UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

ASUS TECHNOLOGY LICENSING INC.,
Patent Owner.

Patent No. 10,798,754

DECLARATION OF CRAIG BISHOP

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I. INTRODUCTION

I, Craig Bishop, declare the following:

1. I have been retained as an independent expert witness on behalf of AT&T Services Inc., T-Mobile USA, Inc., Cellco Partnership d/b/a Verizon Wireless, Ericsson, Inc. and Nokia of America Corporation ("Petitioners"), related to the *Inter Partes* Review ("IPR") of U.S. Patent No. 10,798,754 ("the '754 patent").

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

3. I have no financial interest in the '754 patent and have had no contact with the named inventors of said patent. Neither have I reviewed the '754 patent in detail, nor do I have any personal interest in the outcome of this IPR.

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

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

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information in the declaration in its entirety.

II. QUALIFICATIONS

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

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

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

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

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

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

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(T) WG2, but I also attended TSG RAN and T plenary meetings and sometimes other Working Groups and covering similar technical aspects as in my previous work in ETSI. As an example, RAN WG2 was, and is, a Working Group responsible for the specification of layer 2 and layer 3 Radio Resource, protocols for the UE. As part of this work, I would prepare meeting contributions in support of Samsung's research and development activities. Also, by way of preparation for each meeting, I would download all contributions and review those of interest to Samsung, and where necessary, prepare additional input to the meeting based on said review.

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

12. During this period, in addition to authoring and presenting technical contributions for the 3GPP standard, and producing technical requirements for the radio modem, I acted as Rapporteur for 3GPP Technical Reports covering User Equipment ("UE") capability requirements (3GPP TR 21.904) from 1999–2000, and

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the Evolution of the 3GPP System (3GPP TR 21.902) in 2003 (the first Study Item to consider the 3GPP system beyond UMTS towards LTE/EPS).

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

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

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

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

17. Through my extensive work in ETSI and on 3GPP standardization issues over the years, I have become very familiar with ETSI and 3GPP practices for when and how the technical standards (including revisions thereto) and other standards-related contributions are made publicly available, including in the 1999-2012 timeframe when I was attending or monitoring various 3GPP Working Groups including RAN WG1 and RAN WG2, and since 2013 in support of my work as a

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independent standardisation consultant.

18. For purposes of my analysis in this declaration, I have been informed that a person of ordinary skill in the art ("POSITA") in the field of the '754 patent at the time of the alleged invention of the '754 patent would have had the equivalent of an undergraduate degree in Electrical Engineering, Computer Science, or Computer Engineering, familiarity with the relevant 3GPP standards as of this time, and at least two years of experience in design, development, and/or testing of cellular networks. This definition is approximate, and more education may substitute for industry experience or vice versa.

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

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

A. Prominence and Purpose of 3GPP

20. 3GPP was inaugurated in December 1998 to produce Technical Specifications and Technical Reports for the Universal Mobile Telecommunications

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

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

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(ATIS) from the United States. These Organizational Partners are regional standards organisations that have the authority to define, publish, and set standards for their respective regions. **Appendix 2** at 12. 3GPP also includes "Market Representation Partners" that represent various industry perspectives and offer market advice. **Appendix 5** at 9 (3GPP Working Procedures, "Market Representation Partnership"); **Appendix 2** at 14; **Appendix 4** at 5. Additionally, 3GPP includes individual member companies ("Individual Members") that participate in 3GPP through their membership in a 3GPP Organizational Partner. **Appendix 5** at 9 (3GPP Working Procedures, "Individual Membership"); **Appendix 6** at 5 (textbook including a chart showing 3GPP structure at the time of publication); **Appendix 8** at 9, 10. As an example of how prominent 3GPP was and remains in the industry, there were 466 participating Individual Members in 2017. **Appendix 7** at 8 (3GPP Project Coordination Group document showing 3GPP membership numbers to 2017). There were 781 individual members as of February 2024. **Appendix 9**.

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

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

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

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reference.

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

B. 3GPP's Policy of Making Documents Public

25. 3GPP's policy was to make 3GPP documents available to the public,

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

C. 3GPP Structure and Standards Development Process

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

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Appendix 4 at 6, 11, 12. Each TSG is further divided into a number of Working Groups (WGs). **Appendix 8** at 8, 9; **Appendix 4** at 6; see also **Appendix 5** at 13 (3GPP Working Procedures). Two of the TSGs from 1999 are still in existence in 2024: TSG Radio Access Networks (RAN) and TSG Service & Systems Aspects (SA). The activities of two other TSGs, TSG Core Networks (CN) and TSG Terminals (T), were amalgamated under Core Network and Terminals (CT) following the closure of TSG T in 2005, with responsibility for terminal test specifications being moved to a RAN working group (RAN WG5). The fifth TSG, GSM EDGE Radio Access Networks (GERAN), was responsible for evolution of the GSM radio technology from 2000 until that TSG closed in 2016 and its work was transferred to a RAN working group (RAN WG6) which was itself closed in July 2020.

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

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would be created by the Mobile Competence Centre (MCC) and uploaded to the file server. **Appendix 10** at 6; **Appendix 11** at 1. In that way, the conclusion of 3GPP TSG plenary meetings serves as notice that new versions of specifications incorporating Change Requests approved by the TSG meeting will shortly be made available on the public 3GPP server.

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

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D. 3GPP Documents

1. Technical Specifications and Reports

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

30. As I noted in paragraphs 20 and 22, a primary purpose of 3GPP is to prepare, approve, and maintain globally applicable Technical Specifications and Technical Reports. **Appendix 5** at 7 (3GPP Working Procedures, "Purpose"). A "Technical Specification," as defined by 3GPP, is "[a] 3GPP output document containing normative provisions approved by a Technical Specification Group". **Appendix 5** at 28. 3GPP would (and still does) periodically freeze a complete set of standards (referred to as a "Release"), and each set would include many new specifications. **Appendix 10** at 6. 3GPP would also make publicly available draft specifications that would usually be included as part of the next Release once approved.

31. It was widely known that Technical Specifications (and Technical

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Reports) were publicly available on 3GPP's website. It was also well known that the latest version of a given specification that was under change control would be made available following each TSG Plenary meeting responsible for that specification, and that TSG Plenary meetings usually occur four times per year. **Appendix 10** at 7; **Appendix 11** at 1.

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

33. Additionally, the 3GPP specifications followed a clear numbering scheme to help the public, including interested POSITAs, identify the subject matter of each specification. **Appendix 12** at 1. As described on the 3GPP Numbering Scheme webpage, all 3G and GSM specifications had a specification number of 4 or 5 digits, where the first two digits defined the series. **Appendix 12** at 1. The Numbering Scheme webpage included a table showing the subject matter corresponding to each series. **Appendix 12** at 1. For example, the "36 series" focused on Evolved UTRA (LTE) aspects. **Appendix 12** at 1. An interested POSITA could narrow down the relevant specifications based on whether the specification

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applied to only 5G NR, evolved UTRA (aka 4G or LTE), to 3G, to GSM, or to GSM, 3G and evolved UTRA (GSM only specifications were transferred from ETSI to 3GPP in July 2000). For a specification in the 21–35 series, this could be determined based on the third digit of the specification number, where a "0" would indicate that the specification applied to both systems. **Appendix 12** at 1. Specifications outside the 21–38 series in 2017 applied only to GSM systems. **Appendix 12** at 1.

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

35. The Working Groups would create incremental versions of the draft specifications (*e.g.*, V0.2.1, V1.0.0, V1.1.0, etc.). These versions were made available on the 3GPP website's file repository which is accessible from the 3GPP specifications page. The version numbering scheme for Technical Specifications and Technical Reports was standardized by 3GPP. The version number included three fields: the major version field, the technical version field, and the editorial version field. **Appendix 13** at 3. The major version field reflects the stage of the

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specification, with "0" representing an immature draft and a value of "3" or greater representing a specification that has been approved by the relevant TSG and thus placed under change control. **Appendix 13** at 3. The technical version field begins at zero and is incremented every time a technical change is made to the specification (either as part of the drafting process or as part of an approved change request). **Appendix 13** at 3. The editorial version field begins at zero and is incremented each time a non-technical change is made to the specification (*e.g.*, to fix a typo or formatting issue). **Appendix 13** at 3.

36. I understand that the alleged invention in the '754 patent relates to cellular telecommunications networks, and more particularly to a method and apparatus for serving Quality of Service (QoS) flow. Any POSITA interested in such an invention would have been monitoring 3GPP's activities in this area and would probably have been already participating as a full or associate member or observer in the standard development process or would have at least known that information regarding the proposed revisions to the technical specifications under discussion were available through 3GPP.

2. <u>3GPP TDocs</u>

37. As mentioned in paragraph 29, the technical specifications and reports developed by 3GPP were and are driven by the technical contributions of 3GPP member companies. As part of that development process, various types of

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documents were produced and submitted. As relevant to this case, the 3GPP process involved the consideration of temporary documents or "TDocs," which are also referred to as proposals, contributions, or change requests. The agreement of proposals submitted as TDocs results in the production of technical specifications.

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

39. Each TDoc was assigned a TDoc number, according to a standard format set by 3GPP.[1] As described in the 3GPP Working Procedures, the numbering system followed the format xminnzzzz. **Appendix 5** at 20. This general naming convention has been in use since at least 1999 with only minor variations. Within that format, "x" referred to the relevant TSG. For example, "R" was used for TSG RAN. Likewise, "m" referred to the relevant Working Group. **Appendix 5** at 20. A document for RAN WG2 would therefore begin with "R2". The two digits "nn" represented the year (*e.g.*, 17), and the digits "zzzz" represented the unique document number. This document number was used as the TDoc's filename.

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

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40. Each TDoc would include in its header the meeting at which the contributor intended the TDoc to be discussed. Most TDocs were uploaded to the 3GPP website for public viewing prior to the relevant Working Group meeting listed on the TDoc, although some TDocs including those created at meetings, were uploaded during or after the meeting. **Appendix 10** at 8. The documents were uploaded to the public file repository in an area allocated to the particular Working Group. **Appendix 14** at 2 (RAN WG2 homepage with link to WG2's "Meeting documents"). Immediately upon upload, any member of the public could download and access the TDocs and other documents offered for discussion. This process has been in place since I began attending Working Group meetings in 1999.

E. The 3GPP Website's Public File Repository

41. All TDocs, technical reports, and technical specifications were also freely available to interested member of the public through the public file repository accessible via the 3GPP website. Interested members of the public would have been well aware of 3GPP and of the 3GPP website. 3GPP documents were accessible to any member of the public through the 3GPP website without providing any login credentials or other exclusive access criteria.

42. It is my recollection that, during the 2017 timeframe, any interested member of the public could locate relevant documents of interest on the 3GPP website using reasonable diligence based on the website's indexing scheme or the

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TDoc's naming convention. The documents on the 3GPP website were (and remain) organized according to the relevant Working Groups within 3GPP (each of which focused on particular subject matter) and then further organized based on the meetings of those groups. POSITAs would have known which Working Groups focused on particular subject matter.

43. An interested member of the public could locate documents of interest by first navigating a web browser to the 3GPP website (www.3gpp.org). In the 2017 timeframe, to locate documents from the 3GPP home page, a user could have clicked "Specification Groups" **Appendix 15**. The corresponding webpages contained links to the 3GPP's public file repository (*e.g.*, through the "Meeting documents" link of a Working Group page). **Appendix 14**. Instead of accessing the 3GPP file repository from the 3GPP website home page, a user could have also accessed the file repository through the web address www.3gpp.org/ftp or directly using ftp client software connected to ftp.3gpp.org. A POSITA was also able to search for relevant documents using keywords on the search facility on the 3GPP website from at least 2000, and from 2015 using the 3GPP search portal (https://portal.3gpp.org/#/), where an interested person could search for documents by title and source, among other things.

44. The top two levels of indexing within the file repository were based wholly on subject matter, as reflected by the division of subject matter among the

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various TSGs and Working Groups. Specifically, an individual would select the relevant TSG covering the subject matter of interest. **Appendix 16**.

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

46. For example, if the individual were interested in the Radio Interface Radio layer 2 and Radio layer 3 RRC, the individual would know to choose the folder for WG2. Once a user is in the relevant Working Group folder (RAN WG2 in this example), an individual would see a list of all meetings held by RAN WG2. **Appendix 18**.

47. As shown, a folder existed for each meeting. For example, "TSGR2_98" corresponded to TSG RAN WG2 Meeting #98, and the timestamp associated with the meeting #98 directory indicates that, as of May 9, 2017, the TSGR1_98 directory had most recently been updated on 25 January, 2017. **Appendix 18** at 3.

48. A POSITA would know which meeting(s) would have covered particular subject matter based on the working groups area of responsibility (*e.g.* for RAN WG2 - **Appendix 14)**, and from publicly available meeting agendas. *E.g.*, **Appendix 19** (see link to agenda for RAN WG2 Meeting #98). Many POSITAs received a link to the meeting agenda directly via the 3GPP Working Group email

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reflector lists. **Appendix 20**. Further, an individual could ascertain what subject matter was addressed at each meeting by reviewing the report issued after each meeting, stored in the Report directory and also linked in, or attached to, an email sent via the group's email reflector. **Appendix 19**; **Appendix 21**.

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

50. Once an individual navigated to the desired meeting folder, for example "TSGR2_98" the individual could then select the "Docs" folder to view the documents associated with that meeting. The documents within this folder were listed by TDoc number, and interested members of the public would have known to review the meeting report for each meeting to confirm which topics were discussed at that meeting. *E.g.*, **Appendix 22**.

51. Many TDocs were uploaded to the public file server for public viewing prior to the relevant meeting (although some TDocs, particularly those created during meetings, were submitted during or soon after the meetings). Throughout and since my participation in 3GPP, it was always recommended that delegates attending

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a meeting download the relevant set of documents from the 3GPP file repository onto their personal computers prior to each meeting. Given that any interested member of the public could and was likely to subscribe to the Working Group listserv, it would have been simple to locate the location of relevant TDocs on the 3GPP server based on the information sent out over the listserv.

52. 3GPP's public file repository provides a reliable mechanism for identifying the date and time a document was uploaded to the website and then available to download for public viewing. When a document is uploaded, the file server automatically assigns the document a time stamp—*i.e.*, an accurate and automatically computer-generated electronic record of when the document was uploaded—as part of the regular business practices of 3GPP. **Appendix 10** at 8 (3GPP FAQs). This has always been the practice regarding uploading documents to the 3GPP file repository, and my personal experience confirms that the time stamps have always been a reliable way to determine when a file was uploaded to the 3GPP website and immediately available for public download.

53. Following each 3GPP meeting, the secretary would usually distribute the meeting minutes via the corresponding email list with a request for comments. *E.g.*, **Appendix 21**. Said email would effectively therefore inform subscribers that the meeting had taken place, would inform subscribers of the documents that had been treated (or not), and in the event that the meeting was a TSG plenary meeting,

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serve as notice that new versions of specifications incorporating Change Requests approved by the TSG meeting, would shortly be made available on the 3GPP public server. Further, an interested member of the public following a certain topic would have known to check said report for related contributions as the reports always included a list of all TDocs submitted, indexed by contribution title, TDoc number, source, and agenda item (*e.g.*, Annex B of the report of RAN2 #98, **Appendix 22a**).

IV. 3GPP EXHIBITS

A. Ex-1005: R2-1704250, TSG-RAN Working Group 2 Meeting #98; Agenda Item 10.2.12: "Discussion on QoS mapping"

54. R2-1704250 is a technical contribution submitted to 3GPP TSG RAN WG2, meeting #98 in Hangzhou, PR China, which was held between May 15 – 19, 2017. It follows the general naming format ("xminnzzzz") described in paragraph 39[2]. Accordingly, "R2" indicates that the contribution was submitted to RAN WG2, "17" indicates the year (2017) that this technical contribution was submitted, and "04250" is the unique number that was assigned to this contribution document. It is titled "Discussion on QoS mapping".

55. As I mention in paragraph 41 above, 3GPP meeting documents have always been and were in the 2017 timeframe, made publicly available on the 3GPP

[2] Note that from 2017, RAN2 added another digit to the unique identifier "z" field to cater for the increasing number of Tdocs being submitted.

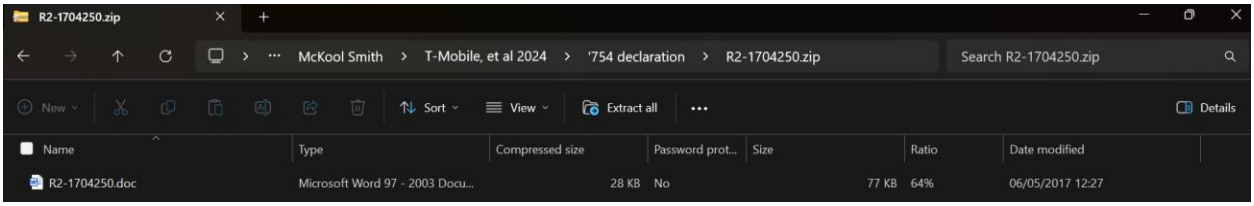
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public file server from where an interested member of the public exercising reasonable diligence could freely access them. To confirm the availability of R2-1704250 on the 3GPP document server in the 2017 timeframe, I navigated to the 3GPP website at http://www.3gpp.org, selected "3GPP Groups" from the drop down menu, and then selected the "RAN2 – Radio Layer 2 and Layer 3 RRC" from the 3GPP Groups page, and the "Meeting documents" link to access the public file server where documents for the TSG-RAN Working Group 2 are stored, and from where I navigated to the documents for RAN WG2 #98. A true and correct copy of the relevant portion of the Documents directory listing produced by the file server website is provided below and in **Appendix 23** at 8.

R2-1704249.zip	2017/05/06 10:04	71,2 KB
R2-1704250.zip	2017/05/06 10:04	28,1 KB
R2-1704251.zip	2017/05/06 10:04	108 KB

56. The Docs directory index stated that R2-1704250 was uploaded on "2017/05/06". I selected the link for "R2-1704250.zip" downloaded a zip file of the same name. The zip file contained a Microsoft Word document, "R2-1704250.doc", with a date stamp of "06/05/2017" (European date format) the same date that the zip file was uploaded.

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57. A true and correct copy of the document within the zip file (R2-1704250.doc) is provided as Ex-1005. Based on my experience, I understand that these date stamps mean that R2-1704250.zip was uploaded to 3GPP's publicly available website on May 6, 2017, prior to the RAN WG2 #98 meeting, and that any member of the public could have downloaded the zip file, extracted the Word document enclosed, and viewed the contents of said document without restriction on May 6, 2017 and thereafter. The draft report from RAN WG2 #98, first made available on June 9, 2017 (**Appendix 21**), confirms the availability of R2-1704250 at the meeting (**Appendix 22** at 228). I have no reason to believe that either the date stamp or the report from RAN WG2 #98 are inaccurate. I have therefore determined that R2-1704250 was publicly available on the file server no later than May 6, 2017.

58. Based on the information above, it is my opinion that R2-1704250 titled "Discussion on QoS mapping" and provided as Ex-1005 was publicly available to download from the 3GPP file server no later than May 6, 2017 and could have been distributed thereafter without restriction. Further, it was publicly available at the 3GPP TSG RAN WG1 #98 meeting held in Hangzhou, PR China, from May 15 – 19, 2017.

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B. Ex-1006: R2-1706381, TSG-RAN Working Group 2 Meeting #NR AH2; Agenda Item 10.3.4.2: "NR SDAP header format"

59. R2-1706381 is a technical contribution submitted to 3GPP TSG RAN WG2, meeting #NR AH2 in Qingdao, PR China, which was held between June 27 – 29, 2017. It follows the general naming format ("xminnzzzz") described in paragraph 39[3]. Accordingly, "R2" indicates that the contribution was submitted to RAN WG2, "17" indicates the year (2017) that this technical contribution was submitted, and "06381" is the unique number that was assigned to this contribution document. It is titled "NR SDAP header format".

60. As I mention in paragraph 41 above, 3GPP meeting documents have always been and were in the 2017 timeframe, made publicly available on the 3GPP public file server from where an interested member of the public exercising reasonable diligence could freely access them. To confirm the availability of R2-1706381 on the 3GPP document server in the 2017 timeframe, I navigated to the 3GPP website at http://www.3gpp.org, selected "3GPP Groups" from the drop down menu, and then selected the "RAN2 – Radio Layer 2 and Layer 3 RRC" from the 3GPP Groups page, and the "Meeting documents" link to access the public file server where documents for the TSG-RAN Working Group 2 are stored, and from

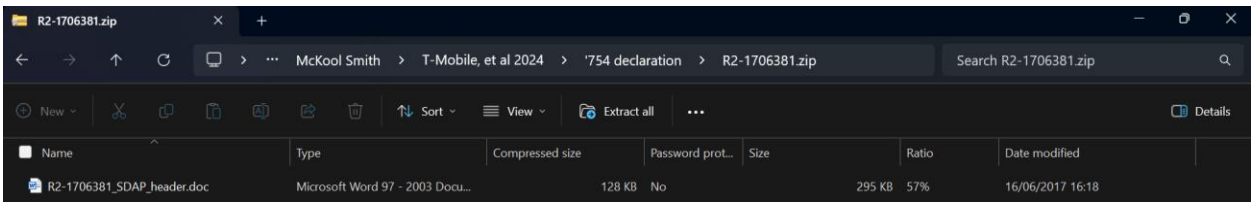
[3] Note that from 2017, RAN2 added another digit to the unique identifier "z" field to cater for the increasing number of Tdocs being submitted.

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where I navigated to the documents for RAN WG2 #NR AH2. A true and correct copy of the relevant portion of the Documents directory listing produced by the file server website is provided below and in **Appendix 24** at 3.

R2-1706380.zip	2017/06/17 1:18	159,7 KB
R2-1706381.zip	2017/06/17 1:18	127,9 KB
R2-1706382.zip	2017/06/17 1:18	56,1 KB

61. The Docs directory index stated that R2-1706381 was uploaded on "2017/06/17". I selected the link for "R2-1706381.zip" downloaded a zip file of the same name. The zip file contained a Microsoft Word document, "R2-1706381_SDAP_header.doc", with a date stamp of "16/06/2017" (European date format), the day before the zip file was uploaded.



62. A true and correct copy of the document within the zip file (R2-1706381_SDAP_header.doc) is provided as Ex-1006. Based on my experience, I understand that these date stamps mean that R2-1706381.zip was uploaded to 3GPP's publicly available website on June 17, 2017, prior to the RAN WG2 #NR AH2 meeting, and that any member of the public could have downloaded the zip

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file, extracted the Word document enclosed, and viewed the contents of said document without restriction on June 17, 2017 and thereafter. The report from RAN WG2 #NR AH2, first made available as a skeleton report on July 19, 2017 (**Appendix 25**), confirms the availability of R2-1706831 at the meeting (**Appendix 26** at 77). I have no reason to believe that either the date stamp or the report from RAN WG2 #NR AH2 are inaccurate. I have therefore determined that R2-1706381 was publicly available on the file server no later than June 17, 2017.

63. Based on the information above, it is my opinion that R2-1706381 titled "NR SDAP header format" and provided as Ex-1006 was publicly available to download from the 3GPP file server no later than June 17, 2017 and could have been distributed thereafter without restriction. Further, it was publicly available at the 3GPP TSG RAN WG2 #NR AH2 meeting held in Qingdao, PR China, from June 27 – 29, 2017.

C. Ex-1007: R2-1706206, TSG-RAN Working Group 2 Meeting #98: "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; NR; NR and NG-RAN Overall Description; Stage 2 (Release 15)"

64. R2-1706206 is a draft Technical Specification produced following 3GPP TSG RAN WG2, meeting #98 in Hangzhou, PR China, which was held between May 15 – 19, 2017. It follows the general naming format ("xminnzzzz")

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described in paragraph 39[4]. Accordingly, "R2" indicates that the document was a RAN WG2 tdoc, "17" indicates the year (2017) that this technical contribution was created, and "06206" is the unique number that was assigned to the document. It is titled "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; NR; NR and NG-RAN Overall Description; Stage 2 (Release 15)".

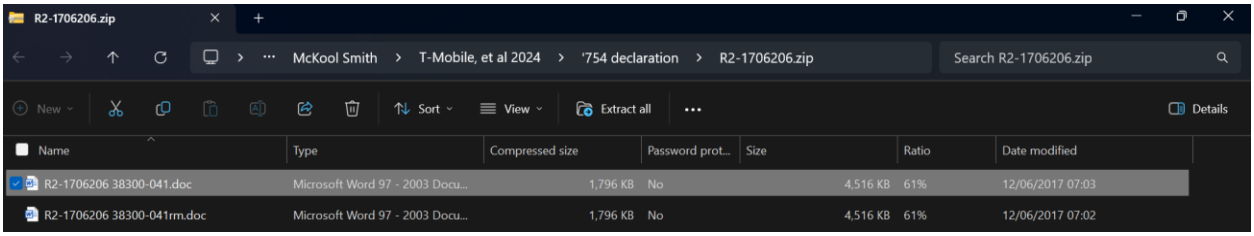
65. As I mention in paragraph 41 above, 3GPP meeting documents have always been and were in the 2017 timeframe, made publicly available on the 3GPP public file server from where an interested member of the public exercising reasonable diligence could freely access them. To confirm the availability of R2-1706206 on the 3GPP document server in the 2017 timeframe, I navigated to the 3GPP website at http://www.3gpp.org, selected "3GPP Groups" from the drop down menu, and then selected the "RAN2 – Radio Layer 2 and Layer 3 RRC" from the 3GPP Groups page, and the "Meeting documents" link to access the public file server where documents for the TSG-RAN Working Group 2 are stored, and from where I navigated to the documents for RAN WG2 #98. A true and correct copy of the relevant portion of the Documents directory listing produced by the file server website is provided below and in **Appendix 23** at 62.

[4] Note that from 2017, RAN2 added another digit to the unique identifier "z" field to cater for the increasing number of Tdocs being submitted.

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R2-1706205.zip	2017/06/09 10:03	3592,9 KB
R2-1706206.zip	2017/06/12 10:29	3590,5 KB
R2-1706207.zip	2017/06/17 5:13	67,7 KB

66. The Docs directory index stated that R2-1706206 was uploaded on "2017/06/12". I selected the link for "R2-1706206.zip" downloaded a zip file of the same name. The zip file contained two Microsoft Word documents, being a clean and a change (redline) marked version of the draft Technical Report. The clean version "R2-1706206 38300-041.doc", had a date stamp of "12/06/2017" (European date format) the same date that the zip file was uploaded.



67. A true and correct copy of the document within the zip file (R2-1706206 38300-041.doc) is provided as Ex-1007. Based on my experience, I understand that these date stamps mean that R2-1706206.zip was uploaded to 3GPP's publicly available website on June 12, 2017, following the RAN WG2 #98 meeting, and that any member of the public could have downloaded the zip file, extracted the Word document enclosed, and viewed the contents of said document

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without restriction on June 12, 2017 and thereafter. As version 0.4.1 of the draft Technical Specification 38.300 was produced subsequent to the RAN2 #98 meeting, it was not mentioned in the report from RAN WG2 #98. However, it was distributed via email to the RAN WG2 email list on June 11, 2017 **Appendix 27**. I have no reason to believe that either the date stamp on the ftp server nor in the email archive are inaccurate. I have therefore determined that R2-1706206 was publicly available on the file server no later than June 12, 2017.

68. Based on the information above, it is my opinion that R2-1706206 titled "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; NR; NR and NG-RAN Overall Description; Stage 2 (Release 15)" and provided as Ex-1007 was publicly available to download from the 3GPP file server no later than June 12, 2017 and could have been distributed thereafter without restriction.

V. CONCLUSION

69. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the

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United States Code.

June 4, 2024



Printed Name: Craig Bishop

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Appendix 1

Curriculum Vitae

Name: Craig Bishop

Contact Tel No.: +44 (0)7984 564949 (mobile)

Email: craig@bishopcom.co.uk

Current job title: Independent Consulting Engineer, CEO

Address: 43 Ospringe Street, Faversham, Kent, ME13 8TW

Key Skills and Experience

- 35 years Telecoms, Radio and Broadcast experience
- 27 years experience of 2G/3G/4G telecoms standardisation
- Extensive knowledge of 3GPP and ETSI specifications and procedures including document handling and publication practices
- Sound understanding of 3GPP systems, including Radio Access Interfaces and Networks, Access Stratum protocols, Core Networks, Non-Access Stratum protocols, and IMS
- Experience of ETSI role from regulatory perspective (harmonised standards, mandates, spectrum, etc)
- Depositions, reports, and declarations as expert witness in cases on 3GPP technologies and on 3GPP & ETSI practices and procedures.
- Intellectual property analysis including prior art search and evaluation of patent essentiality
- Application of data analytics and machine learning techniques to standards and IP data
- Programming in Java, Python, C, Octave (Matlab)

Career History

Bishop Communications Ltd. 01/13 –

Independent Telecommuncations Standards and Intellectual Property Consultant

Company is a full ETSI member

Activities have included:

- Provision of expert support for IPR litigation from standards landscape analysis / background technical reports to expert testimony reports / declarations and depositions on matters including the public availability of 3GPP and ETSI prior art.
- Intellectual property analysis assessing strengths and weaknesses of patents and patent portfolios, conducting searches for prior art, evaluating patent essentiality, and acquring relevant documentation.
- Provision of expertise for EC funded ETSI Specialist Task Force (STF489) to produce implementation guidelines for Total Conversation for emergency services. Project delivered on time / budget and well received. Ouput published March 2016 as ETSI TR 103 201.
- Provision of expertise for ETSI Specialist Task Force (STF555) assessing the impact on existing standards of communications involving IoT devices in all types of emergency situations. Project delivered on time / budget and well received. Ouput published July 2019 as ETSI TR 103 582.
- Provision of standards consultancy services for Samsung Electronics in ETSI including membership of the ETSI Board until November 2014

Technologies covered in patent related work include: 3GPP GSM, UMTS, LTE, 5G NR radio interface technologies (Phy, MAC, RLC, RRC), 3GPP access and core networks (GPRS/UMTS & EPC NAS), IMS. Organisations covered include 3GPP & ETSI.

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Clients served / represented include: ADT, Apple, AT&T, Blackberry, Cradlepoint, DELL, Ericsson, Honeywell, HTC, Huawei, LG, Lenovo, Motorola, Nokia, Oneplus, Oppo, Samsung, Sierra Wireless, Thales, T-Mobile, Sprint, Verizon, Vodafone, Xiaomi, ZTE.

Working with: Addy Hart LLP, Alston & Bird LLP, Baker Botts LLP, Banner Witcoff LLP, DLA Piper LLP, European Telecommunications Standards Institute (ETSI), Fish & Richardson P.C., Gibson Dunn LLP, Haynes and Boone LLP, Hillebrand-CE GmbH, Kirkland & Ellis LLP, K&L Gates LLP, MckoolSmith LLP, PV Law LLP, Paul Hastings LLP, Perkins Coie LLP, Powell Gilbert LLP, Sidley Austin LLP, Samsung Electronics Research & Development Institute UK (SRUK), Taylor Wessing LLP, Williams & Connolly LLP, WilmerHale LLP.

Expert testimony through deposition:

- *Huawei Technologies Co. Ltd. vs. T-Mobile US, Inc., et al.*, Case Nos. 2:16-cv-0052-JRG-RSP, 2:16-cv-0055-JRG-RSP, 2:16-cv-0056-JRG-RSP, and 2:16-cv-0057-JRG-RSP (E.D. Tex.). On behalf of T-Mobile US Inc.
- *T-Mobile US, Inc., et al.* v. *Huawei Technologies Co. Ltd.*, Case Nos. IPR2017-00696 and IPR2017-00697 (PTAB). On behalf of T-Mobile US Inc.
- *LG Electronics, Inc., v. Koninklijke KPN N.V.*, Case No. IPR2018-00558 (PTAB). On behalf of LG Electronics, Inc.
- *Nokia of America Corp. and Ericsson Inc. v. IPCOM, GMBH & Co.,* Case No. IPR2021-00533 (PTAB). On behalf of Ericsson Inc.
- *IPCom, GmbH & Co., Plaintiff, v. AT&T Inc., et al, Defendant, Nokia of America Corp., Intervenor, Ericsson Inc., Intervenor.,* Civil Action No. 2:20-CV-322-JRG*, and IPCom, GmbH & Co., Plaintiff, v. Verizon Communications, et al., Defendant, Nokia of America Corp., Intervenor, Ericsson* nc*., Intervenor.,* Civil Action No. 2:20-CV-323-JRG. On behalf of Ericsson Inc.
- *Ericsson Inc. v. Koninklijke KPN N.V.,* Case No. IPR2022-00069 (PTAB). On behalf of Ericsson Inc.

Expert testimony in court:

- *Between IPCom GmbH and Vodafone, et al.,* Claim No. HP-2018-000030 Claim No. HP-2018-000031, High Court of Justice, Business & Property Courts of England and Wales, Intellectual Property List (ChD), Patents Court. Retained by Vodafone.
- *Between (1) Mitsubishi Electric Corporation (2) Sisvel International SA and Oneplus Mobiletech UK Limited, Oppo Mobile UK Ltd, Xiaomi Technology UK Limited, et al.,* Claim No. HP-2019-000014, High Court of Justice, Business & Property Courts of England and Wales, Intellectual Property List (ChD), Patents Court. Retained by Oneplus, Oppo, and Xiaomi (trial held remotely due to COVID-19 restrictions)

Samsung Electronics Research Institute (SERI) 12/96 – 01/13

Director Standards and Industry Affairs 03/11 – 01/13

Mission and Tasks as for previous role plus:

- Proactive member of ETSI Board following election as Board member in November 2011
- Worked with Samsung internal and external legal counsel in response to EC investigation into Samsung suspected abuse of Standards Essential Patents.
- Deposed by Apple as fact witness in ITC investigation 337-TA-794.

Head of Advanced Technologies Standards & Regulation 09/05 - 03/11

Mission: To help position Samsung and SERI at the forefront of mobile telecommunication developments through participation in and leadership of mobile communications standards and European regulatory affairs

Key tasks:

- Developed standards and research strategy and coordinated activites with head office, acting as official Samsung contact for the European Telecommunications Standars Institute.
- Programme managed standardisation and regulation projects covering 3GPP (RAN2, CT1, SA2, SA1, SA, RAN, CT), OMA, and mobile Broadcast strategies and technologies (DVB Forum), European Framework projects (FP7), Spectrum Management (CEPT, ETSI EM, TFES, BRAN, …) and European Regulatory affairs (Digital Europe, relations with European Commission, …). - Grew department from 3 to 12 persons to cater for these activities.
- Participated and actively contributed to 3GPP SA1 (11/08 – 11/11), SA2 (10/05 – 08/11) , SA and ETSI TC SCP groups on issues including IMS / CS Interworking (VCC / SRVCC, VoLTE, T-ADS, ICS), Local IP Access & Selected IP Traffic Offload (LIPA-SIPTO), MOSAP, M2M/MTC, Embedded / 4FF UICC.
- Drafted and filed communication technology related patents related to 3GPP SA2 and CT1 technologies – 18 filed, mainly IMS and 3GPP NAS related
- Supported Samsung IP team with analysis of Samsung and 3rd party communication technology related patents and claim charts including GSM/GPRS, UTRAN, NAS, and IMS patents
- Chaired SERI Patent Committee from 2007-2009 - SERI achieved patent targets for first time in 2007 and did so in every year following

Standards consultant – part time 09/04 – 09/05

(Whilst studying fulltime for MSC)

During this time, I conducted a review of the wireless communication technolgies and the associated standards space, with a particular emphasis on 802.16a, as well as 3G and 802.11 evolutions. I was also involved in analysis of 3rd party patents and claim charts on request from Samsung IP team.

Technology Manager System Engineering group 06/03 – 09/04

Mission: To establish a System Engineering group within SERI to support development of SERI's dual mode GSM/UMTS radio modem platform.

Key Tasks:

- Defined and implemented System Engineering group strategy including recruitment and line management of the group which grew from 3 to 10 engineers during this period.
- Developed detailed system requirements for SERI's dual mode 2G/3G radio modem platform(s) including production of background documentation describing system wide behaviour
- Defined system test programme for platform, including example test cases using off the shelf test equipment. This project outsourced (under my supervision) to a third party company for completion.
- Provided continued support to development engineers in terms of understanding specification and system requirements, particularly with respect to Access Stratum and Non Access Stratum specifications and protocols.
- Instigated and managed studies investigating optimised system architecture for future Samsung mobile platforms.
- Analysed Samsung and 3rd party 3GPP technology related patents and claim charts on request by Samsung IP team and reported on their value and standards essentiality.

Technology Manager Standards & System Group 04/02 – 06/03

Mission: To provide Standards support to SERI development teams and Samsung's global standardisation activities.

Key Tasks:

- Devised and implemented revised strategy to improve the focus of activities and provide improved support for software developers from a system perspective.

- Attended 3GPP TSG SA plenary and occasional SA WG1 meetings - acted as rapporteur for 3GPP Evolution technical report 3GPP TR 21.902.
- Analysed 3rd party GSM/GPRS technology related patents and claim charts on request by Samsung IP team and reported on their value and standards essentiality.
- Line managed 3 engineers, ensuring that the group provided expert support for SERI SW and HW developers in terms of standards interpretation and system requirements, particularly with respect to the Radio Access Network.

Project Manager 04/00 – 04/02

Mission: To establish and manage development of a dual mode GSM/UMTS modem platform.

Key tasks:

- Defined and managed work relating to core technology development for Samsung's 3G handsets.
- Determined major technical architecture and parameters for the platform producing high level system requirements specification and project development plan.
- As a technical authority on UMTS, supported the project in terms of requirements specification and interpretation (L1, MAC/RLC, RRC, and NAS specifications), and contributed towards the training of UMTS project team members.
- Acting in a consultative capacity, interfaced with other departments in Samsung and with external customers/suppliers on issues relating to 2G and 3G technologies
- Responsible for the overall planning, work allocation and co-ordination of engineers for the project, as well as being involved in recruitment – during this period the number of engineers working on the project increased from 10 to over 40.
- Instigated, defined and managed a feasibility study involving HW and SW engineers, as essential preparation for the development of a dual mode GSM/UMTS radio modem platform.

Senior/Principal Standards Engineer 12/96 – 04/00

Mission: To support Samsung standards and development activities in ETSI and 3GPP.

Key Tasks:

- Gathered and disseminated information throughout Samsung concerning latest specifications and trends in telecommunications, providing advice to Senior Management on future strategies for telecommunications development.
- Acted as sole Samsung representative in ETSI TC SMG2 from December 1996 and during the selection phase for the UMTS Radio Acces Technology providing training for Samsung engineers on elaborated technologies
- Participated in 3GPP TSG RAN WG1 (UTRA Physical Layer), and RAN WG2 (L2/3) contributing specifically in areas related to FEC, Common Packet Channel, and Transmit Diversity
- In 3GPP TSG T WG2 I initiated and acted as rapporteur for the UE capabilities work item. I also acted as liaison officer between TSG T WG2, TSG RAN WG1 and TSG SA WG1 (Service Aspects) on issues of common interest
- Acted as main spokesperson for and advisor on Samsung strategic activities in, 3GPP TSG RAN from 3GPP's creation until April 2000
- Acted in a consultative capacity advising the company on technical, commercial and regulatory issues relating to 3rd generation telecommunications development and implementation.
- Developed and promoted programme to co-ordinate standards activities throughout Samsung. – Samsung Global Standards Strategy Group established in September 1998.
- Attended ETSI TCs, SMG1, SMG4, SMG5, SMG7, SMG9 and SMG11 as required by Samsung to keep abreast of developments prior to establishment of 3GPP

Radiocommunications Agency 06/93 -11/96

HPTO Spectrum Engineer

- Responsible for the management of spectrum for use by PMR and Wireless LAN technologies.
- Defined and instigated development of an improved assignment methodology for Private Mobile Radio (PMR) channels, promoting increased quality and spectrum efficiency.
- Managed research projects involving the assessment and selection of bids from external companies, submitted under competitive tender.
- Represented the Agency in the National and International fora associated with the use of Land Mobile Radio, acting as rapporteur for PMR voice and data standards in ETSI Sub-Technical-Committee RES02, and as chairman of a sub-working group under ITU WP8A drafting the recommendation for use of the radio spectrum by Radio LANs.
- Involved in CEPT Spectrum Engineering Project Teams, dealing with spectrum for Narrow band PMR technology and co-ordination between that technology and T-DAB transmissions in Band III.
- Dispensed technical advice both within the Agency and to external customers, on national and international PMR standards, assessing requests for additional frequencies, and providing technical justification for assignments and wider spectrum policy

BBC Radio 11/89 – 05/93

Radio Operations Engineer

- Worked on projects requiring the design, development, maintenance and testing of equipment for use within the broadcasting chain.
- Responsible for acceptance testing of new studios for Radio 5, and in particular redesign of outside source circuits for the main sports continuity studio.
- Involved in acceptance testing for NICAM transmission routers. Designed and implemented modifications to synchronise transmission feeds, resulting in seamless switching between routers.

Education

1. MSC in Computer Science from the University of Kent

   Awarded (with distinction): 07/2006

   Dissertation title: Roles Variables and Program Analysis – Received prize for outstanding achievement

2. B.Eng. (Hons) in Electronic Engineering from the Polytechnic of Central London

   Awarded: 07/1989

3. In house and external technical and management training including: Learning Tree courses on System Analysis and Design, User Requirements, UML, and Project Management.
4. On-line courses from: Cousera, Udemy, and Zenva courses covering Machine Learning, Python, Data Science, and Natural Language Processing

Appendix 2

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THIRD GENERATION PARTNERSHIP PROJECT (3GPP)

PARTNERSHIP PROJECT DESCRIPTION

During the meeting held in Copenhagen, 2 - 4 December 1998 ARIB, ETSI, T1, TTA and TTC agreed this Partnership Project Description.

Petitioners' Exhibit 1008, p. 46
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Preamble

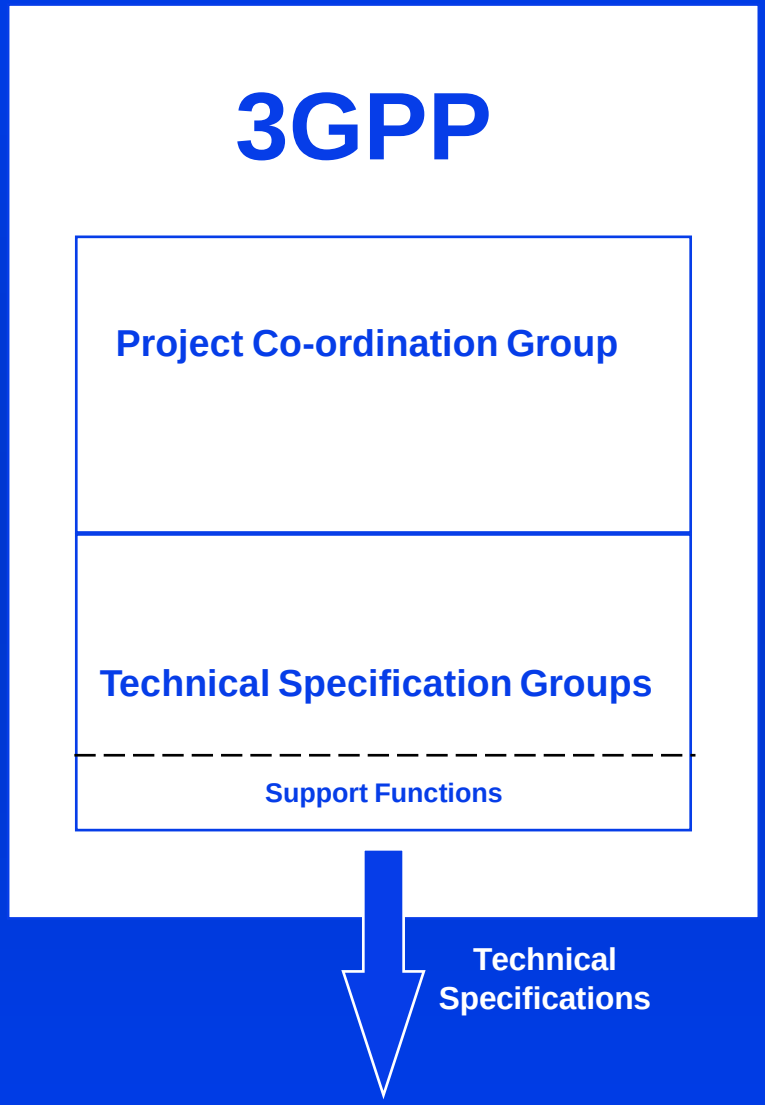
Standards organizations and other related bodies have agreed to co-operate for the production of a complete set of globally applicable Technical Specifications for a 3rd Generation Mobile System based on the evolved GSM core networks and the radio access technologies supported by 3GPP partners (i.e., UTRA both FDD and TDD modes).

The Project is entitled the "Third Generation Partnership Project" and may be known by the acronym "3GPP".

3GPP has been established for the preparation and maintenance of the above mentioned Technical Specifications, and is not a legal entity.

Petitioners' Exhibit 1008, p. 47
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3GPP Overview



Petitioners' Exhibit 1008, p. 48
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Definition of the Third Generation Partnership Project

3GPP will provide globally applicable Technical Specifications for a 3rd Generation Mobile System based on the evolved GSM core network, and the Universal Terrestrial Radio Access (UTRA), to be transposed by relevant standardization bodies (Organizational Partners) into appropriate deliverables (e.g., standards).

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Scope and objectives (1)

The Technical Specifications will be developed in view of global roaming and circulation of terminals.

The 3rd Generation Mobile System and its capabilities will be developed in a phased approach. Initially, 3GPP will elaborate, approve and maintain the necessary set of Technical Specifications for the first phase of a 3rd Generation Mobile System including:

- **UTRAN (including UTRA; W-CDMA in Frequency Division Duplex (FDD) mode and TD-CDMA in Time Division Duplex (TDD) mode)**
- **3GPP Core Network (Third Generation networking capabilities evolved from GSM . These capabilities include mobility management and global roaming.)**
- **Terminals for access to the above (including specifications for a UIM)**
- **System and service aspects**

Petitioners' Exhibit 1008, p. 50
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Scope and objectives (2)

The set of global specifications for the first phase of the 3GPP core network and the specifications for the GSM core network should be common to the largest extent possible and should not be needlessly different.

The results of the 3GPP work will form the basis of member contributions to the ITU in accordance with existing procedures.

3GPP will take account of emerging ITU recommendations on interworking between IMT-2000 family members.

In the framework of agreed relationships, 3GPP will elaborate Technical Specifications that will form the basis of standards, or parts of standards, of the Organizational Partners.

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Characteristics of 3GPP (1)

3GPP is characterized by the following attributes:

- **Minimum production time for Technical Specifications from conception to approval**
- **Fast, electronic based approval process**
- **Maximum use of modern (electronic) working methods**
- **Minimum number of hierarchical levels with decision making taking place at the lowest appropriate levels**

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Characteristics of 3GPP (2)

- **A Project Co-ordination function and a Technical Specification function**
- **Task oriented, ensuring that on completion of the tasks the future of the project is re-evaluated**
- **Cost effective use of financial/human resources provided by Partner Organizations (if required)**

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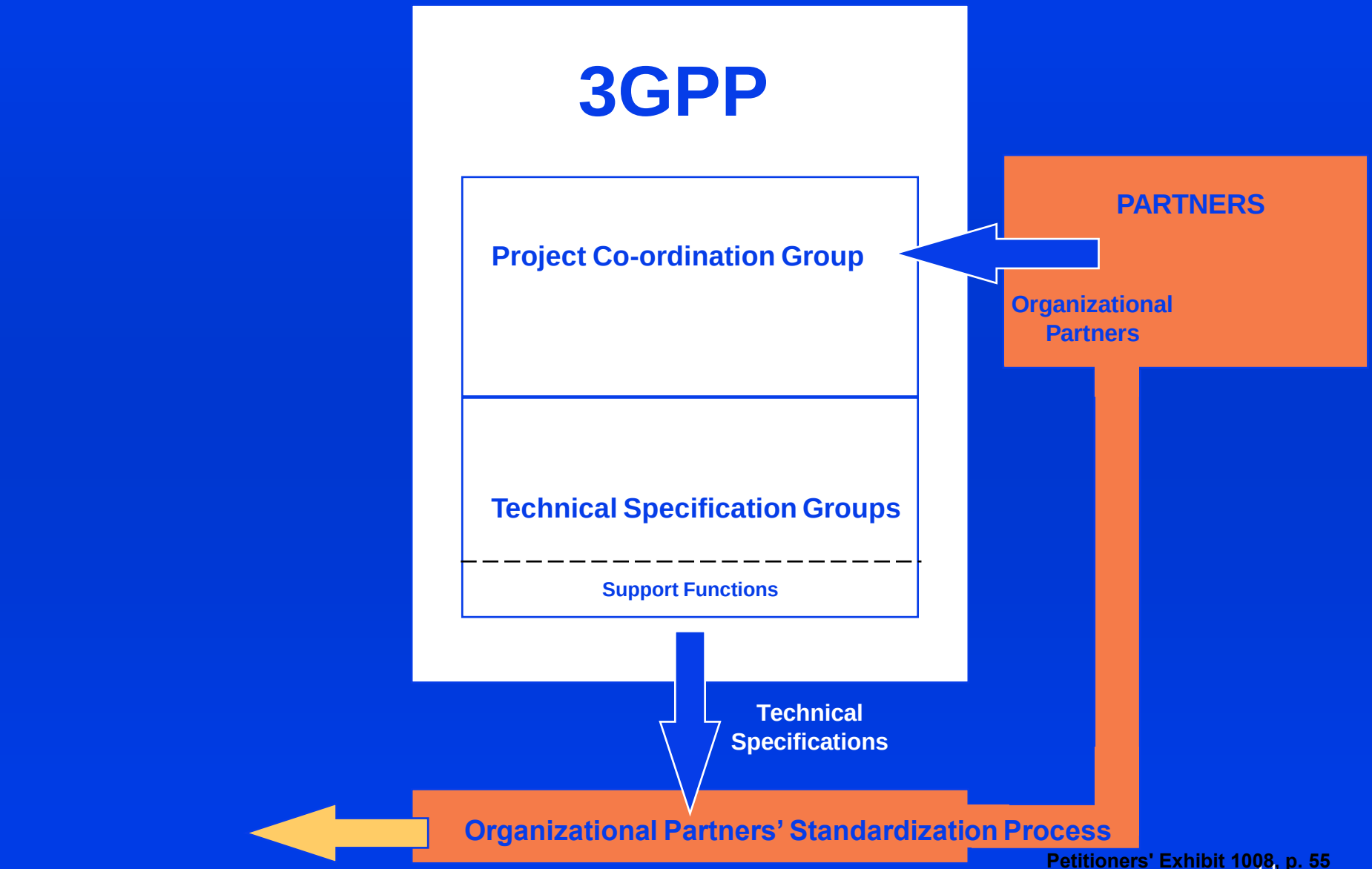
Partnership and Membership

3GPP comprises of:

- **Partners:**
  - **Organizational Partners**
    - **3GPP is open to all standards organizations irrespective of the geographical location.**
  - **Market Representation Partners**
- **Individual Members**

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Organizational Partners (1)



Petitioners' Exhibit 1008, p. 55
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Organizational Partners (2)

An Organizational Partner is:

An open standards organization with a national, regional or other officially recognized status (in their country or region)

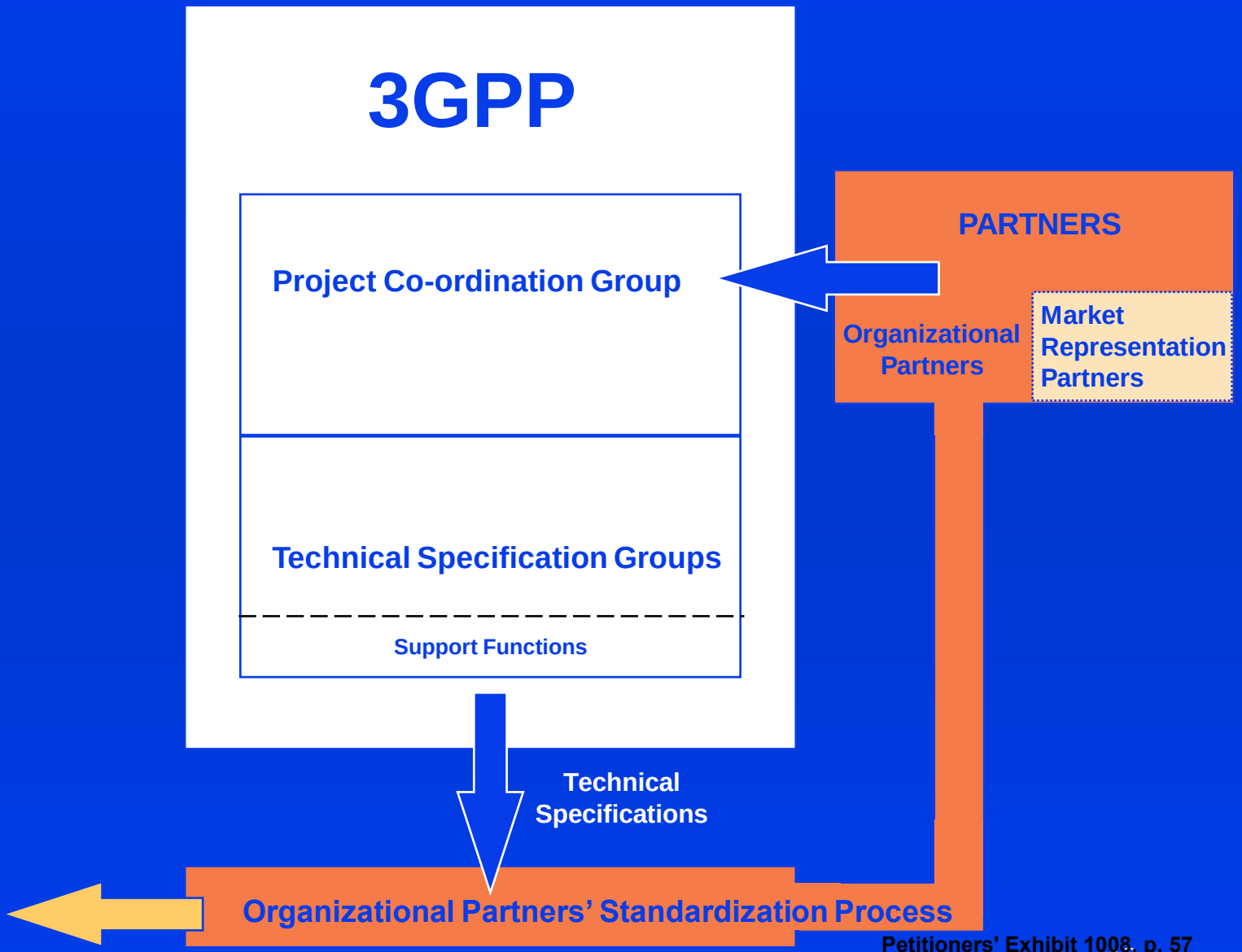
that:

- **has the capability and authority to define, publish and set standards nationally or regionally and**
- **has signed (or whose sponsor has signed) the Partnership Project Agreement**

Organizational Partners will meet as approriate and make decisions by consensus.

