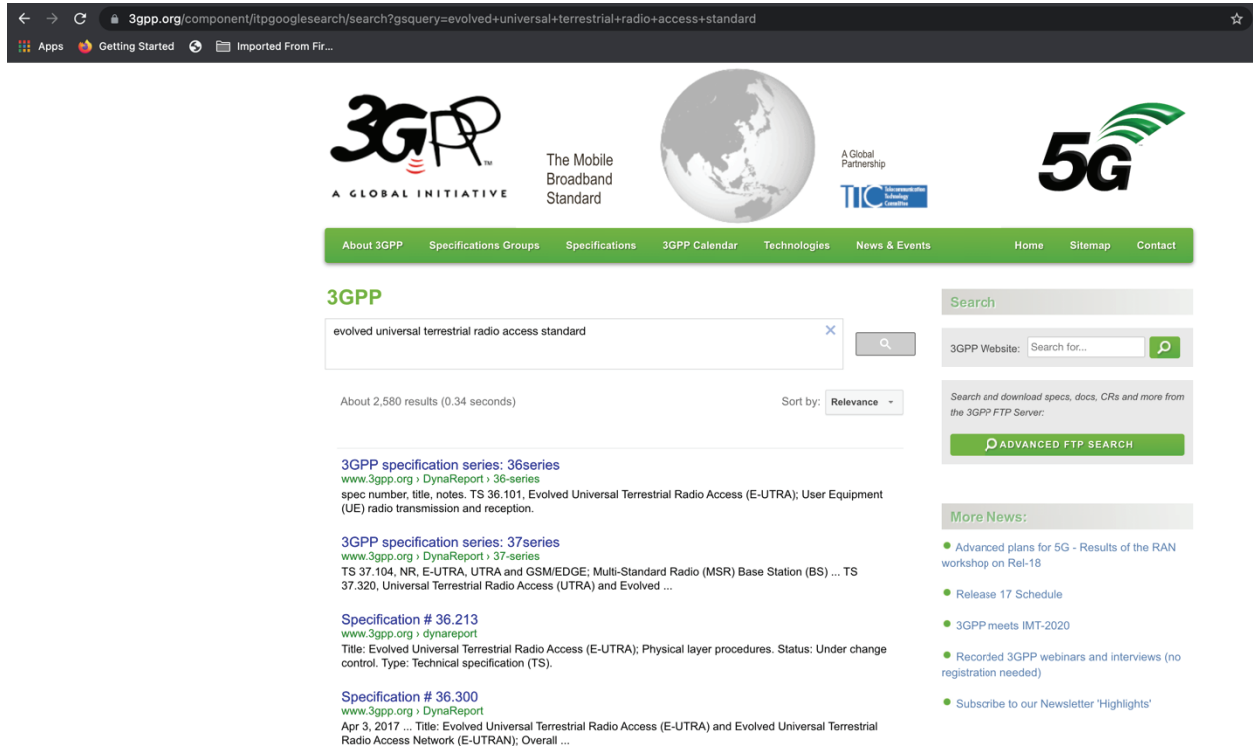
Band

Location

Chairman

84. Entering “evolved universal terrestrial radio access standard” into the search box of the 3GPP website provides “Specification # 36.300” as one of the top results, as can be seen by the screen shot below:

Ex. 1020 - Declaration of Friedhelm Rodermund



85. Following the provided search result link on “Specification # 36.300” leads to the same 3GPP web page as mentioned in paragraph 82 offering under the tab “Versions” download links to all versions of TS 36.300 including version 8.0.0, as shown by the screenshot below:

Ex. 1020 - Declaration of Friedhelm Rodermund

portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?spec...