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Market Representation Partners (1)



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Market Representation Partners (2)

Standardization should meet market needs.

In order to identify market requirements, the high competence of Market Representation Partners should be used.

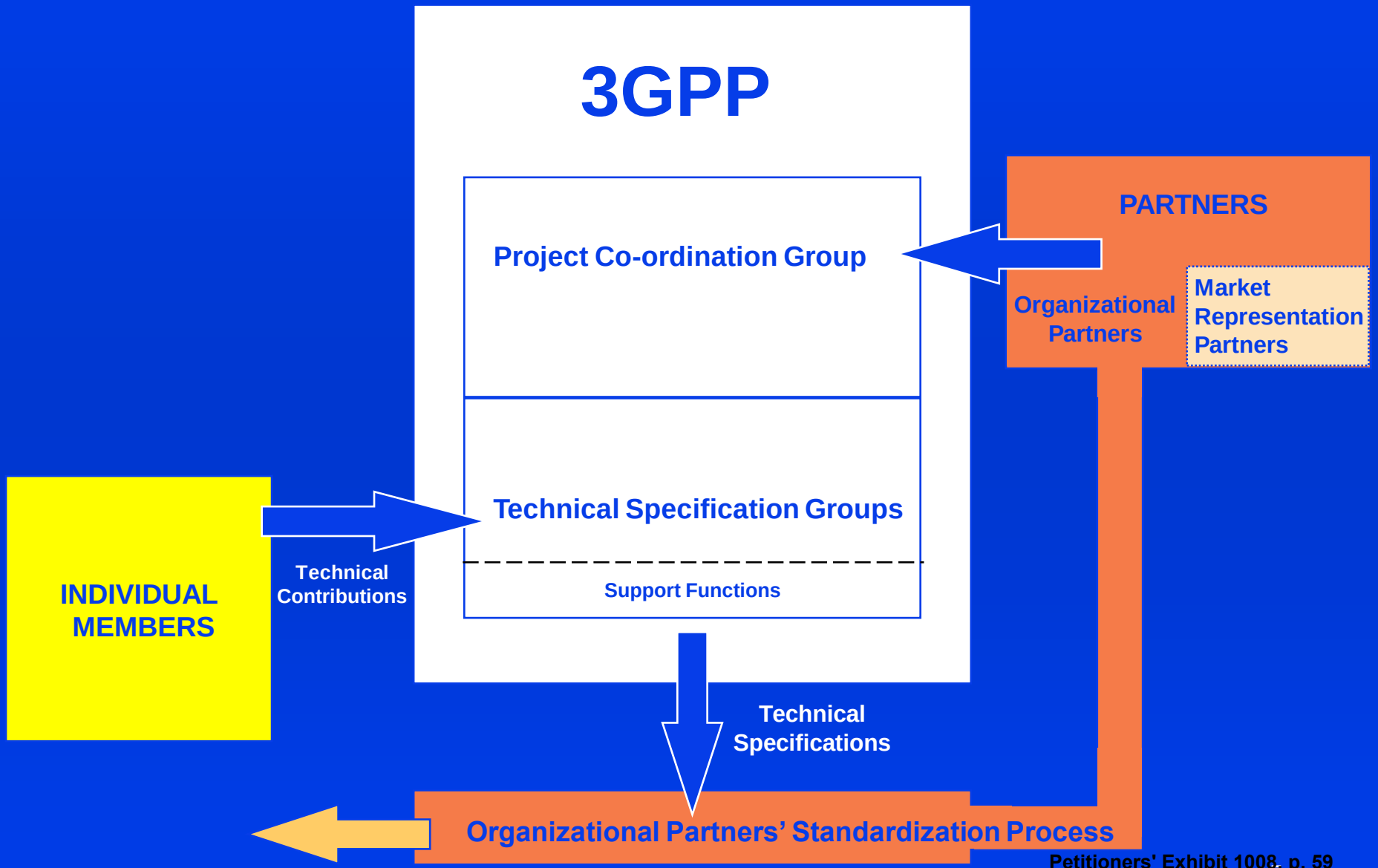
A Market Representation Partner is an organization invited to participate by the Organizational Partners to offer market advice to 3GPP and to bring into 3GPP a consensus view of market requirements (e.g. services, features and functionality) falling within the 3GPP scope.

A Market Representation Partner:

- **does not have the capability and authority to define, publish and set standards nationally or regionally**
- **has signed (or whose sponsor has signed) the Partnership Project Agreement**
- **has committed itself to the 3GPP scope**

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Individual Members (1)



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Individual Members (2)

Membership in an Organizational Partner is a pre-requisite for Individual Membership in 3GPP.

Individual Membership is open to legal entities committed to support 3GPP and to:

- **contribute technically or otherwise to one or more of the Technical Specification Groups within the 3GPP scope**
- **use the 3GPP results to the extent feasible**

Individual Membership in 3GPP will be terminated by dissolution, abolition, resignation or expulsion from the related Organizational Partner.

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Individual Members (3)

All entities registered as members of an Organizational Partner and eligible for participation in the technical work of that Partner, can become Individual Members of 3GPP. Individual members shall apply to their Organizational Partner to participate in 3GPP.

Individual Members act in the 3GPP in their own right; they carry the full responsibility for their contributions.

Individual Membership applicants residing in a country/area without an Organizational Partner can apply for membership in an Organizational Partner according to the rules of each Partner. (e.g. ETSI Associate Membership is available)

Petitioners' Exhibit 1008, p. 61
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Observership

In order to ensure globally applicable Technical Specifications, the status of "Observer" may be granted by the Organizational Partners to an entity which has the qualifications to become a future Organizational Partner. The status of "Observer" includes obligations to:

- **identify as early as possible any regulatory requirements that may lead to options within Technical Specifications**
- **make their IPR policy available for consideration**
- **contribute to the common objective of the 3GPP and avoid duplication of work related to the 3GPP**

The participation rights of an Observer will be decided on a case by case basis.

Petitioners' Exhibit 1008, p. 62
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The following 3 documents describe 3GPP:

- **The Partnership Project Agreement**
- **The Partnership Project Description (this present document)**
- **The Partnership Project Working Procedures**

Petitioners' Exhibit 1008, p. 63
AT&T et al v. Asustek Technology
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The Partnership Project Agreement (1)

The Partnership Project Agreement is a concise legal document signed by participating Partners (or their sponsor).

It contains the minimum legal text necessary for 3GPP to function correctly.

The Partnership Project Agreement refers to the Partnership Project Description and the Partnership Project Working Procedures.

Petitioners' Exhibit 1008, p. 64
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The Partnership Project Agreement (2)

The Partnership Project Agreement includes obligations on Organizational Partners to commit themselves to the 3GPP scope:

- **to encourage their members to contribute to the common set of Technical Specifications and to avoid duplication of work**
- **to convert / transpose / adopt all relevant Technical Specifications resulting from 3GPP into their own relevant deliverables through their normal processes**
- **to identify as early as possible, any national / regional regulatory requirements that may lead to options within the Technical Specifications**
- **to make their IPR Policy available for consideration**

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The Partnership Project Agreement (3)

The Partnership Project Agreement includes obligations on Market Representation Partners to identify market and service requirement of 3GPP and to contribute to:

- **the promotion of 3GPP**
- **the definition of 3GPP System and Service scenarios**

The Market Representation Partners should also encourage their members to contribute to the common objectives of 3GPP and to avoid duplication of work.

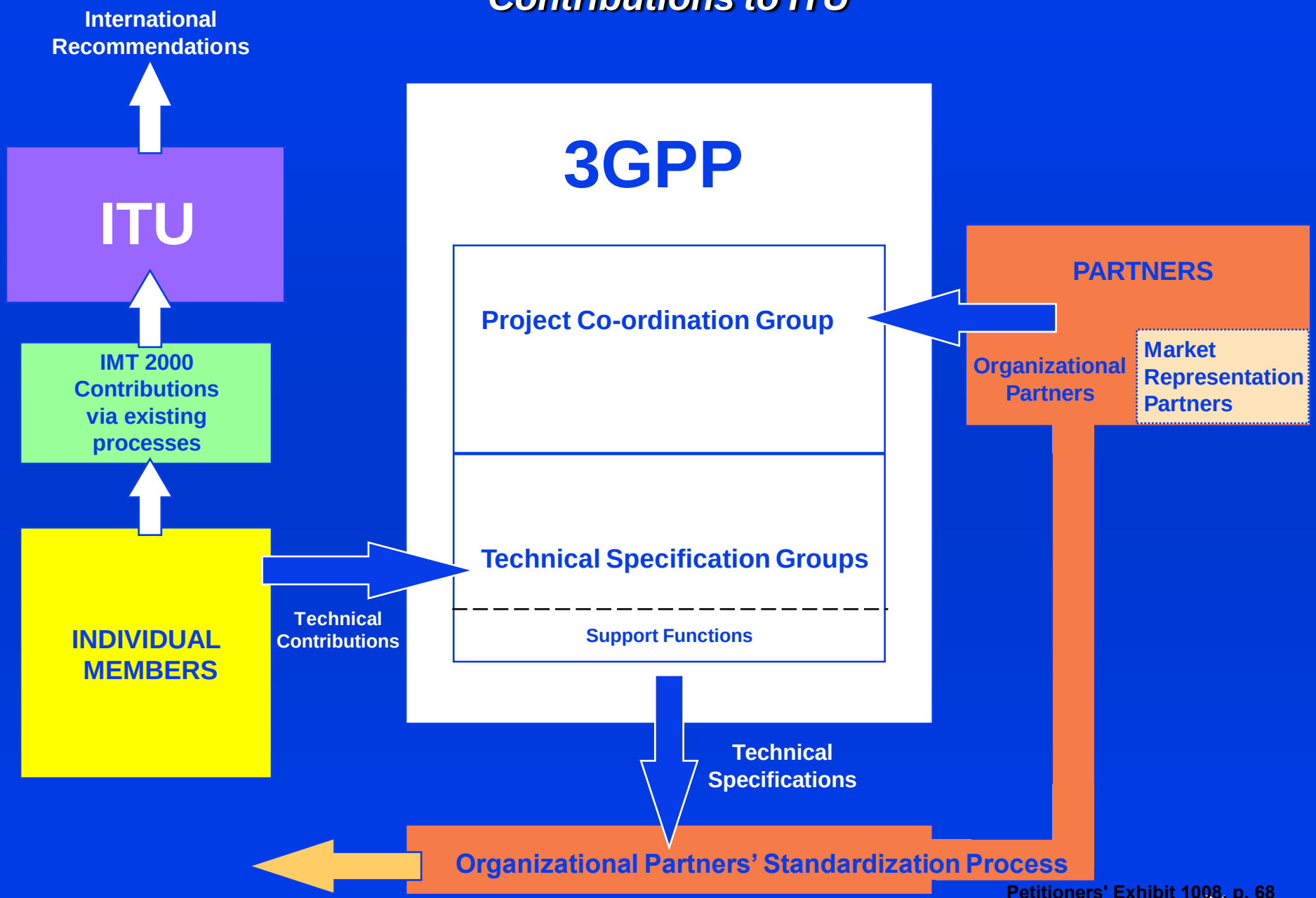
Petitioners' Exhibit 1008, p. 66
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IPR2024-00997

Ownership of the Partnership Project results

The Organizational Partners of 3GPP will have joint ownership (including copyright) of the Technical Specifications.

Petitioners' Exhibit 1008, p. 67
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Contributions to ITU



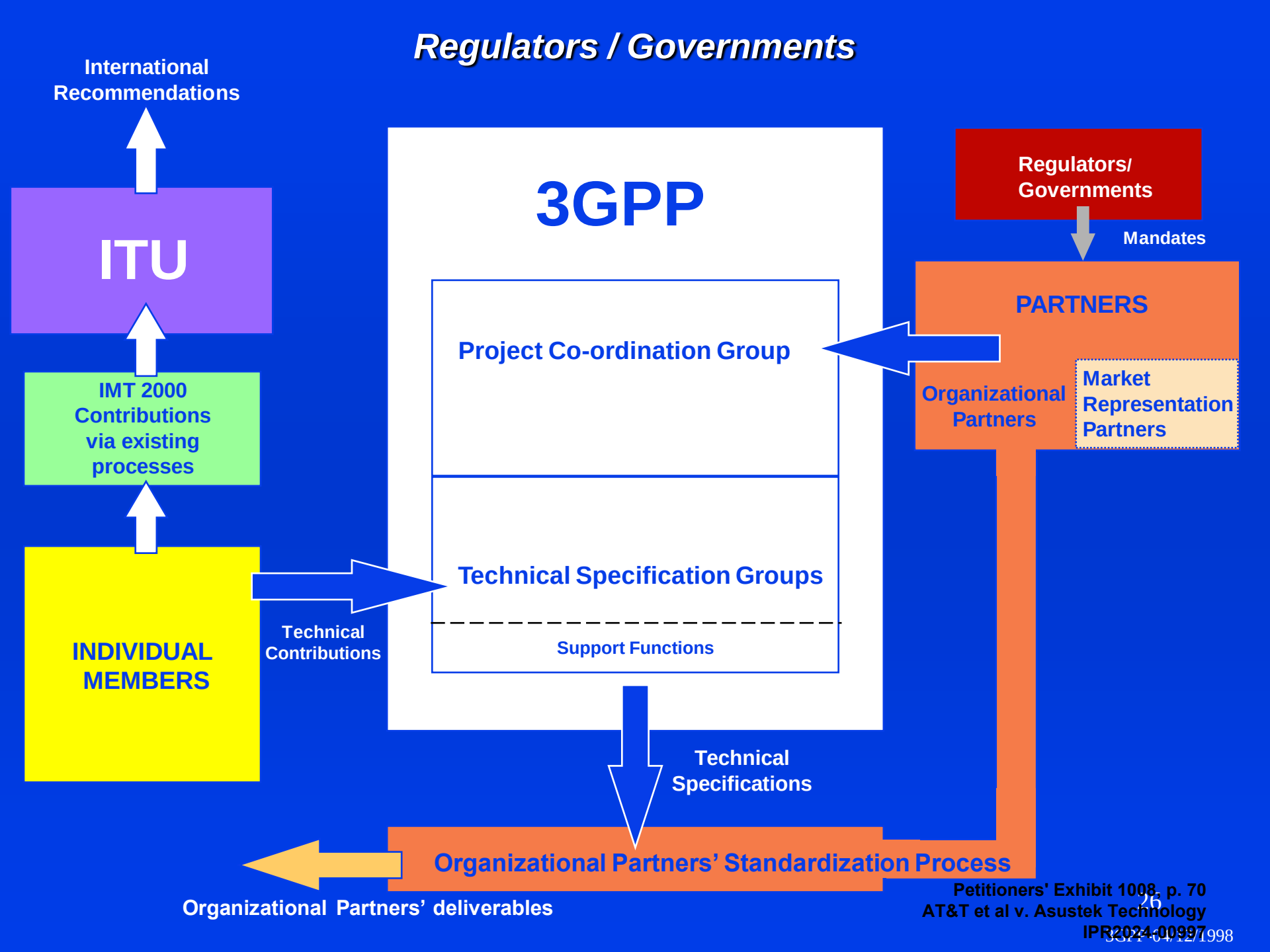
Petitioners' Exhibit 1008, p. 68
AT&T et al v. Asustek Technology
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Submission of 3GPP results to ITU

3GPP will not contribute directly to the ITU.

Formal contributions to ITU Study Groups are made by ITU members following existing national/regional processes.

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Petitioners' Exhibit 1008, p. 70
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National / regional regulatory requirements

Variations imposed by national / regional regulatory requirements will be included in the Technical Specifications as defined by the Technical Specification Groups.

Petitioners' Exhibit 1008, p. 71
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Resource requirements for establishing 3GPP

ETSI will absorb the initial cost of establishing the 3GPP, if required.

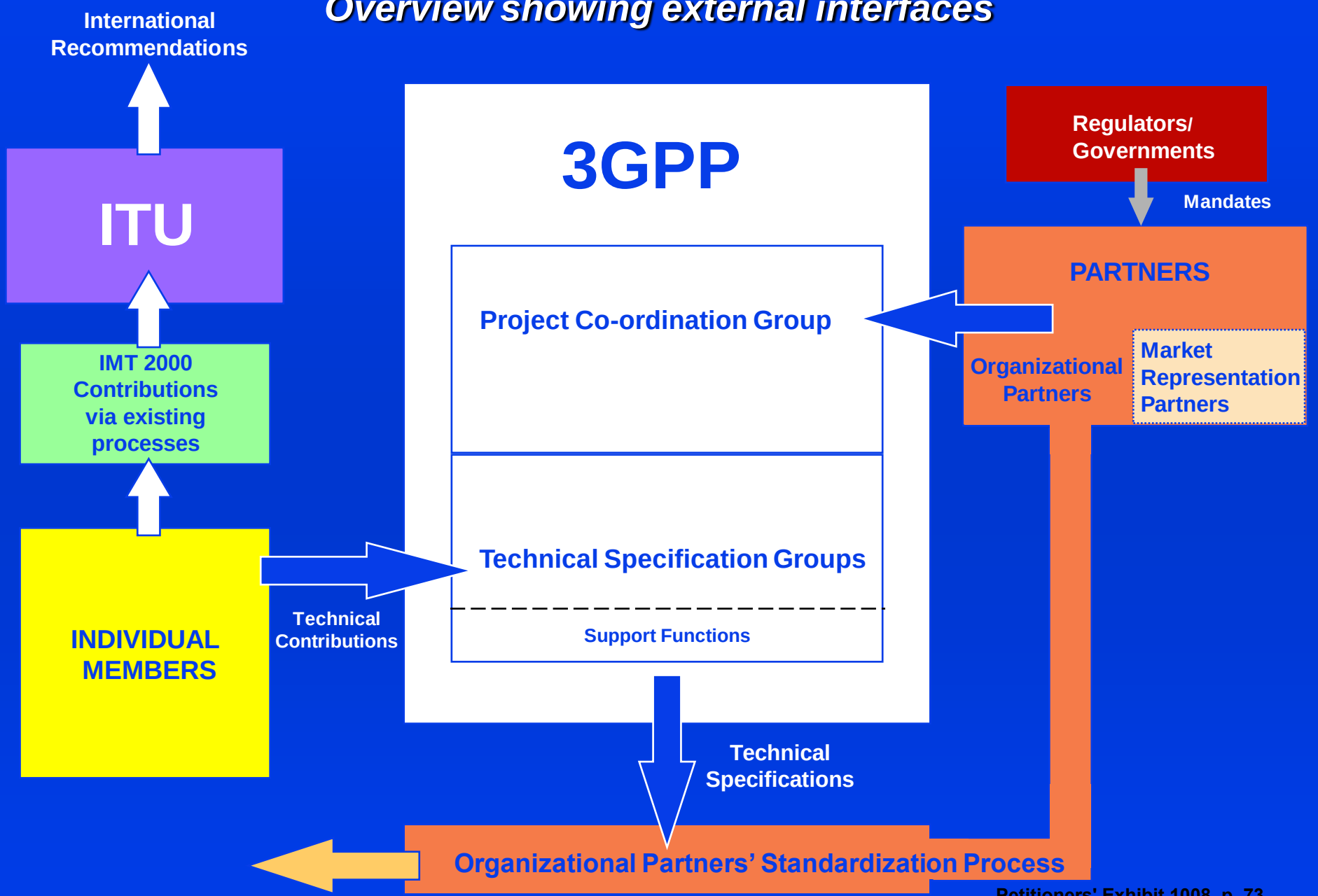
Thereafter, the costs will be shared by the Organizational Partners. There will be no direct 3GPP membership fee for Individual Members.

Partners and Individual Members may provide support functions to the extent that they are able (eg hosting of meetings and provision of Secretariat support).

The longer term financial requirements are for further study.

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Overview showing external interfaces



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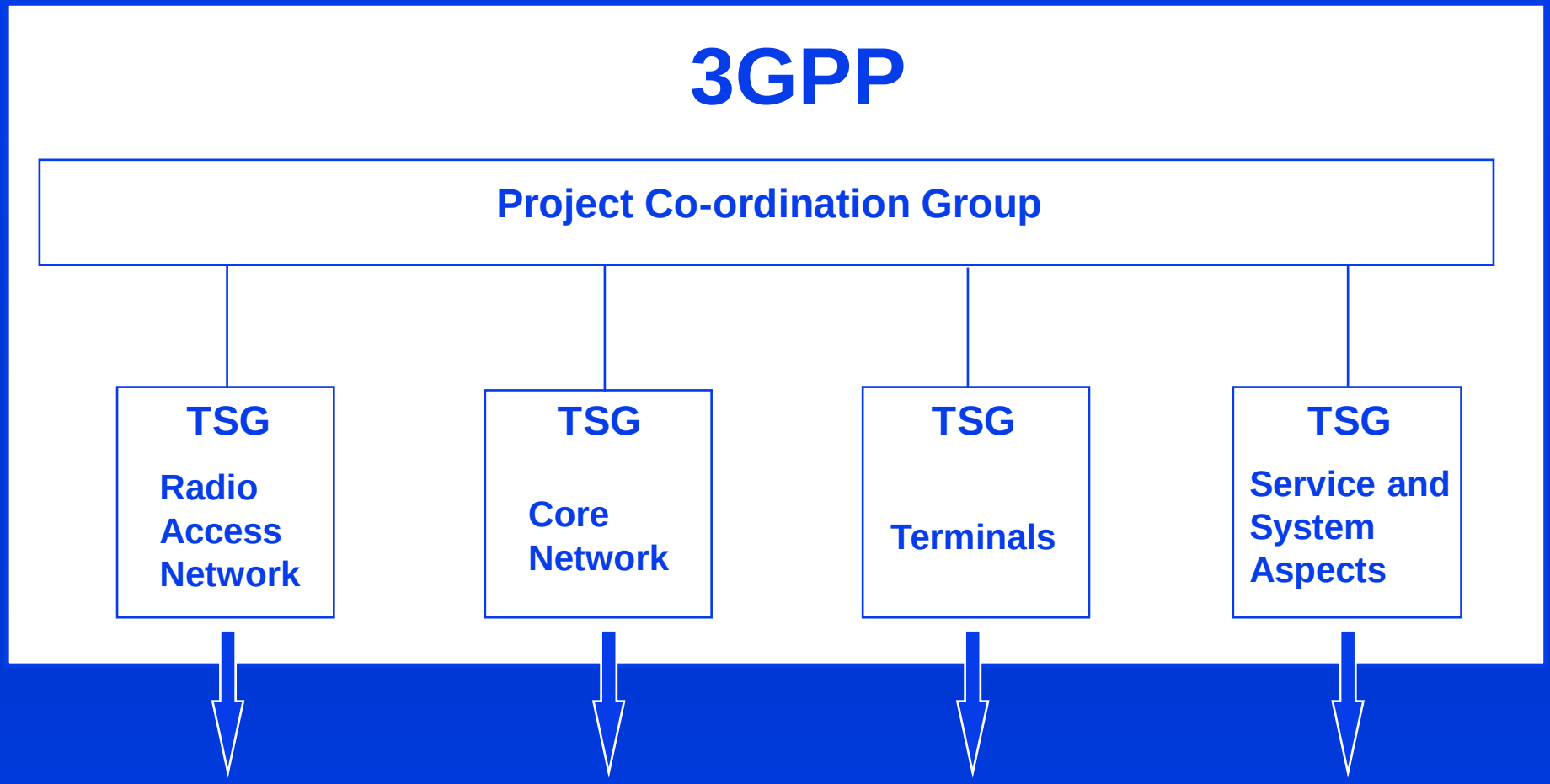
Internal structure of 3GPP (1)

3GPP consists of a Project Co-ordination Group (PCG) and Technical Specification Groups (TSGs).

To assist in the co-ordination of the technical activities, the TSGs are encouraged to meet at the same time and place, as and when appropriate (e.g. twice per year).

Petitioners' Exhibit 1008, p. 74
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Internal structure of 3GPP (2)



Petitioners' Exhibit 1008, p. 75
AT&T et al v. Asustek Technology
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Work areas to be covered by the Radio Access Network TSG

- Radio Layer 1 specification
- Radio Layer 2 specification
- Radio Layer 3 RR specification
- Iub specification
- Iur Interface
- Iu Interface
- UTRAN O&M requirements
- Base station radio performance specification
- Conformance test specification for testing of radio aspects of base stations
- Specifications for radio performance aspects from the system point of view

Petitioners' Exhibit 1008, p. 76
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Work areas to be covered by the Core Network TSG

- **Mobility management, call connection control signalling between the user equipment and the core network**
- **Core network signalling between the core network nodes. the signalling supports functionality such as user location information, subscription information and control of network services**
- **Definition of interworking functions between the core network and external networks**
- **Packet related questions such as mapping of QoS (e.g. transparency for IP domain applications, general for bearer types, special for optimized applications such as Voice over IP)**
- **Core network aspects of the Iu interface**
- **Core network O&M requiremnents**

Petitioners' Exhibit 1008, p. 77
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Work areas to be covered by the Terminal TSG

- **Service capability protocols**
- **Messaging**
- **Services end-to-end interworking**
- **USIM to Mobile Terminal interface**
- **Model/framework for terminal interfaces and services (application) execution**
- **Conformance test specifications of terminals, including radio aspects**

Petitioners' Exhibit 1008, p. 78
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Work areas to be covered by the Service and System Aspects TSG

- **Service capabilities**
  - **Definition of services and feature requirements**
  - **Development of service capabilities and a service architecture for cellular, fixed (and cordless) applications**

- **Stage one and two descriptions for:**
  - **Charging and accounting**
  - **Network Management**
  - **Security Aspects**

- **Architecture**
  - **Definition, evolution, and maintenance of overall architecture, including assignment of functions to particular sub-systems and identification of key information flows**
  - **In co-operation with other TSGs, define required services, service capabilities and bearer capabilities offered by the different sub-systems**

- **Codec aspects**
  - **Principles for definition of end-to-end transmission**
  - **Definition, evolution and maintenance of relevant specifications**

- **Project co-ordination**
  - **High level co-ordination of the work performed in other TSGs and monitoring of progress**

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3GPP-04/12/1998

Primary responsibilities of PCG and TSGs (1)

The primary responsibilities of PCG, TSGs and Organizational Partners are given in the following tables:

	Function	Org Partners collectively	PCG	TSGs
1	Approval of new Partners for 3GPP	X		
2	Approval of Organizational Partner funding requirements and contributions	X		
3	Allocation of human and financial resources provided by Partners to PCG	X		
4	Allocation of resources to TSGs		X	
5	Allocation of resources within TSGs			X

Primary responsibilities of PCG and TSGs (2)

	Function	Org Partners collectively	PCG	TSGs
6	Allocation of voluntary human and financial resources by Market Representation Partners and Individual Members		X	X
7	Handling of appeals from Individual Members on procedural matters	2nd step	1st step	
8	Handling of appeals from Individual Members on technical matters		2nd step	1st step
9	Determine overall time frame and manage overall work progress		X	

Primary responsibilities of PCG and TSGs (3)

	Function	Org Partner collectively	PCG	TSGs
10	Detailed time frame and manage detailed work progress			X
11	Approval of Technical Specifications			X
12	Proposal and approval of work items within the agreed scope and terms of reference			X
13	Final adoption of work items within the agreed scope and terms of reference		X	
14	Management of work items			X

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Primary responsibilities of PCG and TSGs (4)

	Function	Org Partners collectively	PCG	TSGs
15	Technical Co-ordination (System Aspects TSG will play a role here)			X
16	Appointment of Org Partners meeting Chairman (provided by host on a rotational basis)	X		
17	Appointment of PCG Chairman (for one year term)		X	
18	Election of TSG Chairman and Vice Chairmen			X
19	Creation of TSGs and approval of their terms of reference	X		

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Primary responsibilities of PCG and TSGs (5)

	Function	Org Partners collectively	PCG	TSGs
20	Creation of TSG working groups and approval of their terms of reference			X
21	Election of TSG Working Group Chairmen and Vice Chairmen			X
22	Confirmation of individual member participation rights	X		
23	Approval of 3GPP scope and terms of reference	X		
24	Maintain Partnership Project Agreement, Project Description and Working Procedures (consensus agreement by all Partners)	X		

Petitioners' Exhibit 1008, p. 84
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Participation rights in PCG and TSGs

The following have a right to participate in the PCG:

- **Representatives of participating Organizational Partners**
- **Representatives of participating Market Representation Partners**
- **Chairman and Vice Chairmen of the TSGs, as ex-officio members**

The following have a right to participate in the TSGs :

- **Representatives of members of participating Organizational Partners (i.e. Individual Members)**
- **Representatives of participating Organizational and Market Representation Partners**

Petitioners' Exhibit 1008, p. 85
AT&T et al v. Asustek Technology
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Principles for decision making within 3GPP

Decision making within PCGs

- **By consensus amongst the Organizational Partners**
- **By vote amongst the Organizational Partners in unavoidable cases**

Decision making within TSGs

- **By consensus amongst the Individual Members**
- **By vote amongst the Individual Members in unavoidable cases**

The Organizational Partners will conduct a fairness review of the decision making process six months after 3GPP start-up, taking into account all concerns raised

(Note: voting will not be permitted on National/Regional regulatory requirements)

Petitioners' Exhibit 1008, p. 86
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Principles for voting within TSGs

The following principles will be applied for voting within the TSGs

- **One "Individual company Member", one vote**
- **Organizational Partners to interpret " Individual company Member" according to its own rules of membership**
- **The PCG will maintain a register of eligible voters for the TSGs**
- **Each Individual Member may carry the proxy for up to five other Individual Members**

Petitioners' Exhibit 1008, p. 87
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Working language for 3GPP

The working language for 3GPP shall be English

- **Meetings of the PCG and TSGs shall be conducted in English**
- **3GPP Technical Specifications shall be prepared in English**

Petitioners' Exhibit 1008, p. 88
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Relationship with other groups

3GPP will establish and maintain good relationships with groups working on standards for other IMT-2000 family members.

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Intellectual Property Rights (IPR) Principles (1)

The Individual Members of 3GPP are bound by the IPR Policies of their respective Organizational Partner.

Individual Members are encouraged to declare at the earliest opportunity, any IPRs which they may have and believe to be essential, or potentially essential, to any work ongoing within 3GPP.

After comparing their respective IPR policies, ARIB, ETSI, T1, TTA and TTC have agreed that their IPR policies share common principles are quite similar and have agreed on the following additional principles to maximize the success of 3GPP.

Intellectual Property Rights (IPR) Principles (2)

(i) **To encourage their respective members' declaration of willingness to grant licences on fair, reasonable terms and conditions on a non-discriminatory basis, and consistent with the respective Organizational Partners' IPR policies.**

(ii) **To encourage their respective members who may have IPR which they believe to be essential, or potentially essential, and are unwilling to license such IPR, that early indication of such unwillingness be provided to their respective Organizational Partners.**

(iii) **To understand that essential IPRs mean essential IPRs relative to any or all parts of the content of the 3GPP technical specifications.**

(iv) **A mechanism for exchanging information associated with the patent statement among the Organizational Partners will be introduced so that such information may be used when adopting relevant standards in each Partner Organization.**

Appendix 3

Introducing 3GPP



The 3rd Generation Partnership Project (3GPP) unites seven telecommunications standard development organizations (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC), known as “Organizational Partners” providing their members with a stable environment to produce the Reports and Specifications that define 3GPP technologies.

3GPP specifications cover cellular telecommunications technologies, including radio access, core network and service capabilities, which provide a complete system description for mobile telecommunications. The 3GPP specifications also provide hooks for non-radio access to the core network, and for interworking with non-3GPP networks

The Project’s Scope

The original scope of 3GPP (1998) was to produce Technical Specifications and Technical Reports for a 3G Mobile System based on evolved GSM core networks and the radio access technologies that they support (i.e., Universal Terrestrial Radio Access (UTRA) both Frequency Division Duplex (FDD) and Time Division Duplex (TDD) modes).

The scope was subsequently amended to include the maintenance and development of the Technical Specifications and Technical Reports for evolved 3GPP technologies, beyond 3G.

- The latest 3rd Generation Partnership Project Agreement (Annex 42).
- The discussions that led to the signing of the 3GPP Project Agreement were recorded in a series of slides called the “Partnership Project Description” that describes the basic principles and ideas on which the project is based. The document has not been maintained since its first creation, but the principles within do still remain valid.

Petitioners' Exhibit 1008, p. 93
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Organizing the work

The 3GPP Working Procedures are the rule book of 3GPP, with sections covering:

- Description, Purpose, Scope and objectives
- Participation
- Structure
- Partners' collective responsibilities
- Project Coordination Group (PCG)
- Technical Specification Groups (Incl. Elections)
- Work Programme & technical co-ordination
- Deliverables (Technical Specifications and Technical Reports)
- Reporting

The 3GPP production of specifications and studies (TRs) are contribution-driven, by member companies, in Working Groups and at the Technical Specification Group (TSG) level. The Technical Specification Groups in 3GPP are:

- Radio Access Networks (RAN)
- Services & Systems Aspects (SA)
- Core Network & Terminals (CT)

The Working Groups, within the TSGs, meet regularly and come together for their quarterly TSG Plenary meeting, where their work is presented for information, discussion and approval. The last meeting of the week of TSG Plenary meetings is TSG SA, which also has responsibility for the overall coordination of the technical work and for the monitoring of its progress.

Generational Approach

The 3GPP technologies from these groups are constantly evolving through Generations of commercial cellular / mobile systems (see table below). With LTE and 5G work, 3GPP has become the focal point for the vast majority of mobile systems beyond 3G.

Although these Generations have become an adequate descriptor for the type of network under discussion, real progress on 3GPP standards is measured by the milestones achieved in particular Releases. New features

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are 'functionality frozen' and are ready for implementation when a Release is completed. 3GPP works on a number of Releases in parallel, starting future work well in advance of the completion of the current Release. Although this adds some complexity to the work of the groups, such a way of working ensures that progress is continuous & stable.

Backward Compatibility

The major focus for all 3GPP Releases is to make the system backwards and forwards compatible where possible, to ensure that the operation of user equipment is uninterrupted.

For 5G, many operators are starting with dual connectivity between LTE and 5G NR equipment – using the 'Non-Standalone' work completed early in Release 15. In the process of completing the early drop of 5G NR care has been taken to build 'forward compatibility' into Non-Standalone NR equipment, to ensure that it will be fit for use on Standalone 5G NR systems.

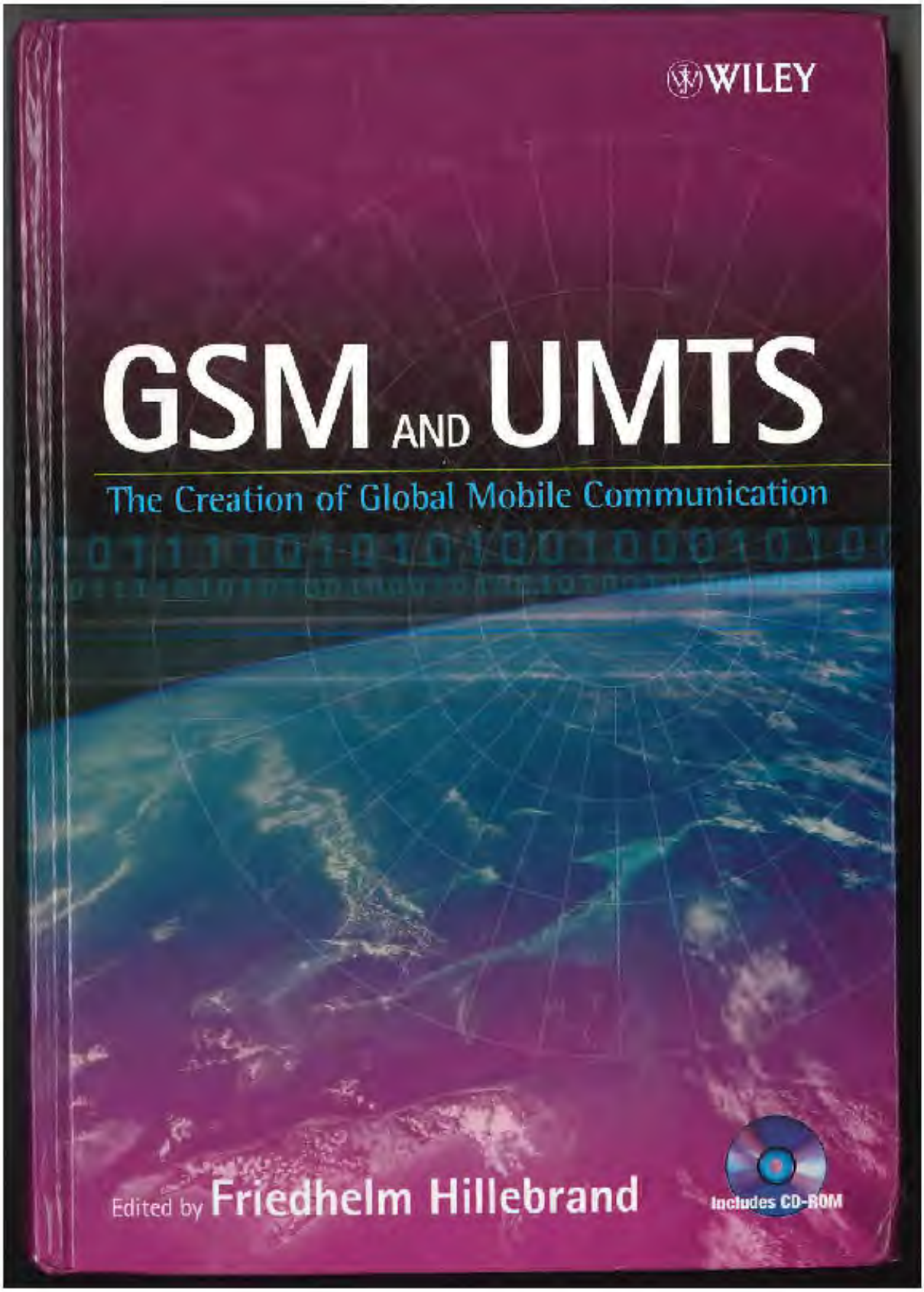
For details of the contents of each Release, see the appropriate 'Release Description' document or go to our dedicated Release page.

Details of all 3GPP Work Items are in the 3GPP Work Plan, which provides details of the cooperation between all of the 3GPP groups on "Features", defined as 'new or substantially enhanced functionality which represents added value to the existing 3GPP system'.

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Appendix 4



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GSM and UMTS

The Creation of Global Mobile Communication

Edited by

Friedhelm Hillebrand
Consulting Engineer, Germany

With contributions from 37 key players involved in the work for GSM and UMTS



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Chapter 9: The Third Generation Partnership Project (3GPP)

Section 1: The Creation of 3GPP

Karl Heinz Rosenbrock

Having read the title, it should not surprise you that this section deals with the creation of the Partnership Project for the standardisation of a Third Generation Mobile Communications System (3GPP).

Why, you may ask, in a history book about the GSM and UMTS development, do I want to talk about the establishment of a partnership project? Isn't it the most natural thing to do? This is, of course, a stance an insider can take today – after nearly 30 months of 3GPP's creation and the smooth and successful running of this project.

As this section will eventually show, it took quite some time, filled with tough and even passionate discussions, before the goal was achieved. Approaching this idea from a rather philosophical point of view, one should not be too surprised about the big efforts needed, of course already the old Greek ancestors knew that "prior to being successful the Gods will demand some sweat"...[2]

This section starts with some general considerations leading the European Telecommunications Standards Institute (ETSI) membership towards a global approach in standardisation and then deals with the establishment of an ad hoc group of the ETSI Board (UGG = UMTS Globalisation Group) to address the matter of global standardisation in this context and the [illegible] meetings and discussions. Afterwards, the 3GPP will be described in a rather general manner, highlighting how it works, who the stakeholders are and dealing with the results achieved so far. The section is rounded up with the relationship towards the International Telecommunication Union (ITU) and other initiatives as well as a few concluding remarks.

9.1.1 First Approaches to Globalisation

The [illegible] process ETSI, the "Excellent" Telecommunications Standards Institute in Europe, undertook in the years 1995/1996 – only 7 years after its creation – resulted in [illegible] a kind of mission statement for the Institute: "Making international standards work for Europe".

[illegible] discussions are those of the author and do not necessarily reflect the views of his affiliation.

[illegible] translations of a German famous "Wo der Erfolg saure die Götter den Schweiß gesetzt".

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- unanimously requested the ETSI Board (through its UMTS Global Action Group) to complete the negotiations with potential partners and to oversee the creation of the Partnership Project;
- unanimously requested the ETSI Board to agree and maintain on behalf of ETSI the final versions of the Partnership Project Description, the Partnership Project Working Procedures, and the Partnership Project Agreement;
- unanimously authorised the director-general to sign the Partnership Project Agreement.

9.1.2.4.14 Happy End in Copenhagen

It was in Copenhagen where the last 3GPP preparatory meeting with all six OPs took place on 2–4 December 1998.

Here, the final fine-tuning of the 3GPP documentation was achieved. In addition, the 3GPP agreement[1] was signed (in a nice framework provided by the host, TeleDenmark) by the following OPs: ARIB, ETSI, T1, TTA, and TTC.

Unfortunately, the partners from CWTS (China) were not authorised to sign the 3GPP agreement yet. Furthermore, owing to the fact that the UMTS Forum was unable to participate in Copenhagen, they were prevented from co-signing the 3GPP agreement as a first Market Representative Partner (MRP).

During that Copenhagen meeting, another discussion ensued about the role the MRPs should play. Finally, it was concluded that the high competence of MRPs should be used in order to identify market requirements, thus enabling 3GPP standardisation to meet the needs of the market. An MRP is an organisation invited by the OPs to participate in 3GPP with the objective of offering market advice to 3GPP and to bring into 3GPP a consensus view of market requirements.

9.1.3 What is 3GPP?

The 3GPP is a global standardisation initiative created in December 1998. Its task was to develop a complete set of globally applicable Technical Specifications for a third generation (3G) mobile telecommunications system based on the evolved GSM core network and its innovative radio interface known as UTRA. The Project is based on a concept devised by ETSI aimed at facilitating better co-operation between regional standards organisations and other industry groupings. 3GPP is a collaborative activity between officially recognised SDOs, with the participation of other industry groups and individual members.

Partnership in 3GPP is open to all national, regional or other SDOs, irrespective of the geographical location – within the project the participating SDOs are referred to as OPs. The OPs may invite MRPs to participate: these may be any organisation from anywhere in the world that can offer market advice to 3GPP and bring a consensus view of market requirements that fall within the project's scope. Individual membership is open to companies and organisations within the communications industry that are active members of one of the OPs. The truly global nature and the breadth of the market interest in the task of specifying a 3G system is evident from the identity of the 3GPP partners (see further in sub-paragraph [illegible]) and all agree that 3GPP is proving a highly successful initiative.

[1] The 3GPP Agreement and the 3GPP Project Description can be found on the attached CD-ROM in [illegible]

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The 3GPP has no legal status. Ownership (including copyright) of the specifications and reports it produces is shared between the partners. The 3GPP process includes a conversion (transposition) of the project's output into official standards and reports by one or more of the OPs.

The specifications being prepared by 3GPP are evolved in part from the enormously successful GSM standard, which is currently (February 2001) serving over 400 million subscribers in more than 140 countries. Building on this massive installed base, the system being specified by 3GPP will be an attractive upgrade path for existing operators and users. It also has an assured compatibility with GSM – good news for both operators and users who are unable, or unwilling, to upgrade to 3G.

Paramount among the 3GPP specifications is the definition of UTRA, the innovative radio access technology that is the key to the new system's high data rates and dramatically improved performance. UTRA is spectrum-efficient and supports FDD and TDD modes. This interface has been accepted by ITU as a member of the IMT-2000 family – or more correctly, as two family members: IMT-DS, the FDD mode; and IMT-TC, the TDD mode. IMT-2000 family membership requires the ability for users to roam globally and seamlessly, which implies interoperability with other family members. 3GPP thus co-operates closely with the 3GPP2 project which is specifying another family member: a 3G CDMA system based on an evolution of the ANSI-41 architecture.

9.1.3.1 How Does 3GPP Work?

3GPP has been designed to minimise delays and inefficiencies. As a result, it has a "flat" organisational structure and a large degree of distributed autonomy. Overall project planning and co-ordination is the responsibility of the PCG, with input primarily from the OPs, guided by the MRPs. It is mainly at this level that regulatory requirements, provided by the telecommunications administrations and governments around the world, are taken into account.

The development of the specifications is performed by TSGs and their subordinate working groups. Here, the main participation is by technical experts from the individual members of the OPs. Individual members (in their capacity as ITU members) are also responsible for applying the results of the 3GPP work to the ITU.

At the time of the creation, 3GPP had structured around four principal aspects of the 3G system being defined as TSGs:

- TSG CN: core network
- TSG RAN: radio access network
- TSG SA: services and systems aspects
- TSG T: terminals

Each TSG is authorised to develop and approve specifications and reports within its scope, and TSG SA also has a role of co-ordinating the work of the TSGs at a more detailed level than the PCG. The result is a process that is able to rapidly produce and approve specifications and reports in response to the needs of the market, although it is important to note that the documents do not have a formal status until they have been transposed by one or more of the OPs.

The formal status is necessary for regulatory and other purposes in the various regions, and the OPs have committed themselves to complete this process rapidly. Each OP will apply

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(its own procedures, appropriate to their respective regions. As the Official European SDO within 3GPP, ETSI recognises the 3GPP output as ETSI Technical Specifications and ETSI Technical Reports without a need for any further endorsement within the Institute. This means that the 3GPP documents are published – within a matter of a few weeks – as identical text directly as ETSI deliverables. In addition, ETSI is transposing, i.e. adapting, a few of the initial 3GPP specifications into ENs for specific European regulatory requirements. This is happening in parallel with the publication of the initial Technical Specifications and will not impede the implementation of 3G in Europe.

9.1.3.1.1 Electronic Working

3GPP has taken a leading role in changing the traditional ways of standards making. A very heavy dependence is now placed on electronic working, both outside and within meetings, advancing a trend that started in ETSI a year or two ago. This means that paper copies of draft documents have been almost entirely eliminated, saving time and expense, and making a significant contribution to the environment.

Given that 3GPP has participants from all over the world, the use of the Internet, e-mail exploders and other such facilities have proved invaluable for distributing and sharing information, working drafts and so on. Delegates to meetings had already become used to downloading working documents from the Internet and having updates to the documents distributed at meetings on CD-ROM. But in recent months, at meetings around the world, participants have experienced the benefits of a local area network (LAN) solution as the next step in improving working methods. ETSI's headquarters premises already have LANs in all its meeting rooms, but most other venues currently rely on temporary LANs (wired or radio) using equipment and support kindly donated by individual members.

Such facilities permit delegates to access all the meeting documents electronically via their laptop computers. As a result, the huge burden of producing paper copies (as many as 1 000 pages per delegate for some meetings) can be eliminated. Delegates can access documents as soon as they are available, rather than having to wait for paper copies to be made or for the documents to be distributed by other means such as diskette or CD-ROM.

9.1.3.1.2 Project Support

For administrative and support purposes the 3GPP Partners have established a Mobile Competence Centre (MCC) which is hosted by ETSI at its premises in Sophia Antipolis, Southern France. The MCC was created in March 1999 to provide support not only to 3GPP but also to ETSI's own studies in mobile technologies. A full description of the MCC, including the financing is given in Chapter 15, Section 3.

9.1.3.2 Who are the Stakeholders in 3GPP?

3GPP has attracted a very strong commitment from organisations and companies throughout the world, reflecting the truly global nature of the project. There are currently six PTOs (in alphabetical order):

- The Association of Radio Industries and Businesses (ARIB), Japan;

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among TD-SCDMA, proposed by CWTS. A similar group, 3GPP2, is preparing the cdma2000 specifications; UWC-136 TDMA specifications are being developed principally by UWCC, and DECT specifications are defined by a set of ETSI standards (Figure 9.1.1).

Since the UWCC and ETSI are both partners in 3GPP (as an MRP and OP respectively), there is direct liaison between the Project and these two sources of specifications for other IMT-2000 family members.

When 3GPP and 3GPP2 were created it was felt that the interests of each group were sufficiently different to require them to remain separate but here again many of the OPs and MRPs are common to both groups, so there are natural channels for information exchange. Particular instances of formal co-operation between the groups were the two joint 3GPP-3GPP2 workshops held in 1999 to address the "Hooks and Extensions" issue aimed at ensuring interworking between the respective technologies.

In addition to all this, the 3GPP TSGs and their working groups are encouraged to have direct ties with relevant technical bodies within the Project as well as among the Partners.

9.1.6 Conclusions

The sensitive reader, and let's assume that you are one, may still be astonished to learn what big efforts have been necessary in order to establish 3GPP.

In the meantime, i.e. in the course of year 2000 nearly the whole work of the former ETSI TC SMG has been incorporated into 3GPP, to a large extent within the new TSG GERAN.

Well, our Japanese friends were not happy about this shift because they feared that it could cause a delay to the 3G introduction in their country. They accepted this because a separate TSG for the GSM work was created.

Trying to recall the heated discussions within ETSI about the scope of 3GPP from 1998, we like to admit that such a move would have been violently rejected by a lot of ETSI members, maybe even by the majority. Using a philosophic approach, one can, of course, say that time helps healing (even wounds).

Today, i.e. February 2001, we can conclude from ETSI's point of view that all standardization work related to further evolution of the second generation mobile system, i.e. GSM and its UMTS is being done well within 3GPP. Thus, the objective to avoid parallel work within ETSI/TIS and 3GPP has been fully achieved.

The ability of organisations and individuals around the world to co-operate and make available a full set of stable, agreed 3GPP specifications in 1 year is a remarkable achievement, one that is unprecedented in the world of standardisation. 3GPP meetings have taken place in many parts of the world, emphasising the strong commitment of the SDOs from China, France, Japan, Korea and the US. The MRPs have also lent very strong support to the work. Thanks to this widespread and determined commitment it has been possible to meet the very aggressive targets for 3G.

But Release 99 was only the first step – the workload has continued to intensify this year, as [illegible] specifications are refined and many new ones added, opening the path to full, [illegible] 3GPP 3G services, changing forever the way that people communicate.

In the meantime, 3GPP has changed the designation of the releases and dropped to number [illegible] to avoid limitations and wrong expectations. Release 99 was first established [illegible] 1999 and got its maturity in the course of year 2000. In 2001, more than 2700 [illegible] were implemented. The next big event will be Release #4 as a result of the

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series of TSG meetings scheduled for March 2001 in Palm Springs, US. This will obviously result in a further stabilisation and extension of the UMTS specifications.

3GPP is running very well. The individual members from the six OPs seem to be very satisfied with this arrangement – and the production line is in full swing.

Without exaggeration, one can give 3GPP the attribute of a success story. One may quote again here Mr Ed Raney who even addressed the 3GPP concept – prior to its realisation – as a "paradigm shift".

As the results of the GSM and UMTS related standardisation work represent a great part of ETSI's deliverables, it might be justified to note here that during the year 2000, ETSI published more than seven new deliverables each working day (Monday through Friday), i.e. one deliverable per hour.

Further information may be found on the 3GPP website at http://www.3gpp.org.

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Chapter 9: The Third Generation Partnership Project (3GPP)

Section 2: UMTS in 3GPP (December 1998–May 2001)

Niels Peter Skov Andersen[1]

9.2.1 A Change of Environment

In the period 1982 until end of 1998 the work on the GSM standard, and in the later part of the period on UMTS, had been performed in the same environment, starting under CEPT and later transferred into ETSI. The Technical Committee GSM, during this period renamed to SMG, and its working groups (Sub Technical Committees) had continuously existed and evolved. The same was the case for the working methods and procedures used within the work. Over time with the success of the GSM system more and more interested parties became involved in the work including parties from outside the original CEPT area. However, this was all a relatively slow evolution and no major revolutions in the organisation of the working methods occurred in this period.

After all these years of continuity in the work the discussions around the creation of 3GPP and the decision to establish 3GPP for the initial phase of UMTS[2] naturally created some uncertainty amongst the members of SMG. Especially the resulting split of the GSM standardisation with the responsibility for the GSM core network transferred to 3GPP, and the responsibility for the GSM radio access Network maintenance remained in ETSI in SMG. This created some concern amongst many delegates. Also the internal structure for the standardisation work within 3GPP was different from the well-known structure in SMG. SMG was based on a technical plenary with a number of working groups (SMG1, SMG2, ...) responsible for performing the detailed technical work. The SMG plenary was the approving body for the results of the work performed by the working groups. Also the plenary was the group responsible for approval of all new work items and the content of the releases. The structure for the work in 3GPP, as agreed by the partners, was quite different. The project

[1] The views expressed in this article are those of the author and do not necessarily reflect the views of his affiliation.

[2] Actually UTRA throughout this section is used to keep consistency of terminology with the later chapters and sections. The name UMTS do not appear in the 3GPP agreement, which defines the system as a third generation mobile system based on evolved GSM core network and UTRAN (including UTRA (FDD and TDD modes)).

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was organised with four equal Technical Specification Groups (TSGs), who had complete autonomy for their area of responsibility, i.e. they were responsible for approval of new work items and final approval of deliverables. The four technical groups originally defined were:

TSG CN	Responsible for the core network development
TSG-RAN	Responsible for the radio access network based on UTRAN (FDD and TDD modes).
TSG-SA	Responsible for services and system aspects
TST T	Responsible for Terminal and UIM

In addition to the technical groups the 3GPP organisation has a Project Coordination Group (PCG). However, the role of this PCG cannot be compared to the role the SMG plenary played. The SMG plenary was an open technical group with the approving authority in all technical questions including approval of new work items. The 3GPP PCG is a closed group with a defined membership consisting of a limited number representative of each of the partners (SDOs, MRPs) and the leadership (chairman and two vice-chairmen) of each TSG. Thus as a closed group the role of the PCG becomes more like a board overlooking the overall well being of the project.

This structure made many long-term SMG delegates concerned about how the overall coordination of the project could be ensured. This new structure was not introduced to overcome known deficits of the SMG organisation, but in my opinion, by political considerations to ensure that no single individual, individual member, organisational partner could obtain a controlling position in the project.

9.2.2 The First Two TSG Meetings

The inauguration meeting of the 3GPP TSGs was held in December 1998 in Sophia Antipolis, France. In the process of creation of 3GPP this was the first time that the 3GPPs real work force – the technical experts – met. The main objectives for this first meeting was to set the work started. One of the elements of the meeting was a presentation from the different partners on the status of their work on the third generation mobile system, the work, which they now were in the process of handing over to 3GPP.

Listening to the presentations and the discussions during the breaks it was very obvious that the background for standardization amongst the delegates was quite different. As an example, I remember that during the coffee break just after I as chairman of ETSI SMG3, had presented the status of the UMTS radio work in ETSI, and had ended my presentation by stating that the UMTS radio work would only be on the agenda of one more meeting of ETSI SMG3. This was in order to complete the documentation to be handed over to 3GPP and that the work on UMTS radio in ETSI would cease, a small group of non-ETSI delegates came to me and asked "if all work on UMTS radio in ETSI ceases, how do the European companies coordinate their views in 3GPP?" Coming from the ETSI SMG background this was a completely unexpected question, as the working procedures for 3GPP were very similar to those in ETSI, it was clear to me that the contributions to 3GPP in general should come from the individual members – the companies, regulators etc. – in their own name and not as national contributions. I explained this, but I also understood that for delegates with a background in international standardization from, e.g. ITU this was the normal way of working. Once

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Annex 2: Organisation Evolution of the Technical Groups

Section 3: 3GPP

Adrian Scrase[1]

A2.3.1 December 1998 to Mid-1999

During the preparatory talks that led to the creation of 3GPP, many discussions took place to find the optimum organizational structure. The ETSI TC SMG model had worked well for many years and it was very tempting to adopt a similar structure and just widen the sphere of participation. However, some voices called for a more radical approach in order to streamline the structure and to reduce the time taken for specifications production. As a result of these discussions, the following key principles were established on which 3GPP was structured:

- Minimum number of hierarchical levels;
- Large degree of distributed autonomy;
- Clear separation of technical activities from political and administrative activities.

When 3GPP was created, four Technical Specification Groups (TSGs) were formed to undertake the preparation of technical specifications. The four TSGs were as follows:

- TSG CN – core network
- TSG RAN – radio access network
- TSG SA – services and system aspects
- TSG T – terminals

Each of the TSGs was authorized to develop and approve specifications and reports within its terms of reference. This represented a departure from the more traditional approach where a single entity (i.e. a plenary) within a project has the authority to approve a project's output. It was believed that by distributing the approval authority, the time taken to produce specifications would be reduced since this effectively removes one level of hierarchy from the approval procedure. However, it was apparent from the outset that distributing the approval of specifications would lead to a greater requirement for technical co-ordination and thus TSG SA was tasked to perform a co-ordination role across all TSGs. This co-ordination role

[1] The views expressed in this section are those of the author(s) and do not necessarily reflect the views of his/her/their employer(s).

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Appendix 5



Third Generation Partnership Project

3GPP

Working Procedures

01 September 2022

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Foreword

These Working Procedures of the Third Generation Partnership Project (3GPP) are effective from 01 September 2022.

An electronic version of these Partnership Project Working Procedures is available from the following address:

http://www.3gpp.org

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SECTION A: GENERAL

Article 1: Description

The Partnership Project is not a legal entity but is a collaborative activity between the following recognized Standards Development Organizations:

ARIB (Japan)

CCSA (China)

ETSI (Europe)

ATIS (US)

TTA (Korea)

TTC (Japan)

TSDSI (India)

The Partnership Project is entitled the "THIRD GENERATION PARTNERSHIP PROJECT" and may be known by the acronym "3GPP".

top

Article 2: Purpose

The purpose of 3GPP is to prepare, approve and maintain globally applicable Technical Specifications and Technical Reports for

- a 3rd Generation Mobile System based on the evolved GSM core network, and the Universal Terrestrial Radio Access (UTRA),
- further development of radio technologies such as LTE, coupled with evolution of core network elements such as the Evolved Packet Core (EPC),
- continuing evolution of the 2nd generation GSM/EDGE Radio Access Network (GERAN),

to be transposed by the Organizational Partners into appropriate deliverables (e.g., standards).

top

Article 3: Scope and objectives

The 3rd Generation Mobile System and its capabilities shall be developed in a phased approach. Initially, 3GPP shall prepare, approve and maintain the necessary set of Technical Specifications and Technical Reports for a 3rd Generation Mobile System including:

- UTRAN (including UTRA; in Frequency Division Duplex (FDD) and Time Division Duplex (TDD) modes);
- 3GPP Core Network (Third Generation networking capabilities evolved from GSM. These capabilities include mobility management, global roaming, and utilisation of relevant Internet Protocols);
- Terminals for access to the above (including specifications for a UIM); and
- System and service aspects.

3GPP shall prepare, approve and maintain the necessary set of Technical Specifications and Technical Reports for:

- the Global System for Mobile communication (GSM) including GSM evolved radio access technologies (e.g., General Packet Radio Service (GPRS) and Enhanced Data rates for GSM Evolution (EDGE)).

3GPP shall consider the long term evolution.

The Technical Specifications and Technical Reports shall be developed in view of global roaming and circulation of terminals.

The set of 3GPP Technical Specifications and Technical Reports for the 3GPP core network and the specifications for the GSM core network should be common to the greatest extent possible and should not be unnecessarily different.

Options in the form of a regulatory requirement particular to one or more regions / nations shall be included in 3GPP specifications. TSGs should not debate the inclusion or rejection of such options.

The results of the 3GPP work shall form the basis of member contributions to the ITU in accordance with existing procedures.

3GPP shall take account of emerging ITU recommendations on interworking between IMT-2000 family members.

In the framework of agreed relationships, the 3GPP Technical Specifications and Technical Reports will form the basis of standards, or parts of standards, of the Organizational Partners.

top

SECTION B: PARTICIPATION

Article 4: Categories

Participation in 3GPP shall be classified into one of the following categories:

- Partners;
- Individual Members;
- ITU Representatives;
- Observers;
- Guests.

top

Article 5: Partnership

Partners in 3GPP shall be classified into one of the following two categories:

- Organizational Partners;
- Market Representation Partners.

top

Article 6: Organizational Partnership

Organizational Partnership is open to any Standards Organization, irrespective of its geographical location, which has:

- a national, regional or other officially recognized status and the capability and authority to define, publish and set standards within the 3GPP scope, in that nation or region;
- an Intellectual Property Rights (IPR) Policy which is compatible with those of the Organizational Partners;
- committed itself to all or part of the 3GPP scope;
- signed the Partnership Project Agreement.

Standards Organizations may apply to become an Organizational Partner by writing to any of the existing Organizational Partners.

top

Article 7: Market Representation Partnership

The Organizational Partners may invite Market Representation Partners to take part in 3GPP.

An invitation for Market Representation Partnership is open to any organization, irrespective of its geographical location, which:

- has the ability to offer market advice to 3GPP and to bring into 3GPP a consensus view of market requirements (e.g., services, features and functionality) falling within the 3GPP scope;
- does not have the capability and authority to define, publish and set standards within the 3GPP scope, nationally or regionally;
- has committed itself to all or part of the 3GPP scope;
- has signed the Partnership Project Agreement.

Organizations may apply to become Market Representation Partners by writing to any of the existing Partners. Further guidance for MRP applicants can be found in annex E.

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Article 8: Individual Membership

Membership in an Organizational Partner is a pre-requisite for Individual Membership of 3GPP. All entities registered as members of an Organizational Partner and eligible for participation in the technical work of that Organizational Partner, can become Individual Members of 3GPP if they are committed to support 3GPP and:

- to contribute technically or otherwise to one or more of the Technical Specification Groups within the 3GPP scope;
- to use the 3GPP results to the extent feasible.

An Individual Member has the right to participate in the work of 3GPP by attending meetings of the Technical Specification Groups and subtending groups.

Applications for Individual Membership of a Technical Specification Group shall be made in writing to the relevant Organizational Partner using the form given at annex C. Applications may also be made on-line using the template available at http://www.3gpp.org.

Individual Members act in 3GPP in their own right and carry the full responsibility for their contributions.

top

Article 9: Termination of Individual Membership

Individual Membership of 3GPP may be terminated by dissolution, abolition, resignation or expulsion from the related Organizational Partner.

top

Article 10: Observers and Guests

The status of Observer may be granted by the Organizational Partners to an entity which has the qualifications to become a future Partner.

An Observer may send a single representative to an Organizational Partners or PCG meeting. An Observer may also have representatives at TSG meetings. Representatives of Observers may receive documents and contribute documents for information, but shall not submit documents that propose changes to the specifications, reports, work item descriptions, work plan, or any other document under the control of the TSG. Observers shall not take part in decision making or hold any leadership positions.

Additional participation rights of an Observer shall be decided by the Organizational Partners on a case-by-case basis.

The status of Guest may be granted for a limited period, by the Organizational Partners to an entity which has the qualifications to become a future Individual Member. The limited period shall be decided by the Organizational Partners on a case-by-case basis.

A Guest may have representatives at TSG and subtending group meetings. Representatives may receive documents but shall not take part in decision making, participate in discussions, contribute documents, or hold any leadership positions.

top

SECTION C: STRUCTURE

Article 11: Structure of 3GPP

3GPP shall consist of a Project Co-ordination Group (PCG) and Technical Specification Groups (TSGs). The Technical Specification Groups may establish Working Groups if required.

The Organizational Partners may decide to call a meeting of the full 3GPP membership if required.

top

SECTION D: PARTNERS' COLLECTIVE RESPONSIBILITIES

Article 12: Organizational Partners' Collective Responsibilities

The Organizational Partners shall determine the general policy and strategy of 3GPP.

In addition the Organizational Partners shall perform the following tasks:

- approval and maintenance of the 3GPP scope;

- maintenance of the Partnership Project Description;
- taking decisions on the creation or cessation of Technical Specification Groups, and approving their scope and terms of reference;
- approval of Organizational Partner funding requirements;
- allocation of human and financial resources provided by the Organizational Partners to the Project Co-ordination Group;
- acting as a body of appeal on procedural matters referred to them;
- conduct compliance training at least annually for elected leadership, relevant Support Team personnel and interested parties on best practices to follow to
  - avoid issues with respect to antitrust/competition laws and regulations;
  - fulfil the leadership/support role with impartiality and in the interests of 3GPP.

top

Article 13: Collective responsibilities of all Partners

Organizational Partners and Market Representation Partners shall perform the following tasks:

- maintenance of the Partnership Project Agreement;
- approval of applications for 3GPP partnership;
- taking decisions relating to the dissolution of 3GPP.

top

SECTION E: PROJECT CO-ORDINATION GROUP (PCG)

Article 14: PCG tasks

The PCG shall perform the following tasks:

- appointment of PCG Chair and Vice Chairs;
- allocation of human and financial resources provided by Organizational Partners to TSGs;
- allocation of voluntary human and financial resources provided by Market Representation Partners and Individual Members;
- management of the 3GPP Support Team;
- handling of appeals from Individual Members on procedural matters referred to them;
- propose and approve modifications to the Partnership Project Working Procedures;
- handling of appeals from Individual Members on technical matters referred to them;
- determination of the overall time frame and manage overall work progress;
- final adoption of new and stopped work items proposed by the TSGs within the agreed 3GPP scope and objectives;
- when a work item is outside the scope of the 3GPP, and where a common global solution is desired, recommend how to achieve a global solution;

- appointment or dismissal of TSG Chairs and Vice Chairs, as proposed by TSGs based on election results. (The proposed candidate shall be appointed unless there are extraordinary reasons that prevent such an appointment, e.g., severe company or geographical imbalance within 3GPP. In such cases the TSG shall be requested to elect an alternative candidate. The decision not to appoint a candidate shall be made by consensus.);
- authorizing requests from the TSGs for approval to liaise with external organizations, and maintain a list of approved requests;
- maintenance of the register of Individual Members eligible to participate in 3GPP;
- maintenance of the register of IPR declarations relevant to 3GPP, received by the Organizational Partners.

The PCG may decide to call a meeting of the full 3GPP membership if required.

top

Article 15: PCG participation

The following shall have a right to participate in the PCG:

- Typically, a maximum of five representatives of each Organizational Partner (not counting the Chair and Vice-Chairs);
- A maximum of three representatives of each Market Representation Partner. (MRPs are however urged to limit their participation to one representative wherever possible.);
- The Chairs and Vice Chairs of the TSGs as ex-officio members;
- A maximum of three ITU representatives;
- One representative of each Observer.

top

Article 16: PCG appointment of Chair and Vice Chairs

The PCG shall appoint their Chair and Vice Chairs from amongst the Organizational Partner representatives.

The Chair and Vice Chairs shall be appointed for a one year term of office.

The Chair and Vice Chairs shall normally serve one term of office. If no other candidates are available, the Chair or Vice Chairs may be appointed for a further term.

Successive Chairs and Vice Chairs should not be from the same Organizational Partner, the same region or from the same group of companies, unless no other candidate is available.

top

Article 17: PCG Chair and Vice Chair Responsibilities

The PCG Chair is responsible for the overall management of the co-ordination work within 3GPP.

The Chair has the overall responsibility to ensure that the Partnership Project Agreement, Partnership Project Description and Partnership Project Working Procedures are followed.

The Chair may nominate officials to assist in the work.

The Chair may be assisted by the Support Team.

The Chair may delegate tasks to the Vice Chairs.

In performing their leadership role, the Chair and Vice Chairs shall maintain impartiality and act in the interests of 3GPP.

At the commencement of each meeting of the PCG, the group shall be reminded that:

(i) compliance with all applicable antitrust and competition laws is required; and

(ii) the leadership will conduct the meeting with impartiality and in the interests of 3GPP.

top

Article 18: PCG meetings

A meeting of the PCG shall be held at least twice per year.

At least thirty days before the due date, a calling notice, draft agenda and supporting documents shall be issued.

top

Article 19: PCG decision making

In any meeting of the PCG, the quorum required for decision making shall be 50% of the total number of Organizational Partners. Proxies shall not be permitted.

The PCG shall endeavour to reach consensus on all issues. The views and opinions of the Market Representation Partners and the Chairs and Vice Chairs of the TSGs shall be taken into account during the consensus building process. If consensus cannot be achieved, the PCG Chair can decide to take a vote. The vote may exceptionally be performed by a secret ballot if decided by the PCG.

Each Organizational Partner shall have one vote. A proposal shall be deemed to be approved if 71% of the votes cast are in favour. Abstentions or failure to submit a vote shall not be included in determining the number of votes cast.

top

SECTION F: TECHNICAL SPECIFICATION GROUPS

Article 20: TSG tasks

The TSGs shall prepare, approve and maintain the 3GPP Technical Specifications and Technical Reports taking into account the market requirements provided by Market Representation Partners.

The TSGs shall also perform the following tasks:

- Propose to the PCG for appointment TSG Chair and Vice Chairs based on election results;
- Creation of TSG Working Groups and approval of their terms of reference;
- When a new Working Group is created, the appointment of TSG Working Group Convenor;
- Allocation of resources within the TSG;
- Allocation of voluntary human and financial resources provided by Market Representation Partners and Individual Members;
- Handling of appeals from Individual Members on technical matters;
- Preparation of a detailed time frame and management of detailed work progress;

- Management of work items;
- Technical Co-ordination;
- Proposal and approval of work items within the agreed scope and terms of reference of the TSG;
- Where a work item is outside the scope of the 3GPP, but a common global solution is desired, recommend an approach to the PCG;
- Assignment of work to Partners. (Specification development may be accomplished using various methods, including the assignment of work to Partners.);
- Maintenance of the list of Individual Members eligible to vote within the TSG (Voting Members).

top

Article 21: TSG participation

The following shall have a right to participate in the TSGs:

- Representatives of members of participating Organizational Partners (i.e. Individual Members);
- Representatives of Organizational Partners;
- Representatives of Market Representation Partners;
- Representatives of Observers;
- Representatives of Guests.

top

Article 22: TSG and WG election of Chair and Vice Chairs

22.1 TSG elections

Regular TSG elections shall be held every two years in the first semester of odd numbered years.

The TSG Chair and Vice Chairs shall be elected by the Technical Specification Group from amongst the Individual Member representatives. Each TSG shall elect a maximum of three Vice Chairs.

A candidate for election to a TSG Chair or Vice Chair position shall provide a letter of support from the Individual Member that they represent. The support letter from the Individual Member shall indicate that the candidate will avail or has availed themselves of 3GPP supplied antitrust and competition law training in order to comply with all applicable antitrust/competition laws and regulations while acting in the capacity of TSG Chair or Vice Chair.

Nominations may be made up to the point when an election takes place.

The Chair and the Vice Chairs shall be elected for a two year term of office. The Chair and Vice Chairs may offer themselves for election for a second consecutive term. The term “consecutive” is taken to mean terms one after the other without another person being elected to the position in the interim. Exceptionally, they may offer themselves for further consecutive terms, subject to the following:

- A two week deadline that expires at noon Central European Time on the Friday which falls between 20 and 14 days prior to the first day of the meeting at which elections are due to be held shall be established.
- A Chair is not permitted to stand for another consecutive term if another candidate is announced via the 3GPP web site or via the relevant 3GPP email reflector prior to this deadline.
- A Chair is not permitted to stand for another consecutive term until after this deadline.

- A Vice Chair is not permitted to stand for another consecutive term in a Vice Chair position for which there is a candidate announced via the 3GPP web site or via the relevant 3GPP email reflector prior to this deadline.

- A Vice Chair is not permitted to stand for another consecutive term until after this deadline. If, by the deadline, the number of candidatures is less than the number of Vice Chair positions, then any incumbent Vice Chair may put forward their candidature.

There is no restriction on a Vice Chair whose term of office is due to expire offering himself for the position of Chair; neither is there any restriction on a Chair whose term of office is due to expire offering himself as a Vice Chair. There is no restriction of a retiring Chair or Vice Chair of one TSG offering himself for election as either Chair or Vice Chair of any other TSG (or WG).

Should the office of Chair or Vice Chair of a TSG become vacant for reasons other than expiration of term of office, a special election shall be conducted to fill the unexpired term. This special election shall be conducted at a meeting of the TSG, and shall be announced in the agenda according to the provisions of article 32.

When such a special election is held to fill the office of Chair, and one or more of the Vice Chairs of the TSG intends to stand for election to that position, the announcement shall also indicate that there will be an election to fill the position of Vice Chair in the event that a Vice Chair be elected to the office of Chair. If at the special election the Vice Chair is elected to the office of Chair, that individual shall become Chair immediately, and, the position of Vice Chair thus being vacant, an election shall be held for the office of Vice Chair.

Similarly, if an incumbent Chair intends to stand for election to the position of Vice Chair, the same applies, with the necessary changes to the text above.

If a Chair or Vice Chair changes the Individual Member that they represent (e.g., job change, merger or acquisition) during their term of office, a new letter of support shall be provided. In order to provide a new letter of support, a Chair or Vice Chair may request a grace period allowing their term to be extended the lesser of 6 weeks or until the day before the next scheduled regular term (e.g., every 2 years) election. Although the term is extended, under the rules of article 22, the Chair or Vice Chair can only chair meetings when representing an Individual Member. This rule continues to apply during the grace period. If the change of company affiliation is due to a move to another company, then the decision for the Chair or Vice Chair to continue in office to the end of the present term shall be made by consensus of the TSG. If consensus cannot be achieved, a special election shall be held for the office. The incumbent Chair or Vice Chair is permitted to offer their candidacy in a special election even if they have held the position for 2 terms or more.

The term of office for a Chair or Vice Chair elected at a special election is a partial term lasting until the end of the current term. If a new Chair or Vice Chair is elected at a special election then the partial term of office does not count towards the two consecutive term limit. If the previous Chair or Vice Chair is re-elected at a special election then the entire term (of two parts) is considered as a single term and does count towards the two consecutive term limit.

Chairs and Vice Chairs should not be from the same region, Organizational Partner, or from the same group of companies, unless no other candidate is available.

Successive Chairs should not be from the same Organizational Partner, the same region or from the same group of companies, unless no other candidate is available. This does not apply to special elections or to regular elections for a second or subsequent consecutive term of office .

When a new TSG is established, the Organizational Partners shall appoint a convenor for the first two TSG meetings. The election for TSG Chair and Vice Chairs shall take place at the second TSG meeting. If the election takes place other than at the normal time for TSG elections (see above), the elected Chair and Vice Chairs shall serve until the next regular TSG election. This partial term of office does not count towards the two consecutive term limit. The provisions of this paragraph may be overridden by consensus of the PCG where a new TSG is formed by the merger of existing TSGs; under these circumstances, the PCG shall establish a set of ad hoc rules for the creation of the new TSG.

Following election by the TSG, the TSG Chair and Vice Chairs shall be appointed by the PCG on the proposal of the TSG.

top

22.2 WG elections

The provisions concerning the election of WG Chairs and Vice Chairs shall be as for TSG Chairs and Vice Chairs as defined in 22.1 above, changing TSG to WG wherever TSG is mentioned, with the following differences.

Each WG shall elect a maximum of two Vice Chairs.

WG elections shall be held when the corresponding terms of office expire or when an existing Chair or Vice Chair resigns. WG elections need not be synchronized within the WG (i.e. elections for Chair and each Vice Chair may occur at different times), across different WGs of the same or other TSGs, nor with the regular TSG elections.

WG Chairs and Vice Chairs are always elected for a period of two years (and not, as is the case with special elections in TSGs, for the unexpired period of the present term of office). An exception to this is where the previous Chair or Vice Chair is re-elected in the special election. In this case the Chair or Vice Chair continues for the unexpired period of the present term of office.

Note: For this reason, elections for WG Chairs and Vice Chairs are likely to become spread over a period of time, rather than being grouped like the TSGs' regular elections.

When a new WG is established, the parent TSG is responsible for appointing a convenor for the first two meetings.

Following election by the WG, the Chair and Vice Chairs hold office immediately, without need of appointment by TSG or PCG.

If a WG does not meet physically with enough frequency to maintain an up to date voting list, the working group may elect to escalate the voting for officers to the parent TSG.

top

Article 23: TSG and WG Chair and Vice Chair responsibilities

The TSG Chair is responsible for the overall management of the technical work within the TSG and its Working Groups. The Chair has an overall responsibility to ensure that the activities of the TSG follow the Partnership Project Working Procedures.

The WG Chair is responsible for the overall management of the technical work within the WG and its sub-groups.

The Chair may nominate officials to assist in the work.

The Chair may delegate tasks to the Vice Chairs.

The Chair may be assisted by the Support Team.

The Chair shall form a Management Team, including the Vice Chairs and Support Team, in order to assist in discharging the Chair’s duties.

Recognizing the need to balance the requirement of rapid specification development with the limited resources of delegates, the Chair should encourage a minimum number of meetings, especially parallel meetings, and maximize the use of electronic means to advance the work.

In performing their leadership role, the Chair and Vice Chairs shall maintain impartiality and act in the interests of 3GPP.

At the commencement of each meeting of a TSG or WG, the group shall be reminded that:

(i) compliance with all applicable antitrust and competition laws is required;

(ii) timely submissions of work items in advance of TSG or WG meetings are important to allow for full and fair consideration of such matters; and

(iii) the leadership will conduct the meeting with impartiality and in the interests of 3GPP.

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Article 24: TSG and WG Chair and Vice Chair dismissal

A secret ballot shall be taken for the proposal to dismiss a TSG or WG Chair or Vice Chair because of a failure to effectively perform their duties, if requested by 30% of the TSG or WG membership list. 71% of the votes cast are required to recommend dismissal.

The PCG shall dismiss a Chair or Vice Chair on the proposal of the TSG.

top

Article 25: TSG and WG decision making

TSGs and WGs shall endeavour to reach consensus on all issues, including decisions on Technical Specifications and Technical Reports. Informal methods of reaching consensus are encouraged (e.g., a show of hands). If consensus cannot be achieved, the Chair can decide to take a vote. The vote may exceptionally be performed by a secret ballot if decided by the TSG or WG. A vote may be conducted during a TSG or WG meeting or by correspondence.

A proposal shall be deemed to be approved if 71% of the votes cast are in favour. Abstentions or failure to submit a vote shall not be included in determining the number of votes cast.

It is the responsibility of the Chair to ensure that questions to be voted upon are phrased in a positive yes/no manner, with 71% required to approve the question. Questions should not be phrased as the TSG shall not do something. Examples of appropriate questions are; Shall the TSG approve the Specification and send it to the SDOs? Shall the liaison be approved? Shall the new WI be approved? Shall the existing WI be stopped? If the issue is to choose option A or B, the question should be split into two questions, with the Chair selecting the order. First, shall the TSG take option A as the way forward? If this question fails the second question is, shall the TSG take option B as the way forward?

Contributions on which decisions will be based should be made available in good time before each meeting. TSGs may establish informal guidelines for dealing with late contributions.

If a WG does not meet physically with enough frequency to maintain an up to date voting list, the working group may elect to escalate the voting to the parent TSG.

Working Agreements may be used to establish tentative agreements in cases where consensus cannot be obtained. The working agreement process is described in annex G.

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Article 26: TSG and WG voting during a meeting

The following procedures apply for voting during a TSG or WG meeting:

- before voting, a clear definition of the issues shall be provided by the Chair;
- Voting Members shall only be entitled to one vote;
- if a Voting Member has more than one representative present, only one representative may vote;
- each Voting Member may only cast the vote once;
- each Voting Member may carry proxy votes for up to five other Voting Members. All proxy votes shall be accompanied by a letter of authority from the authorising Voting Member. Proxies will not be taken into account when determining the quorum;
- the quorum required for voting during a TSG or WG meeting shall be 30% of the total number of Voting Member companies on the TSG or WG voting list;
- the result of the vote shall be recorded in the meeting report.

For the determination of the quorum, see annex H.

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Article 27: TSG or WG voting by correspondence

The following procedures apply for voting by correspondence:

- before voting, a clear definition of the issues shall be provided by the Chair and disseminated to all on the TSG or WG membership list;
- Voting Members shall only be entitled to one vote;
- each Voting Member may only cast the vote once within the voting period;
- the voting period shall be 30 days;
- there are no quorum requirements;
- The result of the vote should be disseminated to the TSG or WG.

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Article 28: TSG or WG voting for the election of TSG or WG Chair and Vice Chair

In the case where there is more than one candidate for TSG or WG Chair or Vice Chair, a secret ballot shall be used. For interpreting the result of the secret ballot the following procedure shall apply:

When, in the first ballot, no candidate has obtained 71% of the votes cast, a second ballot shall be held. In the second ballot, in cases where there are only two candidates, the candidate obtaining the higher number of votes is elected. In cases where there are more than two candidates, if none of them has obtained 71% of the votes, a third and final ballot shall be held among the two candidates who have obtained the highest number of votes in the second ballot. The candidate obtaining the higher number of votes in the third ballot is then elected.

The TSG or WG Chair shall be responsible for the voting process and shall ensure that confidentiality is maintained.

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Article 29: TSG or WG appeal process

An Individual Member of 3GPP who opposes a Chair's ruling on a vote taken within a TSG or WG may submit their case to the PCG for decision. In such cases the Individual Member shall also inform the relevant TSG or WG Chair.

When a TSG or WG Chair has made a ruling, their decision shall be taken as the basis for future operations, unless or until overturned by the PCG.

If an Individual Member in a TSG or WG believes that a Chair or Vice Chair of any such group is acting without impartiality and not in the interests of 3GPP, such Individual Member may object to such actions within the relevant group, and may request that such objection be recorded in the minutes of the applicable group meeting and it shall be so recorded. The objecting Individual Member may ultimately take their objection to the PCG for consideration. In such cases the Individual Member shall also inform the relevant TSG or WG Chair.

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Article 30: TSG and WG meetings

TSGs and WGs shall meet as necessary to complete their work within the prescribed timeframe. TSGs should endeavour to hold their meetings at the same time and place to assist in the overall co-ordination of the work.

Meeting locations should reflect the geographical diversity of the TSG and WG delegates.

Further information on meetings is given in annex F.

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Article 30A: TSG and WG participation

IMs wishing to progress work on topics in 3GPP are expected to participate physically in the meetings.

If a 3GPP IM is materially interested in a specific topic but is unable to participate in a meeting by sending a delegate, the IM is urged to engage the support of other IMs whose delegates will be present at the meeting to present its views. If this is not possible for any reason, the IM may advise the Chair of the situation and may provide documents supporting their position. The Chair may facilitate the introduction of these documents during the meeting and the record of the meeting can include the discussion and outcome. Note that physical participation in meetings is considered the norm and the option to engage the Chair is intended for exceptional situations. The Chair has the right to decline the request.

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Article 31: TSG and WG meeting invitation

The invitation to a TSG or WG meeting and the necessary logistical information should be disseminated as soon as practically possible, taking into account the need to obtain travel documentation. It shall be disseminated at least 28 days before the meeting to all on the TSG or WG membership list.

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Article 32: TSG and WG meeting agenda

The draft agenda for a TSG or WG meeting shall be disseminated by the responsible Chair to all on the TSG or WG membership list at least 21 days before a meeting. The draft agenda should indicate subject matters where voting may be required. The draft agenda shall indicate elections to be held (including known candidates). The draft agenda shall indicate the deadlines (dates and times) for registration and meeting document submission to the TSG/WG meeting. Other deadlines may also be indicated (whenever required).

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Article 33: TSG and WG meeting registration

Delegates and officials must register before participating in any 3GPP meeting. Each delegate or official who represents an Individual Member shall declare the precise name of that Individual Member. A delegate or official may only register to represent one Individual Member.

The deadline for registration for all delegates and officials is one week in advance of the start of the meeting. Registrations after this deadline will still be processed, but timely receipt of meeting related information is not guaranteed for late registrants.

To aid in communication, delegates or officials at co-located meetings may briefly visit a meeting they have not registered for. However, any extensive involvement such as presenting a contribution or formally objecting requires prior registration to the meeting.

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Article 34: TSG and WG meeting document and file naming

Documents for a TSG or WG meeting shall follow a consistent numbering system as shown in the following example:

xminnzzzz

This numbering system has six logical elements:

1) **x**: a single letter corresponding to the TSG;

   where x : **R** (Radio Access Network)

   N (Core Network) [TSG closed March 2005]

   S (Service and System Aspects)

   T (Terminals) [TSG closed March 2005]

   G (GSM/EDGE Radio Access Network)

   C (Core network and Terminals)

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 "-". May take on other values depending on the nature of the meeting at which the document is presented, eg the identity of a subgroup.

4) **nn**: two digits to indicate the year, i.e. 99, 00, 01, etc;

5) **zzzz**: unique number of the document

No provision is made for the use of revision numbers. Documents which are a revision of a previous version should indicate the document number of that previous version.

The filename of documents shall be the document number. Documents may be compressed to .Zip files (and thus bear a file extension ".zip"). For example, document **S1-060357** will be contained in file **S1-060357.zip**.

top

Article 35: TSG and WG Voting Membership List

35.1 Voting list

Each TSG and WG shall maintain a list of Individual Members eligible to vote in that group.

The voting list shall be used to establish quorum and for determining those eligible to take part in a vote.

NOTE 1: The term "membership list" has no particular significance in the context of TSG and WG meetings. The term "attendance list" is used for a list of individuals who attend a given meeting representing an Individual Member or other entity entitled to participate in meetings – see annex F.

For the determination of the quorum, see annex H.

top

35.2 On creation of new TSG or WG

When a new TSG or WG is formed an Individual Member is added to the voting list at the first meeting at which it is represented, and may vote at the second meeting where it is represented.

Exceptionally, if inadequate notice (less than the period of time given in article 31) had been given for the first meeting of the new group, an Individual Member shall be added to the voting list on its delegate's attending the second meeting (the election meeting) and vote at that meeting even if it had not been represented at the group's first meeting.

Only an Individual Member that had been represented at the group's first meeting may provide a proxy for the second meeting.

top

35.3 Established TSGs and WGs

To qualify for the voting list it is necessary for at least one delegate of an Individual Member to attend at least two meetings of the group concerned, without being removed according to the provisions of article 35.4..

An Individual Member having been represented at at least two ordinary meetings of the group has the right to cast a vote by proxy (see article 26). Thus an Individual Member may not cast a vote by proxy during a meeting at which it is not represented unless it had already been represented at two or more qualifying meetings of the group.

top

35.4 Removal from and reinstatement to voting list

An Individual Member which is not represented at three consecutive meetings of the TSG or WG shall be removed from the voting list.

The right to vote is reinstated at the second meeting which a delegate of the Individual Member attends without missing the number of consecutive meetings mentioned in the previous paragraph (but see article 35.3 for eligibility to cast a proxy vote).

EXAMPLE 1: If Individual Member Z is represented at meeting K and K+3 (and is thus eligible to vote) but is not represented at meetings K+4, K+5 and K+6, it is removed from the voting list.

EXAMPLE 2: If Individual Member X, not previously having been represented at a meeting of the group, is represented at meetings N and N+3, it may cast a vote at meeting N+3.

NOTE: Individual Member X might choose to cast a vote by proxy at meeting N+3, even though its delegate is physically present. This is sometimes useful for coordinating company positions where one large company has several Individual Memberships, possibly via several different Organizational Partners.

EXAMPLE 3: If Individual Member Y, not previously having been represented at a meeting of the group, is represented at meeting N only, it may not cast a vote by proxy at meeting N+2.

top

35.5 Meetings other than ordinary meetings

Any group that wants to call an electronic meeting (audio, video, document distribution by posting or e-mail, etc) may do so, although this works best with smaller groups. Therefore, all electronic meetings are allowed but only ordinary meetings (see annex F) count towards attendance. However, if a meeting is designated as face-to-face, provision of bridge and speakerphone capabilities for those requesting it would be at the discretion of the host. Those participating by speakerphone are not to be counted toward quorum or attendance, and are not allowed to vote.

For the determination of the quorum, see annex H.

top

Article 36: TSG Sub Working Groups

A Working Group may establish a Sub Working Group (SWG) with defined Terms of Reference. The Working Group shall appoint a SWG Chair. The SWG shall work by consensus. The meeting notice requirements for a SWG meeting are the same as for TSGs and WGs.

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SECTION G: WORK PROGRAMME AND TECHNICAL CO-ORDINATION

Article 37: Work Programme

The 3GPP Work Programme shall consist of Work Items defined by the TSGs.

top

Article 38: Work Items

A 3GPP Work Item is a specification task defined in terms of the following principal parameters:

- title;
- intended output (i.e. Technical Specifications or Technical Reports);
- impact on other Technical Specifications and Technical Reports;
- technical scope, including the field of application of the intended output;
- impact on other 3GPP Work Items;
- the schedule of tasks to be performed;
- the identities of the supporting Individual Members;
- the identity of the Work Item Rapporteurs.

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Article 39: Work Item creation

Each proposed new Work Item shall be supported by at least four Individual Members, and their names shall be recorded in the Work Item definition prepared for the TSG approval. One or more persons shall be named as Rapporteur for the proposed Work Item, and the Rapporteur shall act as the prime contact point on technical matters and for information on progress throughout the drafting phases. The supporting Individual Members are expected to contribute to and progress the new work item throughout the drafting phases.

In addition to the above, TSGs shall approve new Work Items, giving all essential parameters. The proposal shall be entered into the 3GPP work programme, clearly marked as a new entry, for which a unique reference identity shall be allocated.

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Article 40: Work Item adoption by PCG

The 3GPP work programme shall be made available to all Individual Members. A new Work Item shall remain flagged as "new" until the end of the month following the month during which the 3GPP work item was entered into the 3GPP work programme. A new Work Item shall be adopted by the PCG unless a substantial objection is received from an Individual Member or Partner during this period. At the end of the period, the "new" flag shall be removed (even if there is an objection) and it is the responsibility of any objecting Individual Member or Partner to discuss their objections with the TSG Chair. If it is not possible to resolve the objection, it is the responsibility of the Individual Member or Partner to raise the issue with the PCG.

The TSGs shall ensure that the 3GPP Work Item details are maintained at regular intervals.

top

Article 41: Work Item stopping

Prior to completion of the intended 3GPP output, the responsible TSG may conclude that a Work Item is no longer required. Any Work Item shall automatically be considered by a TSG for stopping, if no progress has been achieved in a given period of time, typically six months, e.g. due to a lack of contribution. In such cases, the Work Item shall be flagged as "stopped" in the Work Programme. The proposal to stop a Work Item shall be fully justified.

The Work Programme shall be updated accordingly, and shall show the Work Item as "stopped" until the end of the month following the month during which the Work Item was initially flagged.

The Work Item will be stopped by the PCG unless substantial objection is received from an Individual Member during this period. It is the responsibility of any objecting Individual Member to discuss their objections with the TSG Chair. If it is not possible to resolve the objection, it is the responsibility of the Individual Member to raise the issue with the PCG.

top

Article 42: Technical co-ordination

The PCG shall be responsible for determining the overall time frame and for managing the overall work progress. The System Aspects TSG shall have a particular responsibility for the technical co-ordination of work being undertaken within 3GPP, and for overall system architecture and system integrity. Problems encountered in performing this technical co-ordination role shall be reported immediately to the PCG.

top

SECTION H: DELIVERABLES

Article 43: Deliverable types

3GPP shall prepare, approve and maintain documents known as Technical Specifications and Technical Reports. Such documents shall be drawn up by the TSGs and shall, following approval at that level, be submitted to the participating Organizational Partners to be submitted to their respective standardization processes.

top

Article 44: Approval process

Approval of Technical Specifications and Technical reports by a TSG shall normally be by consensus.

Where consensus cannot be achieved in the TSG a vote may be taken.

When Technical Specifications and Technical Reports become sufficiently stable, they shall be put under change control of the relevant TSG. The further elaboration of these Technical Specifications and Technical Reports shall be achieved by change requests to be approved by the TSG.

top

Article 45: Drafting rules

The Technical Specifications and Technical Reports drafted by the TSGs shall follow the 3GPP drafting rules, using document processing facilities, format, languages and notations agreed by the Organizational Partners, and on a medium suited for electronic document handling and publishing.

top

Article 46: Copyright and ownership

The Organizational Partners will have joint ownership (including copyright) of the Technical Specifications and Technical Reports produced by 3GPP.

top

Article 47: Conversion by Organizational Partners

Organizational Partners shall use their best endeavours to convert the Technical Specifications and Technical Reports approved by the Partnership Project into national/regional deliverables in a timely manner through their normal processes.

The Organizational Partners are urged not to change the technical parts of the Technical Specifications and Technical Reports; they may add non-technical parts required by their own deliverable schemes and they may add descriptions of options selected.

Organizational Partners should ensure that all unresolved comments raised during their public enquiry and approval phases are delivered to the appropriate TSG.

top

SECTION I: REPORTING

Article 48: Chair’s reporting obligations

A report shall be prepared by the Chair following all PCG and TSG meetings.

top

Article 49: Changes to structure and officials

The Chair of each TSG shall inform the PCG of all organizational changes concerning Working Groups and their officials. An up to date record of the 3GPP structure shall be maintained.

top

Article 50: Calendar of meetings

The PCG and TSGs shall maintain an up to date calendar of the dates and venues for future meetings.

top

SECTION J: EXTERNAL RELATIONS

Article 51: Relationship with the ITU

3GPP results should be submitted to the ITU as appropriate.

For working groups, the following handling of communications toward ITU shall apply:

1 Working groups shall send ITU submissions which are destined to become part of ITU deliverables to their parent TSG for review.

2 Working group communications towards the ITU which are NOT destined to become part of an ITU deliverable must be reviewed by the TSG Chair and the appropriate ITU sector convener (if one exists for the given ITU sector). The working group's TSG Chair and ITU sector convener will determine if such a communication should be sent to the parent TSG for review. If for some reason either the TSG Chair or ITU sector convener is not available, then it is sufficient for the remaining person to review the document and determine if it should be escalated to the TSG or not.

3 If the working group communication does not require TSG review, then it shall be conveyed to the ITU from the WG using one of the mechanisms described below.

For TSGs, the following handling of communications toward ITU shall apply:

1 TSGs shall send ITU submissions which are destined to become part of ITU deliverables to the PCG for review.

2 TSGs communications towards the ITU which are deemed sensitive by the TSG shall be sent to the PCG for review.

3 If the TSG does not judge the communication as sensitive, then it shall be conveyed to the ITU from the WG using one of the mechanisms described below.

To convey a communications towards the ITU, one of the following mechanisms shall be used based upon determination of the sending body (a body may determine a default mechanism).

a) The communication shall be sent from the OPs as a deliverable from their organizations (applicable to PCG reviewed communications only)

b) The communication shall be made by Individual Members who are also members of the ITU. In such a circumstance, the appropriate ITU sector convener will coordinate and handle the administrative matters for the submission. 3GPP Technical Specifications and Technical Reports may be taken as the technical content of such contributions (applicable to PCG reviewed communications or TSG reviewed communications).

c) The communication shall be sent directly from the 3GPP liaison coordinator to the appropriate ITU receiver in the ITU (applicable to TSG reviewed communications or WG reviewed communications).

Representatives of ITU-D, ITU-R and ITU-T are invited to participate in the Project Coordination Group for the efficient coordination and exchange of information.

top

Article 52: Relations with other groups

TSGs and WGs are encouraged to liaise directly with the relevant technical bodies within the 3GPP and Partners as appropriate.

A liaison statement shall clearly communicate what is expected from the receiver, i.e., which parts are for information, which questions are expected to be clarified and by whom (especially if there are multiple receivers), and also when an answer is needed, e.g., when is the next meeting of the group sending the liaison statement.

A TSG or any subtending Working Group may send individual liaisons to any external organization (other than ITU) without PCG approval, except if the statement is considered sensitive by the TSG Chair, in which case PCG clearance is needed.

It is not necessary to have all external liaisons copied to the PCG and/or TSG SA. The liaison originating TSG should decide, at its own discretion, which should be copied. External liaisons that may have management implications such as schedules, organization, process, procedures, and policy shall be copied to the PCG, or approved by the PCG if sensitive.

Relations with the ITU are described in article 51.

top

SECTION K: MISCELLANEOUS

Article 53: Resources

The resources for the operation of 3GPP shall be managed by the Organizational Partners. The resources are allocated to the TSGs by the PCG.

top

Article 54: Support Team

The Partners shall provide logistical support to, and assist in the operation of, 3GPP. The support shall be in the form of a Support Team which shall operate under the overall management of the PCG and the day to day management of TSGs.

top

Article 55: Intellectual Property Rights (IPR) Policy

Individual Members shall be bound by the IPR Policy of their respective Organizational Partner.

Individual Members should declare at the earliest opportunity, any IPRs which they believe to be essential, or potentially essential, to any work ongoing within 3GPP. Declarations should be made by Individual Members to their respective Organizational Partners.

Organizational Partners should encourage their respective members to grant licences on fair, reasonable terms and conditions and on a non-discriminatory basis.

top

Article 56: Working language

The working language for 3GPP shall be English.

Meetings of the PCG and TSGs shall be conducted in English.

3GPP Technical Specifications and Technical Reports shall be prepared in English (as defined by the Shorter Oxford English Dictionary).

top

Article 57: Duration

3GPP shall be task oriented and on completion of the tasks the future of 3GPP shall be re-considered. The continuation of 3GPP shall therefore be confirmed by the Organizational Partners on an annual basis.

top

Article 58: Review of activities

An evaluation of the activities of 3GPP should be made by the Organizational Partners at regular intervals.

top

Article 59: Dissolution, winding up

In the event of a voluntary dissolution of 3GPP, the Partners shall determine the terms of liquidation by consensus. All issues shall be documented and distributed at least 30 days prior to decisions being made.

top

Article 59A: Exhaustion of appeal procedures

In connection with any claim or dispute of an Individual Member arising from or relating to any activity of any 3GPP meeting or action, including in connection with a TSG or WG meeting, such Individual Member shall, prior to commencing any such legal proceeding against 3GPP, its leadership, support staff, or one or more Organizational Partners in a court, an arbitral panel or other adjudicatory body, exhaust all appeal procedures provided in the 3GPP Working Procedures. Exhaustion of appeal procedures shall be diligently expedited by both the appealing party and the appeal body.

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Article 60: Amendments to 3GPP Working Procedures

These Partnership Project Working Procedures may only be amended by decision taken by the PCG.