3GPP Portal
A GLOBAL INITIATIVE

General Versions Responsibility Related **Specification #: 36.300**

Meetings	Version	Upload date	Comment
RAN#47	8.12.0	2010-04-21	
RAN#46	8.11.0	2010-01-06	
RAN#45	8.10.0	2009-09-28	
RAN#44	8.9.0	2009-06-18	
RAN#43	8.8.0	2009-04-03	
RAN#42	8.7.0	2009-01-05	
RAN#41	8.6.0	2008-09-23	
RAN#40	8.5.0	2008-06-25	
RAN#39	8.4.0	2008-03-20	
RAN#38	8.3.0	2008-01-03	
RAN#37	8.2.0	2007-10-05	
RAN#36	8.1.0	2007-07-17	
RAN#35	8.0.0	2007-04-06	
RAN#35	1.0.0	2007-03-19	RP-070136
-	0.9.0	2007-03-04	R2-071124
-	0.8.0		R2-071123
-	0.7.1		R2-071122
-	0.7.0		R2-071120

Exit

86. The above example searches illustrate that it is very easy for an interested member of the public without prior knowledge of the TS number and even without prior knowledge of 3GPP to locate any version of TS 36.300, including version 8.0.0, for download.

87. The above searches were performed at the time of writing this report. According to my personal experience, similar searches done in April 2007 or around that timeframe would have similarly provided the path to download version 8.0.0 of TS 36.300.

V. AVAILABILITY FOR CROSS-EXAMINATION

88. In signing this declaration, I recognize that the declaration may be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross examination in the case and that cross examination will take place within the United States. If cross examination is required of me, I will cooperate to the best of my ability to appear for cross examination within the United States during the time allotted for cross examination.

A. Right To Supplement

89. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner raises and to take into account new information as it becomes available to me.

B. Signature

90. I 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

Ex. 1020 - Declaration of Friedhelm Rodermund

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.

91. I declare under penalty of perjury that the foregoing is true and correct.

Dated: February 28, 2022



Friedhelm Rodermund

CURRICULUM VITAE

I. PERSONAL DATA

Name: **Friedhelm RODERMUND**

Mailing address: Am Steiner Graben 18
56077 Koblenz, Germany

Phone: +49 172 2606489

Email: fred@iotecc.com

II. PROFESSIONAL EXPERIENCE

Summary

Senior expert in telecommunications and Internet of Things (IoT) technology. 25 years of experience within the mobile communications industry, and several years in the IoT domain in various roles such as project management, technology innovation and evolution, standards development, technology strategy, patent creation and patent litigations, and development/introduction of new services.

Recognized standards expert who was actively involved in leading roles in the development of key standards for mobile telephony/data and service enablers across standards development organizations such as 3GPP, ETSI, GSMA, IETF, OMA, and oneM2M. Currently focussing on standards for the Internet of Things.

Founder and director of IOTECC GmbH which provides consulting services around technologies and standards enabling the Internet of Things, and consulting and expert services related to patents for mobile telecommunications and IoT.

01/2015 – present IOTECC GmbH Koblenz, Germany

Founder and CEO

- Mobile telecommunications, Internet of Things (IoT) technology and standards consulting
- Telecommunications and IoT patent consulting
 - Consulting services around telecommunications and IoT patents in particular related to 3GPP, ETSI and OMA standards
 - State of the art/prior art research services related to patent creation e.g. for new 5G patents
 - Prior art research, patent infringement analysis related to litigations and validity actions
 - Advising on IP strategy
 - Advising on Standards Development Organisations (SDO) working processes and IPR policy
 - Experienced expert witness (please see section III for a list of supported actions)

11/2014 – 12/2014 Friedhelm Rodermund Consulting Koblenz, Germany

Internet of Things (IoT) Consultant

- IoT standards development and introduction of new IoT services

CURRICULUM VITAE

01/2011 – 10/2014 Vodafone Germany / Vodafone Group R&D Düsseldorf, Germany

Senior Standards Strategist

- Representing Vodafone in various standardisation bodies
- Driving the standardisation of the Internet of Things
- Work item lead, technical editor and key contributor of Open Mobile Alliance (OMA) "Lightweight M2M (LwM2M)" – the new standard for the Internet of Things
- Advising and supporting various IoT/M2M projects related to e.g. automotive, smart metering, health, industry
- Advising on the introduction of new IoT/M2M technologies and services
- Leading Proof of Concepts of emerging technologies
- Involved in innovation projects
- Supporting the creation and protection of Intellectual Property

01/2009 – 12/2010 Vodafone Germany Düsseldorf, Germany

Vice Chairman Open Mobile Alliance (OMA) Device Management (DM)

- Responsible for Vodafone's Device Management standardisation
- As OMA DM Vice Chairman, co-leading the group, chairing committee meetings and web conferences, steering the technical direction, management of the different work items
- Editor of several specifications, rapporteur of various work items
- Support of projects for the introduction of device management
- Delegate to 3GPP SA1 with responsibility for the introduction of MTC (machine type communications) related service/network requirements

01/2005 – 12/2008 Vodafone Germany Düsseldorf, Germany

Project Manager Mobile Broadcast Standards

- Responsible for Mobile Broadcast standardisation across different broadcast systems/standards bodies and across all Vodafone local operations
- Responsible for Mobile Broadcast standardisation strategy development and implementation
- Delegation Lead for the Open Mobile Alliance (OMA) BCAST working group
- Initiated and managed the BCAST device profile development in the BMCO Forum
- Leading the "Service Protection" (pay-TV) stream of the German DVB-H Consortium
- Filed several patents
- Supporting patent litigations and patent portfolio evaluation (various technical areas)

04/2003 – 12/2003 GSM Association London, United Kingdom

Member of the MMS Task Force

- Verification of the MMS operator interworking framework
- Supporting the definition and specification of the MMS functional evolution
- Acting as a "link" between 3GPP and GSMA in the area of MMS

06/1998 – 12/2004 European Telecommunications Standards Institute (ETSI) Sophia Antipolis, France

01/2002 – 12/2004: Secretary 3GPP Technical Specifications Group "Terminals" and Terminals Working Group 2 "Terminal Services and Capabilities"

01/1999 – 12/2001: Secretary 3GPP Terminals Working Group 2 "Terminal Services and Capabilities" and GERAN 3 "Base Station Testing"

CURRICULUM VITAE

06/1998 – 03/1999: Secretary ETSI SMG4 “Data Services” and SMG8 “Base Station Testing”

- Supported the establishment of 3GPP (3rd Generation Partnership Project) as the leading standards organization for mobile telecommunications
- Project manager and secretary of TSG “Terminals” responsible for Terminal Conformance Testing, Terminal Services and Capabilities, Universal Subscriber Identity Module (USIM)
- Project manager and secretary of Terminals Working Group 2 “Terminal Services and Capabilities” that was responsible for Terminal Execution Environments, Messaging including Short Message Service (SMS), Cell Broadcast Service (CBS), Enhanced Messaging Service (EMS), Multimedia Messaging Service (MMS), Terminal Interfaces incl. AT-commands, Generic User Profile, Data Synchronization and others
- Establishment and management of the Work Plan and follow-up and report on the progress of the related work items
- Advising the chairmen and the standards groups on technical, procedural and political issues
- Editorship of various GSM and UMTS technical specifications
- Responsible for presenting the technical results of the working groups to the parent body
- Responsible for the communication with other standards bodies inside and outside 3GPP
- PR activities (articles, interviews)

12/1993 – 06/1998 Mannesmann Mobilfunk GmbH

Düsseldorf, Germany

System Engineer and Project Manager in Quality Assurance and Technical Standards

- Leadership and management of acceptance test projects in the area of GSM Base Station Controller (BSC) and GSM Base Station (BTS) hardware and software.
- Leading project teams of around 15 people
- Responsible for the clearance of releasing new software/hardware into the network
- Supported Request for Quotations, supplier evaluation and pre-selection, project manager of System Verification as a central part of the supplier selection process.
- Representation of Mannesmann Mobilfunk to the ETSI standardization group “Standardization Technical Committee SMG3 System Architecture”
- Conduction of product and hardware development quality audits
- Representative of Mannesmann Mobilfunk in A-interface interoperability testing activities
- Member of BSS product planning group which was defining operator requirements for future BSS releases
- Development of process improvements for type acceptance

III. LIST OF SUPPORTED PATENT LITIGATIONS AND VALIDITY ACTIONS

2021

Nokia v. Lenovo

Certain Electronic Devices, Including Computers, Tablet Computers, and Components and Modules Thereof, Inv. No. 337-TA-1208 (U.S.I.T.C.)