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Annex A: Definitions

Consensus:	General agreement, characterized by the absence of sustained opposition to substantial issues by any important part of the concerned interest and by a process that involves seeking to take into account the views of all parties concerned and to reconcile any conflicting arguments. (Note: consensus need not imply unanimity).
Conversion:	The transformation of a 3GPP output document into an Organizational Partners deliverable following the Organizational Partners' recognized processes.
Delegate:	An individual taking part in a TSG/WG meeting physically or by electronic means.
Drafting Rules:	A document approved by the Organizational Partners providing rules for the drafting of 3GPP Technical Specifications and Technical Reports.
Election:	The voting process used to identify an individual from a number of individuals.
Guest:	An entity fulfilling the criteria to become a future Individual Member, which has been granted temporary participation rights in the 3GPP
Individual Member:	A member of an Organizational Partner having participation rights within that Organizational Partner and which has registered to take part in 3GPP.
ITU Representative	Representatives of ITU-D, ITU-R and ITU-T invited to participate in the Project Coordination Group for the efficient coordination and exchange of information.
Leadership:	A Chair, Vice-Chair, or Convenor of an OP/PCG/TSG/WG/SWG/Ad-Hoc or any other 3GPP meeting.
Market Representation Partner:	A Partner invited by the Organizational Partners to participate in 3GPP to offer advice and to bring into 3GPP a consensus view of market requirements.
Observer:	An Organization fulfilling the criteria to become a future Partner which has been granted temporary participation rights in 3GPP.
Organizational Partner:	A recognized Standards Organization which has been accepted as a Partner in 3GPP.
Partner:	An Organizational Partner or a Market Representation Partner of 3GPP.
Partnership Project Agreement:	The document signed by 3GPP Partners defining their rights and obligations.
Partnership Project Description:	A document which describes the overall structure and operation of 3GPP.
Represent:	Attend on behalf of. A person who attends a meeting on behalf of an Individual Member represents that Individual Member. The person is not necessarily employed by that Individual Member, but may be, for example, employed by a subsidiary company in the same group as the represented Individual Member; or the person may be an independent consultant under contract to the Individual Member. "Representation" sometimes influences the eligibility to vote – see article 35 and annexes A and F.
Sub Working Group	A subordinate body of a Working Group.
Support Team:	A number of persons dedicated to support 3GPP.
Technical Report:	A 3GPP output document containing mainly informative elements approved by a Technical Specification Group.
Technical Specification:	A 3GPP output document containing normative provisions approved by a Technical Specification Group.
Voting Member	An Individual Member who has voting rights within a TSG/WG.
Work Item:	The documented record of a specific technical activity of 3GPP.
Work Programme:	The documented record of the all technical activities of 3GPP.
Working Group:	A subordinate body of a Technical Specification Group.

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Annex B: Abbreviations

3GPP	Third Generation Partnership Project
ARIB	Association of Radio Industries and Businesses
ATIS	Alliance for Telecommunications Industry Solutions (successor to T1)
CCSA	China Communications and Standards Association (successor to CWTS)
CDMA	Code Division Multiple Access
CWTS	China Wireless Telecommunications Standards Group (superseded by CCSA)
ETSI	European Telecommunications Standards Institute
FDD	Frequency Division Duplex
GSM	Global System for Mobile Communication
IM	Individual Member
IMT-2000	International Mobile Telecommunication
ITU	International Telecommunication Union
MRP	Market Representation Partner
PCG	Project Co-ordination Group
SWG	Sub Working Group
T1	Standards Committee T1 (superseded by ATIS)
TDD	Time Division Duplex
TSDSI	Telecommunications Standards Development Society, India
TSG	Technical Specification Group
TTA	Telecommunications Technology Association
TTC	Telecommunication Technology Committee
UIM	User Identity Module
UTRA	Universal Terrestrial Radio Access
UTRAN	Universal Terrestrial Radio Access Network
WG	Working Group

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Annex C: Individual member application form

APPLICATION FORM
for INDIVIDUAL MEMBERSHIP
of the THIRD GENERATION PARTNERSHIP PROJECT
Please complete this form and return it to your Organizational Partner

COMPANY NAME .....

Please indicate below which ORGANIZATIONAL PARTNER you are a member of

ARIB	
CCSA	
ETSI	
ATIS	
TSDSI	
TTA	
TTC	

Please indicate below which Technical Specification Groups you wish to participate in:

Radio Access Network	
Core Network and Terminals	
Service and System Aspects	
GSM EDGE Radio Access Network (GERAN)	

Upon your approval as an Individual Member of the Third Generation Partnership Project you agree that you will be bound by the Working Procedures of the Third Generation Partnership Project then in effect and as they may be amended from time to time.

Signed by (Authorized Representative) (See Note 1)	
Print name	
Position	
Date	
Telephone	
Fax	
Email	
Company Website URL	

Contact person's family name (See Note 2)	
Contact person's given name	
Job title	
Mailing address	
Telephone	
Fax	

Email	

Note 1: Is either the official contact person or voting contact of a company.

Note 2: People attending meetings and who can also have signing authority.

top

Annex D: (Void)

top

Annex E: Guidance for MRP applicants

E.1 Introduction

The conditions for the acceptance of Market Representation Partners (MRPs) in 3GPP are given in article 7 of these Working Procedures. This annex provides additional guidance to MRP Applicants.

top

E.2 Guidance

During the application process, the Organizational Partners will need to be assured that an Applicant:

(a) Has a field of interest directly or indirectly related to the work being undertaken by 3GPP;

(b) Has attained a demonstrable level of recognition within this field of interest;

(c) Has an understanding of the market requirements relevant to 3GPP;

(d) Is willing to actively contribute to the work of 3GPP and has sufficient resources for this purpose;

(e) Fully supports the goals and objectives of 3GPP and does not take part in activities that conflict with these goals and objectives.

In processing an application, the Organizational Partners will peruse openly available documentation published by an Applicant, including material posted on its Website, in order to confirm that the points listed above have been satisfied.

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Annex F: Guidance on meeting organization

F.1 Meeting classification

TSG and WG Meetings are classified either:

- ordinary; or
- ad hoc.

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F.2 Ordinary meetings

Ordinary meetings are ones where the regular business of the TSG or WG is conducted. Such meetings are normally chaired by the Group's Chair or, if unavailable, a Vice Chair. Ordinary meeting should be announced at least six months prior to the opening day of the meeting.

TSG and WG ordinary meetings shall follow an incrementing number sequence. If an additional ordinary meeting is required between two ordinary meetings, the sequence may be preserved, even though this means renumbering subsequent meetings, or the additional meeting may be numbered using the 'bis' suffix as a numbering scheme.

Attendance at an ordinary meeting counts towards an Individual Member's eligibility to cast a vote in the Group (see articles 26 and 27). The Support Team shall record the participation in an ordinary meeting (each person and organization represented) and the attendance list shall be included in the meeting report.

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F.3 Ad hoc meetings

An ad hoc meeting of a WG or a TSG is one called to address one or more particular topics. The ad hoc meeting shall be called by decision of the WG (or its parent TSG) or TSG concerned; the decision to hold any subsequent ad hoc meetings on the same topic may be made by the ad hoc meeting participants themselves without reference to the parent WG or TSG, although the parent WG or TSG shall review any ad hoc activity at every Ordinary meeting and determine to either continue or to close the ad hoc activity, even if the previous ad hoc meeting suggested a further meeting. The scope of each subsequent ad hoc meeting shall be indicated by the Chair at least 21 days before the meeting. The ad hoc meeting shall not expand or change the scope originally determined by the parent group. An ad hoc meeting is allowed to make decisions only within its pre-defined remit, and any such decisions shall be ratified by the parent WG or TSG unless, in the case of a WG, a decision was previously explicitly delegated by the WG to the ad hoc meeting.

An ad hoc meeting may be chaired as described for an ordinary meeting above, or, with the agreement of the WG or TSG concerned, by a Work Item rapporteur, or other appropriate person. Although open to all 3GPP Individual Members, ad hoc meetings may attract only a subset of Individual Member representatives who would normally participate in ordinary meetings.

Ad hoc meetings shall not be considered when calculating voting rights. That is, attendance at (or absence from) an ad hoc meeting shall not influence voting rights, which are determined solely by attendance at "ordinary" meetings.

No voting shall occur at ad hoc meetings.

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F.4 Attendance register

F.4.1 Face to face meetings

A delegate is deemed to have attended a given meeting if the individual confirms their participation by signing the attendance list made available by the group's secretary during the meeting. If a delegate does not sign the attendance sheet during the meeting, the secretary shall assume that the individual did not attend.

A delegate, having registered and begun to participate in a meeting, is not allowed to change their represented organization during the course of that meeting. An individual delegate is not allowed to simultaneously represent two or more Individual Members at a meeting.

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F.4.2 Electronic meetings

Electronic meetings such as audio / video conferences, email exchanges considered as meetings, etc, are encouraged where appropriate. For such events, the Secretary will establish the attendance list on the basis of those actually participating in the meeting (those dialling in to the conference bridge, those issuing and responding to emails, etc.) Nevertheless, advance registration is strongly encouraged.

Fully electronic meetings are to be considered as "ad hoc" as defined above.

Participation by Individual Member in fully electronic meetings, or electronic participation in a face to face meeting (eg by phoning in) is not considered for the accrual or loss of voting rights.

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Annex G: Working agreements

"Working agreements" are tentative decisions reached by 3GPP groups in order to make progress on matters where consensus (as defined in annex A) cannot be reached. It is intended to be used in situations where there is a clear majority in favour of one approach, but a small minority has sustained opposition to that approach.

The working agreement process has the following steps:

- Consensus cannot be reached on an issue. A substantial majority of individual members prefer a given approach, but there is sustained opposition by a small minority of individual members, preventing consensus.
- The Chair declares a working agreement. The working agreement is documented in the meeting report
- The approach agreed to by the majority and documented in the working agreement can continue unimpeded.
- The working agreement is entered into the 3GPP working agreements page on the 3GPP web site. The window for challenging the working agreement is now open.
- Working agreements may be challenged, resulting in a formal vote. This potential vote would be held at the next meeting of the WG or parent TSG (whichever comes first). If the next meeting is less than 14 days after the establishment of the working agreement, then that meeting is skipped in determining the next meeting. The meeting for potential voting is documented on the 3GPP working agreements page of the 3GPP web site (http://www.3gpp.org/TSG-Working-Agreements).
- The challenge cut-off date is established. This is 7 days before the start of the meeting for potential voting. The cut-off date is documented on the 3GPP working agreements page of the 3GPP web site.
- Organizations wishing to challenge the working agreement may do so until the challenge window closes. A challenge may be made by informing the Chair of the group which will do the voting. Any received challenge is documented on 3GPP working agreements page of the 3GPP web site.
- The group which will be voting is informed of the intention to have a working agreement challenge vote and the specific voting question.
- If no challenge is received by the challenge cut-off date, then the working agreement is confirmed. The confirmation of the working agreement is documented on the 3GPP working agreements page of the 3GPP web site. The issue is closed.
- If a challenge is received, then a formal vote on the working agreement will occur at the designated meeting. If the draft agenda for the designated meeting has already been issued, then it will be updated to include the potential for voting on the working agreement. Voting is as described in articles 25, 26 and 32 of the working procedures with the exception that the requirement for quorum is waived.
- If the challenge fails (at least 71% in favour of the working agreement), then the working agreement is confirmed. The confirmation of the working agreement is documented on the 3GPP working agreements page of the 3GPP web site. The issue is closed.
- If the challenge succeeds (less than 71% in favour of the working agreement), then the working agreement fails. All changes which were made based on the working agreement shall be reversed and the group must continue to search for consensus. The overturning of the working agreement is documented on the 3GPP working agreements page of the 3GPP web site.
- Organizations may withdraw a challenge at any time in the process. If the last challenge is withdrawn after the challenge cut-off, then the working agreement is confirmed. The confirmation of the working agreement is documented on the 3GPP working agreements page of the 3GPP web site. The issue is closed.

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Annex H: Calculation of quorum in TSGs and WGs

Where calculation of a quorum is required in the context of a vote conducted in a TSG or a WG, the quorum shall be deemed to have been met if:
(B – P) / V >= Q
Where:

B is the number of ballot papers issued;

P is the number of proxy votes exercised (i.e. the number of ballot papers issued to delegates bearing authorization to cast votes by proxy);

V is the number of Individual Members having the right to vote at the meeting (including those with only the right to vote “in person” and not by proxy);

Q is the required quorum value given in article 26.

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Annex I: Special procedures for exceptional situations restricting travel

3GPP working procedures are designed around the concept of periodic face to face meetings. This is not always possible. This annex implements modifications to the working procedures intended to allow 3GPP to function in the absence of face to face meetings. The PCG has the responsibility of activating and deactivating this annex.

The following changes in the working procedures are in effect when this annex is activated:

Article 14: PCG tasks

The following item shall be added to the list of PCG tasks:

- *maintenance of the voting and voting rights process integrity, to include disciplinary action if required.*

Article 22: TSG and WG election of Chair and Vice Chairs

The following paragraph is removed from section 22.2

If a WG does not meet physically with enough frequency to maintain an up to date voting list, the working group may elect to escalate the voting for officers to the parent TSG.

Article 26: TSG and WG voting during a meeting

The following additions to article 26 are in effect:

If voting occurs in the context of an Electronic Meeting, then:

- *Proxies are not allowed.*
- *Quorum does not apply.*
- *The voting period shall be a minimum of 18 consecutive hours excluding the period 12:00 UTC Friday to 11:59 UTC Monday which excludes Saturday and Sunday in every time zone. The use of 18:00 UTC to 12:00 UTC the next day is recommended for the voting period.*
- *The voting period shall commence no earlier than the start of the Electronic meeting and complete before the closure of the meeting. Voting for elections may exceptionally extend past the scheduled end of the meeting if additional rounds are required to complete the election of all open positions. Such elections are considered to be part of the meeting in which the elections started.*
- *The starting and closing times of the vote shall be clearly announced and disseminated to all on the principal TSG or WG membership mail exploder lists.*
- *The list of Voting Members (IMs that are eligible to vote) is as defined in article 35. Delegates vote on behalf of the IM under which they have registered, and only delegates checked in to the meeting may vote.*
- *If, in accordance with Article 25, the TSG or WG decides that a secret ballot is required, voting shall preserve the secrecy of the votes cast.*
- *A secure voting tool provided by the MCC shall be used for elections, and is also encouraged for other matters where voting is required.*

Article 28: TSG or WG voting for the election of TSG or WG Chair and Vice Chair

The following new paragraph is added to the end of article 28:

If an election is held during an electronic meeting, the voting shall use the voting procedures described in Article 26 as amended by this Annex.

Article 30: TSG and WG meetings

The following new paragraph is added after the 2nd paragraph of this article:

Electronic meetings are encouraged where appropriate.

Article 30A: TSG and WG participation

The text in article 30A shall be replaced with:

IMs wishing to progress work on topics in 3GPP are expected to participate in both face to face meetings and electronic meetings.

If a 3GPP IM is materially interested in a specific topic but is unable to participate in a meeting by sending a delegate, the IM is urged to engage the support of other IMs whose delegates will be present at the meeting to present its views. If this is not possible for any reason, the IM may advise the Chair of the situation and may provide documents supporting their position. The Chair may facilitate the introduction of these documents during the meeting and the record of the meeting can include the discussion and outcome. The option to engage the Chair is intended for exceptional situations. The Chair has the right to decline the request.

Article 32: TSG and WG meeting agenda

The following paragraph is added:

The draft agenda shall indicate the start and end dates and times of the meeting. The draft agenda shall indicate if the meeting counts toward maintenance of voting rights.

Article 35: TSG and WG Voting Membership List

35.3 Established TSGs and WGs

The text in section 35.3 shall be replaced with:

To qualify for the voting list it is necessary for at least one delegate of an Individual Member to fulfill the voting rights establishment provisions of article 35.4 for the group concerned, without being removed according to the provisions of article 35.4.

An individual member having attained voting rights according to clause 35.4 has the right to cast a vote by proxy (see article 26). Thus, an Individual Member may not cast a vote by proxy during a meeting at which it is not represented unless it had already attained voting rights as described in clause 35.4.

35.4 Removal from and instatement to voting list

The word *reinstatement* in the title of section 35.4 shall be replaced by *instatement*

The text in section 35.4 shall be replaced with:

An Individual Member shall be removed from the voting list when either of the following happens:

1. *The Individual Member is not represented at three consecutive face to face ordinary meetings of the group (TSG or WG),*
2. *The Individual Member is not represented in two consecutive ordinary meetings of the group (TSG or WG) of which at least one is electronic*

The right to vote shall be instated or reinstated for an Individual Member at either of the following events:

1. *the second face to face ordinary meeting which a delegate of the Individual Member attends without missing the number of consecutive face to face ordinary meetings mentioned in the previous paragraph,*
2. *the third consecutive ordinary meeting which a delegate of the Individual Member attends*

Note: See article 35.3 for eligibility to cast a proxy vote.

EXAMPLE 1: *If Individual Member Z is represented at face to face ordinary meeting K and K+3 (and is thus eligible to vote) but is not represented at face to face ordinary meetings K+4, K+5 and K+6, it is removed from the voting list.*

EXAMPLE 2: *If Individual Member X, not previously having been represented at an face to face ordinary meeting of the group, is represented at face to face ordinary meetings N and N+3, it may cast a vote at face to face ordinary meeting N+3.*

NOTE: *Individual Member X might choose to cast a vote by proxy at face to face ordinary meeting N+3, even though its delegate is physically present. This is sometimes useful for coordinating company positions where one large company has several Individual Memberships, possibly via several different Organizational Partners.*

EXAMPLE 3: *If Individual Member Y, not previously having been represented at a meeting of the group, is represented at ordinary meeting N only, it may not cast a vote by proxy at ordinary meeting N+2.*

EXAMPLE 4: *If Individual Member A is represented at electronic ordinary meetings N, N+1, and N+2 (and is thus eligible to vote) but is not represented at electronic ordinary meetings N+3 and N+4, it is removed from the voting list.*

EXAMPLE 5: *If Individual Member B, not previously having been represented at an ordinary meetings of the group, is represented at electronic ordinary meetings N, N+1, and N+2, it may cast a vote at electronic ordinary meeting N+2.*

35.5 (Void)

The contents of this section shall be struck and the heading replaced with VOID.

The following subclause is added to Article 35:

35.6 OP Voting Rights Hardship Exemption

For an IM belonging to an OP that has a voting rights hardship exemption for a given meeting, then missing the meeting is not counted in the voting rights algorithm. (In other words, for that IM, it is treated as though the meeting did not occur). If an IM covered by a voting rights hardship exemption for voting rights does attend the meeting, then it is counted as normal attendance.

If an IM covered by voting rights hardship exemption misses a meeting, there will be a permanent record (e.g., in the relevant meeting report) to note the list of IMs who have the voting rights hardship exemption for that meeting, and the voting rights list will also indicate the voting rights hardship exemption for the relevant meeting.

Voting rights hardship exemptions are granted on a per OP, per meeting basis.

Annex A: Definitions

The following 4 definitions are added:

Ad hoc Meeting	*A meeting called to address one or more particular topics that is not an ordinary meeting (see F.3)*
Electronic meeting:	*A electronic meeting is one where all the participants connect to the meeting using electronic means such as audio/video conference, email, etc.*
Face to face meeting:	*A face to face meeting, also referred to as a physical meeting, is one held at a designated physical location where participants are invited to attend in person.*
Ordinary Meeting	*A meeting where the ordinary business of a group is conducted (see F.2).*

Annex F: Guidance on meeting organization

The title of Annex F shall be changed to Guidance on TSG and WG meeting Organization

F.2 Ordinary meetings

The contents of clause F.2 shall be replaced with the following:

Ordinary meetings are ones where the regular business of the TSG or WG is conducted. Such meetings are normally chaired by the Group's Chair or, if unavailable, a Vice Chair. Ordinary meetings should be announced at least six months prior to the opening day of the meeting. An ordinary meeting may be held as a face to face meeting or as an electronic meeting.

TSG and WG ordinary meetings shall follow an incrementing number sequence. If an additional ordinary meeting is required between two ordinary meetings, the sequence may be preserved, even though this means renumbering subsequent meetings, or the additional meeting may be numbered using the 'bis' suffix as a numbering scheme. Ordinary meetings that are held electronically shall be designated with an 'e' suffix.

Attendance at an ordinary meeting counts towards an Individual Member's eligibility to cast a vote in the Group (see articles 26 and 27). The Support Team shall record the participation in an ordinary meeting (each person and organization represented) and the attendance list shall be included in the meeting report.

If a meeting is designated as face to face, provisions to support remote participation (e.g. by using additional audio/video capabilities) would be at the discretion of the host and leadership. In a meeting designated as face to face, those participating remotely are not to be counted toward quorum or attendance, and are not allowed to vote.

Following each ordinary meeting, the Support Team shall publish a list of IMs that have gained or lost voting rights at that meeting.

F.3 Ad hoc meetings

The contents of clause F.3 shall be replaced with the following:

An ad hoc meeting of a WG or a TSG is one called to address one or more particular topics. An ad hoc meeting may be held as a face to face or as an electronic meeting. The ad hoc meeting shall be called by decision of the WG (or its parent TSG) or TSG concerned; the decision to hold any subsequent ad hoc meetings on the same topic may be made by the ad hoc meeting participants themselves without reference to the parent WG or TSG, although the parent WG or TSG shall review any ad hoc activity at every Ordinary meeting and determine to either continue or to close the ad hoc activity, even if the previous ad hoc meeting suggested a further meeting. The scope of each subsequent ad hoc meeting shall be indicated by the Chair at least 21 days before the meeting. The ad hoc meeting shall not expand or change the scope originally determined by the parent group. An ad hoc meeting is allowed to make decisions only within its pre-defined remit, and any such decisions shall be ratified by the parent WG or TSG unless, in the case of a WG, a decision was previously explicitly delegated by the WG to the ad hoc meeting.

An ad hoc meeting may be chaired as described for an ordinary meeting above, or, with the agreement of the WG or TSG concerned, by a Work Item rapporteur, or other appropriate person. Although open to all 3GPP Individual Members, ad hoc meetings may attract only a subset of Individual Member representatives who would normally participate in ordinary meetings.

Ad hoc meetings shall not be considered when calculating voting rights. That is, attendance at (or absence from) an ad hoc meeting shall not influence voting rights, which are determined solely by attendance at "ordinary" meetings.

No voting shall occur at ad hoc meetings.

F.4 Attendance Register

The contents of clause F.4 (and subclauses) shall be replaced with the following:

A delegate is deemed to have attended a given meeting if the individual confirms their participation by checking in. If a delegate does not check in during the meeting, the secretary shall assume that the individual did not attend. Checking in must be performed between the start and end of the meeting. In addition, the check in process shall clearly inform the delegate that 'Checking in carries the responsibility for participating in relevant parts of the meeting'.

A delegate, having registered and checked in to a meeting, is not allowed to change their represented organization during the course of that meeting. An individual delegate is not allowed to simultaneously represent two or more Individual Members at a meeting.

F.4.1 (void)

F.4.2 (void)

Annex G: Working agreements

The following changes to Annex G are in effect:

Challenge votes may be conducted at Electronic meetings provided they are Ordinary meetings.

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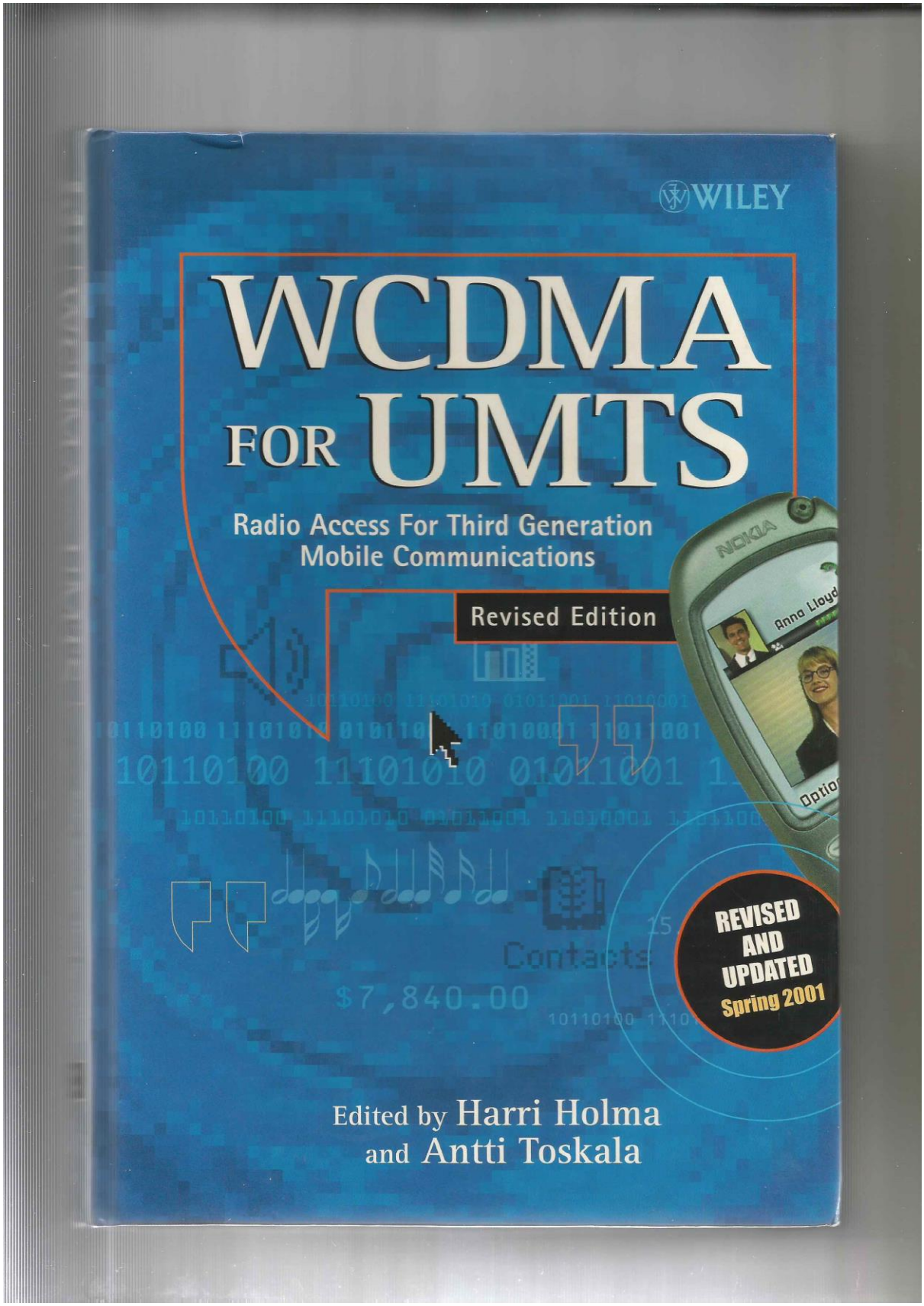
Annex J: Change history

Date	PCG #	PCG Doc.	CR	Rev	Subject/Comment
2002-04-25	6				
2005-03-01	13				Changes agreed at PCG meeting incorporated. [No formal change control system yet in place]
2006-04-24	16	PCG16_07	2		ETSI proposal: Article 10 Clarify the rights of observers and guests
			3		ETSI proposal: Article 15 To allow leeway in the number of delegates representing each OP at PCG (To reflect the decision already taken by PCG#14 on PCG participation)
			9		ETSI proposal: Article 34 To cater for current TSG structure and to reflect common practice of Tdoc numbering
			1	1	Article 3 Reflect decision on regional options (To incorporate PCG#7 decision)
			4	1	Article 22 Clarification and codification of the rights to stand for elected positions in TSGs and WGs
			8		Article 30 & annex F Inclusion of an annex giving guidance on meeting organization
2006-10-27	17	PCG17_15 r1	10		Article 35 Clarification of voting rights
2009-05-18	22	PCG22_18	11	5	Changes resulting from the OP ad hoc group on improvements report and conclusions of OP#20. Articles affected: 22 23 31 35 41 52 Annex D plus sundry spelling corrections.
		PCG22_19	12	2	Rules on eligibility to cast votes at TSG and WG level.
		PCG22_20	13		Bring statement of purpose of 3GPP up to date
		PCG22_23	14		Adding Working Agreements to working procedures
		PCG22_30 r3	15	3	Change of ITU liaison process Note: PCG meeting #22 approved contribution PCG22_30r1 but this was subsequently revised to r3 after the meeting with the apparent approval of the PCG.
					Decision PCG22/11: clause 22.1 changed wording from "in the March time frame in" to "in the first semester of".
2009-08-12					Editorial correction to implementation of CR15r3. (article 52).
2010-04-23	24	PCG24_11	16		TSG vs WG election
		PCG24_12	17		Quorum
		PCG24_13	18		Communication with ITU
		PCG24_25	19		Attendance register for meetings
2012-10-24		PCG29_17	20		Update to 3GPP Working Procedures article 22
2014-07-22	33	PCG33_10	21		Anti-trust / competition law requirements articles 12, 17, 22.1, 23, 29, 59A, annex C
2014-12-31	34	PCG34_14	22		Anti-trust recommendations v1.1.
					Addition of TSDSI to list of OPs in annexes B and C. Minor formatting and spelling corrections, consistent capitalization.

2016-11-15	35	PCG37_14	23		Article 22.1 Modification to clarify obligation on elected officials regarding antitrust/competition law training.
2019-08-22	42	(none)	24		Article 55 Correction of text to reflect actual practice. Note: Decision taken by email in response to Action PCG42/7.
2019-08-23	42	PCG42_18	25		Article 22.2 Adds text allowing WGs which meet infrequently to escalate elections of their officials to the parent TSG. Article 25 Adds text allowing WGs which meet infrequently to escalate technical votes to the parent TSG. Article 30A (new) Introduces procedures for situations where an IM is unable to send a delegate in person to a meeting but nevertheless wishes to contribute to the proceedings. Secretary's note 1: Annex B Added abbreviation 'IM', though this was not included in PCG42_18. Secretary's note 2: Corrected the CR numbers in the previous two change history entries.
2020-02-07	43	PCG43_14			Annex G: Removal of the statement that voting on working agreements was to be a standard element of every meeting agenda. Addition of a reference to article 32. Removal of the requirement for a quorum during voting on working agreements.
2020-05-15	44				Addition of "crisis annex"
2020-09-30	45	PCG45_11			Update to 3GPP Working Procedures Annex I ("crisis annex")
2021-04-29	46	PCG46_20			Decision PCG46/09: Gender Neutrality Changes Annex I Change minimum voting window from 24 to 18 hours
2022-03-07	48	PCG48_12			Voting Rights pCR to Annex I
2022-03-07	48	PCG48_13			Hardship Exemption pCR to Annex I
2022-09-01	49	-			Working Procedures P-CR for Registration

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Appendix 6



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WCDMA FOR UMTS

Radio Access For Third Generation Mobile Communications

Revised edition

Edited by
Harri Holma and Antti Toskala
Both of Nokia, Finland

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4.5.3 *cdma2000*

The cdma2000 air interface proposal to ITU is the result of work in TR45.5 on the evolution of IS-95 towards the third generation. The cdma2000 proposal is based partly on IS-95 principles with respect to synchronous network operation, common pilot channels, and so on, but it is a wideband version with three times the bandwidth of IS-95. The ITU proposal contains further bandwidth options as well as the multi-carrier option for downlink. The cdma2000 proposal has a high degree of commonality with the Global CDMA 1 ITU proposal from TTA, Korea.

The cdma2000 multi-carrier option is covered in more detail in Chapter 13, as being currently standardised by 3GPP2.

4.5.4 *TR46.1*

The WIMS W-CDMA was not based on work derived from an existing second generation technology but was a new third generation technology proposal with no direct link to any second generation standardisation. It was based on the constant processing gain principle with a high number of multicodes in use, thus showing some fundamental differences but also a level of commonality with WCDMA technology in other forums.

4.5.5 *WP-CDMA*

WP-CDMA (Wideband Packet CDMA) resulted from the convergence between W-CDMA N/A of T1P1 and WIMS W-CDMA of TR46.1 in the US. The main features of the WIMS W-CDMA proposal were merged with the principles of W-CDMA N/A. The merged proposal was submitted to the ITU-R IMT-2000 process towards the end of 1998, and to the 3GPP process at the beginning of 1999. Its the most characteristic feature, compared with the other WCDMA-based proposals, was a common packet mode channel operation for the uplink direction, but there were also a few smaller differences.

4.6 Creation of 3GPP

As similar technologies were being standardised in several regions around the world, it became evident that achieving identical specifications to ensure equipment compatibility globally would be very difficult with work going on in parallel. Also, having to discuss similar issues in several places was naturally a waste of resources for the participating companies. Therefore initiatives were made to create a single forum for WCDMA standardisation for a common WCDMA specification.

The standardisation organisations involved in the creation of the 3rd Generation Partnership Project (3GPP) [9] were ARIB (Japan), ETSI (Europe), TTA (Korea), TTC (Japan) and T1P1 (USA) as shown in Figure 4.2. The partners agreed on joint efforts for the standardisation of UTRA, now standing for Universal Terrestrial Radio Access, as distinct from UTRA (UMTS Terrestrial Radio Access) from ETSI, also submitted to 3GPP. Companies such as manufacturers and operators are members of 3GPP through the respective standardisation organisation to which they belong.

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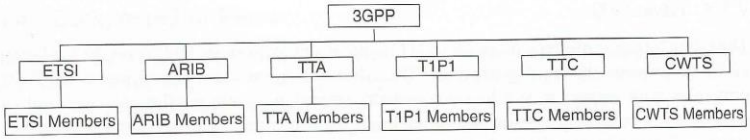


Figure 4.2. 3GPP organisational partners

Later during 1999, CWTS (the China Wireless Telecommunication Standard Group) also joined 3GPP and contributed technology from TD/SCDMA, a TDD-based CDMA third generation technology already submitted to ITU-R earlier.

3GPP also includes market representation partners: GSM Association, UMTS Forum, Global Mobile Suppliers Association, IPv6 Forum and Universal Wireless Communications Consortium (UWCC). In [9] there are up-to-date links to all participating organisations.

The work was initiated formally at the end of 1998 and the detailed technical work was started in early 1999, with the aim of having the first version of the common specification, called Release-99, ready by the end of 1999.

Within 3GPP, four different technical specification groups (TSG) were set up as follows:

- Radio Access Network TSG
- Core Network TSG
- Service and System Aspects TSG
- Terminals TSG

Within these groups the one most relevant to the WCDMA technology is the Radio Access Network TSG (RAN TSG), which has been divided into four different working groups as illustrated in Figure 4.3.

The RAN TSG will produce Release-99 of the UTRA air interface specification. The work done within the 3GPP RAN TSG working groups has been the basis of the technical description of the UTRA air interface covered in this book. Without such a global initiative, this book would have been forced to focus on a single regional specification, though with many similarities to those of other regions. Thus the references throughout this book are to the specification volumes from 3GPP.

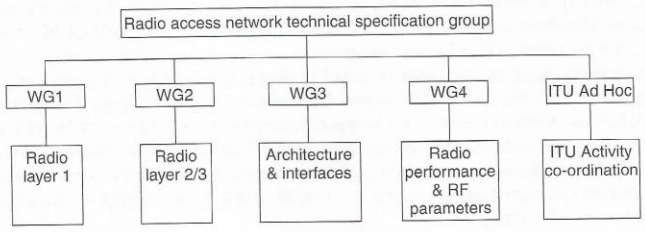


Figure 4.3. 3GPP RAN TSG working groups

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During the first half of 1999 the inputs from the various participating organisations were merged in a single standard, leaving the rest of the year to finalise the detailed parameters for the first full release, Release-99, of UTRA from 3GPP. The member organisations have undertaken individually to produce standard publications based on the 3GPP specification. Thus, for example, the Release-99 UMTS specifications from ETSI are identical to the Release-99 specifications produced by 3GPP. The latest specifications can be obtained from 3GPP [9].

During 2000, further work on GSM evolution was moved from ETSI and other forums to 3GPP, including work on GPRS and EDGE. A new TSG, TSG GERAN was set up for this purpose.

4.7 Creation of 3GPP2

Work done in TR45.5 and TTA was merged to form 3GPP2, focused on the development of cdma2000 Direct-Sequence (DS) and Multi-Carrier (MC) mode for the cdma2000 third generation component. This activity has been running in parallel with the 3GPP project, with participation from ARIB, TTC and CWTS as member organisations. Recently the main concentration has been on the MC mode work, due to decisions resulting from the global harmonisation efforts.

4.8 Harmonisation Phase

During the spring of 1999 several operators and manufacturers held series of meetings to seek further harmonisation and convergence between the CDMA-based third generation solutions, WCDMA and cdma2000. For the 3GPP framework the ETSI, ARIB, TTA and T1P1 concepts had already been merged to a single specification, while cdma2000 was still on its own in TR45.5. As a result of several meetings and telephone conferences, the manufacturers and operators agreed to adopt a harmonised global third generation CDMA standard consisting of three modes: Multi-Carrier (MC), Direct Spread (DS) and Time Division Duplex (TDD). The MC mode was based on the cdma2000 multi-carrier option, the DS mode on WCDMA (UTRA FDD), and the TDD mode on UTRA TDD. The agreement was to phase in a modular approach in which both core networks could be used with all air interface alternatives, as described in Figure 1.4 in Chapter 1.

The main technical impacts of these harmonisation activities were the change of UTRA FDD and TDD mode chip rate from 4.096 Mcps to 3.84 Mcps and the inclusion of a common pilot for UTRA FDD. The work in 3GPP2 focused on the MC mode, and the DS mode from cdma2000 was abandoned. The result is that globally there is only one Direct Spread (DS) wideband CDMA standard, WCDMA.

4.9 IMT2000 Process in ITU

In the ITU, recommendations have been developed for third generation mobile communications systems, the ITU terminology being called IMT-2000 [10], formerly FPLMTS. In the ITU-R, ITU-R TG8/1 has worked on the radio-dependent aspects, while the radio-independent aspects have been covered in ITU-T SG11.

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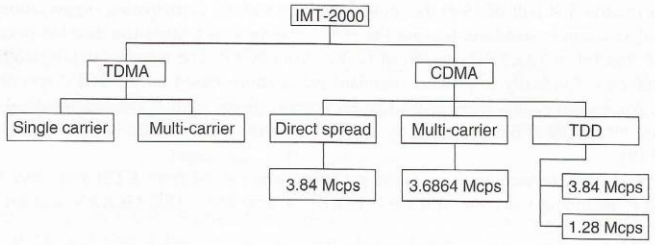


Figure 4.4. ITU-R IMT-2000 grouping

In the radio aspects, ITU-R TG8/1 received a number of different proposals during the IMT-2000 candidate submission process. In the second phase of the process, evaluation results were received from the proponent organisations as well as from the other evaluation groups that studied the technologies. During the first half of 1999 recommendation IMT.RKEY was created which describes the IMT-2000 multimode concept.

The ITU-R IMT-2000 process was finalised at the end of 1999, when the detailed specification (IMT-RSCP) was created and the radio interface specifications were approved by ITU-R [11]. The detailed implementation of IMT-2000 will continue in the regional standards bodies. The ITU-R process has been an important external motivation and timing source for IMT-2000 activities in regional standards bodies. The requirements set by ITU for an IMT-2000 technology have been reflected in the requirements in the regional standards bodies, for example in ETSI UMTS 21.01 [5], in order for the ETSI submission to fulfil the IMT-2000 requirements. The ITU-R interaction between regional standardisation bodies in the IMT-2000 process is reflected in Figure 4.5.

The ITU-R IMT-2000 grouping, with TDMA- and CDMA-based groups, is illustrated in Figure 4.4. The UTRA FDD (WCDMA) and cdma2000 are part of the CDMA interface, as CDMA Direct Spread and CDMA Multi-Carrier respectively. UWC-136 and DECT are part of the TDMA-based interface in the concept, as TDMA Single Carrier and TDMA Multi-Carrier respectively. The TDD part in CDMA consists of UTRA TDD from 3GPP and TD-SCDMA from CWTS. For the FDD part in the CDMA interface, harmonisation has been completed, and the harmonisation process is expected to continue for the CDMA TDD mode within 3GPP during 2000 and 2001.

4.10 Beyond 3GPP Release-99

Upon completion of the Release-99 specifications, work will concentrate on specifying new features as well as making the necessary corrections to Release-99. Typically such corrections arise as implementation proceeds and test systems are updated to include the latest changes in the specifications. As experience in various forums has shown, a major step forward in system capabilities with many new features requires a phasing-in period for the specifications. Fortunately, the main functions have been verified in the various test systems in operation since 1995, but only the actual implementation will reveal any errors and inconsistencies in the fine detail of the specifications.

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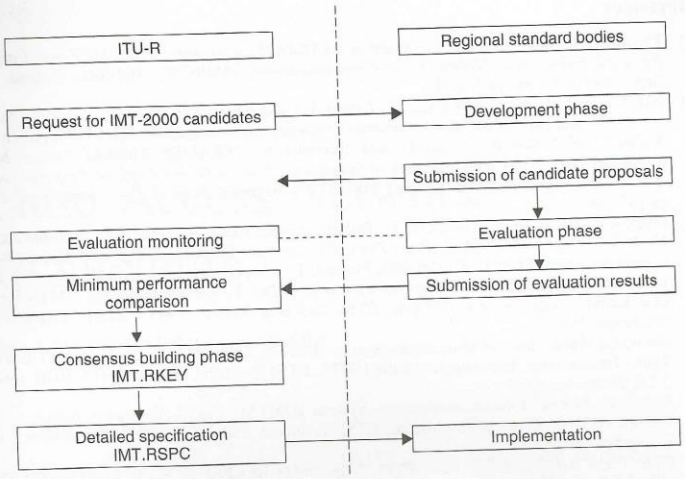


Figure 4.5. Relationship of ITU-R to the regional standards bodies

In 3GPP the next version of the specifications was originally considered as Release 2000, but since that the Release naming was adjusted so that next release is called Release 4 due to the 03/2001. Release 4 will contain only minor adjustment with respect to the Release'99. Bigger items are foreseen for inclusions in Release 5, including reaching for the data rates even up to the 10 Mbps in the downlink direction. Release 5 is due for the end of 2001. Release'99 specifications have a version number starting with 3 while Release 4 and 5 specifications have version number starting logically with 4 and 5 respectively.

During coming years, part of the process is to specify the extensions for connecting UTRA FDD to IS-41 based core networks. Work will be carried out on cdma2000 to allow connection to GSM-based core networks. This development will offer operators some degree of flexibility in selecting their third generation technology, assuming they are not aiming to launch such a service immediately, since Release-99 does not yet contain these options.

On the TDD side, further alignment is expected between the TDD mode in UTRA and the TDD mode from CWTS (China). This process is expected to continue after Release-99 is completed in 3GPP. 3GPP Release-4 is also planned to cover the lower chip rate (1.28 Mcps) TDD.

Other interesting developments are expected in the area of using IP based technology in UTRA. First step is going to be the IP based transport option in Release 4 and further releases are likely to see IP technology shaping the internal architecture of the UTRA Network (UTRAN). Also some of the protocols developed by the Internet Engineering Task Force (IETF) [12], such as robust IP header compression suitable for cellular transmission, are foreseen to be adopted as part the UTRA Rel'4 specifications.

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[2] Nikula, E., Toskala, A., Dahlman, E., Girard, L., and Klein, A., 'FRAMES Multiple Access for UMTS and IMT-2000', *IEEE Personal Communications Magazine*, April 1998, pp. 16–24.

[3] Klein, A., Pirhonen, R., Sköld, J., and Suoranta, R., 'FRAMES Multiple Access Mode 1—Wideband TDMA with and without Spreading', *Proc. IEEE Int. Conf. on Personal Indoor and Mobile Radio Communications*, PIMRC'97, Helsinki, Finland, 1–4 September 1997, pp. 37–41.

[4] Ovesjö, F., Dahlman, E., Ojanperä, T., Toskala, A., and Klein, A., 'FRAMES Multiple Access Mode 2—Wideband CDMA', *Proc. IEEE Int. Conf. on Personal Indoor and Mobile Radio Communications*, PIMRC'97, Helsinki, Finland, 1–4 September 1997, pp. 42–46.

[5] Universal Mobile Telecommunications System (UMTS), Requirements for the UMTS Terrestrial Radio Access System (UTRA), ETSI Technical Report, UMTS 21.01 version 3.0.1, November 1997.

[6] Universal Mobile Telecommunications System (UMTS), Selection Procedures for the Choice of Radio Transmission Technologies of the UMTS, ETSI Technical Report, UMTS 30.03 version 3.1.0, November 1997.

[7] Universal Mobile Telecommunications System (UMTS), UMTS Terrestrial Radio Access System (UTRA) Concept Evaluation, ETSI Technical Report, UMTS 30.06 version 3.0.0, December 1997.

[8] ETSI Press Release, SMG Tdoc 40/98, 'Agreement Reached on Radio Interface for Third Generation Mobile System, UMTS', Paris, France, January 1998.

[9] http://www.3GPP.org

[10] http://www.itu.int/imt/

[11] ITU Press Release, ITU/99–22, 'IMT-2000 Radio Interface Specifications Approved in ITU Meeting in Helsinki', 5 November 1999.

[12] http://www.ietf.org

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Appendix 7

3GPP PCG#38
West Palm Beach, 25 April 2017
PCG38_20

MCC Activity Report

Source

Adrian Scrase

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Contents

- Departures and Arrivals
- Resource Allocation
- Personnel Changes
- Workload
- 3GPP Membership
- Antitrust Compliance Training
- Summary and Outlook

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Departures and Arrivals

Kyoungseok OH has joined MCC from the beginning of 2017 as the seconded expert from TTA. He has been allocated Working Group RAN4.



Hakim MKINSI has joined MCC from the beginning of February 2017 and has been allocated Working Group CT6 (as a part time assignment, the remainder of his time being allocated to ETSI TC SCP.)



As a result of these arrivals, Juha Korhonen has now been allocated Working Group RAN2, and Issam Toufik has been allocated Working Group RAN3.



Due to the increasing number of additional meetings, a flexible assignment may be necessary on a case by case basis.



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Resource Allocation



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Workload: Change Requests

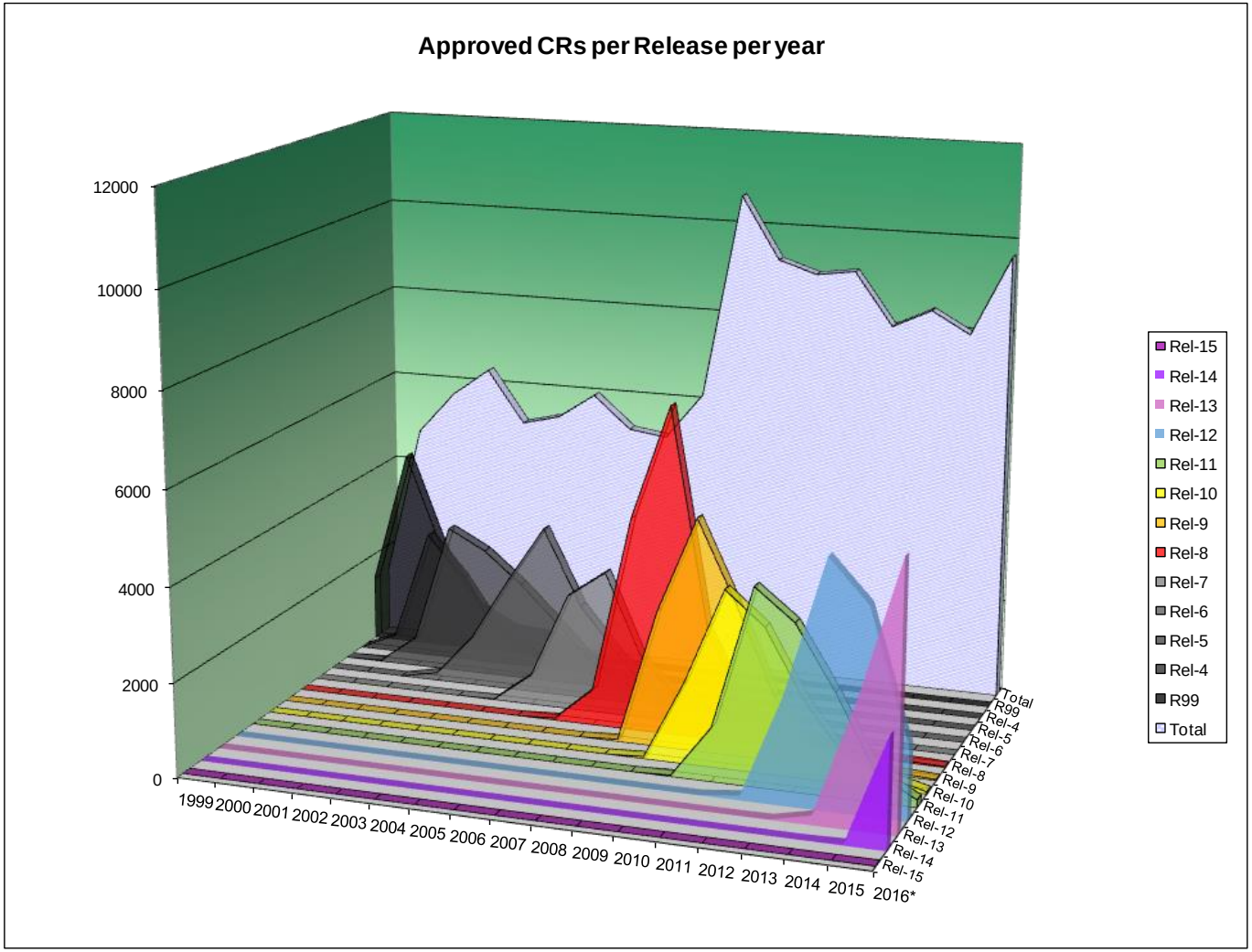
Approved CRs per Release per Year

Release	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016*	Total
R99	1408	4398	2266	1004	581	512	111	42	23	5	5	1	0						**10356**
Rel-4		376	2828	1900	690	257	122	63	48	22	20	13	11	8	7	2			**6367**
Rel-5		27	644	3274	2842	2162	1357	509	94	25	22	7	7	5	3	2			**10980**
Rel-6				172	1088	2458	3721	2074	1078	212	74	19	17	10	4	4			**10931**
Rel-7					1	20	663	2529	3132	1262	492	176	91	43	25	15			**8449**
Rel-8								49	777	4609	7073	2347	706	347	184	91	46	22	**16251**
Rel-9										49	2918	4991	3252	1366	376	165	70	26	**13213**
Rel-10											47	1722	3800	3103	1636	584	267	50	**11209**
Rel-11												32	1152	4178	3525	2186	622	163	**11858**
Rel-12													6	102	2254	5181	4287	1530	**13360**
Rel-13															8	200	2648	5571	**8427**
Rel-14																	24	2315	**2339**
Rel-15																		6	**6**
Total	**1408**	**4801**	**5738**	**6350**	**5202**	**5409**	**5974**	**5266**	**5152**	**6184**	**10651**	**9308**	**9042**	**9162**	**8022**	**8430**	**7964**	**9683**	123746

* It should be noted that **9683** Change Requests were processed during 2016, which represents the highest peak since 2009 (Release 8 (LTE) freeze). It is predicted that the Release 15 and Release 16 freezes (5G) will result in an even higher number of Change Requests to be processed (i.e., the Perfect Storm).

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Workload: CRs



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Workload: Committee Support

PCG#36 requested that MCC provide support to ad hoc meetings, bis meetings and workshops to the extent that this is possible within the overall budget. This request has been implement and, in most cases, such meetings have received support.

At PCG#37, I gave warning that the increasing workload was likely to become unsustainable and would necessitate an increase in MCC resources.

A proposal is therefore made at this PCG to increase MCC resources and this can be found in document PCG38_21.