On behalf of Lenovo

Counsel: WilmerHale

Role: Expert witness and consulting services

2021

Optis Cellular Technology LLC et al. v. Apple

Claim No. HP-2019-000006 (High Court of Justice, Business and Property Courts of England and Wales)

On behalf of Apple

Counsel: WilmerHale

Role: Expert witness and consulting services

2021

Ericsson v. Samsung

Inter Partes Review matters

On behalf of Samsung

Counsel: Kirkland&Ellis LLP, Fish&Richardson

Role: Expert witness and consulting services

2020

Panoptis Patent Management LLC et al. v. Apple Inc.

Civil Action No. 2:19-cv-66 (E.D. Tex.)

On behalf of Apple

Counsel: WilmerHale

Role: Expert witness at bench trial

2020

Sol IP, LLC v. AT&T Mobility, LLC et al.

Civil Action No. 2:18-cv-526 (E.D. Tex.)

On behalf of AT&T, Verizon, Sprint

Counsel: Gibson Dunn

Role: Expert witness and consulting services

2020

Bell Northern Research LLC v. LG Electronics Inc. et al.

Civil Action No. 18-CV-2864-CAB-BLM (S.D. Cal.)

On behalf of LG Electronics Inc.

Counsel: Fish&Richardson

Role: Expert witness and consulting services

2019

Conversant Wireless Licensing S.a.r.l. v. LG Electronics Deutschland GmbH

Civil Action No. 7 O 3277/18 (Landgericht Munich, Germany)

On behalf of LG Electronics Deutschland GmbH

Counsel: Wildanger Kehrwald Graf von Schwerin & Partner mbB

Role: Expert witness and consulting services

2019

Bell Northern Research, LLC v. Huawei Device Co., Ltd, et al.

Civil Action No. 3:18-cv-01784-CAB-BLM

On behalf of Huawei

Counsel: Fish&Richardson

Role: Expert witness and consulting services

CURRICULUM VITAE

2019

Uniloc USA, Inc., et al. v. Samsung Electronics America, Inc. and Samsung Electronics Co. Ltd.

Civil Action Nos. 2:18-cv-00040-JRG, 2:18-cv-00041-JRG, 2:18-cv-00042-JRG and 2:18-cv-00044-JRG (United States District Court for the Eastern District of Texas)

On behalf of Samsung

Counsel: Greenberg Traurig

Role: Expert witness and consulting services

2019

Uniloc USA, Inc., et al. v. Huawei Device USA, Inc. et al.

Civil Action No. 2:18-cv- 00072-JRG-RSP (E.D. Tex.)

On behalf of Huawei

Counsel: McGuireWoods

Role: Expert witness and consulting services

2019

Microsoft Corporation v. Uniloc 2017 LLC

Inter Partes Review of U.S. Pat. No. 7,167,487

Inter Partes Review of U.S. Pat. No. 7,075,917

On behalf of Microsoft and on behalf of Apple as joinder petitioner

Counsel: Klarquist Sparkman (Microsoft), Erise IP (Apple)

Role: Expert witness and consulting services

2019

Qualcomm v. KFTC

South Korean Case, Seoul High Court

On behalf of intervenor Apple supporting the KFTC

Counsel: Boies Schiller Flexner

Role: Expert witness

2018/19

Evolved Wireless, LLC v. Apple, Inc.

Civil Action No. 1:15-cv-00542-JFB-SRF

On behalf of Apple

Counsel: DLA Piper

Role: Expert witness and consulting services

2018/19

Cisco Systems Inc. v. Traxcell Technologies

Inter Partes Review of Traxcell Technologies patents

On behalf of Cisco

Counsel: King&Spalding

Role: Expert witness and consulting services

2018/19

Qualcomm Inc. v. Apple Inc.

Civil Action No. 3:17- cv-02398-DMS-MDD (United States District Court for the Southern District of California)

Civil Action No. 3:17-cv-02402-WQH-MDD

Certain Mobile Electronic Devices and Radio Frequency and Processing Components Thereof (II), Inv. No. 337-TA-1093

Inter Partes Review of U.S. PATENT NO. 9,154,356

Cases IPR2019-00047, IPR2019-00048, IPR2019-00049, IPR2019-00128, IPR2019-00129

On behalf of Apple and Intel

Counsel: WilmerHale

Role: Expert witness and consulting services

2018/19

Apple Inc. v. Qualcomm Inc.