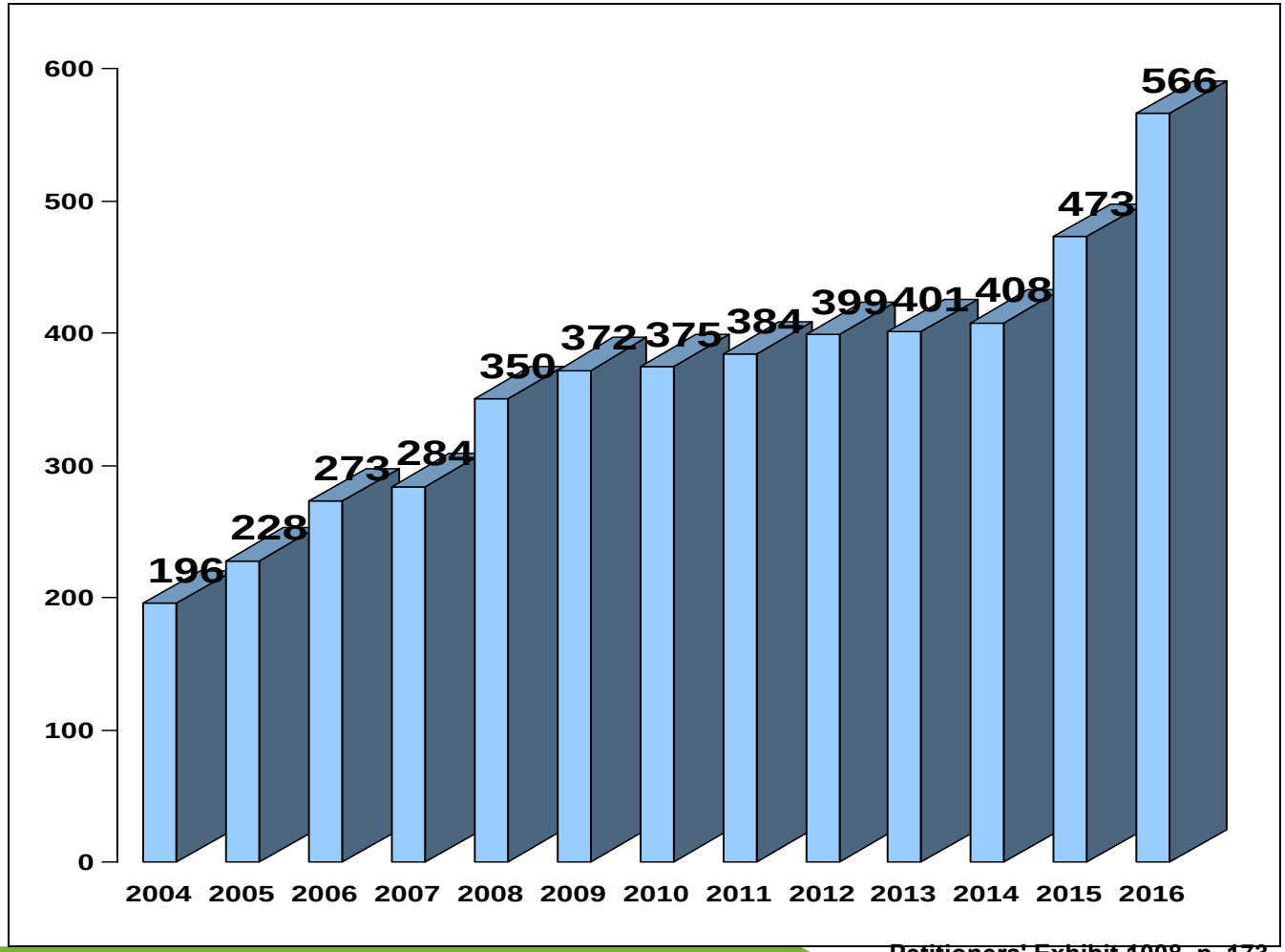
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3GPP Membership

3GPP Membership currently stands at *566* Individual Members. In addition, there are 26 companies having Guest Status, which are potential IMs

Number of Individual Members in 3GPP

3GPP Individual Members come from 45 Countries worldwide



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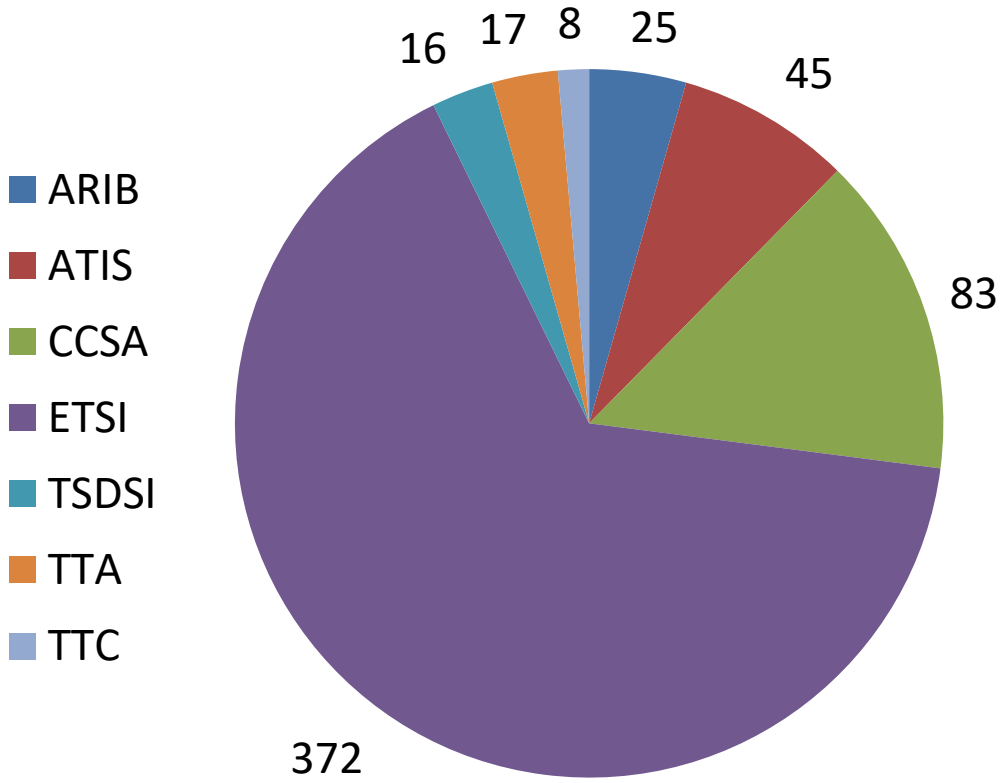
3GPP Member Territories

AUSTRALIA	DENMARK	ISRAEL	POLAND	SOUTH AFRICA
AUSTRIA	ESTONIA	ITALY	PORTUGAL	SPAIN
AZERBAIJAN	FINLAND	JAPAN	QATAR	SWEDEN
BELGIUM	FRANCE	KOREA (REPUBLIC OF)	ROMANIA	SWITZERLAND
BOTSWANA	GERMANY	LEBANON	RUSSIAN FEDERATION	TAIWAN, PROVINCE OF CHINA
BRAZIL	HONG KONG	LUXEMBOURG	SERBIA	TURKEY
CANADA	INDIA	MALAYSIA	SINGAPORE	UNITED ARAB EMIRATES
CHINA	INDONESIA	NETHERLANDS	SLOVAKIA	UNITED KINGDOM
CZECH REPUBLIC	IRELAND	NORWAY	SLOVENIA	UNITED STATES

Note: Membership is growing substantially, and also outside of traditional 3GPP territories. This may well lead to proposals for 3GPP meetings to be held in such locations.

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Individual Members in 3GPP



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Antitrust Training

Three antitrust and competition law training sessions are planned for 2017:

27 March:	convenient for European based leaders
03 May:	convenient for US based leaders
01 June:	convenient for Asian based leaders

Each session is delivered by trainers based in the specific region

These sessions are currently aimed at the TSG Leadership, MCC and OP staff. The question has been raised as to whether such training should be extended to delegates as well? Some advice from the PCG on this would be helpful.

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Summary and Outlook

3GPP Membership continues to show a 20% annual growth and there is no indication that this will reduce. On the contrary, as 5G normative work has only just begun, further growth is expected

The workload within the TSGs is increasing and will continue to do so in order to meet the accelerated timeline for Release 15 and 16 delivery

The increasing workload within the TSGs places a higher workload on MCC which is now working at capacity with no margin for the unforeseen

3GPP has become *the* focal point for delivery of 5G standards and it is important to ensure that the workload within the TSGs (and therefore within MCC) remains manageable

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Appendix 8

The 3G IP Multimedia Subsystem (IMS)

Merging the Internet and the Cellular Worlds

Gonzalo Camarillo and Miguel A. García-Martín

Both of
Ericsson, Finland



John Wiley & Sons, Ltd

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Chapter 2

The History of the IMS Standardization

In Chapter 1 we mentioned that the IMS uses Internet protocols. When the IMS needs a protocol to perform a particular task (e.g., to establish a multimedia session), the standardization bodies standardizing the IMS take the Internet protocol intended for that task and specify its use in the IMS. Still, no matter how simple this may sound the process of choosing protocols to be used in the IMS can sometimes get tricky. Sometimes, the Internet protocol that is chosen lacks some essential functionality, or does not even exist at all. When this happens the IMS standardization bodies contact the standardization body developing Internet protocols to work together on a solution. We will cover this collaboration in Section 2.5. Nevertheless, before jumping into that we will introduce in Section 2.1 all the standardization bodies involved in IMS development. We need to know who is who and which functions of the IMS each of them performs.

2.1 Relations between IMS-related Standardization Bodies

The ITU (International Telecommunication Union) IMT-2000 (International Mobile Telecommunications-2000) is the global standard for 3G (third generation) networks. IMT-2000 is the result of the collaboration between different standards bodies and aims at providing access to telecommunication services using radio links, which include satellite and terrestrial networks.

We will focus on two of the standard bodies involved in IMT-2000: 3GPP (Third Generation Partnership Project) and 3GPP2 (Third Generation Partnership Project 2). Still, they are not the only ones working within IMT-2000. Other bodies, such as the ITU-R (ITU-Radiocommunication Sector), for instance, are also involved in IMT-2000 but on different areas than the IMS.

Both 3GPP and 3GPP2 have standardized their own IMS (IP Multimedia Subsystem). The 3GPP IMS and the 3GPP2 IMS are fairly similar, but, nevertheless, have a few differences (Appendix A lists the most important differences).

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An important similarity between the 3GPP IMS and the 3GPP2 IMS is that both use Internet protocols, which have been traditionally standardized by the IETF (Internet Engineering Task Force). Consequently, both 3GPP and 3GPP2 collaborate with the IETF in developing protocols that fulfill their requirements. The following sections introduce the IETF, 3GPP, and 3GPP2 and provide a brief history of the IETF-3GPP/3GPP2 collaboration.

In addition to the standard bodies we have just mentioned, OMA (Open Mobile Alliance [144]) will play an important role in developing IMS services in the near future. While 3GPP and 3GPP have standardized (or are standardizing) a few IMS services, such as basic video calls or conferencing, from now on OMA will focus on service standardization for the IMS (of course, other standard bodies and third parties besides OMA may also develop services for the IMS).

2.2 Internet Engineering Task Force (IETF)

The Internet Engineering Task Force (IETF) is a loosely self-organized collection of network designers, operators, vendors, and research institutions that work together to develop the architecture, protocols, and operation of the public Internet. The IETF is body that is open to any interested individual. The IETF is not a corporation and, therefore, does not have a board of directors, members, nor dues.

The IETF is the standardization body that has developed most of the protocols that are currently used on the Internet. The IETF does not standardize networks, architectures combining different protocols, the internal behaviour of nodes, nor APIs (Application Programming Interface). The IETF is the protocol factory for IP-related protocols.

2.2.1 Structure of IETF

Work in the IETF is organized in working groups. Each working group is chartered to perform specific tasks, such as the delivery of a precise set of documents. Each working group has from one to three chairs, who take care that the working group completes its chartered tasks in time. Working groups have a temporary lifetime; so, once they have delivered their documents, either they are rechartered or they cease to exist. Figure 2.1 shows a few, but not all, of the working groups in the IETF; there are more than 100 active working groups in the IETF. The complete up-to-date list of active working groups is available at:

`http://www.ietf.org/html.charters/wg-dir.html`

Working groups get an acronym name that identifies the chartered task. For instance, SIPPING is the acronym of "Session Initiation Protocol Investigation", SIMPLE is the acronym of "SIP for Instant Messaging and Presence Leveraging Extensions" or AAA for "Authentication, Authorization and Accounting".

A collection of working groups form an Area Directorate. There are currently eight areas, as illustrated in Figure 2.1.

Each area has one or two area directors who, together with the IETF chairman, form the IESG (Internet Engineering Steering Group). The IESG is the technical

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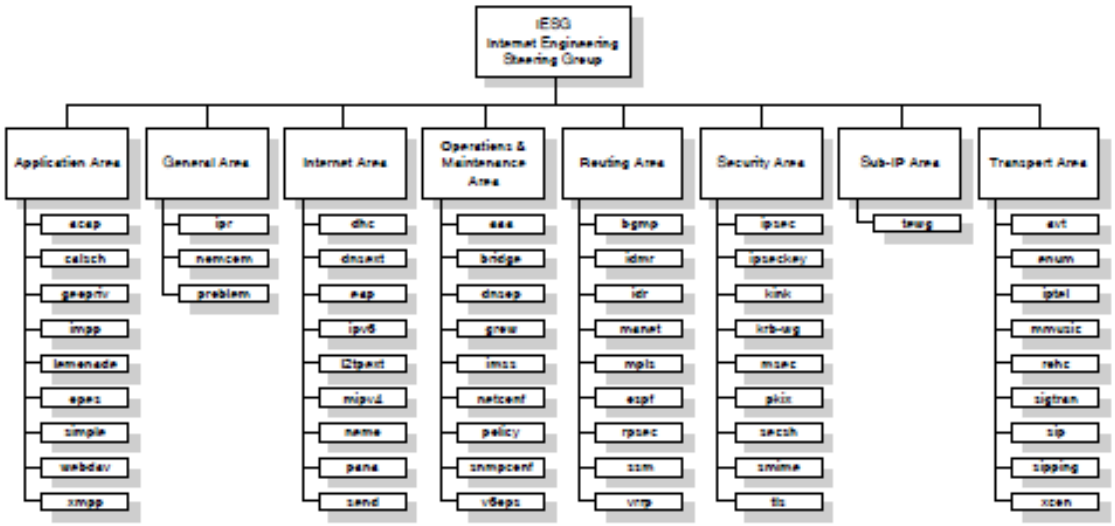


Figure 2.1: The structure of the IETF

management team of the IETF. They decide on which areas the IETF should work and review all the specifications that are produced.

The following web pages contain the complete list of the working groups of all areas and the charter of the SIPPING working group respectively.

`http://www.ietf.org/html.charters/wg-dir.html`
`http://www.ietf.org/html.charters/sipping-charter.html`

The IAB (Internet Architecture Board) is the body that provides technical leadership and handles appeals. Its web page is:

`http://www.iab.org/`

2.2.2 Working Group Operations

The technical work in the IETF is done within the working groups. Working groups do not have any kind of membership; they are formed by a number of volunteers that work as individuals. That is, they do not represent their companies when working for the IETF.

Most of the technical discussions within a working group take place in its mailing list. Even the decisions made at face-to-face meetings (held three times a year) have to be confirmed in the mailing list.

The technical documents used within the working groups are called Internet-Drafts. There are two types of them: individual submissions and working group items. Individual submissions are technical proposals submitted by an individual or individuals. If the working group decides that an individual submission is a good starting point to work on a particular topic, it becomes a working group item.

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Individual submissions and working group items can be distinguished by the name of the file where they are stored. Individual submissions start with:

```
draft-author's_name
```

while working group items start with:

```
draft-ietf-name_of_the_working_group
```

A list of all the Internet-Drafts can be found at:

```
http://www.ietf.org/internet-drafts/
```

When a working group feels that a working group item is ready for publication as an RFC the working group chairs send it to the IESG. The IESG may provide feedback to the working group (e.g., ask that working group to change something in the draft) and, eventually, decides whether or not a new RFC is published.

Although most of the Internet-Drafts that the IESG receives come from working groups an individual may also submit an Internet-Draft to the IESG. This usually happens with topics that are not large enough to grant the creation of a working group, but which, nevertheless, are of interest to the Internet community.

It is important to note that Internet-Drafts, even if they are working group items, represent work in progress and should only be referenced as such. Internet-Drafts are temporary documents that expire and cease to exist six months after they are issued. They can change at any time without taking into consideration backward compatibility issues with existing implementations. Only when a particular Internet-Draft becomes an RFC can it be considered a stable specification.

2.2.3 Types of RFCs

The technical documents produced by the IETF are called RFCs (Request For Comments). According to the contents of the document there are three main types of RFCs:

- Standards-track RFCs.
- Non-standards-track RFCs.
- BCP (Best Current Practise) RFCs.

Standards-track RFCs typically define protocols and extensions to protocols. According to the maturity of the protocol there are three levels of standards-track RFCs: proposed standard, draft standard, and Internet standard. Standards-track specifications are supposed to advance from proposed to draft and, finally, to Internet standard as they get more and more mature. An important requirement in this process is that a particular specification is implemented by several people to show that different independently built implementations that follow the same specification can successfully interoperate.

Nevertheless, in practise only a few RFCs reach the draft standard level and even fewer become Internet standards. At present, the specifications of many protocols that are used massively on the Internet are proposed standards.

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There are three types of non-standards-track RFCs: experimental, informational, and historical (which are called *historic* RFCs). Experimental RFCs specify protocols with a very limited use, while informational RFCs provide information for the Internet community about some topic, such as a requirements document or a process. When a standards-track RFC becomes obsolete, it becomes a historic RFC.

BCP RFCs record the best current practise known to the community to perform a particular task. They may deal with protocol issues or with administrative issues.

Figure 2.2 shows the relations between all the RFC types. A list of all the RFCs published so far and their status can be fetched from:

`http://www.ietf.org/iesg/1rfc_index.txt`

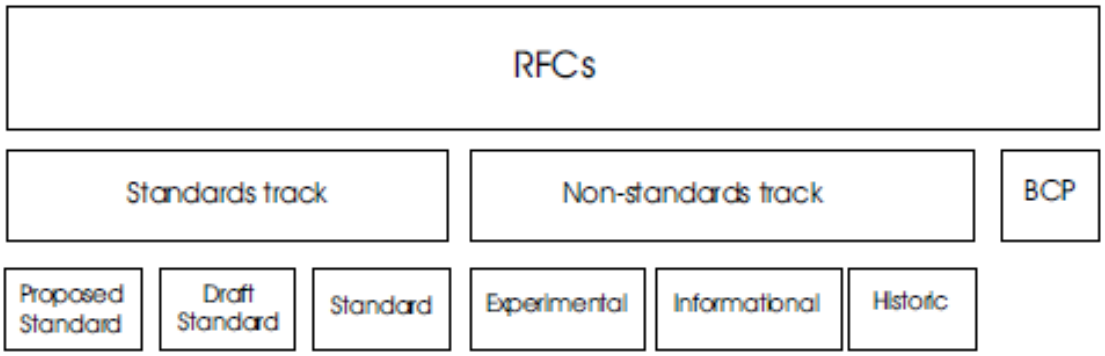


Figure 2.2: RFC types

RFCs can be downloaded from the following web page by just introducing the RFC number:

`http://www.ietf.org/rfc.html`

Additionally, the RFC Editor offers a web page that allows us to search for RFCs by title, number, author and keywords:

`http://www.rfc-editor.org/rfcsearch.html`

2.3 Third Generation Partnership Project (3GPP)

The Third Generation Partnership Project (3GPP) was born in 1998 as a collaboration agreement between a number of regional telecommunication standard bodies, known as *organizational partners*. The current 3GPP organizational partners are:

1. ARIB (Association of Radio Industries and Business) in Japan,

   `http://www.arib.or.jp/english/`

2. CCSA (China Communications Standards Associations) in China,

   `http://www.ccsa.org.cn/english/`

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3. ETSI (European Telecommunications Standards Institute) in Europe,

   `http://www.etsi.org/`

4. Committee T1 in the United States of America,

   `http://www.t1.org/`

5. TTA (Telecommunications Technology Association) of Korea

   `http://www.tta.or.kr/English/`

6. TTC (Telecommunication Technology Committee) in Japan,

   `http://www.ttc.or.jp/e/`

3GPP was originally chartered to develop globally applicable Technical Specifications and Technical Reports for a third-generation mobile system based on GSM. The scope has been reinforced to include maintenance and development of GSM specifications including the supported and evolved radio networks, technologies, and packet access technologies.

Besides the organizational partners, *market representation partners* provide the partnership with market requirements. Market representation partners include, among others, the UMTS Forum, 3G Americas, the GSM Association, the Global mobile Suppliers Association, the TD-SCDMA Forum, and the IPv6 Forum.

3GPP maintains an up-to-date web site at:

`http://www.3gpp.org/`

2.3.1 3GPP Structure

3GPP is organized in a Project Co-ordination Group (PCG) and Technical Specification Groups (TSGs), as illustrated in Figure 2.3. The PCG is responsible for the overall management of 3GPP, time plans, allocation of work, etc. The technical work is produced in the TSGs. At the moment there are five TSGs, responsible for the Core Network (CN), System and Services Aspects (SA), GSM EDGE Radio Access Network (GERAN), Radio Access Network (RAN), and Terminals (T). Each of the TSGs is further divided into Working Groups. Each of the Working Groups is allocated particular tasks. For instance, CN WG1 is responsible for all the detailed design of the usage of SIP and SDP in the IMS, CN WG3 for interworking aspects and CN4 for all the detailed design of the usage of Diameter. SA WG1 is responsible for the requirements, SA2 for the architecture, SA WG3 for the security aspects, SA WG4 for the codecs, and SA WG5 for the operation and maintenance of the network.

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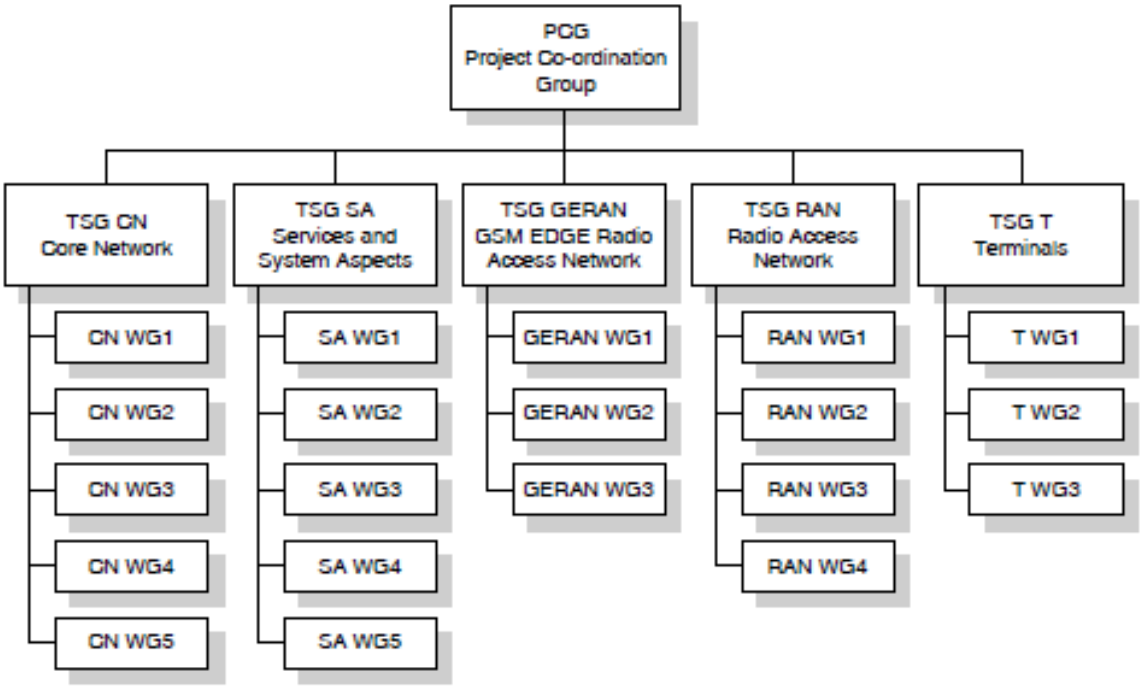


Figure 2.3: The structure of 3GPP

2.3.2 3GPP Deliverables

3GPP working groups do not produce standards. Instead, they produce Technical Specifications (TS) and Technical Reports (TR) that are approved by the TSGs. Once approved they are submitted to the organizational partners to be submitted to their respective standardization processes. The final part of the process is in the organizational partners' hands when they approve the TSs or TRs as part of their standards procedures. As a result, there is a set of globally developed standards that are ready to be used in a particular region.

3GPP TSs and TRs are numbered according to the sequence of four or five digits that follow the pattern "xx.yyy". The first two digits "xx" identify the series number, and the last two or three digits "yy" or "yyy" identify a particular specification within a series. For instance, 3GPP TS 23.228 [21] describes the architectural aspects of the IMS.

3GPP groups its specifications in what is called a *Release*. 3GPP Release 5 contains the first version of the IMS. 3GPP Release 6 contains enhancements to the IMS. The reader must note that the IMS is just a fraction of the 3GPP deliverables in a particular Release, as there are other non-IMS specifications included in a 3GPP Release. 3GPP TSs and TRs include a version number that follows the pattern "x.y.z", where "x" represents the 3GPP Release where the specification is published, "y" is the version number, and "z" is a sub-version number. So, 3GPP TS 23.228 version 5.8.0 means version 8.0 of the Release 5 version of TS 23.228.

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3GPP TSs and TRs are publicly available at the 3GPP web site at either of the following URIs:

`http://www.3gpp.org/specs/specs.htm`

`http://www.3gpp.org/ftp/Specs/archive/`

2.4 Third Generation Partnership Project 2 (3GPP2)

If 3GPP was born to evolve GSM specifications into a third-generation cellular system, the Third Generation Partnership Project 2 (3GPP2) was born to evolve North American and Asian cellular networks based on ANSI/TIA/EIA-41 standards and CDMA2000© radio access into a third-generation system. 3GPP2 like 3GPP is a partnership project whose members are also known as *organizational partners*. The current list of organizational partners include ARIB (Japan), CCSA (China), TIA (Telecommunications Industry Association) (North America), TTA (Korea), and TTC (Japan). Probably, the reader has noticed that most of them are also organizational partners of 3GPP.

Like 3GPP, 3GPP2 gets market requirements and advice from *market representation partners*. At the moment the list includes the IPv6 Forum and the CDMA Development Group.

2.4.1 3GPP2 Structure

The 3GPP2 structure mimics the structure of 3GPP, as illustrated in Figure 2.4. A Steering Committee (SC) is responsible for the overall standardization process and the planning. The technical work is done in Technical Specification Groups (TSGs). TSG-A is focused on the Access Network Interface, TSG-C on CDMA2000© technology, TSG-S on Service and System Aspects, and TSG-X in Intersystems Operations. TGS-X was born as a merger between the former TSG-N (Core Networks) and TSG-P (Packet Data) TSGs. The structure of TSN-X is not completely defined yet.

2.4.2 3GPP2 Deliverables

Like 3GPP, 3GPP2 does not produce standards but, instead, Technical Specifications (TSs) and Technical reports (TRs). The documents are created by the TSGs and approved by the SC. Then, they are submitted to the organizational partners to be submitted to their respective standardization processes.

3GPP2 TSs and TRs are numbered with a sequence of letters and digits that follows the scheme "A.Bxxxx-yyy-R" where "A" is a letter that represents the name of the TSG that delivers the document, "B" can be an "R" letter to indicate a TR or a requirements document, but it can also be an "S" letter to indicate a TS. "xxxx" is a sequential number allocated to the document. An optional "yyy" sequence of digits can further identify the chapter within a specification series. The "R" letter identifies the revision. The version number follows the specification and indicates a major and

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Appendix 9

3GPP MEMBERSHIP

2024-02-19 Version 1.1

New Query

Selected categories:

- **Individual Members (all partners)**

Choose csv separator : , export to csv file

INDIVIDUAL MEMBERS

Organization	Country	Partner
3in (Industrial Internet Innovation Center (Shanghai) Co.,Ltd.)	CHINA	CCSA
450connect GmbH (450connect GmbH)	GERMANY	ETSI
A.S.T.R.I.D. SA/NV (A.S.T.R.I.D. SA)	BELGIUM	ETSI
ABP, NRTA (Academy of Broadcasting Planning, NRTA)	CHINA	CCSA
ABS (Academy of Broadcasting Science)	CHINA	CCSA
AccelerComm Ltd (AccelerComm Ltd)	UNITED KINGDOM	ETSI
Acer Incorporated (Acer Incorporated)	TAIWAN, PROVINCE OF CHINA	ETSI
adare GmbH (adare GmbH)	GERMANY	ETSI
Airbus (Airbus DS SLC)	FRANCE	ETSI
albis-elcon system GermanyGmbH (albis-elcon system Germany GmbH)	GERMANY	ETSI
Alibaba (China) Group., Ltd. (Alibaba (China) Group., Ltd.)	CHINA	CCSA
Allot Ltd (Allot Ltd)	ISRAEL	ETSI
Altan Redes S.A.P.I. de C.V. (Altan Redes S.A.P.I. de C.V.)	MEXICO	ETSI
Amazon Web Services (Amazon Web Services EMEA SARL)	LUXEMBOURG	ETSI
Amdocs Software Systems Ltd (Amdocs Software Systems Limited)	IRELAND	ETSI
Analog Devices, Inc. (Analog Devices, Inc.)	UNITED STATES	ATIS
Anemone Technology (Anemone Technology)	DENMARK	ETSI
Anritsu Corporation (ANRITSU CORPORATION)	JAPAN	ARIB
Anritsu EMEA Ltd (Anritsu EMEA Ltd)	UNITED KINGDOM	ETSI
Anterix (Anterix)	UNITED STATES	ATIS
Apple (Apple Purchase Operation management)	CHINA	CCSA
Apple (Guizhou) (Apple Technology Services (Guizhou) Ltd.)	CHINA	CCSA

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Apple (UK) Limited **(Apple (UK) Limited)**	UNITED KINGDOM	ETSI
Apple (Ulanqab) **(Apple Technology Services (Ulanqab) Ltd)**	CHINA	CCSA
Apple AB Denmark **(Apple AB, filial AF Apple Aktiebolag, Sverige)**	DENMARK	ETSI
Apple Benelux B.V. **(Apple Benelux B.V.)**	NETHERLANDS	ETSI
Apple Benelux B.V. - Belgium **(Apple Benelux B.V. - Belgium Branch)**	BELGIUM	ETSI
Apple Computer Trading Co. Ltd **(Apple Computer Trading (Shanghai) Co., Ltd.)**	CHINA	CCSA
Apple Distribution Intl Ltd **(Apple Distribution International Limited)**	IRELAND	ETSI
Apple France **(Apple France)**	FRANCE	ETSI
Apple GmbH **(Apple GmbH)**	GERMANY	ETSI
Apple Inc **(Apple Inc)**	UNITED STATES	ATIS
Apple R&D **(Apple R&D)**	CHINA	CCSA
Apple Solutions **(Apple Solutions Consulting Services (Beijing) Company Limited)**	CHINA	CCSA
Apple Switzerland AG **(Apple Switzerland AG)**	SWITZERLAND	ETSI
Apple Trading **(Apple Trading (Shanghai) Company Limited)**	CHINA	CCSA
AQSACOM S.A.S. **(AQSACOM S.A.S.)**	FRANCE	ETSI
Arriver Software AB **(Arriver Software AB)**	SWEDEN	ETSI
ARTICLE19 **(ARTICLE19)**	UNITED KINGDOM	ETSI
ASELSAN **(ASELSAN Inc.)**	TÜRKIYE	ETSI
AsiaInfo **(AsiaInfo Technologies (China), Inc.)**	CHINA	CCSA
AsiaInfo Technologies Inc **(AsiaInfo Technologies Inc)**	CHINA	ETSI
ASR **(ASR Microelectronics Co., Ltd.)**	CHINA	CCSA
ASTRI **(Hong Kong Applied Science & Technology Research Institute)**	HONG KONG	ETSI
Astrome Technologies Pvt Lt **(Astrome Technologies Pvt Lt)**	INDIA	TSDSI
ASUSTEK COMPUTER (SHANGHAI) **(ASUSTEK COMPUTER (SHANGHAI) CO. LTD.)**	CHINA	CCSA
AT&T **(AT&T)**	UNITED STATES	ATIS
AT&T GNS Belgium SPRL **(AT&T Global Network Services Belgium SPRL)**	BELGIUM	ETSI
AT&T Labs, Inc **(AT&T Labs, Inc)**	UNITED STATES	ATIS
AT&T Services, Inc. **(AT&T Services, Inc.)**	UNITED STATES	ATIS
ATEME **(ATEME SA)**	FRANCE	ETSI
Avanti **(Avanti Communications Ltd)**	UNITED KINGDOM	ETSI
BAE Systems AI Ltd **(BAE Systems Applied Intelligence Limited)**	UNITED KINGDOM	ETSI
Baicells Technologies Co. Ltd **(Baicells Technologies Co. Ltd)**	CHINA	CCSA
BBC	UNITED KINGDOM	ETSI

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(BRITISH BROADCASTING CORPORATION)		
B-Com **(B-Com)**	FRANCE	ETSI
BDBOS **(Federal Agency for Public Safety Digital Radio)**	GERMANY	ETSI
BeammWave AB **(BeammWave AB)**	SWEDEN	ETSI
Beijing Lenovo Software Ltd. **(Beijing Lenovo Software Ltd.)**	CHINA	CCSA
BEIJING SAMSUNG TELECOM R&D **(BEIJING SAMSUNG TELECOM R&D CENTER)**	CHINA	CCSA
Beijing Xiaomi Electronics **(Beijing Xiaomi Electronics)**	CHINA	CCSA
Beijing Xiaomi Mobile Software **(Beijing Xiaomi Mobile Software Co., Ltd)**	CHINA	CCSA
Beijing Xiaomi Mobile Software **(Beijing Xiaomi Mobile Software Co., Ltd.)**	CHINA	ETSI
Beijing Xiaomi Software Tech **(Beijing Xiaomi Software Technology)**	CHINA	CCSA
Bell Mobility **(Bell Mobility)**	CANADA	ETSI
BfV **(Bundesamt für Verfassungsschutz)**	GERMANY	ETSI
Bharti Airtel Limited **(Bharti Airtel Limited)**	INDIA	TSDSI
BIFNC **(BRICS Institute of Future Network)**	CHINA	CCSA
BIPT **(BIPT - Belgian Institute for Postal services & Telecommunications)**	BELGIUM	ETSI
Bittium Wireless Ltd. **(Bittium Wireless Ltd.)**	FINLAND	ETSI
BJTU **(Beijing Jiaotong University)**	CHINA	CCSA
BKA **(Bundeskriminalamt)**	GERMANY	ETSI
Bluetest AB **(Bluetest AB)**	SWEDEN	ETSI
BMF **(Austrian Federal Ministry of Finance)**	AUSTRIA	ETSI
BMWK **(Bundesministerium für Wirtschaft und Klimaschutz)**	GERMANY	ETSI
BOCRA **(Botswana Communications Regulatory Authority)**	BOTSWANA	ETSI
BOUYGUES Telecom **(BOUYGUES Telecom)**	FRANCE	ETSI
Broadcom (EU) **(Broadcom Europe Ltd)**	UNITED KINGDOM	ETSI
BSI (DE) **(Bundesamt für Sicherheit in der Informationstechnik)**	GERMANY	ETSI
BSNL **(Bharat Sanchar Nigam Limited)**	INDIA	TSDSI
BT plc **(British Telecommunications plc)**	UNITED KINGDOM	ETSI
BTL Inc. **(BTL Inc.)**	CHINA	ETSI
BTPDI **(Beijing Telecom Planning & Designing Institute Co.,LTD.)**	CHINA	CCSA
BUPT **(Beijing University of Posts and Telecommunications)**	CHINA	CCSA
Bureau Veritas ADT **(Bureau Veritas Consumer Products Services (Hong Kong) Limited, Taoyuan Branch)**	TAIWAN, PROVINCE OF CHINA	ETSI
Bytedance **(Bytedance (Nanjing) Technology Research and Development Co., Ltd.)**	CHINA	CCSA
C Spire Wireless **(C Spire Wireless)**	UNITED STATES	ATIS

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CableLabs **(CableLabs)**	UNITED STATES	ETSI
Cadence Design Systems Inc. **(Cadence Design Systems Inc.)**	UNITED STATES	ETSI
CAICT. **(China Academy of Information and Communications Technology)**	CHINA	CCSA
CALTTA **(CALTTA TECHNOLOGIES CO., LTD.)**	CHINA	CCSA
Cambium Networks Limited **(Cambium Networks Limited)**	UNITED KINGDOM	ETSI
CAMBRIDGE CONSULTANTS LTD **(CAMBRIDGE CONSULTANTS LTD)**	UNITED KINGDOM	ETSI
CANON Research Centre France **(CANON Research Centre France SAS)**	FRANCE	ETSI
Casa Systems Inc. **(Casa Systems Inc.)**	UNITED STATES	ETSI
Catapult **(Satellite Applications Catapult Ltd)**	UNITED KINGDOM	ETSI
CATT **(China Academy of Telecommunications Technology (CATT))**	CHINA	ETSI
CATT **(China Academy of Telecommunication Technology - (Datang Telecom Technology and Industry Group))**	CHINA	CCSA
CBN **(China Broadcasting Network Group Corporation Ltd.)**	CHINA	CCSA
CCU **(National Chung Cheng University)**	TAIWAN, PROVINCE OF CHINA	ETSI
C-DAC **(Centre for Development of Advanced Computing)**	INDIA	TSDSI
C-DOT **(C-DOT)**	INDIA	TSDSI
CEA **(Commissariat à l'Energie Atomique et aux Energies Alternatives)**	FRANCE	ETSI
Cellnex **(Cellnex Telecom)**	SPAIN	ETSI
CENC **(CETC Network & Communications Group Co., Ltd.)**	CHINA	CCSA
CEPRI **(China Electric Power Research Institute)**	CHINA	CCSA
Ceragon Networks AS **(Ceragon Networks AS)**	NORWAY	ETSI
CERTH **(CENTRE FOR RESEARCH AND TECHNOLOGY HELLAS)**	GREECE	ETSI
cetecom advanced GmbH **(cetecom advanced GmbH)**	GERMANY	ETSI
CEWiT **(Centre of Excellence in Wireless Technology (CEWiT))**	INDIA	TSDSI
CGL **(CHAZAH GROUP LTD)**	UGANDA	ETSI
Charter Communications, Inc **(Charter Communications, Inc)**	UNITED STATES	ATIS
Chengdu OPPO Telecommunication **(Chengdu OPPO Mobile Telecommunications Corp., ltd.)**	CHINA	CCSA
CHENGDU TD TECH LTD. **(CHENGDU TD TECH LTD.)**	CHINA	CCSA
China Broadnet **(China Broadnet Mobile Communications Co., Ltd.)**	CHINA	CCSA
China Mobile (Hangzhou) Inf. **(China Mobile (Hangzhou) Information Technology Co., Ltd.)**	CHINA	CCSA
China Mobile (Suzhou) Software **(China Mobile (Suzhou) Software Technology Co., Ltd.)**	CHINA	CCSA
China Mobile Com. Corporation **(China Mobile Communications Corporation (CMCC))**	CHINA	CCSA
China Mobile E-Commerce Co. **(China Mobile E-Commerce Co.)**	CHINA	CCSA
China Mobile Group Device Co.	CHINA	CCSA

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(China Mobile Group Device Co., Ltd)		
China Mobile International Ltd **(China Mobile International Limited)**	CHINA	CCSA
China Mobile M2M Company Ltd. **(China Mobile M2M Company Ltd.)**	CHINA	CCSA
China Southern Power Grid Co. **(China Southern Power Grid Co., Ltd.)**	CHINA	CCSA
China Telecom Corporation Ltd. **(China Telecom Corporation Ltd.)**	CHINA	CCSA
China Telecommunications **(China Telecommunications Corporation)**	CHINA	ETSI
China Telecomunication Corp. **(China Telecomunication Corporation)**	CHINA	CCSA
China Unicom **(China Unicom)**	CHINA	CCSA
Chinatelecom Cloud **(China Telecom Cloud Technology Co., Ltd)**	CHINA	CCSA
Chongqing University **(Chongqing University)**	CHINA	CCSA
Chosun University **(Chosun University)**	KOREA (REPUBLIC OF)	TTA
CHTTL **(Chunghwa Telecommunication Laboratories, Chunghwa Telecommunication Co.)**	TAIWAN, PROVINCE OF CHINA	ETSI
CICT **(China Information Communication Technologies Group)**	CHINA	ETSI
CICT **(China Information Communication Technologies Group Corporation)**	CHINA	CCSA
CICT Mobile **(CICT Mobile Communication Technology Co., Ltd.)**	CHINA	CCSA
CICTCI **(CICT Connected and Intelligent Technologies Co., Ltd)**	CHINA	CCSA
CIS **(Center for Internet Security)**	UNITED STATES	ETSI
CISA ECD **(Cybersecurity and Infrastructure Security Agency (CISA) ECD)**	UNITED STATES	ATIS
Cisco Systems **(Cisco Systems)**	UNITED STATES	ATIS
Cisco Systems Belgium **(Cisco Systems Belgium)**	BELGIUM	ETSI
Cisco Systems France **(Cisco Systems France)**	FRANCE	ETSI
CITC **(CHINA INFORMATION TECHNOLOGY DESIGNING&CONSULTING INSTITUTE CO.,LTD.)**	CHINA	CCSA
CKH IOD UK LIMITED **(CKH IOD UK LIMITED)**	UNITED KINGDOM	ETSI
CMDI **(China Mobile Group Design Institute Co., Ltd)**	CHINA	CCSA
CNC **(CLAP-N-CLANK)**	JAPAN	ETSI
CNES **(CNES - Centre National d'Etudes Spatiales)**	FRANCE	ETSI
Cobham SatCom A/S **(Thrane & Thrane A/S)**	DENMARK	ETSI
Cognyte **(Cognyte Technologies Israel Ltd.)**	ISRAEL	ETSI
Cohere Technologies **(Cohere Technologies)**	UNITED STATES	ATIS
Comba **(Comba Network Systems Company Limited)**	CHINA	CCSA
Comcast **(Comcast)**	UNITED STATES	ATIS
Comprion GmbH **(Comprion GmbH)**	GERMANY	ETSI
Comtech Telecommunications Cor **(Comtech Telecommunications Corp)**	UNITED STATES	ATIS

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Consort Digital **(Consort Digital Private Limited)**	INDIA	ETSI
Continental Automotive **(Continental Automotive Technologies GmbH)**	GERMANY	ETSI
Convida Wireless **(Convida Wireless, LLC)**	UNITED STATES	ETSI
Cosmian **(Cosmian Tech SAS)**	FRANCE	ETSI
COSMOTE S.A. **(COSMOTE MOBILE TELECOMMUNICATIONS S.A.)**	GREECE	ETSI
CQUPT **(Chongqing University of Posts and Telecommunications)**	CHINA	CCSA
Crosscall **(Crosscall)**	FRANCE	ETSI
CSA **(Cyber Security Agency of Singapore)**	SINGAPORE	ETSI
CSCN **(CHINA SATELLITE NETWORK GROUP CO., LTD.)**	CHINA	CCSA
CSIRO **(Commonwealth Scientific and Industrial Research Organisation)**	AUSTRALIA	ETSI
cstconsultancy **(CyberSecurity & Technology Consultancy LTD)**	UNITED KINGDOM	ETSI
CTSI **(China Telecom System Integration Co., Ltd)**	CHINA	CCSA
CTTC **(Centre tecnologic de Telecomunicacions de Catalunya)**	SPAIN	ETSI
CU Digital Technology **(China Unicom Digital Technology Co., Ltd.)**	CHINA	CCSA
CUC **(Communication University of China)**	CHINA	CCSA
CUG **(China Unicom Global Limited)**	CHINA	CCSA
Cybercore **(Beijinig Cybercore Technology Co., Ltd.)**	CHINA	CCSA
Cygnusemi **(Cygnusemi)**	CHINA	CCSA
Czech Telecommunication Office **(Czech Telecommunication Office)**	CZECH REPUBLIC	ETSI
DAC-UPC **(Departamento de Arquitectura de Computadores de la Universidad Politecnica de Cataluna (DAC-UPC))**	SPAIN	ETSI
DanKook University **(DanKook University)**	KOREA (REPUBLIC OF)	TTA
DARS TELECOM S.L. **(DARS TELECOM S.L.)**	SPAIN	ETSI
Datang Linktester Technology **(Datang Linktester Technology Co., Ltd.)**	CHINA	CCSA
Datang Mobile Com. Equipment **(Datang Mobile Communications Equipment Co., Ltd)**	CHINA	CCSA
DEKRA **(DEKRA testing and Certification, S.A.U.)**	SPAIN	ETSI
Dell Technologies **(Dell Technologies)**	UNITED STATES	ATIS
DENSO CORPORATION **(DENSO CORPORATION)**	JAPAN	ARIB
Department of Telecom **(Department of Telecommunications)**	INDIA	TSDSI
Dept of Home Affairs **(Department of Home Affairs)**	AUSTRALIA	ETSI
Deutsche Telekom AG **(Deutsche Telekom AG)**	GERMANY	ETSI
DIGG **(Agency for Digital Government)**	SWEDEN	ETSI
DISA **(Defense Information Systems Agency)**	UNITED STATES	ATIS
Dish Network	UNITED STATES	ATIS

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(Dish Network)		
DLR **(Deutsches Zentrum für Luft- und Raumfahrt e.V.)**	GERMANY	ETSI
DOCOMO Beijing Labs **(DOCOMO Beijing Communications Laboratories Co., Ltd)**	CHINA	CCSA
DOCOMO Communications Lab. **(DOCOMO Communications Laboratories Europe GmbH)**	GERMANY	ETSI
Dolby France SAS **(Dolby France SAS)**	FRANCE	ETSI
Dolby Germany GmbH **(Dolby Germany GmbH)**	GERMANY	ETSI
Dolby Sweden AB **(Dolby Sweden AB)**	SWEDEN	ETSI
Douyin **(Beijing Douyin Information Service Co., Ltd.)**	CHINA	CCSA
DP **(DigitalPlatforms SpA)**	ITALY	ETSI
DSIT **(Department for Science, Innovation and Technology)**	UNITED KINGDOM	ETSI
DTCY **(Deloitte Tohmatsu Cyber LLC)**	JAPAN	TTC
DTS Licensing Limited **(DTS Licensing Limited)**	IRELAND	ETSI
EBU **(EBU - European Broadcasting Union)**	SWITZERLAND	ETSI
ECTL **(Enhanced Communications & Technologies Pvt Ltd)**	INDIA	TSDSI
EDF Recherche et Développement **(EDF)**	FRANCE	ETSI
EFORT **(Etudes et Formations en Telecommunication)**	FRANCE	ETSI
Elbit Systems **(Elbit Systems C4I and Cyber Ltd)**	ISRAEL	ETSI
Element Materials Technology **(Element Materials Technology Warwick Ltd)**	UNITED KINGDOM	ETSI
Elena **(Elena Geo Systems Pvt Ltd)**	INDIA	TSDSI
Embotech AG **(Embotech AG)**	SWITZERLAND	ETSI
EMITE **(EMITE Ingenieria S.L.)**	SPAIN	ETSI
ENENSYS **(ENENSYS Technologies SA)**	FRANCE	ETSI
Ericsson España S.A. **(Ericsson España S.A.)**	SPAIN	ETSI
Ericsson France S.A.S **(Ericsson France S.A.S)**	FRANCE	ETSI
Ericsson GmbH, Eurolab **(Ericsson GmbH, Eurolab - Unternehmensbereich Forschung und Entwicklung)**	GERMANY	ETSI
Ericsson Hungary Ltd **(Ericsson Hungary Ltd)**	HUNGARY	ETSI
Ericsson Inc. **(Ericsson Incorporated)**	UNITED STATES	ATIS
Ericsson India Private Limited **(Ericsson India Private Limited)**	INDIA	TSDSI
Ericsson Japan K.K. **(Ericsson Japan K.K.)**	JAPAN	ARIB
Ericsson Limited **(Ericsson Limited)**	UNITED KINGDOM	ETSI
Ericsson LM **(Ericsson Telefonaktiebolaget LM)**	SWEDEN	ETSI
Ericsson Telecomunicazioni SpA **(Ericsson Telecomunicazioni SpA)**	ITALY	ETSI
Ericsson-LG Co., LTD **(Ericsson-LG Co., LTD)**	KOREA (REPUBLIC OF)	TTA

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Erillisverkot **(Suomen Erillisverkot Oy)**	FINLAND	ETSI
ERNET India **(ERNET India)**	INDIA	TSDSI
ESA **(ESA - European Space Agency)**	NETHERLANDS	ETSI
E-SPACE **(E-SPACE SAS)**	FRANCE	ETSI
ESSEN INNOVATION **(ESSEN INNOVATION COMPANY LIMITED)**	CHINA	CCSA
E-surfing Digital **(E-surfing Digital Life Technology Co., Ltd)**	CHINA	CCSA
Esurfing IoT **(Esurfing IoT Tech Co., Ltd)**	CHINA	CCSA
ETELM **(Electronique Telematique ETELM)**	FRANCE	ETSI
Etherstack Wireless Limited **(Etherstack Wireless Limited)**	UNITED KINGDOM	ETSI
ETRI **(Electronics & Telecommunications Research Institute)**	KOREA (REPUBLIC OF)	TTA
ETS-Lindgren Europe **(ETS-Lindgren Europe)**	FINLAND	ETSI
EURECOM **(EURECOM)**	FRANCE	ETSI
Eurofins KCTL **(Eurofins KCTL Co. Ltd)**	KOREA (REPUBLIC OF)	ETSI
European Commission **(EC - European Commission)**	BELGIUM	ETSI
European Patent Organisation **(European Patent Organisation)**	GERMANY	ETSI
EUTC **(European Utilities Telecom Council (EUTC))**	BELGIUM	ETSI
Eutelsat Group **(Eutelsat S.A.)**	FRANCE	ETSI
EVE Compliancy Solutions **(EVE Compliancy Solutions)**	NETHERLANDS	ETSI
Everactive **(Everactive)**	UNITED STATES	ATIS
F5 **(F5, Inc.)**	UNITED STATES	ETSI
Fabasoft AG **(Fabasoft AG)**	AUSTRIA	ETSI
Facebook Japan G.K. **(Facebook Japan G.K.)**	JAPAN	ARIB
Fastweb S.p.A. **(Fastweb S.p.A.)**	ITALY	ETSI
FAU **(Friedrich-Alexander-Universität Erlangen-Nürnberg)**	GERMANY	ETSI
FBK **(Fondazione Bruno Kessler)**	ITALY	ETSI
FCC **(Federal Communications Commission)**	UNITED STATES	ATIS
Fiberhome Technologies Group **(Fiberhome Technologies Group)**	CHINA	CCSA
FirstNet **(FirstNet)**	UNITED STATES	ATIS
FORCE Technology **(FORCE Technology)**	DENMARK	ETSI
Ford **(Ford Motor Company)**	UNITED STATES	ETSI
Fraunhofer FOKUS **(Fraunhofer Institute for Open Communication Systems FOKUS)**	GERMANY	ETSI
Fraunhofer HHI **(Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute)**	GERMANY	ETSI
Fraunhofer IIS	GERMANY	ETSI

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(Fraunhofer Institut für Integrierte Schaltungen IIS)		
Frequentis AG **(Frequentis AG)**	AUSTRIA	ETSI
Fujitsu Limited **(Fujitsu Limited)**	JAPAN	ETSI
Fujitsu Limited. **(Fujitsu Limited.)**	JAPAN	TTC
Fujitsu Limited.. **(Fujitsu Limited..)**	JAPAN	ARIB
Futurewei **(Futurewei Technologies Inc.)**	UNITED STATES	ETSI
Futurewei Technologies **(Futurewei Technologies)**	UNITED STATES	ATIS
G+D MS **(Giesecke+Devrient Mobile Security Germany GmbH)**	GERMANY	ETSI
Gatehouse Satcom A/S **(Gatehouse Satcom A/S)**	DENMARK	ETSI
GDCNI **(Guangdong Communications and Networks Institute)**	CHINA	CCSA
GE Network Technologies, LLC **(GE Network Technologies, LLC)**	UNITED STATES	ATIS
GEESPACE **(ZHE JIANG GEESPACE TECHNOLOGY CO., LTD.)**	CHINA	CCSA
Gigaset Communications GmbH **(Gigaset Communications GmbH)**	GERMANY	ETSI
Gilat **(Gilat Satellite Networks Ltd)**	ISRAEL	ETSI
GLOBALSTAR Inc. **(GLOBALSTAR Inc.)**	UNITED STATES	ETSI
GM - ATCI **(General Motors - ATCI)**	ISRAEL	ETSI
Google Inc. **(Google Inc.)**	UNITED STATES	ATIS
Group 2000 **(Group 2000 Nederland B.V.)**	NETHERLANDS	ETSI
GTRC **(Georgia Tech Research Corporation)**	UNITED STATES	ETSI
GUANGDONG GENIUS TECHNOLOGY CO **(GUANGDONG GENIUS TECHNOLOGY CO., LTD.)**	CHINA	CCSA
Guangdong OPPO Mobile Telecom. **(Guangdong OPPO Mobile Telecommunications Corp., Ltd)**	CHINA	CCSA
GW **(Greenerwave)**	FRANCE	ETSI
HA/ST **(HARTING Stiftung & Co. KG)**	GERMANY	ETSI
Hangzhou Douku **(Hangzhou Douku Software Technologies Co., Ltd.)**	CHINA	CCSA
Hangzhou Mengyuxiang **(Hangzhou Mengyuxiang Network Technology Corp., Ltd.)**	CHINA	CCSA
Harman GmbH **(Harman Becker Automotive Systems GmbH)**	GERMANY	ETSI
HEAD acoustics GmbH **(HEAD acoustics GmbH)**	GERMANY	ETSI
Hewlett-Packard Enterprise **(Hewlett-Packard Enterprise)**	FRANCE	ETSI
HiSilicon Technologies Co. Ltd **(HiSilicon Technologies Co.Ltd)**	CHINA	CCSA
HISPASAT SA **(HISPASAT SA)**	SPAIN	ETSI
HOME OFFICE **(HOME OFFICE)**	UNITED KINGDOM	ETSI
Honda Motor Co., Ltd **(Honda Motor Co., Ltd)**	JAPAN	ARIB
Honor **(Honor Device Co., Ltd)**	CHINA	ETSI

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Honor **(Honor Device Co., Ltd.)**	CHINA	CCSA
Huawei Device Co., Ltd **(Huawei Device Co., Ltd)**	CHINA	CCSA
HUAWEI TECH. GmbH **(HUAWEI TECHNOLOGIES Duesseldorf GmbH)**	GERMANY	ETSI
Huawei Tech.(UK) Co.. Ltd **(Huawei Technologies (UK) Co., Ltd.)**	UNITED KINGDOM	ETSI
Huawei Technologies (Korea) **(Huawei Technologies (Korea))**	KOREA (REPUBLIC OF)	TTA
HUAWEI TECHNOLOGIES Co. Ltd. **(Huawei Technologies Co. Ltd.)**	CHINA	ETSI
HuaWei Technologies Co., Ltd **(HuaWei Technologies Co., Ltd)**	CHINA	CCSA
Huawei Technologies France **(Huawei Technologies France)**	FRANCE	ETSI
Huawei Technologies Japan K.K. **(Huawei Technologies Japan K.K.)**	JAPAN	TTC
HUAWEI Technologies Japan K.K. **(HUAWEI Technologies Japan K.K.)**	JAPAN	ARIB
Huawei Technologies R&D UK **(Huawei Technologies Research & Development (UK) Limited)**	UNITED KINGDOM	ETSI
Huawei Technologies Sweden AB **(Huawei Technologies Sweden AB)**	SWEDEN	ETSI
Huawei Telecommunication India **(Huawei Telecommunication (India) Co. Pvt. Ltd.)**	INDIA	TSDSI
HUGHES Network Systems Ltd **(HUGHES Network Systems Ltd)**	UNITED KINGDOM	ETSI
Husqvarna AB **(Husqvarna AB (publ))**	SWEDEN	ETSI
Hytera Communications Corp. **(Hytera Communications Corporation Limited)**	CHINA	CCSA
Hyundai Motor Company **(Hyundai Motor Company)**	KOREA (REPUBLIC OF)	TTA
IBM Europe **(IBM Europe)**	GERMANY	ETSI
ICS **(Institute for Communication Systems - University of Surrey)**	UNITED KINGDOM	ETSI
IDEMIA **(IDEMIA)**	FRANCE	ETSI
IDRBT **(Institute for Development and Research in Banking Technology)**	INDIA	TSDSI
III **(Institute for Information Industry)**	TAIWAN, PROVINCE OF CHINA	ETSI
IIIT Bangalore **(International Institute of Information Technology - Bangalore)**	INDIA	TSDSI
IIIT Naya Raipur **(International Institute of Information Technology, Naya Raipur)**	INDIA	TSDSI
IISc, Bangalore **(Indian Institute of Science, Bangalor)**	INDIA	TSDSI
IIT Bhilai **(Indian Institute of Technology Bhilai)**	INDIA	TSDSI
IIT Bombay **(Indian Institute of Technology Bombay)**	INDIA	TSDSI
IIT Delhi **(Indian Institute of Technology Delhi)**	INDIA	TSDSI
IIT Gandhinagar **(Indian Institute of Technology Gandhinagar)**	INDIA	TSDSI
IIT JODHPUR **(Indian Institute of Technology Jodhpur)**	INDIA	TSDSI
IIT Kanpur **(Indidan Institute of Technology Kanpur)**	INDIA	TSDSI
IIT Mandi **(Indian Institute of Technology Mandi)**	INDIA	TSDSI
IIT Patna	INDIA	TSDSI

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(Indian Institute of Technology Patna)		
IIT, Kharagpur **(IIT, Kharagpur)**	INDIA	TSDSI
IMDA **(Infocomm Media Development Authority)**	SINGAPORE	ETSI
IMU **(Istanbul Medipol University)**	TÜRKIYE	ETSI
Indian Institute of Tech (H) **(Indian Institute of Technology Hyderabad)**	INDIA	TSDSI
Indian Institute of Tech (M) **(Indian Institute of Technology Madras)**	INDIA	TSDSI
INFINEON TECHNOLOGIES **(Infineon Technologies)**	GERMANY	ETSI
Inmarsat **(Inmarsat)**	UNITED KINGDOM	ETSI
Institut Mines-Telecom **(Institut Mines-Telecom)**	FRANCE	ETSI
Institute VEDECOM **(Institute VEDECOM)**	FRANCE	ETSI
Intel **(Intel)**	UNITED STATES	ATIS
Intel Belgium SA/NV **(Intel Belgium SA/NV)**	BELGIUM	ETSI
Intel China Ltd. **(Intel China Ltd.)**	CHINA	CCSA
Intel Corporation (UK) Ltd **(Intel Corporation (UK) Ltd)**	UNITED KINGDOM	ETSI
Intel Corporation Italia SpA **(Intel Corporation Italia SpA)**	ITALY	ETSI
Intel Corporation SAS **(Intel Corporation SAS)**	FRANCE	ETSI
Intel Deutschland GmbH **(Intel Deutschland GmbH)**	GERMANY	ETSI
Intel Ireland **(Intel Ireland Ltd)**	IRELAND	ETSI
Intel K.K. **(Intel K.K.)**	JAPAN	ARIB
Intel Sweden AB **(Intel Sweden AB)**	SWEDEN	ETSI
Intel Technology India Pvt Ltd **(Intel Technology India Pvt. Ltd.)**	INDIA	TSDSI
Intel Technology Poland SP Zoo **(Intel Technology Poland SP Zoo)**	POLAND	ETSI
Intelsat **(Intelsat)**	UNITED STATES	ATIS
InterDigital Belgium. LLC **(InterDigital Belgium, LLC)**	BELGIUM	ETSI
InterDigital Canada **(InterDigital Canada)**	CANADA	ATIS
InterDigital Communications **(InterDigital Communications Corporation)**	UNITED STATES	ATIS
InterDigital Finland Oy **(InterDigital Finland Oy)**	FINLAND	ETSI
InterDigital France R&D, SAS **(InterDigital France R&D, SAS)**	FRANCE	ETSI
InterDigital New York **(InterDigital New York)**	UNITED STATES	ATIS
InterDigital Pennsylvania **(InterDigital Pennsylvania)**	UNITED STATES	ATIS
InterDigital, Europe, Ltd. **(InterDigital, Europe, Ltd.)**	UNITED KINGDOM	ETSI
InterDigital, Inc. **(InterDigital, Inc.)**	UNITED STATES	ETSI
Intersec **(Intersec SA)**	FRANCE	ETSI

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Intertek **(Intertek)**	UNITED KINGDOM	ETSI
IPCom GmbH & Co.KG **(IPCom GmbH & Co.KG)**	GERMANY	ETSI
IPLOOK **(IPLOOK Networks Co., Ltd.)**	CHINA	CCSA
iQoo **(iQoo Software Technology (Shanghai) Co., Ltd.)**	CHINA	CCSA
Iridium Satellite LLC **(Iridium Satellite LLC)**	UNITED STATES	ATIS
IRT Saint Exupery **(Institut de recherche technologique Saint Exupery)**	FRANCE	ETSI
ISED **(Innovation, Science and Economic Development Canada)**	CANADA	ETSI
ISRO **(Indian Space Research Organisation)**	INDIA	TSDSI
ISSDU **(Information Security Service Digital United Inc.)**	TAIWAN, PROVINCE OF CHINA	ETSI
ITL **(Innovative Technology Lab Co., Ltd)**	KOREA (REPUBLIC OF)	TTA
ITOCHU Techno-Solutions Corp **(ITOCHU Techno-Solutions Corporation)**	JAPAN	TTC
ITRI **(Industrial Technology Research Institute)**	TAIWAN, PROVINCE OF CHINA	ETSI
ITRON SAS **(ITRON SAS)**	FRANCE	ETSI
Ittiam System Pvt Ltd **(Ittiam System Pvt Ltd)**	INDIA	TSDSI
Japan Radio Co., Ltd **(Japan Radio Co., Ltd)**	JAPAN	ARIB
Jetflow **(Jetflow Technologies Co., Ltd)**	CHINA	CCSA
Jio **(Jio Estonia OÜ)**	ESTONIA	ETSI
JMA Wireless **(JMA Wireless)**	UNITED STATES	ATIS
John Deere GmbH & Co. KG **(John Deere GmbH & Co. KG)**	GERMANY	ETSI
Johns Hopkins University APL **(Johns Hopkins University Applied Physics Laboratory)**	UNITED STATES	ATIS
JSI GmbH **(JSI GmbH)**	GERMANY	ETSI
Juniper Networks **(Juniper Networks)**	UNITED STATES	ETSI
Kapsch TrafficCom AG **(Kapsch TrafficCom AG)**	AUSTRIA	ETSI
KDDI Corporation **(KDDI Corporation)**	JAPAN	TTC
KDDI Corporation **(KDDI Corporation)**	JAPAN	ARIB
Kepler **(Kepler Communications GmbH)**	GERMANY	ETSI
Keysight Technologies UK Ltd **(Keysight Technologies UK Ltd)**	UNITED KINGDOM	ETSI
KIPO **(Korean Intellectual Property Office)**	KOREA (REPUBLIC OF)	TTA
Kontron Transportation France **(Kontron Transportation France S.A.S)**	FRANCE	ETSI
Korea Testing Laboratory **(Korea Testing Laboratory)**	KOREA (REPUBLIC OF)	TTA
KPN N.V. **(Koninklijke KPN N.V.)**	NETHERLANDS	ETSI
KRRI **(Korea Railroad Research Institute)**	KOREA (REPUBLIC OF)	TTA
KT Corp.	KOREA (REPUBLIC OF)	TTA

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(KT Corporation)		
Kymeta Corporation **(Kymeta Corporation)**	UNITED STATES	ETSI
Kyocera Corporation **(Kyocera Corporation)**	JAPAN	ARIB
Kyonggi University **(Kyonggi University)**	KOREA (REPUBLIC OF)	TTA
Kyoto University **(Kyoto University)**	JAPAN	ETSI
L.M. Ericsson Limited **(L.M. Ericsson Limited)**	IRELAND	ETSI
L3Harris Technologies **(L3Harris Technologies)**	UNITED STATES	ATIS
Langbo **(Shanghai Langbo Communication Technology Co., Ltd.)**	CHINA	CCSA
Lansus **(Lansus Technologies Inc.)**	CHINA	CCSA
LEGRAND FRANCE **(LEGRAND FRANCE ISERE)**	FRANCE	ETSI
Lekha Wireless Solutions **(Lekha Wireless Solutions Pvt Ltd)**	INDIA	TSDSI
Lenovo (Beijing) Ltd **(Lenovo (Beijing) Ltd)**	CHINA	CCSA
Lenovo Future Communications **(Lenovo Future Communications Technology (Chongqing) Co., Ltd.)**	CHINA	CCSA
Lenovo Information Technology **(Lenovo (Beijing) Information Technology Co., Ltd.)**	CHINA	CCSA
Leonardo SpA **(Leonardo SpA)**	ITALY	ETSI
LG Electronics Deutschland **(LG Electronics Deutschland GmbH)**	GERMANY	ETSI
LG Electronics Finland **(LG Electronics Finland Lab Oy)**	FINLAND	ETSI
LG Electronics France **(LG Electronics France)**	FRANCE	ETSI
LG Electronics Inc. **(LG Electronics Inc.)**	KOREA (REPUBLIC OF)	TTA
LG Electronics Polska **(LG Electronics Polska Sp. z.o.o.)**	POLAND	ETSI
LG Electronics UK **(LG Electronics UK Ltd)**	UNITED KINGDOM	ETSI
LG Uplus **(LG Uplus)**	KOREA (REPUBLIC OF)	TTA
Ligado Networks **(Ligado Networks)**	UNITED STATES	ETSI
LKA Niedersachsen **(Landeskriminalamt Niedersachsen)**	GERMANY	ETSI
Locaila **(Locaila)**	UNITED STATES	ATIS
Lockheed Martin **(Lockheed Martin)**	UNITED STATES	ATIS
Lynk Global **(Lynk Global)**	UNITED STATES	ATIS
Magister Solutions Ltd **(Magister Solutions Ltd)**	FINLAND	ETSI
Maketh Secure Limited **(Maketh Secure Limited)**	UNITED KINGDOM	ETSI
MATRIXX Software **(MATRIXX Software, Inc.)**	UNITED STATES	ETSI
Mavenir **(Mavenir Systems, Inc)**	UNITED STATES	ETSI
MaxWave Micro **(MaxWave Microelectronics Ltd.)**	CHINA	CCSA
MediaTek (Chengdu) Inc. **(MediaTek (Chengdu) Inc.)**	CHINA	CCSA

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MediaTek (Hefei) Inc. **(MediaTek (Hefei) Inc.)**	CHINA	CCSA
MediaTek (Shenzhen) Inc. **(MediaTek (Shenzhen) Inc.)**	CHINA	CCSA
MediaTek (Wuhan) Inc. **(MediaTek (Wuhan) Inc.)**	CHINA	CCSA
MediaTek Beijing Inc. **(MediaTek Beijing Inc.)**	CHINA	CCSA
MediaTek Inc. **(MediaTek Incorporated)**	TAIWAN, PROVINCE OF CHINA	ETSI
Mediatek India Technology Pvt. **(Mediatek India Technology Pvt. Ltd.)**	INDIA	TSDSI
MediaTek Korea Inc. **(MediaTek Korea Inc.)**	KOREA (REPUBLIC OF)	TTA
MediaTek UK **(MTK Wireless Ltd)**	UNITED KINGDOM	ETSI
MeitY **(Ministry of Electronics & Information Technology)**	INDIA	TSDSI
Meizu Technology **(Meizu Technology)**	CHINA	CCSA
Mercedes-Benz AG **(Mercedes-Benz AG)**	GERMANY	ETSI
Mesaqin.com s.r.o (Ltd.) **(Mesaqin.com s.r.o (Ltd.))**	CZECH REPUBLIC	ETSI
Meta India **(Meta India Online Services Pvt Ltd)**	INDIA	TSDSI
Meta Ireland **(Meta Platforms Ireland Ltd.)**	IRELAND	ETSI
Meta USA **(Meta USA)**	UNITED STATES	ATIS
Microchip Technology, Inc. **(Microchip Technology, Inc.)**	UNITED STATES	ATIS
Microsoft Europe SARL **(Microsoft Europe SARL)**	FRANCE	ETSI
MidWave Wireless **(MidWave Wireless)**	UNITED STATES	ATIS
MIMIT **(Ministry of Enterprises and Made in Italy)**	ITALY	ETSI
MinEA **(Ministry of Economic Affairs and Climate Policy)**	NETHERLANDS	ETSI
MINECO **(MINISTRY OF ECONOMIC AFFAIRS AND DIGITAL TRANSFORMATION)**	SPAIN	ETSI
MINISTERE DE L'INTERIEUR **(MINISTERE DE L'INTERIEUR)**	FRANCE	ETSI
Ministère Economie et Finances **(Ministère de l'Economie et des Finances)**	FRANCE	ETSI
Ministry of Transport SR **(Ministry of Transport of the Slovak Republic)**	SLOVAKIA	ETSI
MITRE Corporation **(MITRE Corporation)**	UNITED STATES	ETSI
Mitsubishi Electric Co. **(Mitsubishi Electric Co.)**	JAPAN	ARIB
Mitsubishi Electric Corp **(Mitsubishi Electric Corporation)**	JAPAN	TTC
Mitsubishi Electric RCE **(Mitsubishi Electric R&D Centre Europe)**	FRANCE	ETSI
Motorola Mobile Com Technology **(MOTOROLA MOBILE COMMUNICATION TECHNOLOGY LTD.)**	CHINA	CCSA
Motorola Mobility España SA **(Motorola Mobility España SA)**	SPAIN	ETSI
Motorola Mobility France S.A.S **(Motorola Mobility France S.A.S)**	FRANCE	ETSI
Motorola Mobility Germany GmbH **(Motorola Mobility Germany GmbH)**	GERMANY	ETSI
Motorola Mobility UK Ltd.	UNITED KINGDOM	ETSI

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(Motorola Mobility UK Ltd.)		
Motorola Solutions Germany **(Motorola Solutions Germany GmbH)**	GERMANY	ETSI
Motorola Solutions UK Ltd. **(Motorola Solutions UK Ltd.)**	UNITED KINGDOM	ETSI
MTCC **(Mobile Technology Convergence Center)**	KOREA (REPUBLIC OF)	TTA
Murata Manufacturing Co Ltd. **(Murata Manufacturing Co Ltd.)**	JAPAN	ARIB
MVG Industries **(MVG Industries)**	FRANCE	ETSI
Nanjing Ericsson Panda Com Ltd **(NANJING ERICSSON PANDA COMMUNICATIONS LTD)**	CHINA	CCSA
Nanjing Weibo **(Nanjing Weibo Software Technology Co., Ltd.)**	CHINA	CCSA
National Instruments Corp. **(National Instruments Corporation)**	UNITED STATES	ETSI
National Radio Research Agency **(National Radio Research Agency)**	KOREA (REPUBLIC OF)	TTA
National Spectrum Consortium **(National Spectrum Consortium)**	UNITED STATES	ATIS
National Technical Assistance **(National Technical Assistance Centre)**	UNITED KINGDOM	ETSI
nbn co Limited **(nbn co Limited (ABN 86 136 533 741))**	AUSTRALIA	ETSI
NCI Agency **(NATO Communication and Information Agency)**	NETHERLANDS	ETSI
NCIS **(National Criminal Investigation Service)**	NORWAY	ETSI
NCSC **(National Cyber Security Centre)**	UNITED KINGDOM	ETSI
NDRE **(National Defence Radio Establishment)**	SWEDEN	ETSI
NEC Corporation **(NEC Corporation)**	JAPAN	ARIB
NEC Corporation **(NEC Corporation)**	JAPAN	ETSI
NEC Corporation. **(NEC Corporation)**	JAPAN	TTC
NEC Europe Ltd **(NEC Europe Ltd)**	UNITED KINGDOM	ETSI
NEC Telecom MODUS Ltd. **(NEC Telecom MODUS Ltd.)**	UNITED KINGDOM	ETSI
NEMERGENT **(NEMERGENT SOLUTIONS SL)**	SPAIN	ETSI
NERCDTV **(Shanghai National Engineering Research Center of Digital Television Co.,Ltd.)**	CHINA	CCSA
Netherlands Police **(Netherlands Police, Division MDC)**	NETHERLANDS	ETSI
Netscout Systems Inc. **(Netscout Systems Inc.)**	UNITED STATES	ETSI
Network Rail **(Network Rail infrastructure limited)**	UNITED KINGDOM	ETSI
New H3C Technologies Co., Ltd. **(New H3C Technologies Co., Ltd.)**	CHINA	CCSA
NextNav **(NextNav)**	UNITED STATES	ATIS
NHK **(NHK (Japan Broadcasting Corporation))**	JAPAN	ARIB
NICT **(National Institute of Information and Communications Technology)**	JAPAN	ARIB
Niral **(Niral Networks Private Limited)**	INDIA	TSDSI
NIST **(National Institute of Standards and Technology)**	UNITED STATES	ATIS

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Nkom **(Norwegian Communications Authority)**	NORWAY	ETSI
Nokia **(Nokia)**	UNITED STATES	ATIS
Nokia Belgium **(Nokia Bell N.V.)**	BELGIUM	ETSI
Nokia Corporation **(Nokia Corporation)**	FINLAND	ETSI
Nokia Denmark **(Nokia Denmark A/S)**	DENMARK	ETSI
Nokia France **(Nokia Networks France)**	FRANCE	ETSI
Nokia Germany **(Nokia Solutions and Networks GmbH & Co. KG)**	GERMANY	ETSI
Nokia Hungary **(Nokia Solutions and Networks Kft.)**	HUNGARY	ETSI
Nokia Japan **(Nokia Japan)**	JAPAN	ARIB
Nokia Korea **(Nokia Korea)**	KOREA (REPUBLIC OF)	TTA
Nokia Poland **(Nokia Solutions and Networks Sp. z.o.o.)**	POLAND	ETSI
Nokia Shanghai Bell **(Nokia Shanghai Bell Co., Ltd)**	CHINA	CCSA
Nokia Solutions & Networks (I) **(Nokia Solutions and Networks India Pvt. Ltd.)**	INDIA	TSDSI
Nokia UK **(Nokia UK Ltd.)**	UNITED KINGDOM	ETSI
Nordic Semiconductor ASA **(Nordic Semiconductor ASA)**	NORWAY	ETSI
NOVAMINT **(NOVAMINT)**	UNITED KINGDOM	ETSI
NTIA **(National Telecommunications and Information Administration)**	UNITED STATES	ATIS
NTPU **(National Taipei University)**	TAIWAN, PROVINCE OF CHINA	ETSI
NTT **(Nippon Telegraph and Telephone Corporation (NTT))**	JAPAN	TTC
NTT corporation **(Nippon Telegraph and Telephone Corporation)**	JAPAN	ETSI
NTT DOCOMO INC. **(NTT DOCOMO INC.)**	JAPAN	TTC
NTT DOCOMO INC.. **(NTT DOCOMO INC.)**	JAPAN	ARIB
NTT-AT Corp. **(NTT Advanced Technology Corporation)**	JAPAN	TTC
NTU **(National Taiwan University)**	TAIWAN, PROVINCE OF CHINA	ETSI
Nubia Technology Co.,Ltd **(Nubia Technology Co.,Ltd)**	CHINA	CCSA
NUFRONT **(Nufront (Beijing) Technology Co., Ltd.)**	CHINA	CCSA
NVIDIA **(NVIDIA Corporation)**	UNITED STATES	ATIS
NXP Semiconductors Netherlands **(NXP Semiconductors Netherlands B.V.)**	NETHERLANDS	ETSI
NYCU **(National Yang Ming Chiao Tung University)**	TAIWAN, PROVINCE OF CHINA	ETSI
Odido **(Odido Netherlands B.V.)**	NETHERLANDS	ETSI
Ofcom (CH) **(Ofcom (CH))**	SWITZERLAND	ETSI
Ofcom (U.K.) **(Ofcom - Office of Communications (U.K.))**	UNITED KINGDOM	ETSI
Oki Electric Industry Co. Ltd.	JAPAN	TTC

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(OKi Electric Industry Co., Ltd)		
Omnispace **(Omnispace)**	UNITED STATES	ATIS
ONE Media 3.0 LLC **(ONE Media 3.0 LLC)**	UNITED STATES	ATIS
one2many B.V. **(one2many B.V.)**	NETHERLANDS	ETSI
OnePlus **(OnePlus (Shenzhen) Technology Co., LTD)**	CHINA	CCSA
OPPO **(Guangdong OPPO Mobile Telecommunications Corp.,Ltd.)**	CHINA	ETSI
OPPO (chongqing) Intelligence **(OPPO (chongqing) Intelligence Technology Limited)**	CHINA	CCSA
OPPO Beijing **(Beijing OPPO Telecommunications Corp., ltd.)**	CHINA	CCSA
OptM Media **(OptM Media Solutions Private Limited)**	INDIA	TSDSI
OQTEC **(OQ TECHNOLOGY)**	LUXEMBOURG	ETSI
Oracle Corporation **(Oracle Corporation)**	UNITED STATES	ETSI
Orange **(Orange)**	FRANCE	ETSI
Orange Romania **(Orange Romania)**	ROMANIA	ETSI
Orange Spain **(France Telecom España S.A.U.)**	SPAIN	ETSI
Orange UK **(Orange Brand Services Ltd)**	UNITED KINGDOM	ETSI
ORS **(Österreichische Rundfunksender GmbH & Co KG)**	AUSTRIA	ETSI
OTD_US **(OTD_US)**	UNITED STATES	ATIS
OTECH **(OTECH Germany GmbH)**	GERMANY	ETSI
P.I. WORKS **(P.I. WORKS TR BILISIM HIZMETLERI A.S.)**	TÜRKIYE	ETSI
Panasonic Holdings Corporation **(Panasonic Holdings Corporation)**	JAPAN	ARIB
PANASONIC R&D Center Germany **(PANASONIC R&D Center Germany GmbH)**	GERMANY	ETSI
PCCW Global B.V. **(PCCW Global B.V.)**	FRANCE	ETSI
Peking University **(Peking University)**	CHINA	CCSA
Pengcheng laboratory **(Pengcheng laboratory)**	CHINA	CCSA
Peraton Labs **(Peraton Labs)**	UNITED STATES	ATIS
Philips International B.V. **(Philips International B.V.)**	NETHERLANDS	ETSI
PHY Wireless **(PHY Wireless)**	UNITED STATES	ATIS
PIDS **(PIDS)**	NETHERLANDS	ETSI
Pivotal Commware **(Pivotal Commware)**	UNITED STATES	ATIS
Plan-S **(Plan S Uydu ve Uzay Teknolojileri A.S)**	TÜRKIYE	ETSI
PML **(Purple Mountain Laboratories: Networking, Communications and Security)**	CHINA	CCSA
Polaris Wireless **(Polaris Wireless)**	UNITED STATES	ATIS
Polisen **(Polismyndigheten)**	SWEDEN	ETSI

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POST Luxembourg **(POST Luxembourg)**	LUXEMBOURG	ETSI
Prasar Bharati **(Prasar Bharati)**	INDIA	TSDSI
Proximus Plc **(Proximus Plc)**	BELGIUM	ETSI
PSCE **(Public Safety Communication Europe Forum)**	BELGIUM	ETSI
PT PORTUGAL SGPS SA **(PT Portugal SGPS SA)**	PORTUGAL	ETSI
PTS **(Swedish Post and Telecom Authority)**	SWEDEN	ETSI
Public Safety Canada **(Public Safety Canada)**	CANADA	ETSI
Qihoo 360 **(Qihoo 360 Technology Co., Ltd.)**	CHINA	CCSA
Qorvo **(Qorvo)**	UNITED STATES	ETSI
Qualcomm Austria RFFE GmbH **(Qualcomm Austria RFFE GmbH)**	AUSTRIA	ETSI
QUALCOMM Europe Inc. - Italy **(QUALCOMM Europe Inc. - Italy Branch Office)**	ITALY	ETSI
QUALCOMM Europe Inc. - Spain **(QUALCOMM Europe Inc. - Spain Branch Office)**	SPAIN	ETSI
Qualcomm Finland RFFE Oy **(Qualcomm Finland RFFE Oy)**	FINLAND	ETSI
Qualcomm France **(Qualcomm France SARL)**	FRANCE	ETSI
Qualcomm Germany **(Qualcomm Germany GmbH)**	GERMANY	ETSI
Qualcomm Incorporated **(Qualcomm Incorporated)**	UNITED STATES	ATIS
Qualcomm India Pvt Ltd **(Qualcomm India Pvt Ltd)**	INDIA	TSDSI
QUALCOMM JAPAN LLC. **(QUALCOMM JAPAN LLC.)**	JAPAN	ARIB
Qualcomm Korea **(Qualcomm Korea)**	KOREA (REPUBLIC OF)	TTA
Qualcomm Tech. Netherlands B.V **(Qualcomm Technologies Netherlands B.V.)**	NETHERLANDS	ETSI
Qualcomm Technologies Int **(Qualcomm Technologies International, Ltd)**	UNITED KINGDOM	ETSI
Qualcomm Technologies Ireland **(QT Technologies Ireland Limited)**	IRELAND	ETSI
Quanray **(Shanghai Quanray Electronics Co., Ltd.)**	CHINA	CCSA
Quectel **(Quectel Wireless Solutions Co., Ltd.)**	CHINA	CCSA
RadiSys **(RadiSys Inc.)**	CANADA	ETSI
Rakuten Mobile, Inc **(Rakuten Mobile, Inc)**	JAPAN	ARIB
RATEL **(Regulatory Authority For Electronic Communications and Postal Services)**	SERBIA	ETSI
Reliance Jio **(Reliance Jio)**	INDIA	TSDSI
RICHTEK KOREA **(RICHTEK KOREA)**	KOREA (REPUBLIC OF)	TTA
RISE **(RISE Research Institutes of Sweden)**	SWEDEN	ETSI
ROBERT BOSCH GmbH **(ROBERT BOSCH GmbH)**	GERMANY	ETSI
Rogers Communications Canada **(Rogers Communications Canada Inc.)**	CANADA	ETSI
ROHDE & SCHWARZ	GERMANY	ETSI

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(ROHDE & SCHWARZ GmbH & Co.KG)		
Ruijie Network Co. Ltd **(Ruijie Network Co. Ltd)**	CHINA	CCSA
SAICT **(Shenzhen Academy of Information and Communication Technology)**	CHINA	CCSA
Samsung Electronics Co., Ltd **(Samsung Electronics Co., Ltd.)**	KOREA (REPUBLIC OF)	TTA
Samsung Electronics Czech **(Samsung Electronics Czech)**	CZECH REPUBLIC	ETSI
Samsung Electronics France SA **(Samsung Electronics France SA)**	FRANCE	ETSI
Samsung Electronics GmbH **(Samsung Electronics GmbH)**	GERMANY	ETSI
Samsung Electronics Iberia SA **(Samsung Electronics Iberia SA)**	SPAIN	ETSI
Samsung Electronics Nordic AB **(Samsung Electronics Nordic AB)**	SWEDEN	ETSI
Samsung Electronics Polska **(Samsung Electronics Polska)**	POLAND	ETSI
Samsung Guangzhou Mobile R&D **(Samsung Guangzhou Mobile R&D Center)**	CHINA	CCSA
Samsung Nanjing **(Samsung Electronic (China) R&D Center)**	CHINA	CCSA
Samsung R&D Institute India **(Samsung R&D Institute India - Bangalore Pvt. Ltd)**	INDIA	TSDSI
SAMSUNG R&D INSTITUTE JAPAN **(SAMSUNG R&D INSTITUTE JAPAN)**	JAPAN	ARIB
Samsung R&D Institute UK **(Samsung R&D Institute UK)**	UNITED KINGDOM	ETSI
Samsung Research America **(Samsung Research America)**	UNITED STATES	ATIS
Samsung Shenzhen **(Samsung Network R&D Center-Shenzhen)**	CHINA	CCSA
Sandvine Incorporated **(Sandvine Incorporated)**	CANADA	ETSI
Sanechips **(Sanechips Technology Co. , Ltd.)**	CHINA	CCSA
Sateliot **(Satelio IoT Services)**	SPAIN	ETSI
Schindler **(Schindler Elevator Ltd)**	SWITZERLAND	ETSI
SDI Squared **(SDI Squared LLC)**	UNITED STATES	ETSI
Sectra Communications AB **(Sectra Communications AB)**	SWEDEN	ETSI
Security Service **(Swedish Security Service)**	SWEDEN	ETSI
Semtech Neuchatel SA **(Semtech Neuchatel SA)**	SWITZERLAND	ETSI
Sennheiser Electronic GmbH **(Sennheiser Electronic GmbH & Co. KG)**	GERMANY	ETSI
Sensus UK **(Sensus UK Systems Limited)**	UNITED KINGDOM	ETSI
Sepura Ltd **(Sepura Limited)**	UNITED KINGDOM	ETSI
Sequans Communications **(Sequans Communications)**	FRANCE	ETSI
SES S.A. **(SES S.A.)**	LUXEMBOURG	ETSI
SETS **(Society for Electronic Transactions and Security)**	INDIA	TSDSI
SEU **(Southeast University)**	CHINA	CCSA
SGDSN **(Secrétariat Général de la Défense et de la Sécurité Nationale (SGDSN))**	FRANCE	ETSI

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SGITG **(State Grid Information & Telecommunication Group Co., Ltd.)**	CHINA	CCSA
SGS Wireless **(SGS Wireless)**	UNITED KINGDOM	ETSI
Shanghai Chen Si Electronics **(Shanghai Chen Si Electronics Technology Co., Ltd)**	CHINA	CCSA
Shanghai Jiao Tong University **(Shanghai Jiao Tong University)**	CHINA	CCSA
Shanghai Tejet Com Technology **(Shanghai Tejet Communications Technology Co., Ltd.)**	CHINA	CCSA
SHARP Corporation **(SHARP Corporation)**	JAPAN	ARIB
Shenzhen Heytap **(Shenzhen Heytap Technology Corp.,Ltd.)**	CHINA	CCSA
ShenZhen Zhongxing Shitong **(ShenZhen Zhongxing Shitong Tech. Co.,Ltd.)**	CHINA	CCSA
SIA **(Shenyang Institute of Automation, Chinese Academy of Sciences)**	CHINA	CCSA
Siemens AG **(Siemens AG)**	GERMANY	ETSI
Signalchip Innovations Pvt. **(Signalchip Innovations Pvt. Ltd.)**	INDIA	TSDSI
SIST **(Slovenian Institute for Standardisation)**	SLOVENIA	ETSI
Sisvel **(Sisvel International S.A.)**	LUXEMBOURG	ETSI
SK Telecom **(SK TELECOM)**	KOREA (REPUBLIC OF)	TTA
SKY Perfect JSAT Corporation **(SKY Perfect JSAT Corporation)**	JAPAN	ARIB
Skylo Technologies **(Skylo Technologies)**	UNITED STATES	ATIS
Skyworks Solutions Inc. **(Skyworks Solutions Inc.)**	UNITED STATES	ETSI
SmarterMicro Inc. **(Smarter Microelectronics(Guangzhou) Co.,Ltd)**	CHINA	CCSA
SnT - University of Luxembourg **(Interdisciplinary Centre for Security, Reliability and Trust/University of Luxembourg)**	LUXEMBOURG	ETSI
SoftBank Corp. **(SoftBank Corp.)**	JAPAN	ARIB
Softel Systems **(Softel Systems Pty Ltd)**	AUSTRALIA	ETSI
Softil Ltd **(Softil Ltd)**	ISRAEL	ETSI
Sony Corporation **(Sony Corporation)**	JAPAN	ARIB
Sony Europe B.V. **(Sony Europe B.V.)**	UNITED KINGDOM	ETSI
Sony Group Corporation **(Sony Group Corporation)**	JAPAN	ARIB
Sooktha Consulting Pvt Ltd **(Sooktha Consulting Pvt Ltd)**	INDIA	TSDSI
Southern Linc. **(Southern Linc.)**	UNITED STATES	ATIS
Southwest Jiaotong university **(Southwest Jiaotong university)**	CHINA	CCSA
SpaceX **(SpaceX Netherlands B.V)**	NETHERLANDS	ETSI
Spark NZ Ltd **(Spark NZ Ltd)**	NEW ZEALAND	ATIS
Spirent Communications **(Spirent Communications)**	UNITED STATES	ETSI
Sporton International Inc **(Sporton International Inc.)**	TAIWAN, PROVINCE OF CHINA	ETSI
Spreadtrum Communications	CHINA	CCSA

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(Spreadtrum Communications (Shanghai) Co., Ltd.)		
SRTC **(The State Radio_monitoring_center Testing Center)**	CHINA	CCSA
SS8 **(SS8 Networks Inc.)**	UNITED STATES	ETSI
SSNS **(Special Service for the National Security of Hungary)**	HUNGARY	ETSI
Starpoint **(Beijing Starpoint Technology Company Limited)**	CHINA	CCSA
STE IDIRECT IRELAND LTD **(ST ENGINEERING IDIRECT (IRELAND) LIMITED)**	IRELAND	ETSI
Stellar **(Stellar telecommunications)**	FRANCE	ETSI
STMicroelectronics **(STMicroelectronics International NV)**	SWITZERLAND	ETSI
Sumitomo Elec. Industries, Ltd **(Sumitomo Electric Industries, Ltd.)**	JAPAN	ARIB
SUTD **(Singapore University of Technology and Design)**	SINGAPORE	ETSI
Swift Navigation **(Swift Navigation)**	UNITED STATES	ATIS
SWISSCOM **(SWISSCOM SA)**	SWITZERLAND	ETSI
SWR **(Südwestrundfunk)**	GERMANY	ETSI
SyncTechno Inc. **(SyncTechno Inc.)**	KOREA (REPUBLIC OF)	TTA
Syniverse **(M/s Syniverse Technologies Services India Pvt. Ltd.)**	INDIA	TSDSI
TA **(Tantra Analyst)**	UNITED STATES	ETSI
Tait Europe Limited **(Tait Europe Limited)**	AUSTRIA	ETSI
Tata Elxsi Limited. **(Tata Elxsi Limited.)**	INDIA	TSDSI
TCL **(Shenzhen TCL New Technology Company Ltd.)**	CHINA	CCSA
TCS **(TATA Consultancy Services)**	INDIA	TSDSI
TD Tech Ltd **(TD Tech Ltd)**	CHINA	CCSA
TDF **(TDF SAS)**	FRANCE	ETSI
Tech Mahindra Limited **(Tech Mahindra Limited)**	INDIA	TSDSI
Tejas Network Limited **(Tejas Network Limited)**	INDIA	TSDSI
Tektronix GmbH **(Tektronix GmbH)**	GERMANY	ETSI
TELECOM ITALIA S.p.A. **(Telecom Italia S.p.A.)**	ITALY	ETSI
Telefonica Germany GmbH **(Telefónica Germany GmbH & Co OHG)**	GERMANY	ETSI
TELEFONICA S.A. **(TELEFONICA S.A.)**	SPAIN	ETSI
Telekom Deutschland GmbH **(Telekom Deutschland GmbH)**	GERMANY	ETSI
TELENOR ASA **(Telenor ASA)**	NORWAY	ETSI
Telesat International Limited **(Telesat International Limited)**	UNITED KINGDOM	ETSI
Telia Company AB **(Telia Company AB)**	SWEDEN	ETSI
Telit Communications S.p.A. **(Telit Communications S.p.A.)**	ITALY	ETSI

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Telstra Limited **(Telstra Limited)**	AUSTRALIA	ETSI
TELUS **(TELUS)**	CANADA	ATIS
Tencent **(Shenzhen city Tencent computer system Co. Ltd.)**	CHINA	CCSA
Tencent Cloud **(Tencent cloud computing Beijing Co., Ltd)**	CHINA	CCSA
Teradyne **(Teradyne)**	UNITED STATES	ATIS
TerreStar Solutions Inc. **(TerreStar Solutions Inc.)**	CANADA	ATIS
Texas A&M University **(Texas A&M University)**	UNITED STATES	ETSI
TEXAS Instruments **(Texas Instruments France)**	FRANCE	ETSI
THALES **(THALES)**	FRANCE	ETSI
THURAYA TELECOM CO. **(THURAYA TELECOMMUNICATIONS COMPANY)**	UNITED ARAB EMIRATES	ETSI
Tiami Networks **(Tiami Networks)**	UNITED STATES	ATIS
TII **(Technology Innovation Institute)**	UNITED ARAB EMIRATES	ETSI
T-Mobile Austria GmbH **(T-Mobile AUSTRIA GmbH)**	AUSTRIA	ETSI
T-Mobile Polska S.A. **(T-Mobile Polska Spolka Akcyjna)**	POLAND	ETSI
T-Mobile USA **(T-Mobile USA, Inc.)**	UNITED STATES	ETSI
T-Mobile USA Inc. **(T-Mobile USA Inc.)**	UNITED STATES	ATIS
TNO **(TNO)**	NETHERLANDS	ETSI
Tongji University **(Tongji University)**	CHINA	CCSA
Toshiba **(Toshiba)**	UNITED KINGDOM	ETSI
TOWE Wireless **(Sushi TOWE Wireless Testing (Shenzhen) Co.,Ltd.)**	CHINA	ETSI
TOYOTA Info Technology Center **(TOYOTA Info Technology Center USA, Inc.)**	UNITED STATES	ETSI
TOYOTA MOTOR CORPORATION **(TOYOTA MOTOR CORPORATION)**	JAPAN	TTC
TRAFICOM **(The Finnish Transport and Communications Agency)**	FINLAND	ETSI
Trafikverket **(Trafikverket)**	SWEDEN	ETSI
Transsion Holdings **(Transsion Holdings)**	CHINA	CCSA
TransUnion **(TransUnion)**	UNITED STATES	ATIS
Trimble **(Trimble)**	UNITED STATES	ATIS
Tron Future Tech Inc. **(Tron Future Tech Inc.)**	TAIWAN, PROVINCE OF CHINA	ETSI
TTP plc **(TTP plc)**	UNITED KINGDOM	ETSI
Turk Telekomunikasyon A.S. **(Turk Telekomunikasyon A.S.)**	TÜRKIYE	ETSI
TURKCELL **(Turkcell Iletisim Hizmetleri A.S.)**	TÜRKIYE	ETSI
U.S. Department of Defense **(U.S. Department of Defense)**	UNITED STATES	ATIS
U.S. Department of Transport.	UNITED STATES	ATIS

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(U.S. Department of Transportation)		
U.S. National Security Agency **(US National Security Agency)**	UNITED STATES	ATIS
Uangel **(Uangel Corporation)**	KOREA (REPUBLIC OF)	TTA
ubinexus **(Beijing Ubinexus Technology Development Co., Ltd)**	CHINA	CCSA
u-blox AG **(u-blox AG)**	SWITZERLAND	ETSI
UESTC **(University of Electronic Science and Technology of China)**	CHINA	CCSA
UL VS Ltd **(UL VS Ltd)**	UNITED KINGDOM	ETSI
UMA **(Universidad de Malaga)**	SPAIN	ETSI
umlaut **(umlaut communications GmbH)**	GERMANY	ETSI
UNIBO **(ALMA MATER STUDIORUM Università di Bologna)**	ITALY	ETSI
UniBw M **(University of the Bundeswehr Munich)**	GERMANY	ETSI
Unicom Broadband Online **(Unicom Broadband Online Co., Ltd.)**	CHINA	CCSA
Unicompay **(Unicompay Co., Ltd.)**	CHINA	CCSA
Union Inter. Chemins de Fer **(Union Internationale des Chemins de Fer)**	FRANCE	ETSI
Union Telephone Company **(Union Telephone Company)**	UNITED STATES	ATIS
Unisoc **(Unisoc (Shanghai) Technologies Co., Ltd.)**	CHINA	CCSA
Unisoc Beijing **(Beijing Unisoc Communications Technology Co., Ltd.)**	CHINA	CCSA
UPV/EHU **(Universidad del País Vasco/Euskal Herriko Unibertsitatea)**	SPAIN	ETSI
US Cellular Corporation. **(US Cellular Corporation/TDS.)**	UNITED STATES	ATIS
UTIMACO TS GmbH **(UTIMACO TS GmbH)**	GERMANY	ETSI
UTokyo **(The University of Tokyo)**	JAPAN	ETSI
Vaan Megam **(Vaan Megam Networks)**	INDIA	TSDSI
Valeo **(Valeo Telematik und Akustik GmbH)**	GERMANY	ETSI
VALID SOLUCIONES TECNOLÓGICAS **(VALID SOLUCIONES TECNOLÓGICAS S.A.U)**	SPAIN	ETSI
Valid8 **(Valid8.com, Inc.)**	UNITED STATES	ETSI
Vanchip **(Vanchip (Tianjin) Technology Co., Ltd.)**	CHINA	CCSA
Verizon Denmark **(Verizon Denmark A/S)**	DENMARK	ETSI
Verizon Spain **(Verizon Spain S.L.)**	SPAIN	ETSI
Verizon Sweden **(Verizon Sweden Aktiebolag 2116)**	SWEDEN	ETSI
Verizon Switzerland AG **(Verizon Switzerland AG)**	SWITZERLAND	ETSI
Verizon UK Ltd **(Verizon UK Ltd)**	UNITED KINGDOM	ETSI
Vestel **(Vestel Elektronik Sanayi ve Ticaret A.S)**	TÜRKIYE	ETSI
ViaSat Satellite Holdings Ltd **(ViaSat Satellite Holdings Ltd)**	UNITED KINGDOM	ETSI

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VIAVI Solutions **(Viavi Solutions UK Ltd.)**	UNITED KINGDOM	ETSI
vivo Mobile Com. (Chongqing) **(vivo Mobile Communication (Chongqing) Co., Ltd)**	CHINA	CCSA
vivo Mobile Communication (H) **(vivo Mobile Communication (Hangzhou) Co., Ltd.)**	CHINA	CCSA
vivo Mobile Communication (S) **(vivo Mobile Communication (Shenzhen) Co., Ltd.)**	CHINA	CCSA
vivo Mobile Communication Co., **(vivo Mobile Communication Co., Ltd)**	CHINA	CCSA
VIVO TECH GmbH **(VIVO TECH GmbH)**	GERMANY	ETSI
Vodafone GmbH **(Vodafone GmbH)**	GERMANY	ETSI
VODAFONE Group Plc **(Vodafone Group Plc)**	UNITED KINGDOM	ETSI
Vodafone Ireland Plc **(Vodafone Ireland Plc)**	IRELAND	ETSI
Vodafone Italia SpA **(Vodafone Italia SpA)**	ITALY	ETSI
Vodafone Romania S.A. **(Vodafone Romania S.A.)**	ROMANIA	ETSI
Vodafone Telekomünikasyon A.S. **(Vodafone Telekomünikasyon A.S.)**	TÜRKIYE	ETSI
VoiceAge Corporation **(VoiceAge Corporation)**	CANADA	ETSI
Volkswagen AG **(Volkswagen AG)**	GERMANY	ETSI
VSENS **(Unicom Vsens Telecommunications Co., Ltd)**	CHINA	CCSA
VTT **(VTT Technical Research Centre of Finland)**	FINLAND	ETSI
WE Certification Oy **(WE Certification Oy)**	FINLAND	ETSI
Wiliot Ltd. **(Wiliot Ltd.)**	ISRAEL	ETSI
WILUS Inc. **(WILUS Inc.)**	KOREA (REPUBLIC OF)	TTA
Wipro GE **(Wipro GE Healthcare Private Limited)**	INDIA	TSDSI
Wisig Networks Pvt Ltd **(Wisig Networks Pvt Ltd)**	INDIA	TSDSI
Wuhan CICT Mobile **(Wuhan CICT Mobile Communications Technology Co., Ltd.)**	CHINA	CCSA
Wuhan Hongxin Technical **(Wuhan Hongxin Technical Services Co., Ltd.)**	CHINA	CCSA
Wuhan Hongxin Technology **(Wuhan Hongxin Technology Development Co., Ltd.)**	CHINA	CCSA
Xiaomi Communications **(Xiaomi Communications)**	CHINA	CCSA
Xiaomi EV Technology **(Xiaomi EV Technology Co., Ltd.)**	CHINA	CCSA
Xiaomi Technology **(Xiaomi Technology)**	CHINA	CCSA
Xidian University **(Xidian University)**	CHINA	CCSA
Xilinx Ireland **(Xilinx Ireland)**	IRELAND	ETSI
Zhejiang Lab **(Zhejiang Lab)**	CHINA	CCSA
Zhejiang University **(Zhejiang University)**	CHINA	CCSA
ZITiS **(Central Office for Information Technology in the Security Sector)**	GERMANY	ETSI
Zollkriminalamt (ZKA)	GERMANY	ETSI

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(Zollkriminalamt (ZKA))		
ZONSON **(ZONSON SAMRT AUTO CORPORATION)**	CHINA	CCSA
ZTE **(ZTE Telecom India Pvt Ltd)**	INDIA	TSDSI
ZTE Corporation **(ZTE Corporation)**	CHINA	CCSA
ZTE Corporation **(ZTE Corporation)**	CHINA	ETSI
ZTE FRANCE SASU **(ZTE FRANCE SASU)**	FRANCE	ETSI
ZTE Italia **(ZTE Italia S.R.L)**	ITALY	ETSI
ZTE JAPAN K.K. **(ZTE JAPAN K.K..)**	JAPAN	TTC
ZTE Japan K.K. **(ZTE Japan K.K.)**	JAPAN	ARIB
ZTE Korea Limited **(ZTE Korea Limited)**	KOREA (REPUBLIC OF)	TTA
ZTE Photonics **(ZTE Photonics Technology Co.,Ltd.)**	CHINA	CCSA
ZXNE **(ZXNE CORPORATION)**	CHINA	CCSA

Total : 781 Individual Members

Any comments or problems with this application? Please let us know...

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Appendix 10

The Wayback Machine - https://web.archive.org/web/20170510190630/http://www.3gpp.org:80/about-3gpp/3gpp-faqs

3GPP FAQs

3GPP FAQs

Questions about 3GPP Membership
Questions about 3GPP email exploder lists
Questions about Legal Matters
Questions about 3GPP Specifications
Questions about Technical Specification Group/Working Group
Questions about Documents and TSG/WG Meetings
Questions about Work Items and Deliverables
Miscellaneous
Technical topics

Questions about 3GPP Membership

Who can become an Individual Member of 3GPP and how much does it cost?
Who may participate in 3GPP meetings?
Who shall fill in the 3GPP Individual Member Application form?
What shall I do if a 3GPP company or official contact details change?
What are the different membership categories?
Who may become an observer?
Who may become a Guest Member and do guests have to pay any fees?
Who can apply for market representative Partnership?
Can an ETSI Observer become an Individual Member of 3GPP?
Can an ETSI Applicant apply for 3GPP Membership?
Can an ETSI Member apply for 3GPP Guest status?

Questions about 3GPP email exploder lists

Are there discussion archives for the 3GPP exploder lists?
How do I subscribe to the 3GPP exploder lists?