CURRICULUM VITAE

Civil Action No. 3:17-CV-00108-GPC-MDD (United States District Court for the Southern District of California)
On behalf of Apple
Counsel: Fish&Richardson, Boies Schiller Flexner
Role: Expert witness and consulting services

2018

3G Licensing, S.A. et al. v. LG Electronics Inc. et al
Inter Partes Review of U.S. Patent No. 7,995,091
On behalf of LG Electronics
Counsel: Fish&Richardson
Role: Expert witness

2017

Huawei Technologies Co. LTD. v. T-Mobile US, Inc. & T-Mobile USA, Inc.
E.D. Tex. Case Nos. 2:16-cv-00052-JRG-RSP; 2:16-cv-00055-JRG-RSP; 2:16-cv-00056-JRG-RSP; and 2:16-cv-00057-JRG-RSP
On behalf of T-Mobile
Counsel: Gibson Dunn
Role: Expert witness and consulting services

2016

Koninklijke KPN N.V. v. Samsung Electronics America, Inc. et al.
Civil Action No. 14-cv-1165
On behalf of Samsung Electronics
Counsel: Baker Botts
Role: Expert witness and consulting services

2016

SSH v. Sony
OLG Düsseldorf, Germany
On behalf of SSH
Counsel: Cohausz&Florack
Role: Technical expert support

2015/16

LG Electronics v. Core Wireless Licensing S.A.R.L.
Inter Partes Review of U.S. Patent No. 8,165,049
On behalf of LG Electronics
Counsel: Greenberg Traurig
Role: Expert witness

2015/16

Core Wireless Licensing S.A.R.L. v. LG Electronics Inc. and LG Electronics MobileComm U.S.A., Inc
Civil Action No. 2:14-cv-911 (lead case) and Civil Action No. 2:14-cv-912 (consolidated)
On behalf of LG Electronics
Counsel: Greenberg Traurig, Sidley Austin
Role: Expert witness

2015

Intellectual Ventures I LLC v. T-Mobile USA, Inc. & T-Mobile US, Inc.
D. Del. Case No. 1:13-cv-01632
Intellectual Ventures II LLC v. T-Mobile USA, Inc. & T-Mobile US, Inc.
D. Del. Case No. 1:13-cv-01633
On behalf of T-Mobile
Counsel: Gibson Dunn
Role: Technical expert support

CURRICULUM VITAE

IV. EDUCATION

- 10/1984 – 10/1993** **University of Technology Aachen** **Aachen, Germany**
Graduate of Electrical Engineering with a focus on telecommunications technologies (Dipl.-Ing. TH)
- 10/1992 – 04/1993** **University of Technology Trondheim** **Trondheim, Norway**
Diploma Thesis "Design of a dual processor computer for digital signal processing in power electronics"

V. LANGUAGES

German, English, French

VI. RECENT PUBLICATIONS

- "Unlocking the internet of things and driving the need for interoperability", Global Telecoms Business, December 2013
- "The need for standardisation in the M2M services layer", Global Telecoms Business, February 2014
- Co-authored white paper "Lightweight M2M: Enabling device management and applications for the internet of things", Open Mobile Alliance, March 2014
- "Objects are a new way to create M2M applications", Global Telecoms Business, April 2014
- "The need for standardisation in the M2M services layer", M2M Now, July 2015



3GPP_TSG_SA_WG2@LIST.ETSI.ORG

☰

Options:

Use Proportional Font

Show Text Part by Default

Show All Mail Headers

Message:

[<< First] [< Prev] [Next >] [Last >>]

Topic:

[<< First] [< Prev] [Next >] [Last >>]

Author:

[<< First] [< Prev] [Next >] [Last >>]

Subject:

Updated specifications after SA-Plenary

From:

Maurice Pope <Maurice.Pope@ETSI.ORG>

Reply To:

Maurice Pope <Maurice.Pope@ETSI.ORG>

Date:

Thu, 15 Mar 2007 17:14:58 +0100

Content-Type:

text/plain

Parts/Attachments:

text/plain (73 lines)

🖨

✎

Dear SA WG2 Members,

After further consultation with the specifications manager, we have agreed that I can put the updated specifications in a temporary area for SA WG2 members to use for the CRs for the Warsaw meeting.