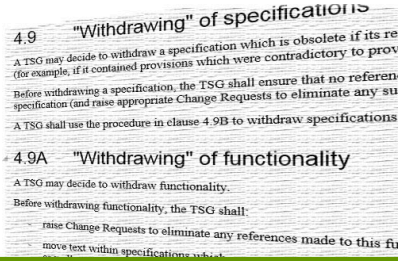
Questions about Legal Matters

What is the 3GPP IPR Policy?
What is the 3GPP policy on licensing?
Who owns the Technical Specifications and the Technical Reports approved by 3GPP?
Are meeting contributions to ETSI TC SMG publically available?
Is permission needed to use the 3GPP logo in marketing collaterals or on a web site?
Can I use computer code included with a 3GPP TS to implement a product?

Questions about 3GPP Specifications

How do I create the next Release version of a TS or TR?
Where can the rules, protocols or software needed to develop applications for UMTS be found?
What is the correlation between Stage 1, Stage 2 and Stage 3?
Are the 3GPP specifications produced only in word?
Which group works with specifications covering the use of the GSM codec (either in C or Java based)?
Where can I find documents produced by the GSM MoU Group / GSM Association?
Where would I find a document (e.g. UMTS 30.03 version 3.1.0) which does not appear on the status list?
Where are all the Change Requests (CRs) located?
Where are all the current ETSI SMG specs located?
Which group works on Physical Layer aspects of UMTS/LTE?
Where can I find the list of Abstract syntax notation (ASN.1) object identifiers?
Where can I find the 3GPP Confidentiality and Integrity algorithms?
What is a Release - how does specification version numbering work?
Where can I find information on the current status of 3GPP specifications?
What is the system for numbering specifications?
What is the meaning of the text at the foot of the TS/TR cover page?

Questions about Technical Specification Group/Working Group


4.9 "Withdrawing" of specifications

A TSG may decide to withdraw a specification which is obsolete if its re
(for example, if it contained provisions which were contradictory to prov

Before withdrawing a specification, the TSG shall ensure that no referen
specification (and raise appropriate Change Requests to eliminate any su

A TSG shall use the procedure in clause 4.9B to withdraw specifications

4.9A "Withdrawing" of functionality

A TSG may decide to withdraw functionality.

Before withdrawing functionality, the TSG shall:

- raise Change Requests to eliminate any references made to this fu
- move text within specifications

Proposal to withdraw TR 38.900
(channel model for spectrum above 6GHz)
at RAN#76

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Who are the TSG/WG Officials and Support team and where can I find their contact details?
Where can I find the Terms of Reference for my TSG/WG?
May I become an Official?
Where are my TSG/WGs documents stored?

Questions about Documents and TSG/WG Meetings

How do I register for a meeting?
Who can submit a change proposal on any 3GPP specifications to 3GPP?
If a change proposal is submitted how long does it take for it to get approved?
How to get a user name and password for "Reserve a Document Number"?
How do I obtain a document number for my contribution?
Where can I download documents for an upcoming meeting?
Where can I find a temporary document template?

Questions about Work Items and Deliverables

What is my role when my TSG/WGs has to approve a deliverable?
What are the different types of deliverables?
Can I write an 3GPP Document myself?
Do I and my company have to support my TSG/WGs Work Items?

Miscellaneous

Do I need a password and user name to access the 3GPP Web site ?
Can you give me information about which companies manufacture particular types of equipment. (...)
How can I determine when a meeting contribution document (TDoc) became publicly available?
Is it possible to determine the date and time of publication of a particular version of a 3GPP specification?

Technical topics

What formalities do I have to go through to get type approval for terminal equipment in Europe? Is there a single point of contact? What standards does my equipment need to conform to in order that I can place it on the market?
Where can I find a list of technical terms and abbreviations used in 3GPP documents?
What is the difference between a SIM and a USIM? What is a UICC?
I have transferred a video file from my phone to my PC. Where can I find a player for 3gp files?
Where can I find the specification of the SIM Lock feature?

Who can become an Individual Member of 3GPP and how much does it cost?

Individual Members are by definition members of the Organizational Partners of 3GPP. This means that members of standardization bodies such as ETSI, ARIB, TTA, TTC, ATIS and CCSA have a right to take part in 3GPP. If your company becomes an ETSI member, please be informed that for participation in 3GPP you need to pay 3 units of contribution as a minimum except SMEs, Users, Universities, Public Research Bodies who should pay 2 units (instead of 1).

ETSI Members' and associate members' fees are calculated by class. The class is derived from the member company's annual ECRT band (Electronics Communications Related Turnover) – see ECRT definition.
Each class corresponds to a number of units. This number determines the contribution payable.

Example: If your organization declares an annual ECRT of up to 135€ million, you would need to pay 2 Units of Contribution (corresponding to 9380€ per year) plus an additional UoC for participation in 3GPP of 3380€ (see fees table). Members joining ETSI during the 2nd half of the year benefit from a 50% rebate on the membership fee of the current year. In this case, you would pay 12760€ minus 50% = 6380€ for yyyy.

Who may participate in 3GPP meetings?

To attend a 3GPP meeting, you must be a 3GPP Individual Member (i.e., you must be a Member of one of the Organizational Partners involved in the project; ARIB, CCSA, ETSI, ATIS, TTA , TTC or TSDSI). A non-member company should seek membership with one of the above partners to be eligible to contribute and participate at 3GPP Meetings.

Who shall fill in the 3GPP Individual Member Application form?

The person legally responsible for the requesting company shall fill in the form.

What shall I do if a 3GPP company or official contact details change?

All changes of correspondence should be notified to ETSI Membership and 3GPPMembership.
In case of change of official contact an ETSI Online (EOL) account will be created for the new contact.
Please note that as official contact person you can view and modify your personal and organization's contact details via the "Manage my membership" web interface.

What are the different membership categories?

The different membership categories of 3GPP are described in Article 4 of the 3GPP Working Procedures.

Who may become an observer?

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The status of Observer may be granted by the Organizational Partners to an entity which has the qualifications to become a future Partner (see also 3GPP Working Procedures Article 10)

Who may become a 3GPP Guest Member and do guests have to pay any fees?

The 3GPP Guest status is for potential Individual Members who may be granted permission to participate in 3GPP for a maximum period of 6 months. Guest status is granted on a case-by-case basis by the Organizational Partners (see also 3GPP Working Procedures Article 10). If you like to apply for a Guest status, please complete the on-line 3GPP Application form.

No membership fees are requested for Guest applications. The Guest status is a one time only membership which is used to enable a company to decide whether or not they wish to become a full member (by joining one of the Partners).

Who can apply for market representative Partnership?

Organisation who have the ability to offer market advice to 3GPP and to bring into 3GPP a consensus view of market requirements (e.g., services, features and functionality) falling within the 3GPP scope (see also 3GPP Working Procedures, Article 7).

Can an ETSI Observer become an Individual Member of 3GPP?

An ETSI Observer cannot become an Individual Member of 3GPP. An ETSI Observer may "observe" all activities, but their participation is limited to the ETSI General Assembly only. Therefore, ETSI Observers have no participation rights in 3GPP. ETSI Observers have access to ETSI documentation and of course to 3GPP documentation since that is openly published on the web.

3GPP does have it's own category called "Observer" but that is entirely different and is used for potential Partners.

Can an ETSI Applicant apply for 3GPP Membership?

YES, an ETSI Applicant means that your request to become an ETSI Member will be addressed (and normally approved) at the next General Assembly and that the company has specified they want to participate in 3GPP activities. See also above regarding 3GPP fees.

Can an ETSI Member apply for 3GPP Guest status?

Yes, any ETSI Member can apply for a 3GPP Guest status by filling in the on-line 3GPP Application form.

Are there discussion archives for the 3GPP exploder lists?

Yes! To see the complete list please have a look here: Home page of listserv and scroll down until you find the list you are interested in. For example, the archives for the main RAN email list.

How do I subscribe to the 3GPP exploder lists?

All 3GPP email exploder lists can be found at list.3gpp.org. In order to subscribe to any of the lists, scroll down until you find the list you are interested in, then click on the link and on the right side of the page you will find Subscribe or Unsubscribe. Click on the link and follow the simple instructions. Delegates who already have an ETSI username and password should use the list management application on the ETSI site.

What is the 3GPP IPR Policy?

The 3GPP Organizational Partners have agreed that their IPR policies should be respected and that their respective members should be encouraged to declare "their willingness to grant licenses on fair, reasonable terms and conditions and on non discriminatory basis" (Article 3.1 of the Third Generation Partnership Project). For more information, look here >>>

The above-mentioned principles are further reflected in Article 55 of the 3GPP Working Procedures which request that each Individual Members should declare "at the earliest opportunity, any IPR which they believe to be essential, or potentially essential, to any work ongoing within 3GPP".

What is the 3GPP policy on licensing?

Some aspects of 3GPP systems are covered by essential Intellectual Property Rights (IPR) - that is, patented technologies without which equipment cannot be implemented. The IPR vests in - i.e. the patents are held by - individual companies, and not by 3GPP itself or any of its Organizational Partners (OPs). All Individual Members of 3GPP abide by the IPR policies of the OP to which they belong; all such policies are broadly similar see also "What is the 3GPP IPR Policy", and require IPR holders to make licences available to all third parties, whether or not they are 3GPP Individual Members, under fair, reasonable and non-discriminatory (FRAND) terms.

Neither 3GPP nor its component OPs offer an IPR search service. It is the responsibility of each manufacturer / system implementor to seek and obtain its own licenses from the individual IPR holders. For more information, and a guide to the IPRs declared to each 3GPP OP, look here>>>

Who owns the Technical Specifications and the Technical Reports approved by 3GPP?

According to the Article 3.2.2 of the Third Generation Partnership Project Agreement, the 3GPP Organizational Partners jointly own copyright on the Technical Specifications and the Technical Reports approved by 3GPP.

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Are meeting contributions to ETSI TC SMG publically available?

ETSI TC SMG meeting documents can be found on the ETSI docbox file server. Access is limited to bona fide representatives of ETSI member organizations. These, together with early versions of the GSM specifications, have been gathered together into a set of DVDs "A Technical History of GSM" available to ETSI members via the ETSI WEB store.

The GSM standardization work was transferred from CEPT to ETSI in 1991. TC SMG was closed at meeting #32 and TC MSG created to continue the work. Like almost all ETSI Technical Committees, participation in TC SMG and its working groups was open to all ETSI member organizations. That is, any bona fide representative of an ETSI member was free to participate. Exceptionally, other individuals could participate by express invitation of the chairman. Each meeting report contains a list of participants with their corporate affiliations.

Until the late 1990s, all meeting documents were circulated in paper form. Electronic files started to take over from paper in around 1997. Meeting documents ("TDocs") were distributed by post (later, by fax) in batches prior to the meeting, to those persons registered as regular participants in SMG or the appropriate working group, and many more documents were produced during the course of the meeting itself. Although a provision existed (and still exists) in the context of the IPR Policy for contributors to place restrictions on the distribution of TDocs via a formal notification at the time the document was provided, this was seldom if ever invoked. In the absence of such a condition, all TDocs were free of any restriction on subsequent distribution. Thus no restriction has ever been placed on how meeting participants dispose of the documents subsequent to their distribution before, during, or after the meeting. There were no non-disclosure agreements.

ETSI maintains a paper archive of the SMG TDocs, and bona fide representatives of current ETSI members can, by appointment, make an accompanied search of the archives. This facility extends to members which may not have been members at the time the document was originally produced.

TC-approved versions of ETSI “deliverables” (see ETSI Directives for formal definition of this term) would have been transferred by the support officer of the committee to the secretariat team responsible for publishing ETSI deliverables. That team would have made cosmetic (non-technical) modifications to the draft deliverables before issuing them. Depending on the type of “deliverable”, those documents would have been issued via National Standards Organizations (NSOs) either for immediate publication, or first via either a one-step or two-step national public enquiry and vote process prior to final publication by ETSI. In ETSI parlance, “publication” of a deliverable is the final step in the development cycle of a technical standard, and has a precise meaning. That meaning is not “making publically available”, since draft deliverables released for public enquiry or for vote are "publically available" but not yet "published".

If the confidentiality conditions described above had been imposed on a TDoc by its authors, if the text of that TDoc was in due course incorporated into an ETSI "deliverable", then those conditions are regarded as annulled from the date on which the deliverable is published.

Collections of TDocs / meeting reports have from time to time been made available to ETSI members in CD or DVD form, look here >>>

Is permission needed to use the 3GPP logo in marketing collaterals or on a web site?

ETSI (European Telecommunications Standards Institute) is the sole owner of the following acronyms:

ETSI,
DECT,
UMTS,
3GPP and
TIPHON,

as well as the ETSI, TIPHON, 3GPP and LTE logos. ETSI Members are authorized to use these Trade Marks in accordance with Collective Letter 1943. Authorization is needed to use the above mentioned acronyms and logos.

For further information contact the ETSI Legal Team or see http://www.3gpp.org/about-3gpp/legal-matters/logo-use.

Can I use computer code included with a 3GPP TS to implement a product?

Yes, but read this clause carefully. Some 3GPP Technical Specifications include computer code such as ASN.1 or XML (protocols), ANSI-C language (codecs), ...; and some include test vectors (codecs) for verifying implementations. These are published to allow users of these TSs to implement real-world products. No permission is required from 3GPP or its Organizational Partners (OPs) to use this code in the design of products - e.g. to compile the C to implement a codec in machine code.

Nevertheless, there may be essential IPR involved with such a design, and implementers are obliged to seek licences from IPR owners to use that technology. See also What is the 3GPP policy on licensing?

Moreover, the copyright of all 3GPP TSs and TRs vests jointly by all the 3GPP OPs. Other than for in-house copies for the purpose of further development of the 3GPP standard or for product design purposes, etc. you may not reproduce any part of a 3GPP TS or TR without seeking permission from 3GPP (e.g. from the ETSI Legal Team): use the procedure described on the legal area of this site. This means that you must not provide verbatim copies of source code (or lightly modified copies) without seeking permission from 3GPP.

Finally, you are reminded that 3GPP TSs and TRs have no legal status, and you should not design products directly to them. See the advice notice on the cover page of every 3GPP TS and TR. Instead, use the technically identical publication of one of the OPs.

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How do I create the next Release version of a TS or TR?

There are three ways of upgrading a Release X spec to Release X+1:

1. Write a CR to the latest Release X version to incorporate technical changes to satisfy a Release X+1 work item, and on the cover sheet showing the WI code for that work item and the Release code for Release X+1. If the CR is approved at TSG level, this will automatically create the first instance of the next Release of the spec.
2. Make a specific request to the TSG to upgrade the latest version of the spec from Release X to Release X+1. This might be needed if the functionalities of the two Releases diverge, though backwards-incompatibility is to be avoided if possible.
3. Do nothing. If a spec has survived unchanged throughout the period during which Release X+1 was developed, when Release X+1 is frozen, all such specs will automatically be upgraded from Release X to Release X+1 without technical change.

Where can the rules, protocols or software needed to develop applications for UMTS be found?

A good place to start is on the 3GPP website, and particularly the specifications list.

What is the correlation between Stage 1, Stage 2 and Stage 3?

A three-stage methodology as defined in ITU T Recommendation I.130 is applied in 3GPP according TR 21.900 clause 4.1:

> Stage 1 is an overall service description from the user's standpoint.
> Stage 2 is an overall description of the organization of the network functions to map service requirements into network capabilities.
> Stage 3 is the definition of switching and signalling capabilities needed to support services defined in stage 1.

Are the 3GPP specifications produced only in word?

The 3GPP specs are published as ETSI deliverables, and these are available in PDF form http://www.etsi.org/standards-search. But you can download a free Word viewer (i.e. read only) from the Microsoft web site. PDF is inherently secure (more so than html, in fact), and because WordViewer is very simple (it can not handle macros, for example), it is pretty safe too. ETSI has no plans at present to publish specifications in plain text or in html.

Which group works with specifications covering the use of the GSM codec (either in C or Java based)?

The SMG STC SMG11 and 3GPP SA4 specifications, available from http://www.3gpp.org, respectively deal with this. It gives you a list of specifications via the status list (look for the GSM specs in the MS-Access database at : http://www.3gpp.org/ftp/Information/Databases/Spec_Status/)

and you can then download the specs you need. If you do not have an ETSI EOL account, you can download the ETSI equivalent standards from http://www.etsi.org/standards-search.

Where can I find documents produced by the GSM MoU Group / GSM Association?

These documents are not available via 3GPP or its Organizational Partners. You must address this question to the GSM Association.

Where would I find a document (e.g. UMTS 30.03 version 3.1.0) which does not appear on the 3GPP Status List?

Look at http://www.3gpp.org/DynaReport/3003U.htm. It is a document stemming from the initial TC-SMG studies on UMTS, not a product of 3GPP. It was, in fact, published as an ETSI deliverable, TR 101 112, and this may be downloaded via http://www.etsi.org/standards-search.

Where are all the Change Requests (CRs) located?

The CR database can be downloaded under: http://www.3gpp.org/ftp/Information/Databases/Change_Request/

Or you select the specification under:
http://www.3gpp.org/specifications/79-specification-numbering

The information is classed by series so it is very easy to locate the particular specification which interests you. After selecting a series and a specification you will find a line "Change Requests for this spec: click here." which provides a web list of the CRs for this specification.

If, for example, you are looking for CRs on GSM 08.18 then you would use this link:
http://www.3gpp.org/ftp/Specs/html-info/0818-CRs.htm
http://www.3gpp.org/DynaReport/0818http://www.3gpp.org/ftp/Specs/html-info/0818-CRs.htm
-CRs.htm

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Where are all the current ETSI SMG specs located?

All the ETSI SMG specs are located here archives for the GSM documentation. An ETSI On-Line account is needed to access these documents. You can apply for an ETSI online account.
In general, the cross-referencing between GSM and ETSI deliverables, and between 3GPP and ETSI deliverables may be found at http://webapp.etsi.org/key/queryform.asp

Which group works on Physical Layer aspects of UMTS/LTE?

The radio aspects are standardised in TSG-RAN. The technical work is done in the 5 Working Groups of RAN (WG1 radio layer 1, WG2 radio layer 2/3, WG3 interfaces, WG4 RF measurements, WG5 Mobile Terminal Conformance Testing).
So Physical Layer aspects are addressed by TSG RAN WG1. Their UMTS specifications are numbered 25.2xx and their LTE specifications are numbered 36.2xx.
The temporary documents (meeting documents etc.) of WG1 are stored on ftp://ftp.3gpp.org/TSG_RAN/WG1_RL1.

Where can I find the list of Abstract syntax notation (ASN.1) object identifiers?

The expandable list of object identifiers is available here >>>. To see the formal definition of the object identifiers, see the document cited on the right. The tree is not necessarily complete; further extensions may be included in the referenced document. For more information look here >>>.

Where can I find the 3GPP Confidentiality and Integrity algorithms?

The 3GPP Confidentiality and Integrity algorithms F8 & F9 (KASUMI) have been developed through the collaborative efforts of the 3GPP Organizational Partners. For more information and in order to download the algorithms look here >>>.

What is a Release - how does specification version numbering work?

To meet new market requirements, 3GPP specifications are continually being enhanced with new features. In order to provide developers with a stable platform for implementation while at the same time allowing the addition of new features, the 3GPP uses a system of parallel "releases". For more information look here >>>.

Where can I find information on the current status of 3GPP specifications?

New versions of many 3GPP specifications are made available shortly after the 3GPP TSG plenary meetings which take place four times a year (March, June, September and December). In order to identify what the current version is or and how to find information about older versions of specifications look here >>>.

What is the system for numbering specifications?

All 3G and GSM specifications have a 3GPP specification number consisting of 4 or 5 digits. (e.g., 09.02 or 29.002). For a more complete description and examples look here >>>.

Who are the TSG/WG Officials and Support team and where can I find their contact details?

Each TSG/WG has a Chairman, up to two Vice-Chairmen (three Vice-Chairmen) in the case of TSGs and a secretary who is a member of the support team. From the 3GPP structural organization page, click on the TSG or WG of interest to reach its home page. From there, click on the "officials" entry in the table.

Where can I find the Terms of Reference for my TSG/WG?

The current Terms of Reference for each TSG/WG appear on the web pages of each TSG/WG.

May I become an Official?

The TSG Chairman and Vice Chairmen are elected by the Technical Specification Group from amongst the Individual Member representatives. Each TSG can elect a maximum of two Vice Chairmen. Once elected, these candidates are proposed to the PCG for appointment.
The Working Group Chairman and Vice Chairmen are elected by the Working Group from amongst the Individual Member representatives. Each Working Group can elect a maximum of two Vice Chairmen.
A candidate for TSG or Working Group election shall provide a letter of support from his Organization and nominations may be made up to the point when an election takes place.
The TSG Chairman and Vice-Chairmen shall be appointed by the PCG on the proposal of the TSG.
The Chairman and the Vice-Chairmen shall be appointed for a two year term of office. The Chairman and Vice-Chairmen may be appointed for one further consecutive term. If, at the end of a Chairman or Vice Chairmans second term, no other candidates are available, the Chairman or Vice Chairmen may be appointed for a further term.
Chairman and Vice Chairmen should not be from the same region, Organizational Partner, or from the same group of companies, unless no other candidate is available.
Successive Chairmen should not be from the same Organizational Partner, the same region or from the same group of companies, unless no other candidate is available

How do I register for a meeting?

To register to any 3GPP TSG/WG meeting, please go to the Meetings tab on the 3GPP Ultimate portal (3GU) at https://portal.3gpp.org/, log in with your EOL credentials, and click "Not registered" in the Registration column of the meeting in question. When registration is complete, you will receive a confirmation email. Keep this email, it contains important information,

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without which you will not be able to confirm your presence!

Once you are at the meeting you have to "Check-in" to confirm your presence at the meeting itself. To check in, open the registration confirmation email and click on the check-in URL. This will take you to a page on the local meeting server (not the Internet). After you have checked in, your token will be sent to the main 3GPP server, and the web-based participants list will now show "yes" in the Participated column. Obviously you must be physically present at the meeting venue to be able to reach the local server.

Who can submit a change proposal on any 3GPP specifications to 3GPP?

Any bona fide representative of any 3GPP Individual Member (see list via the first sentence at http://www.3gpp.org/membership) can present a technical contribution - for example, a Change Request - to any 3GPP TSG or WG meeting.

If a change proposal is submitted how long does it take for it to get approved?

The usual procedure is that the responsible Working Group will examine a CR and agree it (or revise it until such time as it be agreeable - or not!). Having been agreed at WG level, it is packaged with related CRs and sent to the TSG plenary, where it will be discussed if necessary and then - if appropriate - formally approved. Within a matter a few weeks at most, a new version of the Specification is produced, which includes the contents of the TSG-approved CR.

TSGs meet every three months, and WGs meet at least once between each TSG meeting (sometimes two or occasionally even more times). Thus from inception of a CR to its approval is normally a matter of a few weeks, depending on the point in the meeting schedule of the WG and TSG concerned.

How to get a user name and password for "Reserve a Document Number"?

You need to request an EOL account via: http://webapp.etsi.org/createaccount/form.asp (username and password will then be sent to you by separate email).

How do I obtain a document number for my contribution?

Delegates wishing to make contributions must first obtain a document number either from the secretary or automatically via an on-line application "Automatic Document Numbering (ADN)" which is used by some groups.

You need a user name and password to "Reserve a Document Number" (see above).

Where can I download documents for an upcoming meeting?

Each TSG/WG has a specific area allocated on the 3GPP ftp server. For example TSG SA look here ftp://ftp.3gpp.org/tsg_sa/TSG_SA/. It is advisable for delegates attending a meeting to download the documents available prior to the meeting from the ftp server and onto their personal computers.

Where can I find a temporary document template?

The document template is made available by each TSG/WG in the meeting respective folder on the ftp server (see above).

What is my role when my TSG/WGs has to approve a deliverable?

Approval of Technical Specifications and Technical reports by a TSG shall normally be by consensus. Where consensus cannot be achieved in the TSG a vote may be taken.
When Technical Specifications and Technical Reports become sufficiently stable, they shall be put under change control of the relevant TSG. The further elaboration of these Technical Specifications and Technical Reports shall be achieved by Change Requests (CRs) to be approved by the TSG.

What are the different types of deliverables?

3GPP shall prepare, approve and maintain documents known as Technical Specifications and Technical Reports. Such documents shall be drawn up by the TSGs and shall, following approval at that level, be submitted to the participating Organizational Partners to be submitted to their respective standardization processes.

Can I write an 3GPP Document myself?

Why not?! If you wish to propose a deliverable then bring it to the attention of your chairman and the other members of the TSG/WG in order to discuss the subject.
Each proposed new Work Item shall be supported by at least four Individual Members, and their names shall be recorded in the Work Item definition prepared for the TSG approval. One or more persons shall be named as Rapporteur for the proposed Work Item, and the Rapporteur shall act as the prime contact point on technical matters and for information on progress throughout the drafting phases. The supporting Individual Members are expected to contribute to and progress the new work item throughout the drafting phases.
In addition to the above, TSGs shall approve new Work Items, giving all essential parameters. The proposal shall be entered into the 3GPP work programme, clearly marked as a new entry, for which a unique reference identity shall be allocated.

Do I and my company have to support my TSG/WGs Work Items?

Neither you or your company is obliged to support the work items of your TSG/WG, however it is normal that if you and your company are supporting members of a Work Item that you be in agreement with their work and will normally support the production of the related deliverable.

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Do I need a password and user name to access the 3GPP Web site ?

No password is needed to access any information on the 3GPP Web site, all information is openly published.

Can you give me information about which companies manufacture particular types of equipment. Or about what services are available on particular networks?

No. The 3GPP Support Team must remain neutral and must not show bias to any of its Individual Members. Such information may be available from the Global Mobile Suppliers Association (www.gsacom.com) where you will find a statistics area which could be of help.

How can I determine when a meeting contribution document (TDoc) became publicly available?

TDoc numbers start to be allocated some weeks before a 3GPP meeting, and the authors then create them and they or the group's secretary uploads them to the public file server as soon as possible. Some may have been distributed to the group's members in draft form for review, using the email exploder, in advance of the final one becoming available, and for some groups, it is normal to distribute even the final TDoc via the exploder, where the secretary picks it up and copies it to the public server. Typically, at the start of a meeting, around 50% of the TDocs are available.

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 unpoliced.

During the meeting, further TDocs are created, mostly revisions of ones available before the meeting, but probably some brand new ones too – for example, outgoing liaison statements. These are uploaded to the meeting server, but (until recently) may or may not be uploaded to the public server during the meeting. (Since 2014, for most meetings, meeting server contents have been mirrored to a folder on the public server, but these copies are deleted shortly after the end of the meeting.)

Soon after the end of the meeting – same day, or at worst within a few days – the TDocs created during the meeting are uploaded by the secretary to the public server. Occasionally, some matters from the meeting cannot be resolved until maybe one week later, and these might result in some very late TDocs which are produced well after the end of the meeting, and thus uploaded onto the public server correspondingly late.

When the secretary copies from the meeting server (or from his own PC) to the public server, he may opt to only copy the missing files (i.e. the new ones), which is the best approach; or he may decide to overwrite everything and thus do a complete refresh of the files on the public server, which will now get an upload date/time-stamp of the new upload. This latter approach is now deprecated but has sometimes happened; you can detect this most easily when a meeting shows the same date/time-stamp for all TDoc files.

In cases such as this, one has to descend to greater subterfuge to narrow down the likely "public availability" moment. The zip file for a TDoc typically contains a Word file which has a particular date/time-stamp, which puts an absolute limit on the earliest moment that the TDoc could have become available in that form.

Searching the group's email exploder archive (http://list.etsi.org/scripts/wa.exe?INDEX) on or about the suspected production date gleaned from the file date/time-stamp may well reveal the message in which the TDoc was first distributed, or perhaps the message by which the group's secretary announced that it was available on the server. Note however that this technique does not reveal any earlier versions of the TDoc which might have been circulated, either as draft versions of the identified TDoc or as other Tdocs which were ultimately revised into the actual TDoc of interest. In order to identify this latter case, it is necessary to refer to the official secretary's report of the meeting, where the train of revisions will be evident.

Is it possible to determine the date and time of publication of a particular version of a 3GPP Spec?

During the drafting phase (versions lower than 3.0.0), 3GPP TSs and TRs ("Specs") are under the control of their authors ("rapporteurs") and are handled like normal meeting contributions (see above). Revised versions incorporating text agreed by the responsible working group are often made available by the rapporteur via the group's email exploder shortly after the end of the meeting at which such text was discussed. Again, consultation of the exploder archives can reveal this. Alternatively, a revised draft may be sent directly to the 3GPP Support Team, and it will be uploaded to the public file server (specs archive directory) shortly afterwards. Again, the time stamp of the Zip file can be relied upon to indicate when the upload occurred.

After formal approval by the TSG (versions 3.0.0 or greater), Specs are edited only by the Support Team. The first approved version is based upon the draft version formally approved by the TSG, and thereafter versions are generated whenever Change Requests are approved by the TSG. These versions are made available shortly after the TSG meeting at which such approval occurred. The date (year and month) shown at the top of the Spec's cover page indicates either the date of (the last day of) the meeting, or the month in which the new version was prepared. However a more precise indication of the date of availability can be obtained from the Spec's web page (via the table at http://www.3gpp.org/specifications/) where a precise date is shown in the "available" column.

More information on the procedures relating to Spec handing can be found in 3GPP TR 21.900.

Note that, in accordance with the statement at the foot of the cover page of all 3GPP Specs, 3GPP does not "publish" its Specs per se. Formal publication is the responsibility of the individual Standards Development Organizations which comprise the Organizational Partners of 3GPP. For further information, see http://www.3gpp.org/specifications/63-official-publications.

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What formalities do I have to go through to get type approval for terminal equipment in Europe? Is there a single point of contact? What standards does my equipment need to conform to in order that I can place it on the market?

The legal requirements for the marketing of electrical products in Europe are governed by various EU Directives, depending on the nature of the equipment. Conformity with any of these Directives can be demonstrated by the use of Harmonized Standards, whose title has been cited in the Official Journal of the European Union. The lists of relevant standards can be found on the Commission web site which can be accessed via http://www.newapproach.org/Directives/DirectiveList.asp.

General electrical equipment is covered by the EMC Directive & Low Voltage Directives, see http://ec.europa.eu/enterprise/sectors/electrical/documents/index_en.htm.
The harmonized standards are listed at http://ec.europa.eu/enterprise/policies/european-standards/harmonised-standards/index_en.htm
More general information on procedures to declare conformity and how equipment should be marked are contained on the web sites related to the two Directives.

Radio Equipment and Telecommunications Terminal Equipment is covered by the Radio and Telecommunications Terminal Equipment Directive, see http://ec.europa.eu/enterprise/policies/european-standards/harmonised-standards/rtte/index_en.htm, which also includes a link to the one-stop procedure for "placing on the market" (http://ec.europa.eu/enterprise/sectors/rtte/documents/guidance/one-stop-procedure_en.htm).

Further information on EU harmonized standards relevant to telecommunications can be found on the ETSI site at http://www.etsi.org/standards/looking-for-an-etsi-standard/list-of-harmonized-standards, and the published standards themselves can be downloaded via http://pda.etsi.org/pda/queryform.asp.

Where can I find a list of technical terms and abbreviations used in 3GPP documents?

Individual terms are defined in each 3GPP Technical Specification and Technical Report. A compendium of terms and abbreviations can be found in 3GPP TR 21.905. ETSI maintains a list of all terms and abbreviations defined in its publications in "TEDDI".

What is the difference between a SIM and a USIM? What is a UICC?

The Universal Integrated Circuit Card (UICC) is the removable card bearing a silicon chip which holds 3GPP system subscriber information. The UICC is a general purpose card having both non-volatile memory and a general-purpose processor. Thus while it is used, in a 3GPP terminal, to hold (U)SIM information / applications, it is can also be used for other purposes, possibly unrelated to telecommunications. A common use of UICCs is in the well-known credit card format, and there is no reason why a single card could not hold (U)SIM functionality in addition to electronic purse / credit card functionality, or indeed any other application / data.

The Subscriber Identity Module (SIM) is the collection of functions which personalize a 3GPP terminal. The SIM contains static information about the services subscribed to, the phone number, the identity of the home network, a list of preferred roaming networks, and so on. The SIM also contains storage capacity for the subscriber's contacts' phone numbers. The term "SIM" is often misused for "UICC". The SIM concept was created during the early development of the GSM standards, and second-generation (based on GERAN) terminals up to and including Release 4 use SIM functionality.

For third generation systems (based on UTRAN), more complex functionality was called for, and the SIM evolved into the USIM or Universal Subscriber Identity Module. Release 99 3rd generations onwards use USIMs rather than SIMs. From Release 5 onwards, both second and third generation terminals use USIMs (though to maintain backwards compatibility with older networks and terminals, later Release 2nd generation USIMs are likely to implement Rel-4 SIM functionality in addition to Rel-5 or later USIM functionality).

For further information on the 3GPP Release system, see the Release page.

I have transferred a video file from my phone to my PC. Where can I find a player for 3gp files?

The 3gp file format is defined in 3GPP TS 26.244 and in 3GPP TS 26.412. However, 3GPP has not defined a specific decoder. Your phone manufacturer may have supplied a player (check the CD-ROM which came with your phone) or look on its web site. Alternatively, search the Internet: a number of commercial players exist, and trial versions of some may be downloaded without charge.

Where can I find the specification of the SIM Lock feature?

In clause 8 of 3GPP TS 22.022.

What is the meaning of the text at the foot of the TS/TR cover page?

> The present document has been developed within the 3rd Generation Partnership Project (3GPP TM) and may be further elaborated for the purposes of 3GPP..
> The present document has not been subject to any approval process by the 3GPPOrganizational Partners and shall not be implemented.
> This Specification is provided for future development work within 3GPPonly. The Organizational Partners accept no liability for any use of this Specification.

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Specifications and Reports for implementation of the 3GPP TM system should be obtained via the 3GPP Organizational Partners' Publications Offices.

3GPP is not a legally incorporated body, and its technical work is conducted under the auspices of its Organizational Partners, each of which transposes relevant 3GPP specifications as its own publications. Thus the "raw" 3GPP TSs and TRs have no legal status per se. Under an agreement with the ITU at the time 3GPP was created, the ITU would not publish the output of 3GPP but would make reference to the publications of the participating Organizational Partners from its Recommendations; this state of affairs accounts for the text found on the cover of each 3GPP TS and TR. More information can be found here.

Revision histoory:

2016-11-16: Correction of minor typo. (JMM)

ABOUT RELEASES

- Release 15
- Release 14
- Release 13
- Release 12
- Release 11
- Release 10
- Release 9
- Release 8
- Release 7
- Release 6
- Release 5
- Release 4
- Release 1999

FULL MEETING CALENDAR

GERAN	**74**		15-19 May 2017
CT	**76**	**West Palm Beach, Florida**	05-06 Jun 2017
RAN	**76**	**West Palm Beach, Florida**	05-08 Jun 2017
SA	**76**	**West Palm Beach, Florida**	07-09 Jun 2017
GERAN	**75**	**Berlin (TBC)**	21-25 Aug 2017
CT	**77**	**Sapporo**	11-12 Sep 2017
RAN	**77**	**Sapporo**	11-14 Sep 2017
SA	**77**	**Sapporo**	13-15 Sep 2017
GERAN	**76**	**US**	27 Nov-01 Dec 2017
CT	**78**	**Lisbon**	18-19 Dec 2017
RAN	**78**	**Lisbon**	18-21 Dec 2017
SA	**78**	**Lisbon**	20-22 Dec 2017
CT	**79**	**India**	19-20 Mar 2018
RAN	**79**	**India**	19-22 Mar 2018
SA	**79**	**India**	21-23 Mar 2018

BROWSE TECHNOLOGIES

- LTE-Advanced
- LTE
- Carrier Aggregation Explained
- HetNet/Small Cells
- NAS
- The Evolved Packet Core
- HSPA
- UMTS
- W-CDMA
- GPRS & EDGE

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Appendix 11

The Wayback Machine - https://web.archive.org/web/20170509045639/http://www.3gpp.org:80/specifications/specifications

Specifications Home

3GPP specifications are published - free of charge - up to four times a year following the quarterly Technical Specification Group (TSG) plenary meetings. At each TSG round, specs can be

- Newly brought under change control (i.e. at least 80% complete)
- Unchanged from their previous versions
- Revised as a result of incorporating approved Change Requests (either in existing Releases or in the latest Release)
- At Release-freeze time, upgraded to that Release with no technical change

The 3GPP Mobile Competence Centre (MCC) aims to make all Specs available following a TSG round as soon as possible. The target dates are shown in the table below. Where very many CRs have to be implemented, or very many specifications are to be produced, a further week beyond the above deadlines may be required. These dates are agreed by the TSG Chairmen. Over the Christmas and New Year period, when the winter TSG round finishes shortly before the holiday period, an extra week or so is normally added to the final deadlines.

Quick link to the specifications file server area

The link above takes you straight to the specifications, but you need to know what you are looking for.

To find a particular specification by series, look at the Numbering page.

3GPP specifications

The term "3GPP specification" covers all GSM (including GPRS and EDGE), W-CDMA (including HSPA) and LTE (including LTE-Advanced and LTE-Advanced Pro) specifications, and the emerging 5G specifications.

Revised versions of many of these specifications are produced up to four times a year following the quarterly TSG plenary meetings.

The table below leads to information about:

- Specifications arising from each plenary TSG meeting, including the latest versions of each specification that was not changed at that meeting. i.e. each directory holds a complete set of specifications.
- The month of the meeting and the meeting number
- The Status List (ZIPped RTF or Word format) summarizing the current version number for every release of every 3GPP specification following each TSG plenary meeting.
- Details of each specification (working group, rapporteur, the Project Manager in MCC (Mobile Competence Centre), the meeting at which it was, or is expected to be, "frozen" (i.e. the point after which only corrections are allowed) - all are in the Status lists.

Full details of the Specifications, their history and current status can be found in the 3GPP Specifications Status database.

year-month	remark click here to see list of specs awaiting upload	latest status	specs directory	TSG CN #	TSG RAN* #	TSG T #	TSG SA #	TSG GERAN #	TSG CT #
2017-03	Target for availablilty of all new/revised specs: TSG CT, SA = 2017-03-24 TSG RAN = 2017-03-31	StatusList	2017-03		75		75		75
2016-12		StatusList	2016-12		74		74		74
2016-09		StatusList	2016-09		73		73		73
2016-06		StatusList	2016-06		72		72	70	72

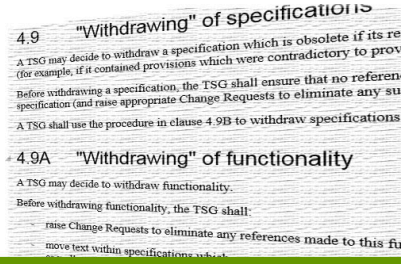
Search

3GPP Website: Search for...

Search and download specs, docs, CRs and more from the 3GPP FTP Server:

ADVANCED FTP SEARCH

More news...



Proposal to withdraw TR 38.900 (channel model for spectrum above 6GHz) at RAN#76

News Feeds

- 3GPP News
- 3GPP tweets

year-month	remark click here to see list of specs awaiting upload	latest status	specs directory	TSG CN #	TSG RAN* #	TSG T #	TSG SA #	TSG GERAN #	TSG CT #
2016-03		StatusList	2016-03		71		71	69	71
2015-12		StatusList	2015-12		70		70	68	70
2015-09		StatusList	2015-09		69		69	67	69
2015-06		StatusList	2015-06		68		68	66	68
2015-03		StatusList	2015-03		67		67	65	67
2014-12		StatusList	2014-12		66		66	64	66
2014-09		StatusList	2014-09		65		65	63	65
2014-06		StatusList	2014-06		64		64	62	64
2014-03		StatusList	2014-03		63		63	61	63
2013-12		StatusList	2013-12		62		62	60	62
2013-09		StatusList	2013-09		61		61	59	61
2013-06		StatusList	2013-06		60		60	58	60
2013-03		StatusList	2013-03		59		59	57	59
2012-12		StatusList	2012-12		58		58	56	58
2012-09		StatusList	2012-09		57		57	55	57
2012-06		StatusList	2012-06		56		56	54	56
2012-03		StatusList	2012-03		55		55	53	55
2011-12		StatusList	2011-12		54		54	52	54
2011-09		StatusList	2011-09		53		53	51	53
2011-06		StatusList	2011-06		52		52	50	52
2011-03		StatusList	2011-03		51		51	49	51
2010-12		StatusList	2010-12		50		50	48	50
2010-09		StatusList	2010-09		49		49	47	49
2010-06		StatusList	2010-06		48		48	46	48
2010-03		StatusList	2010-03		47		47	45	47
2009-12		StatusList	2009-12		46		46	44	46
2009-09		StatusList	2009-09		45		45	43	45
2009-06		StatusList	2009-06		44		44	42	44
2009-		StatusList	2009-03		43		43	41	43

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year-month click here to see list of specs awaiting upload 03	remark	latest status	specs directory	TSG CN #	TSG RAN* #	TSG T #	TSG SA #	TSG GERAN #	TSG CT #
2008-12		StatusList	2008-12		42		42	40	42
2008-09		StatusList	2008-09		41		41	39	41
2008-06		StatusList	2008-06		40		40	38	40
2008-03		StatusList	2008-03		39		39	37	39
2007-12		StatusList	2007-12		38		38	36	38
2007-09		StatusList	2007-09		37		37	35	37
2007-06		StatusList	2007-06		36		36	34	36
2007-03		StatusList	2007-03		35		35	33	35
2006-12		StatusList	2006-12		34		34	32	34
2006-09	GERAN henceforward meets synchronously with other TSGs, so no further "delta" directories necessary.	StatusList	2006-09		33		33	31	33
2006-06	New at GERAN only.		2006-06					30	
2006-06		StatusList	2006-06		32		32		32
2006-04	New at GERAN only.		2006-04					29	
2006-03		StatusList	2006-03		31		31		31
2006-01	New at GERAN only.		2006-01					28	
2005-12		StatusList	2005-12		30		30		30
2005-11	New at GERAN only.		2005-11					27	
2005-09		StatusList	2005-09		29		29		29
2005-08/09	New at GERAN only.		2005-09					26	
2005-06	New at GERAN only.		2005-06					25	
2005-06		StatusList	2005-06		28		28		28
2005-04	New at GERAN only.		2005-04					24	
2005-03	RAN closed and RANnew opened, CN and T closed, CT opened.	StatusList	2005-03	27	27bis, 27	27	27		27
2005-01	New at GERAN only.		2005-01					23	
2004-12		StatusList	2004-12	26	26	26	26		
2004-11	New at GERAN only.		2004-11					22	
2004-		StatusList	2004-09	25	25	25	25		

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year-month click here to see list of specs awaiting upload 09	remark	latest status	specs directory	TSG CN #	TSG RAN* #	TSG T #	TSG SA #	TSG GERAN #	TSG CT #
2004-08	New at GERAN only.		2004-08					21	
2004-06	New at GERAN only.		2004-06					20	
2004-06		StatusList	2004-06	24	24	24	24		
2004-04	New at GERAN only.		2004-04					19	
2004-03		StatusList	2004-03	23	23	23	23		
2004-02	New at GERAN only.		2004-02					18	
2003-12		StatusList	2003-12	22	22	22	22		
2003-11	New at GERAN only.		2003-11					17	
2003-09		StatusList	2003-09	21	21	21	21		
2003-09	New at GERAN only.		2003-09					16	
2003-06	New at GERAN only.		2003-06					15	
2003-06		StatusList	2003-06	20	20	20	20		
2003-04	New at GERAN only.		2003-04					14	
2003-02		StatusList	2003-03	19	19	19	19		
2003-02	New at GERAN only.		2003-02					13	
2002-12, 2002-11		StatusList	2002-12	18	18	18	18	12	
2002-09		StatusList	2002-09	17	17	17	17	11	
2002-06	Rel-5 GERAN features content functionally frozen		2002-06					10	
2002-06	Rel-5 features content functionally frozen (remainder, non-GERAN)	StatusList	2002-06	16	16	16	16		
2002-04			2002-04					9	
2002-03	Rel-5 features content functionally frozen (part)	StatusList	2002-03	15	15	15	15		
2002-02								8	
2001-12		StatusList	2001-12	14	14	14	14		
2001-11								7	
2001-09		StatusList	2001-09	13	13	13	13		
2001-08								6	
2001-06		StatusList	2001-06	12	12	12	12	5	

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year-month	remark click here to see list of specs awaiting upload	latest status	specs directory	TSG CN #	TSG RAN* #	TSG T #	TSG SA #	TSG GERAN #	TSG CT #
2001-06	Rel-4 GERAN features content functionally frozen							4	
2001-03	Rel-4 non-GERAN features content functionally frozen	StatusList	2001-03	11	11	11	11		
2001-01								3	
2000-12, 2000-11		StatusList	2000-12	10	10	10	10	2	
2000-11									
2000-09		StatusList	2000-09	9	9	9	9	1	
2000-06		StatusList	2000-06	8	8	8	8		
2000-03				7	7	7	7		
1999-12	R99 features content functionally frozen			6	6	6	6		
1999-10				5	5	5	5		
1999-06					4	4	4		
1999-05				4					
1999-04				3	3	3	3		
1999-03				2	2	2	2		
1998-12				1	1	1	1		

** TSG RAN was closed at the end of meeting 27 and re-opened for meeting 27 bis.*

If you plan to download a large number of specifications we recommend using an FTP client software tool such as:

- Ipswitch WS_FTP Pro
- FTPSync
- Filezilla

For additional information relating to 3GPP Specifications, their creation and maintenance, etc. go here.

Confidential Algorithms

3GPP confidentiality and integrity algorithms The 3GPP Confidentiality and Integrity algorithms F8 & F9 (KASUMI) have been developed through the collaborative efforts of the 3GPP Organizational Partners. They may be used only for the development and operation of 3G Mobile Communications and services. Every Beneficiary must sign a Restricted Usage Undertaking with a Custodian and (...)
more »

ASN.1

ASN.1 Object Identifiers Abstract syntax notation (ASN.1) object identifiers maintained by ETSI. ETSI is a recognized organization under the ITU-T (formerly CCITT) arc. The formal rules governing assignment of object identifier values are given in ETSI EG 200 351. Since the 3GPP technical specifications are based on GSM specifications, which use object identifiers under the ETSI node, it (...)
more »

Drafting Rules

The Specification drafting rulesTR 21.801 are the rules for the structure and drafting of documents intended to become a 3GPP Technical Specification or Technical Report. These rules are intended to ensure that such documents are drafted in as uniform a manner as is practicable, irrespective of the technical content. 21.801 is based on the ISO/IEC Directives, Part 3, but is a self-contained (...)
more »

Official Publications

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The 3GPP Technical Specifications and Technical Reports have, in themselves, no legal standing. They only become "official" when transposed into corresponding publications of the Partner Organizations (or the national / regional standards body acting as publisher for the Partner). At this point, the specifications are referred to as UMTS within ETSI and FOMA within ARIB/TTC. Some TRs (...)
more »

Page reviewed and updated every 3 months

ABOUT RELEASES

- Release 15
- Release 14
- Release 13
- Release 12
- Release 11
- Release 10
- Release 9
- Release 8
- Release 7
- Release 6
- Release 5
- Release 4
- Release 1999

FULL MEETING CALENDAR

GERAN	**74**		15-19 May 2017
CT	**76**	**West Palm Beach, Florida**	05-06 Jun 2017
RAN	**76**	**West Palm Beach, Florida**	05-08 Jun 2017
SA	**76**	**West Palm Beach, Florida**	07-09 Jun 2017
GERAN	**75**	**Berlin (TBC)**	21-25 Aug 2017
CT	**77**	**Sapporo**	11-12 Sep 2017
RAN	**77**	**Sapporo**	11-14 Sep 2017
SA	**77**	**Sapporo**	13-15 Sep 2017
GERAN	**76**	**US**	27 Nov-01 Dec 2017
CT	**78**	**Lisbon**	18-19 Dec 2017
RAN	**78**	**Lisbon**	18-21 Dec 2017
SA	**78**	**Lisbon**	20-22 Dec 2017
CT	**79**	**India**	19-20 Mar 2018
RAN	**79**	**India**	19-22 Mar 2018
SA	**79**	**India**	21-23 Mar 2018

BROWSE TECHNOLOGIES

- LTE-Advanced
- LTE
- Carrier Aggregation Explained
- HetNet/Small Cells
- NAS
- The Evolved Packet Core
- HSPA
- UMTS
- W-CDMA
- GPRS & EDGE

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Appendix 12

The Wayback Machine - https://web.archive.org/web/20170422110018/http://www.3gpp.org:80/specifications/79-specification-numbering

Specification Numbering

All 3GPP specifications have a specification number consisting of 4 or 5 digits. (e.g. 09.02 or 29.002).

The first two digits define the series, followed by 2 further digits for the 01 to 13 series or 3 further digits for the 21 to 55 series.

The full title, specification number and latest version number for every specification can be found in the current status list (warning: large file!).

An automated list of Specification numbers - with the Title and details of the Specification Group responsible.

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	-	-

Note (1): The 13 series GSM specifications relate to European-Union-specific regulatory standards. On the closure of ETSI TC SMG, responsibility for these specifications was transferred to ETSI TC MSG, (Mobile Specification Group) and they do not appear on the 3GPP file server.

Note (2): The specifications of these aspects are spread throughout several series.

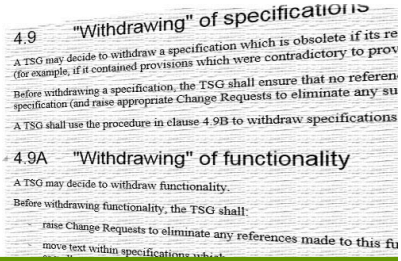
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Note (3): Algorithms may be subject to export licensing conditions. See the relevant 3GPP page. See also the relevant ETSI pages.

Note (4): The original GSM algorithms are not published and are controlled by the GSM Association.

Technical Reports are of two classes:

> Those intended to be transposed and issued by the Organizational Partners as their own publications; and
>
> Those not intended for publication but which are simply 3GPP internal working documents, used, for example, for documenting planning and scheduling of work, or for holding the interim results of feasibility studies.

The first category have numbers of the form: xx.9xx

The second category have numbers of the form:
xx.8xx (feasibility study reports, etc) or, more rarely,
30.xxx / 50.xxx (planning and scheduling)
For some spec series, the stock of xx.8xx TRs has been exhausted, and in these cases, further internal TRs are allocated xx.7xx numbers.

Missing Specs: Click here to see those Specs not yet available following the most recent round of TSG meetings.

The 3GPP Specifications are stored on the file server as zipped MS-Word files. The filenames have the following structure:

SM[-P[-Q]]-V.zip

where the character fields have the following significance ...

S = series number - 2 characters (see the table above)
M = mantissa (the part of the spec number after the series number) - 2 or 3 characters (see above)
P = optional part number - 1 or 2 digits if present
Q = optional sub-part number - 1 or 2 digits if present
V = version number, without separating dots - 3 digits (6 digits when any component of the three-digit range has been exhausted - see the fifth example below)

So for example:

> 21900-320.zip is 3GPP TR 21.900 version 3.2.0
> 0408-6g0.zip is 3GPP TS 04.08 version 6.16.0
> 32111-4-410 is 3GPP TS 32.111 part 4 version 4.1.0
> 29998-04-1-100 is 3GPP TS 29.998 part 4 sub-part 1 version 1.0.0
> 29898-133601 is 3GPP TR 29.898 version 13.36.1

Further information:

Latest version
The latest versions of the approved specifications in the "latest" directory. The latest version of draft specs (i.e. those not yet under change control) are in the "latest-drafts" directory. See also the page on version numbering.