I have finished the implementation and placed the updated specifications in the following folder:

ftp://ftp.3gpp.org/tsg_sa/WG2_Arch/Latest_SA2_Specs/_AFTER_SA35
or
http://www.3gpp.org/ftp/tsg_sa/WG2_Arch/Latest_SA2_Specs/_AFTER_SA35

23060-740.zip
23167-740.zip
23203-720.zip
23204-720.zip
23206-720.zip
23221-710.zip
23228-6g0.zip
23228-770.zip
23228-800.zip
23234-750.zip
23246-720.zip
23271-780.zip
23279-760.zip

Please use these specifications for further CRs.

NOTE that if the specifications manager finds any errors with the documents, we will need to revise them again before putting them in the official specifications area. In this case they will appear with updated version numbers x.y.1.

Best regards,

Maurice Pope

From: Ricky Kaura [mailto:rkaura@nortel.com]
Sent: Thu 15/03/2007 10:36
To: Maurice Pope
Subject: Updated specifications after SA-Plenary

Hi Maurice,

I have some CRs to present that are based upon changes that were agreed at the Florence meeting. I was wondering when the specifications (specifically 23.228 and 23.206) will be available to base my CRs upon, seeing as the deadline is approaching fast.

Regards,

Ricky Kaura

Nortel MOCN Architecture and Standard Team (EP10)

3GPP SA2 IMS Prime

[Email : rkaura@nortel.com <mailto:rkaura@nortel.com>] [ESN : 560 4544] [Mobile ESN : 748 9376]
[Work : +44 (0) 1628 434544] [Mobile : +44 (0) 7740 539376] [Alternate Mobile : +44 (0) 7748 963503]
[Address : Maidenhead Office Park, Westacott Way, Maidenhead, Berks. SL6 3QH, UK.]

- Subscriber Options
- LISTSERV Archives
- Search Archives
- Subscriptions
- Preferences
- Change Password
- Log Out



3GPP_TSG_SA_WG2 Archives

May 2007

New in LISTSERV 17.0

3GPP_TSG_SA_WG2@LIST.ETSI.ORG

Options: [Use Proportional Font](#)
[Show Text Part by Default](#)
[Show All Mail Headers](#)

Message: [[<< First](#)] [[< Prev](#)] [[Next >](#)] [[Last >>](#)]

Topic: [[<< First](#)] [[< Prev](#)] [[Next >](#)] [[Last >>](#)]

Author: [[<< First](#)] [[< Prev](#)] [[Next >](#)] [[Last >>](#)]

Subject: [\[SAE\] Updated TS 23.401 v0.5.1](#)
From: "Wong, Gavin, VF-Group" <Gavin.Wong@VODAFONE.COM>
Reply To: Wong, Gavin, VF-Group
Date: Tue, 29 May 2007 01:21:40 +0200
Content-Type: multipart/mixed
Parts/Attachments: [text/plain](#) (889 bytes) , [text/html](#) (2976 bytes) , [23401v051.zip](#) (346 kB)



Dear All,

please find an updated version of the TS 23.401, that includes the changes to the title that was discussed earlier on this email list.

I have also corrected a couple of Word style formatting (in titles and figures) which aren't entirely easy to spot.

Maurice, please use this version to create version 1.0.0 for presentation to SA. Also if at all possible, please could you get it onto the RAN document list for information also - due to the changes in some of the terminology used as highlighted in previous versions of the TS.

Best regards,

Gavin Wong
Standards Engineer
R & D - Standards, Service Enablers and Architecture

Tel: +44 (0) 1635 672912
Fax: +44 (0) 1635 238087
E-mail: [gavin.wong \(at\) vodafone.com](mailto:gavin.wong@vodafone.com)

Vodafone Group Services Limited
Registered Office: Vodafone House, The Connection, Newbury, Berkshire, RG14 2FN
Registered in England No 3802001

[ATOM](#) [RSS1](#) [RSS2](#)