Particular version
All older versions of specifications (where available) are stored in the archive subdirectory. All versions of all releases of a given specification are placed directly under the name of the specification.

Title or subject
If you only know the title or the subject, but not the specification number, the best place to start looking is the complete list of all 3GPP specification numbers and titles. This list also shows the most recent version in each Release.

Specs related to a particular working group
Each 3GPP TSG Working Group has a home page, which lists the specifications under its responsibility. Follow the links from here, or use the main menu item "Specification Groups".

Official versions published by recognized Standards Development Organizations
The 3GPP Technical Specifications (and Technical Reports) which are publicly available from this site have, in themselves, no legal standing. They only become "official" when transposed into corresponding publications of the Partner Organizations. If you are looking for the official versions, see the official publications page.

Yet more information:

Work plan
The 3GPP Work plan describes the new functionality currently being elaborated in the TSG working groups. It also indicates the expected timescales for their finalization.

Releases (and phases, stages)
An introduction to the 3GPP mechanism for specifications releases can be found here.

Historical information
If you need to look for old / superseded specifications or change requests, start here.

TSG working methods
The procedures for creating, enhancing and maintaining specifications are described in TR 21.900. A presentation outlining the release and change request process can be found here.

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3GPP Drafting rules
The rules for drafting specifications are described in TR 21.801.

Change Requests
The change request mechanism is used when a correction or new functionality is required for an existing specification.

Version numbering
More information on the version numbering page.

Issuing new TS/TR numbers. More information on this page.

Page updated:

2016-12-08: Spec file structure caters for the six-character version format used for specs where the three-character limit has been exhausted.
2016-01-12: Mention of TRs numbered xx.7xx as overflow of xx.8xx allocations (JMM)
2015-10-01: Fix broken link to specification groups (JMM)

ABOUT RELEASES

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FULL MEETING CALENDAR

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RAN	77	Sapporo	11-14 Sep 2017
SA	77	Sapporo	13-15 Sep 2017
GERAN	76	US	27 Nov-01 Dec 2017
CT	78	Lisbon	18-19 Dec 2017
RAN	78	Lisbon	18-21 Dec 2017
SA	78	Lisbon	20-22 Dec 2017
CT	79	India	19-20 Mar 2018
RAN	79	India	19-22 Mar 2018
SA	79	India	21-23 Mar 2018

BROWSE TECHNOLOGIES

LTE-Advanced
LTE
Carrier Aggregation Explained
HetNet/Small Cells
NAS
The Evolved Packet Core
HSPA
UMTS
W-CDMA
GPRS & EDGE

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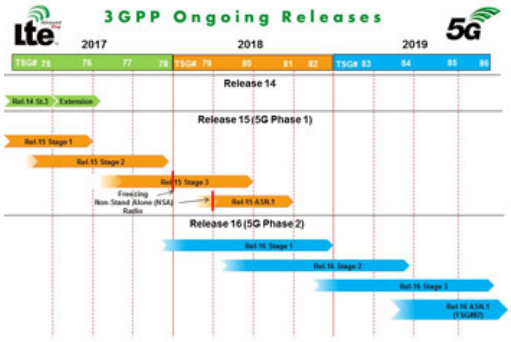
Appendix 13

The Mobile Broadband Standard
EDGE

Releases

3GPP uses a system of parallel "Releases" which provide developers with a stable platform for the implementation of features at a given point and then allow for the addition of new functionality in subsequent Releases. You can learn more about 3GPP Releases by looking in to the following resources:

- A brief description of each Release can be found in the footer of this page, in the 'About Releases' section.
- Full details of the specifications needed for each 3GPP Release can be found in the "Release Description" folder of the ftp site.
- A table of the features, by Release, can also be found in the 3GPP Work Plan.
- There is also a 3GPP Specification Release version matrix which is a listing (with links) of the Specifications - showing the Release in which each specification was first developed.



Click to enlarge this view...

Start, Freeze and End dates:

The table below is extracted from the data on the 3GPP Ultimate portal at https://portal.3gpp.org/ "Releases" tab. Please refer to that data for the most up-to-date information.

Future dates are proposals, subject to change.

Name	Status [Note 3]	Start date [Note 2a]	End date	Closure date
Release 15	Open	2016-06-01	2018-09-14 (SA#81)	
Release 14	Open	2014-09-17	2017-06-09 (SA#76)	
Release 13	Frozen	2012-09-30	2016-03-11 (SP-71)	
Release 12	Frozen	2011-06-26	2015-03-13 (SP-67)	
Release 11	Frozen	2010-01-22	2013-03-06 (SP-59)	
Release 10	Frozen	2009-01-20	2011-06-08 (SP-52)	
Release 9	Frozen	2008-03-06	2010-03-25 (SP-47)	
Release 8	Frozen	2006-01-23	2009-03-12 (SP-43)	
Release 7	Closed	2003-10-06	2008-03-13 (SP-39)	2014-09-17 (SP-65)
Release 6	Closed	2000-03-28	2005-09-28 (SP-29)	2014-09-17 (SP-65)
Release 5	Closed	2000-05-01 [Note 2a]	2002-09-12 (SP-17)	2014-09-17 (SP-65)

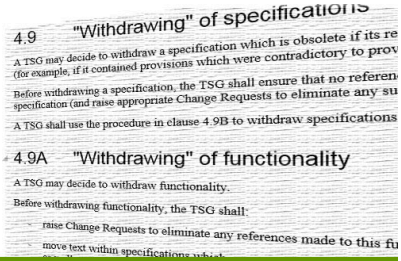
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4.9 "Withdrawing" of specifications
A TSG may decide to withdraw a specification which is obsolete if its re
(for example, if it contained provisions which were contradictory to prov
Before withdrawing a specification, the TSG shall ensure that no referen
specification (and raise appropriate Change Requests to eliminate any su
A TSG shall use the procedure in clause 4.9B to withdraw specifications
4.9A "Withdrawing" of functionality
A TSG may decide to withdraw functionality.
Before withdrawing functionality, the TSG shall:
- raise Change Requests to eliminate any references made to this fu
- move text within specifications

Proposal to withdraw TR 38.900 (channel model for spectrum above 6GHz) at RAN#76

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Release 4	Closed	1998-08-01	2001-06-21 (SP-12)	2014-09-17 (SP-65)
Release 2000 [Note 1]	Closed	1999-03-30 [Note 2a]		1999-12-17 (SP-06)
Release 1999	Closed	1996-11-01	1999-12-17 (SP-06)	2008-06-05 (SP-40)
UMTS	Closed	1994-08-18	1999-02-12 (SMG-28)	2005-06-08 (SP-28)
Release 1998	Closed	1996-03-26	1999-02-12 (SMG-28)	2005-06-08 (SP-28)
Release 1997	Closed	1996-04-15 [Note 2a]		2005-06-08 (SP-28)
Release 96 / Phase 2+	Closed	1995-07-20		2004-09-16 (SP-25)
Phase 2	Closed	1993-03-25		2004-09-16 (SP-25)
Phase 1 extension	Closed	1994-10-01		
Phase 1 DCS-1800	Closed	1992-12-03		
Phase 1	Closed	1987-01-01		

GSM Phases and Version numbers

GSM Release	TS/TR version [Note 2, 4]	3GPP Release	TS/TR version
GSM Phase 1	3.x.y		
GSM Phase 2	4.x.y		
GSM Phase 2+	5.x.y		
GSM Phase 2+ Release 97	6.x.y		
GSM Phase 2+ Release 98	7.x.y		
GSM Phase 2+ Release 99	8.x.y	UMTS Release 99	3.x.y
GSM Phase 2+ Release 00	*9.x.y*		

3GPP Releases and Version numbers

Release	TS/TR version
Release 4	4.x.y
Release 5	5.x.y
Release 6	6.x.y
...	
Release 14	12.x.y
...	

Other associated terms

Stages

The term "Stage" derives from the ITU-T (originally CCITT) method for categorizing specifications (Recommendation I.130).

> "Stage 1" refers to the service description from a service-user's point of view.
> "Stage 2" is a logical analysis, devising an abstract architecture of functional elements and the information flows amongst them across reference points between functional entities.

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> "Stage 3" is the concrete implementation of the functionality and of the protocols appearing at physical interfaces between physical elements onto which the functional elements have been mapped.

In addition, 3GPP often performs feasibility studies the results of which are made available in Technical Reports (normally 3GPP-internal TRs, numbered xx.8xx, not intended for transposition by the Organizational Partner SDOs). The feasibility study might be considered as a sort of "Stage 0". Furthermore, some Stage 3 specifications require test specifications to be prepared: effectively a "Stage 4".

Phases

This term has two distinct usages within the 3GPP:

> in reference to GSM specifications, Phase 1, Phase 2 and Phase 2+ referred to releases of specifications (see table above);
> some features within GSM/3G specifications have been enhanced over the years. For example, enhancements to the original CAMEL functionality are referred to as CAMEL phase 2, CAMEL phase 3 and CAMEL phase 4.

Further information

The mechanisms for creating and maintaining specifications are described in TR 21.900. A presentation outlining the release and change request process can be found here.

Note 1: The term "Release 2000" was used only temporarily and was eventually replaced by "Release 4" and "Release 5" (most elements originally in Release 2000 were renamed Release 4, but some were deferred until Release 5).

Note 2: A Specification with a version number of 0.x.y, 1.x.y or 2.x.y indicates that it is a new, draft, specification which has not yet been approved. The anticipated release is normally shown on the cover of the document.

Note 2a: The start date for a Release is an indication of when the first work item for that Release was approved at TSG level. In fact, it is somewhat approximate because often work items started in an earlier Release, but not completed, are "promoted" to the next Release. The end date for a Release is an indication of when the detailed protocols become stable. However, see Note 3 below.

Note 3: After "freezing", a Release can have no further additional functions added. However, detailed protocol specifications (stage 3) may not yet be complete. "Freezing" is applied successively for each of the three stages (see below), with stage 3 normally being frozen one or two TSG meetings earlier than the "end" date. The "end" date shown on the 3GU portal is indicative only, since for each Release, a considerable number of refinements and corrections can be expected for at least two years following this date. In addition, OA&M specs and test specs may lag by some considerable time. A "frozen" Technical Specification is one which can have no further category B or C (new or modified functionality) Change Requests, other than to align earlier stages with later stages. The individual stage freeze dates can only be seen by 3GU account holders (delegates, officials, secretariat).

Note 4: In the version number of a 3GPP TS or TR, the first field (before the first dot) indicates the Release number according to the table below. The field "x" is incremented at each change in the spec resulting from one or more Change Requests approved by the responsible TSG. Field "y" is incremented whenever an editorial change is made to a specification; editorial changes are those which cannot in any way change the technical interpretation of the spec, and are introduced at the discretion of the Support Team. Exceptionally, field "y" is incremented when a newly-provided version of a spec is found to be flawed due to, for example, misimplementation of a newly-approved CR; however, this circumstance is only permitted during the three-week period following the end of a TSG plenary round, during which new versions of specs are produced. Every change of version is documented in the "change history" annex of the spec. When "x" is incremented, field "y" is reset to zero. When the Release field (the first digit) is incremented, fields "x" and "y" are reset to zero. Version numbering was unified from Release 4 onwards, regardless of radio access technology. This implied a renumbering of the GSM-only specifications (see the Specification Numbering page).

ABOUT RELEASES

Release 15
Release 14
Release 13
Release 12
Release 11
Release 10
Release 9
Release 8
Release 7
Release 6
Release 5
Release 4
Release 1999

FULL MEETING CALENDAR

GERAN	74		15-19 May 2017
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SA	76	West Palm Beach, Florida	07-09 Jun 2017
GERAN	75	Berlin (TBC)	21-25 Aug 2017
CT	77	Sapporo	11-12 Sep 2017
RAN	77	Sapporo	11-14 Sep 2017
SA	77	Sapporo	13-15 Sep 2017
GERAN	76	US	27 Nov-01 Dec 2017
CT	78	Lisbon	18-19 Dec 2017
RAN	78	Lisbon	18-21 Dec 2017
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Appendix 14

The Wayback Machine - https://web.archive.org/web/20170509050236/http://www.3gpp.org:80/specifications-groups/ran-plenary/ran2-radio-layer-2-and-radio-layer-3-rr

RAN2 - Radio layer 2 and Radio layer 3 RR

RAN WG2 is in charge of 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.
Within the scope of TSG RAN, RAN WG2 is responsible for the development of specifications dealing with UTRA, Evolved UTRA, and beyond.

Terms of Reference

The latest terms of reference were approved at RAN#53 in document RP-110964.

RAN WG2 is responsible for:

- Specification of the radio interface architecture and protocol termination
- Specification of radio interface protocols between UE and RAN,
- Specification of radio interface protocols common to RAN and GERAN
- Maintaining the specifications for the protocol used to configure UE loop back functionality for UTRAN
- Specification of radio interface parameters to be exchanged between RNCs and between RNCs and BSCs in case of SRNS relocation
- For EUTRAN, specification of the radio interface parameters to be exchanged between eNodeBs in case of inter eNodeB handover, and between eNodeB and RNC/BSC in case of inter-RAT handovers
- Stage 2 Specifications of the services offered by the physical layer to upper layers
- Specification of Cell selection and re-selection procedures
- Specification of UE capabilities for UE - RAN interface (in collaboration with RAN WG1 for Layer 1 capabilities)
- Definition of RRM strategies to be supported by RAN
- Definition of protocol methodology in RAN specifications
- Identification of the requirements for UE protocol tests to be defined by TSG RAN WG5, for new functions under RAN WG2 responsibility
- For EUTRAN, specification of radio interface protocols between UE and positioning server
- Specification of radio measurements reported to the OAM domain and the radio interface protocols used to collect them

Useful links and information

About RAN WG2	List of elected officials
Documents	Meeting documents
	Specifications
	Work items
Meetings	Next meeting information & previous meeting reports and documents
	Liaisons Statements
	Full RAN WG2 meeting calendar
General info	Email exploder lists

RAN Working groups and Ad Hoc groups	
TSG RAN Plenary	

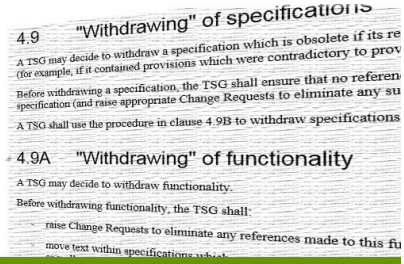
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RAN Working groups and Ad Hoc groups	
TSG RAN WG1	Radio Layer 1 specification
TSG RAN WG2	Radio Layer 2 and Radio Layer 3 RR specification
TSG RAN WG3	Iub Iur and Iu specification - UTRAN O&M requirements
TSG RAN WG4	Radio performance and protocol aspects (system) - RF parameters and BS conformance
TSG RAN WG5	Mobile terminal conformance testing
TSG RAN WG6	Legacy RAN radio and protocol
TSG RAN AHG1	Ad-hoc group on ITU (internal) co-ordination

ABOUT RELEASES

Release 15
Release 14
Release 13
Release 12
Release 11
Release 10
Release 9
Release 8
Release 7
Release 6
Release 5
Release 4
Release 1999

FULL MEETING CALENDAR

GERAN	**74**		15-19 May 2017
CT	**76**	**West Palm Beach, Florida**	05-06 Jun 2017
RAN	**76**	**West Palm Beach, Florida**	05-08 Jun 2017
SA	**76**	**West Palm Beach, Florida**	07-09 Jun 2017
GERAN	**75**	**Berlin (TBC)**	21-25 Aug 2017
CT	**77**	**Sapporo**	11-12 Sep 2017
RAN	**77**	**Sapporo**	11-14 Sep 2017
SA	**77**	**Sapporo**	13-15 Sep 2017
GERAN	**76**	**US**	27 Nov-01 Dec 2017
CT	**78**	**Lisbon**	18-19 Dec 2017
RAN	**78**	**Lisbon**	18-21 Dec 2017
SA	**78**	**Lisbon**	20-22 Dec 2017
CT	**79**	**India**	19-20 Mar 2018
RAN	**79**	**India**	19-22 Mar 2018
SA	**79**	**India**	21-23 Mar 2018

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Appendix 15

The Wayback Machine - https://web.archive.org/web/20170509042413/http://www.3gpp.org:80/specifications-groups/specifications-groups

A GLOBAL INITIATIVE

The Mobile Broadband Standard

EDGE

roups Home

rt below - to go to that Group's home page to find information on its elected officials, its nd Specifications for which it is responsible, etc.

Project Co-ordination Group (PCG)

TSG RAN Radio Access Network	TSG SA Service & Systems Aspects	TSG CT Core Network & Terminals
RAN WG1 Radio Layer 1 spec	SA WG1 Services	CT WG1 MM/CC/SM (Iu)
RAN WG2 Radio Layer 2 spec Radio Layer 3 RR spec	SA WG2 Architecture	CT WG3 Interworking with external networks
RAN WG3 Iub spec, Iur spec, Iu spec UTRAN O&M requirements	SA WG3 Security	CT WG4 MAP/GTP/BCH/SS
RAN WG4 Radio Performance Protocol aspects	SA WG4 Codec	CT WG6 Smart Card Application Aspects
RAN WG5 Mobile Terminal Conformance Testing	SA WG5 Telecom Management	
RAN WG6 Legacy RAN radio and protocol	SA WG6 Mission-critical applications	

RAN

3G systems should be based on new wide band, multimode, flexible radio access. This approach will ensure that systems based on 3GPP specifications will be capable of rapid development and deployment of competitive service offerings while still enabling global roaming.

TSG Radio Access Network (TSG RAN) is responsible for the definition of the functions, requirements and interfaces of the UTRA/E-UTRA network in its two modes, FDD & TDD. More precisely: radio performance, physical layer, layer 2 and layer 3 RR specification in UTRAN/E-UTRAN; specification of the access network interfaces (Iu, Iub, Iur, S1 and X2); definition of the O&M requirements in UTRAN/E-UTRAN and conformance testing for User Equipment and Base Stations...more

SA

The TSG Service and System Aspects (TSG-SA) is responsible for the overall architecture and service capabilities of systems based on 3GPP specifications and, as such, has a responsibility for cross TSG co-ordination...more

CT

The TSG Core Network and Terminals (TSG CT) is responsible for specifying terminal interfaces (logical and physical), terminal capabilities (such as execution environments) and the Core network part of 3GPP systems...more

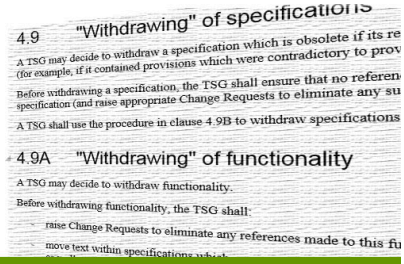
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Historical Information (Incl. Closed groups)

The original specification work started in 1987, with the first Phase of GSM specifications. If you have an ETSI On-Line account (ETSI Members), you can access the ETSI Technical Committee SMG documents (including Change Requests) via the On-line archive. For past & present 3GPP group's meeting documents (including Change Requests) choose the appropriate Technical Specification Group's (...)
more »

TSG Working Agreements

"Working Agreements" are tentative decisions reached by 3GPP groups in order to make progress on matters where consensus [1] cannot be reached. See the 3GPP Working Procedures, article 25. See document PCG20_04 (slides 4 & 5) for further background information. To propose additions to this page: 3GPPcontact@3gpp.org. Only working agreements explicitly documented in meeting reports (...)
more »

3GPP E-mail Exploder Lists

A full list of the 3GPP email exploder lists is available at http://list.3gpp.org/ This also contains all the ETSI exploder lists, however the majority of the 3GPP lists are located right at the top. In order to subscribe to any of these lists please scroll down until you find the list you are interested in, click on the link and follow the simple instructions. Those delegates who already (...)
more »

Uniform Resource Identifier (URI) list

Uniform Resource Name values maintained by 3GPP: The tables below list URIs registered by 3GPP. Applications for new entries must be made via email to the TSG CT WG1 Secretary. Applications must contain: a proposal for the URN value; a brief description of its functionality; a reference to the specification or other publicly available document (if any) containing the definition; the (...)
more »

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Release 14
Release 13
Release 12
Release 11
Release 10
Release 9
Release 8
Release 7
Release 6
Release 5
Release 4
Release 1999

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SA	77	Sapporo	13-15 Sep 2017
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SA	78	Lisbon	20-22 Dec 2017
CT	79	India	19-20 Mar 2018
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SA	79	India	21-23 Mar 2018

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www.3gpp.org - /ftp/

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The Wayback Machine - https://web.archive.org/web/20170509042359/http://www.3gpp.org:80/ftp/tsg_ran/

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The Wayback Machine - https://web.archive.org/web/20170414213726/http://www.3gpp.org:80/ftp/TSG_…

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The Wayback Machine - https://web.archive.org/web/20170805062327/http://www.3gpp.org:80/ftp/tsg_ra…

www.3gpp.org - /ftp/tsg_ran/WG2_RL2/TSGR2_98/

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Petitioners' Exhibit 1008, p. 256
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Appendix 20



3GPP_TSG_RAN_WG2 Archives

April 2017, Week 3

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Options: Use Monospaced Font
Show Text Part by Default
Show All Mail Headers

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Reply To: Burbidge, Richard C
Date: Tue, 18 Apr 2017 08:52:33 +0000
Content-Type: multipart/mixed
Parts/Attachments: text/plain (2277 bytes) , text/html (12 kB) , R2-17xxxxx-RAN2-98-Hangzhou-Proposed-Agenda-v1.0.doc (454 kB) , RAN2-98-Hangzhou-schedule-v1.0.doc (334 kB)

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Dear All

Please find attached the draft agenda and schedule for our meeting in Hangzhou. A few points to note, including the usual reminders about deadlines and CRs.

Schedule

- The schedule is subject to change as I do not yet have final information about the meeting room availability.

Deadlines

- Document number request deadline and document submission deadline: **Friday, 2017-May-05, 23:59 Pacific time**
- Upload announcements on the RAN2 email reflector are not required for tdocs submitted before the submission deadline. In the exceptional case that you upload a document after the submission deadline, an announcement is required to be sent on the RAN2 email reflector. Late submissions might not be treated.
- Juha will provide instruction for requesting tdoc numbers using the 3GU tool. Please read and follow his instructions carefully.

CR quality and isolated impact statements:

- Please focus on high quality CRs and CR coversheets
- Isolated impact statements, following the agreed guidelines, should be provided for all CRs up to and including Rel-13.
- The reason for change should fully describe the reason for the CR, even if you have provided a separate discussion paper. Also, please only provide a separate discussion paper if the problem really requires additional supporting information to justify the change.
- Ensure that the CR is based on the latest available version of the specification and that all fields on the cover page are set correctly.
- Follow the specification drafting rules in TR 21.801 when creating your CRs.
- Ensure that ASN.1 in your CRs passes syntax check.

Best regards

Richard

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ATOM RSS1 RSS2

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Appendix 21



3GPP_TSG_RAN_WG2 Archives

June 2017, Week 2

New in LISTSERV 17.0 ×

3GPP_TSG_RAN_WG2@LIST.ETSI.ORG

Options: Use Monospaced 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: Draft RAN2#98 meeting report (v1)
From: Juha Korhonen <Juha.Korhonen@ETSI.ORG>
Reply To: Juha Korhonen <Juha.Korhonen@ETSI.ORG>
Date: Fri, 9 Jun 2017 10:34:07 +0000
Content-Type: multipart/mixed
Parts/Attachments: text/plain (256 bytes) , text/html (2323 bytes) ,
Draft_RAN2#98_Meeting_Report_v1.zip (1 MB)

Dear All,

I have attached the draft report of RAN2#98 (Hangzhou).
Also the latest tdoclist is included.

Comments are welcome. Note that since the next RAN2 meeting in Qingdao is an AdHoc, this report will be approved only in RAN2#99 in Berlin in August.

BR,
Juha

ATOM RSS1 RSS2

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Appendix 22

3GPP TSG-RAN WG2 meeting #99 **R2-1707601**

Berlin, Germany, August 21 – 25, 2017

Agenda Item: 2.2

Source: ETSI MCC

Title: Report of 3GPP TSG RAN2#98 meetinng, Hangzhou, China

Document for: Approval

Report of 3GPP TSG RAN WG2 meeting #98
Hangzhou, China
15 - 19 May, 2017

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IPR2024-00997

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Organisation of the meeting

Meeting:	3GPP TSG RAN2#98	
Meeting location:	Hangzhou, China	
Duration:	15.05 - 19.05.2017	
Host:	Huawei)	
TSG RAN WG2 Chairman:	Richard Burbidge (Intel Corporation) (richard.c.burbidge@intel.com)	
TSG RAN WG2 Vice chairman:	Hu Nan (CMCC) (hunan@chinamobile.com)	
TSG RAN WG2 Vice chairman:	Diana Pani (Interdigital Communications (diana.pani@interdigital.com)	
TSG RAN WG2 MCC Support:	Juha Korhonen (ETSI MCC) (juha.korhonen@etsi.org)	
Email reflector:	3GPP_TSG_RAN_WG2@LIST.ETSI.ORG	
Technical documents:	ftp://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_98/Docs	
Next meetings:	TSG RAN#76	05.06 - 08.06.2017, West Palm Beach, USA
	TSG RAN2-NR#2_AH	27.06 - 29.06.2017, Qingdao, China
	TSG RAN2#99	21.08 - 25.08.2017, Berlin, Germany

Statistics/Executive Summary

TSG RAN2#98 was held in Hangzhou, China, hosted by Huawei. The meeting had 4 parallel sessions: The main session (mainly NR), LTE and NR User Plane (NR UP) session, LTE session, and UMTS session. The agenda items and schedule for each session can be found from section 2 of this report.

- 320 participants (registered: 418 participants).
- 2213 Tdocs allocated with 1446 available contributions. (See the attached tdoc list)
- 54 incoming liaison statements, out of which 50 were noted and 1 withdrawn (submitted for a second time by accident). The remaining 3 LSin will be handled in future meetings.
- 29 outgoing liaison statements.
- 56 email approvals/discussions scheduled after RAN2#98 meeting, see section 17.3.
- Number of CRs submitted 572. Of these, 200 were agreed (including 9 for UTRA specifications and 191 for LTE specifications). 10 further CRs were endorsed and submitted for RAN#76 for decision. See Annex E for details.

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1 Opening of the meeting (9 AM)

1.1 Call for IPR

The attention of the delegates of this Working Group is drawn to the fact that **3GPP Individual Members have the obligation** under the IPR Policies of their respective Organizational Partners **to inform their respective Organizational Partners of Essential IPRs** they become aware of.

The delegates were asked to take note that they were hereby invited:

- to investigate whether their organization or any other organization owns IPRs which were, or were likely to become Essential in respect of the work of 3GPP.
- to notify their respective Organizational Partners of all potential IPRs, e.g., for ETSI, by means of the IPR Statement and the Licensing declaration forms (http://webapp.etsi.org/Ipr/).

NOTE: IPRs may be declared to the Director-General or Chairman of the SDO, but not to the RAN WG2 Chairman.

1.2 Network usage conditions

The PCG has laid down the following network usage conditions

1. **Users shall not use the network to engage in illegal activities. This includes activities such as copyright violation, hacking, espionage or any other activity that may be prohibited by local laws.**

2. **Users shall not engage in non-work related activities that consume excessive bandwidth** or cause significant degradation of the performance of the network.

Since the network is a shared resource, users should exercise some basic etiquette when using the 3GPP network at a meeting. It is understood that high bandwidth applications such as downloading large files or video streaming might be required for business purposes, but delegates should be strongly discouraged in performing these activities for personal use. Downloading a movie or doing something in an interactive environment for personal use essentially wastes bandwidth that others need to make the meeting effective. The meeting chairman should remind end users that the network is a shared resource; the more one user grabs, the less there is for another. Email and its attachments already take up significant bandwidth (certain email programs are not very bandwidth efficient). In case of need the chair can ask the delegates to restrict IT usage to things that are essential for the meeting itself.

1. DON'T place your WiFi device in ad-hoc mode

2. DON'T set up a personal hotspot in the meeting room

3. DO try 802.11a if your WiFi device supports it

4. DON'T manually allocate an IP address

5. DON'T be a bandwidth hog by streaming video, playing online games, or downloading huge files

6. DON'T use packet probing software which clogs the local network (e.g., packet sniffers or port scanners)

1.3 Other

In accordance with the Working Procedures it is reaffirmed that:

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(i) compliance with all applicable antitrust and competition laws is required;

(ii) timely submissions of work items in advance of TSG or WG meetings are important to allow for full and fair consideration of such matters; and

(iii) the chairman will conduct the meeting with strict impartiality and in the interests of 3GPP

Note on (i): In case of question please contact your legal counsel.

Note on (ii): WIDs don't need to be submitted to the RAN2 meeting and will typically not be discussed here either.

2 General

THANK YOU to companies that request TDoc numbers and submit contributions early before deadline (really appreciated). Will start to refrain from treating late documents.

2.1 Approval of the agenda

A draft schedule for the week is provided as a separate document, distributed via the RAN2 email reflector and made available during the meeting week in the RAN2\Inbox\Chair_note folder.

R2-1704000 Agenda for RAN2#98 Chairman agenda

=> Approved

2.2 Approval of the report of the previous meeting

R2-1704001 RAN2#97bis meeting report ETSI report

=> Approved

2.3 Reporting from other meetings

2.4 Others

Rapporteur changes

Spec	former rapporteur	proposed new rapporteur
TS 25.321	Mr. Jing, HE	Mr. Ayaz, Ahmed

Isolated impact analysis

Note that an isolated impact analysis is required for Rel-8 to Rel-13 CRs from Q2 2016 onwards.

Only corrections where there is a proven problem are allowed for frozen releases (Rel-8 to Rel-13).

RAN2 WG compendium

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Latest version can always be found at ftp://ftp.3gpp.org/tsg_ran/WG2_RL2/Org/RAN2_Compendium/

Drafting rules

Note that specification drafting rules in TR 21.801 must be followed when drafting a CR and draft TS/TR.

Latest version can always be found at http://www.3gpp.org/ftp/specs/archive/21_series/21.801/

Time Budget

The time budget endorsed at RAN-75 is available in RP-1708223

3 Incoming liaisons

Note: LSs are moved to the respective agenda items if any.

3.1 Joint UMTS/LTE relevance

3.2 LTE relevance

R2-1704005 Reply LS on optimisation of network selection (C1-171943; contact: Intel) CT1 LS in

=> Noted

R2-1704006 Reply LS on LTE call redirection to GERAN (C1-171945; contact: Nokia) CT1 LS in

=> Noted

R2-1704008 Response LS to clarification on PUSCH-Config in case of multiple uplink serving cells (R1-1706342; contact: Qualcomm) RAN1 LS in

- Qualcomm intend to bring a contribution to the next meeting to address the field description, no ASN,1 change needed

=> Noted

R2-1704014 Response LS Applying Extended NAS timers based on UE's operation in CE Mode B (R3-171379; contact: Intel) RAN3 LS in

=> Noted

R2-1704015 LS on Collection Period correction for MDT M3 measurement in eUTRAN (R3-171382; contact: Ericsson) RAN3 LS in

=> Noted

R2-1704019 LS on new UE power class for Rel-15 LTE_eMTC4 (R4-1703377; contact: Ericsson) RAN4 LS in

=> Noted

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R2-1704024 LS On Access Control for Light Connected state in LTE (S2-172802; contact: Nokia) SA2 LS in

- Nokia explain that SA1 will also be sending an LS

=> Noted

R2-1705839 LS on Access Control for Light Connected state in LTE SA1

- Huawei think the concern in SA1 is that a UE stays in this state and never goes to idle. In RAN2 we had a decision not to do this. In RAN2 we can only discuss next time if the WI is resumed.

  Ericsson would like light connection and inactive to be consistent and inactive will have access control.

=> We will look at this again in the next meeting if the WI is resumed by RAN in the next quarter

=> LS noted

R2-1704027 LS to RAN2 on adding PRB usage distribution and IP throughput distribution measurements (S5-171993; contact: Huawei) SA5 LS in

- Vivo wonder which release this should be done in.
- Huawei explain that SA5 don't have a release 15 WI on this.

=> We will look at this again under TEI15 in Q4.

=> LS noted

R2-1704028 LS to RAN2 on adding measurements on average number of total active UEs (S5-171996; contact: Huawei) SA5 LS in

=> We will look at this again under TEI15 in Q4.

=> LS noted

R2-1704029 LS on MBMS bearer event notification (S6-170441; contact: Ericsson) SA6 LS in

- Ericsson think that SA2 and RAN3 should work on this first.
- Nokia have the same view as don't see immediate impact in RAN2.

=> We will wait to see if SA2 /RAN3 work identifies any impact for RAN2.

=> LS noted

R2-1704115 LS on eVoLP parameters (S4-170502; contact: Qualcomm) SA4 LS in Rel-14 LTE_VoLTE_ViLTE_enh, FS_eVoLP SA2, RAN2 RAN3

=> Noted

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R2-1705997 Reply LS to Reply LS from 3GPP RAN2 on Estimated Throughput (11-17/315r0) IEEE P802.11 LS in To: RAN2

- Chair thinks that we can consider this in future release (beyond release 14) if IEEE work reaches any conclusions

=> Noted

R2-1706052 Reply LS on optimisation of network selection (C6-170262; contact: Safran) CT6 LS in Rel-15 HORNS To: SA1, CT1; Cc: RAN2

- New LS in

=> Noted

R2-1706059 LS on extension of NS and CA_NS signalling space (R4-1706076; contact: Nokia) RAN4 LS in Rel-14 EI14 RAN2

- New LS in

=> Noted

R2-1706136 [feMTC] RAN4

=> Already covered in RAN2 CRs being agreed by email.

=> Noted

R2-1706138 Monitoring of partial NPDCCH search spaces RAN1

=> Postponed

Documents relalted to incoming LSs

R2-1704967 Overview on new LTE measurements Huawei, HiSilicon, China Telecom discussion Rel-15 TEI15

R2-1705086 Dynamic Configuration of MBSFN areas for MC service Hytera Communications Corp. CR 36.300 14.2.0 1025 F Rel-14 MBMS_Mcservices

R2-1705103 Discussion on MCCH modification period for MCPTT Hytera Communications Corp. CR 36.331 14.2.2 2850 C Rel-14 MBMS_Mcservices

=> Not treated as covered by the LS discussions above

3.3 UMTS relevance

4 Joint UMTS/LTE: Rel-13 and earlier releases

Contributions submitted under this agenda item will be handled in a joint UMTS/LTE session.

4.1 Joint UMTS/LTE: Rel-12 and earlier releases

(SIMTC-RAN_OC-Core, leading WG: RAN2, REL-11, started: Sep.11, closed: Sep. 12, WID: RP-111373)

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(eMDT_UMTSLTE-Core, leading WG: RAN2, REL-11, started: Sep.11, closed: Dec.12, WID: RP-121204)

(SONenh2_LTE_UTRA-Core, leading WG: RAN3, REL-11, started: Sep.11, closed: Dec.12, WID: RP-120314)

(rSRVCC-GERAN, leading WG: GERAN2, REL-11, started: Sep.11, closed: Nov.13, WID: GP-111290)

(EHNB_enh3-Core, leading WG: RAN3, REL-12, started: Sep.12, closed: Dec 13, WID: RP-130741)

(MTCe_RAN-Core, leading WG: RAN2, REL-12, started: Dec.13, closed: Sep.14, WID: RP-132053)

(UTRA_LTE_WLAN_interw-Core, leading WG: RAN2, REL-12, started: Dec.13, closed: Sep.14, WID: RP-132101)

(LTE_UTRA_IncMon-Core, leading: RAN4, REL-12, started: Dec.13, closed: Dec. 14, WID: RP-132061)

Including corrections to joint LTE+UMTS TEI functionality in Rel-8 to 12. E.g. "Multiple Frequency Bands per Cell", …

4.2 Joint UMTS/LTE: Rel-13 WIs

Including correction related to the following WIs:

(ACDC-RAN-Core; leading WG: RAN2; REL-13; started: Mar. 15; closed: Dec. 15; RP-150662)

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5 Joint UMTS/LTE: Rel-14

UTRA_LTE_iPos_enh2-Core will be treated under separate UMTS and LTE agenda items in 8.7 and 13.4 respectively.

5.1 Enhancements of Dedicated Core Networks for UMTS and LTE

(eDECOR-UTRA_LTE-Core; leading WG: RAN3; REL-14; started: Dec. 16; closed: Mar. 17: WID: RP-162543)

This agenda item is for correction CRs to the closed WI.

R2-1705408 Miscellaneous eDECOR corrections and clarifications resulting from ASN.1 review Ericsson CR 36.331 14.2.1 2871 F Rel-14 eDECOR-UTRA_LTE-Core

moved from 8.26 to 5.1

=> Agreed

R2-1706089 LS on support of eDECOR for NB-IoT (S2-173647; contact: Ericsson) SA2 LS in Rel-14 eDECOR-UTRA_LTE-Core To: RAN2

- New LS in

=> Noted

R2-1706048 Support eDECOR for NB-IoT HTC Corporation CR Rel-14 36.331 14.2.2 eDECOR-UTRA_LTE-Core 2706 1 F

=> Agreed

5.2 Other Joint UMTS/LTE Rel-14 WIs

5.3 Joint UMTS/LTE TEI14 enhancements

Small Technical Enhancements affecting both LTE and UMTS Rel-14 that do not belong to any Rel-14 WI.

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Note: A TEI enhancement proposal should be treated for only one meeting cycle and involve only one WG. Otherwise, a WI should be proposed at RAN plenary!

6 LTE: Rel-12 and earlier releases

(LTE-L23, leading WG: RAN2, REL-8, started: Sep. 06, closed: Dec. 08, WID: RP-080747)

(LTE_CA-Core, leading WG: RAN1, REL-10, started: Dec. 09, closed: June 11, WID: RP-100661)

(LTE_UL_MIMO-Core, leading WG: RAN1, REL-10, started: Dec.09, closed: June 11, WID: RP-100959)

(LTE_eDL_MIMO-Core, leading WG: RAN1, REL-10, started: Dec.09, closed: March 11, WID: RP-100196)

(LTE_Relay-Core, leading WG: RAN1, REL-10, started: Dec. 09, closed: June 11, WID: RP-110911)

(MBMS_LTE_enh-Core, leading WG: RAN2, REL-10, started: June 10, closed: March 11, WID: RP-101244)

(MDT_UMTSLTE-Core, leading WG: RAN2, REL-10, started: Dec. 09, closed: June 11, WID: RP-100360)

(eICIC_LTE-Core, leading WG: RAN1, REL-10, started: March 10, closed: June 11, WID: RP-100383)

(SONenh_LTE-Core, leading WG: RAN3, REL-10, started: March 10, closed: June 11, WID: RP-101004)

(LTE_CA_enh-Core, leading WG: RAN1, REL-11, started: March 11, closed: Mar.13, WID: RP-121999)

(MBMS_LTE_SC-Core, leading WG: RAN2, REL-11, started: June 10, closed: Sep.12, WID: RP-120258)

(LTE_eDDA-Core, leading WG: RAN2, REL-11, started: March 11, closed: Dec.12, WID: RP-120256)

(LCS_LTE-NBPS-Core, leading WG: RAN2, REL-11, started: March 09, closed: June. 13, WID: RP-131259)

(eICIC_enh_LTE-Core, leading WG: RAN1, REL-11, started: March 11, closed: Dec. 12, WID: RP-120860)

(SPIA_IDC_LTE-Core, leading WG: RAN2, REL-11, started: Sep.11, closed: Dec. 12, WID: RP-111355)

(COMP_LTE_DL-Core, leading WG: RAN1, REL-11, started: Sep.11, closed: Dec.12, WID: RP-111365)

(COMP_LTE_UL-Core, leading WG: RAN1, REL-11, started: Sep.11, closed: Dec.12, WID: RP-111365)

(LTE_TDD_add_subframe, leading WG: RAN1, REL-11, started: March 12; closed: Sep. 12, WID: RP-120384)

(FS_HetNet_eMOB_LTE, leading WG: RAN2, REL-11, started: March 11, closed: Sep. 12, WID: RP-110709)

(LTE_enh_dl_ctrl-Core, leading WG: RAN1, REL-11, started: Dec. 11, closed: Dec. 12, WID: RP-120871)

(LTE_SC_enh_dualC-Core, leading WG: RAN2, REL-12, started: Dec.13, closed: Dec.14, WID: RP-141797)

(LTE_SC_enh_L1-Core, leading WG: RAN1, REL-12, started: Dec.13, closed: Dec.14, WID: RP-132073)

(LTE_D2D_Prox-Core, leading WG: RAN1, REL-12, started: Mar.14, closed: Mar.15, WID: RP-142043)

(MBMS_LTE_OS-Core, leading WG: RAN2, REL-12, started: Sep.13, closed: Dec.14, WID: RP-140282)

(LTE_NAICS-Core, leading WG: RAN1, Rel-12, started: Mar 14, closed: Dec.14, WID: RP-140519)

(LC_MTC_LTE-Core, leading WG: RAN1, REL-12, started: Jun 13, closed: Dec 14, WID: RP-140522)

(GCSE_LTE-MBMS_CM-Core, leading WG: RAN3, started: Sep. 14, closed: Mar. 2015, WID: RP-141035)

(LTE_CA_TDD_FDD-Core, leading WG: RAN1, REL-12, started: Jun 13, closed: Jun 14, WID: RP-140465)

(LCS_BDS-LTE-Core, leading WG: RAN2, REL-12, started: Mar 13, closed: Dec 13, WID: RP-130416)

(LTE_eDL_MIMO_enh-Core, leading WG: RAN1, REL-12, started: Sep 12, closed: June 14, WID: RP-121416)

(HetNet_eMOB_LTE-Core, leading WG: RAN2, REL-12, started: Dec.12, , closed: Sep 14, WID: RP-122007)

(Cov_Enh_LTE-Core, leading WG: RAN1, REL-12, started: Jun.13, closed: Jun.14, WID: RP-130833)

(LTE_TDD_eIMTA-Core, leading WG: RAN1, REL-12, started: Dec 12, closed: Jun.14, WID: RP-121772)

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(SCM_LTE-Core, leading WG: RAN2, REL-12, started: Mar.14, closed: Sep.14, WID: RP-140434)

6.0 In principle agreed CRs

Including the technically endorsed CRs from RAN2#97bis

R2-1704033 Optional feature without UE capability bit for VoLTE Huawei, HiSilicon CR
36.306 12.11.0 1456 F Rel-12 TEI12, LTE-L23

R2-1704034 Optional feature without UE capability bit for VoLTE Huawei, HiSilicon CR
36.306 13.5.0 1457 A Rel-13 TEI12, LTE-L23

R2-1704035 Optional feature without UE capability bit for VoLTE Huawei, HiSilicon CR
36.306 14.2.0 1458 A Rel-14 TEI12, LTE-L23

=> All above CRs are agreed

R2-1706038 Entry-Level UE Support UL 64QAM MediaTek Inc., SequansCR Rel-12 36.331
12.13.0 TEI12 2793 1 B

R2-1706039 Entry-Level UE Support UL 64QAM MediaTek Inc., SequansCR Rel-13 36.331
13.5.0 TEI12 2794 1 A

R2-1706040 Entry-Level UE Support UL 64QAM MediaTek Inc., SequansCR Rel-14 36.331
14.2.2 TEI12 2795 1 A

=> Technically endorsed

R2-1706044 Entry-Level UE Support UL 64QAM MediaTek Inc., CMCC, Verizon, Sequans CR
Rel-12 36.306 12.11.0 TEI12 1440 2 B

R2-1706045 Entry-Level UE Support UL 64QAM MediaTek Inc., CMCC, Verizon, Sequans CR
Rel-13 36.306 13.5.0 TEI12 1441 2 A

R2-1706046 Entry-Level UE Support UL 64QAM MediaTek Inc., CMCC, Verizon, Sequans CR
Rel-14 36.306 14.2.0 TEI12 1442 2 A

=> Technically endorsed

6.1 Other

R2-1704195 Handling of GERAN redirection without AS security discussion Nokia, Alcatel-Lucent Shanghai Bell
Rel-12 TEI12

- Nokia explain that SA3 are also discussing and we have not yet received an LS from them.
- Ericsson think that CT1 agreed it was possible for NAS to configure the UE whether to accept or not the un-protected redirection. On top this adds another way to protect the redirection.
- Qualcomm ask if this mechanism is for the case that unprotected redirection is allowed. Nokia think the CT1 solution doesn't work.
- CT1 mechanism is that by default the UE will not accept un protected redirections. This means in a legacy deployment a new UE might fail to be redirection.
- Ericsson think that SA3 will not discuss the CSFB delay issues related to the new mechanism verses the current AS security.

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=> Send LS to CT1 to clarify their intention about the default behaviour of Rel-14 UEs and explain the consequences from RAN2 point of view of the different default behaviours.

=> Wait for SA3 input regarding the new mechanism for protection of redirection.

=> Response LS to CT1 in R2-1705881 (Nokia, offline discussion 01)

R2-1705881 [DRAFT] [Response LS on Handling of GERAN redirection without AS security] Nokia LS out TEI12 To: CT1

- Huawei explain that CT1 intent that the default behaviour was just meant to be for the case that the UE has not yet attached to the network and hence no issue in legacy networks.

=> Revised in R2-1706090

R2-1706090 [DRAFT] [Response LS on Handling of GERAN redirection without AS security] Nokia LS out TEI12 To: CT1

=> Approved in R2-1706149

R2-1704284 additionalSpectrumEmission value range extension discussion Nokia, Alcatel-Lucent Shanghai Bell Rel-9 TEI9

- DOCOMO think RAN4 is going to send an LS.

=> CRs will be targeted for the next RAN2.

=> Offline discussion to progress on the target release and other details (Nokia, offline discussion 03)

- Update from offline: It was concluded safest to do the CRs from release 9 and also safest to update the CA values at the same time even though this is not yet essential. The intention is to not update NB-IoT at this time.

- MediaTek have concerns with release 9. DOCOMO have view it is essential from release 10.

=> The CRs will be prepared for Rel-10

✉ **[98#xx][LTE/] NS extension (Nokia)**

Progress CR to extend the value range for the NS values.

Intended outcome: Agreeable CR for next meeting

Deadline: Thursday 2017-08-03

R2-1705801 Revert PDCP state variable HFN and SN back to the values used in the source cell Qualcomm CR 36.331 12.13.0 2938 F Rel-12 TEI12

- LG think it was discussed 5 years ago and it was agreed to just capture in the chair notes because there are many other configurations that should be restored before re-establishment is performed. MediaTek have a similar view and this has been working for a long time. Could add a note

- Qualcomm think it was a bad decision to only capture this in the chair notes. Also think it is only the HFN and SN that matter as re-establishment is about to happen.

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- Ericsson would support to add a note. DOCOMO also support to add a note.

=> Revised in R-1705882 to capture the behaviour in the spec. (Qualcomm, offline discussion 04)

=> CR will be release 14 with 'magic' sentence

R2-1705882 Revert PDCP state variable HFN and SN back to the values used in the source cell Qualcomm
CR 36.331 14.2.2 2940 1 F Rel-14 TEI12

=> Revised to R2-1706144

R2-1706144 Revert PDCP state variable HFN and SN back to the values used in the source cell Qualcomm
CR 36.331 14.2.2 2940 1 F Rel-14 TEI12

=> All new text should be part of the note

=> Agreed in R2-1706152

R2-1705802 Revert PDCP state variable HFN and SN back to the values used in the source cell Qualcomm
CR 36.331 13.5.0 2939 A Rel-13 TEI12

R2-1705803 Revert PDCP state variable HFN and SN back to the values used in the source cell Qualcomm
CR 36.331 14.2.2 2940 A Rel-14 TEI12

7 LTE: Rel-13

7.1 WI: Licensed-Assisted Access using LTE

(LTE_LAA-Core, leading WG: RAN1, REL-13; started: June 15, closed: Dec. 15, WID: RP-151045)

Including output from email discussion [97bis#06][LTE/LAA] LAA/WiFi sharing (Apple)

R2-1704929 Report of email discussion [97bis#06][LTE/LAA] LAA/WiFi sharing Apple Switzerland AG
discussion Rel-13

P1

- Ericsson think we should talk about the feature first.
- Intel think we have agreed to have a simplified mechanism and it is important for the network to know that UE only supports the simplified feature and not full IDC. And also means it is not linked to LAA support.
- Nokia think this will be needed if we add new configuration signalling.
- LG agree with Nokia and Ericsson.

P2

- Nokia think the point is that network configures when this indication of LAA/WiFi sharing is allowed.
- Apple think in the discussion all companies thought network configuration was needed.

P3

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- Ericsson wonder whether the eNB really cares if the IDC indication is caused by LAA/WiFi sharing.
- Intel think some network vendors have implemented IDC and the new extension is needed to distinguish between legacy IDC and the new simplified IDC.
- Nokia think it is needed to differentiate between the existing IDC and the new IDC for WiFi use and the network might want to configure both. It is safer for the network to know.
- BlackBerry think that the network and UE actions will be different.
- LG think it is not needed as the network knows if LAA is configured.
- Apple think the new indication to avoid risk that legacy network implementations.
- Samsung also agree that a new indication is needed.
- Qualcomm also think something explicit is needed as hardware sharing is separate from existing IDC.
- Ericsson thinks the eNB response will be the same. And has not heard any alternative action than for the eNB to deconfigure the SCell. Qualcomm think that the eNB might keep the configuration but just not schedule. BlackBerry think the eNB needs to know that something different is happening to measurements , etc.
- Sony also support an explicit indication.
- BlackBerry think it was concluded offline that it UE behaviour is different for the 2 cases then there should be a new indication.
- Nokia think the network could react differently for legacy and new IDC indication. Is we don't have the indication then we limit the network to have to respond in a single way.
- Nokia wonders whether the UE can indicate it has 2 problems in the same IDC message. How does network know which frequencies are sharing problems and which are interference.

P4

- Ericsson assume that the network will deactivate the SCells.
- LG think that the UE can just wait for the network to deactivate the SCell. The network knows this is the only option as there is a new indication.
- Intel think the majority wanted to go for deactivating the SCell.
- Nokia think that we can rely on the eNB to react. The discussion is whether we have a resume.
- MediaTek thinks this should be autonomous for UE to suspend but after sending the IDC to indicate resume it can be the network to activate again.
- Ericsson think deactivation should be fast enough. For resume an empty IDC indication is already there.
- BlackBerry think once the IDC indication is sent the UE is already not able to transmit and receive on the SCell.
- LG think the eNB can just not schedule the UE and rely on autonomous deactivation.
- Nokia think the UE should continue to send CQI until it is deactivated by the network.
- Apple would be ok to rely on network deactivation.
- Samsung think we need well defined UE behaviour, or we require well defined network behaviour otherwise the problem is not solved.

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Agreements:

1: The signalling in the IDC indication for hardware sharing is to have:

- The existing affectedCarrierFreqList is used to indicate the affected carrier.
- TDM and UL CA combination information is not needed for hardware sharing.
- New explicit indication to indicate that it is hardware sharing issue

2 Network configuration is added to config the UE to enable IDC indication for hardware sharing.

3 Introduce a new UE capability for hardware sharing and this can only be set if UE supports LAA. It is for Rel-13 onwards.

=> Discuss offline to conclude on P5 and if anything should be captured in stage 2 regarding network behaviour. (Apple, offline discussion 5)

- Update from offline: Updated CRs are provided for stage 2 and stage 3.Companies seem ok to update stage 2.

R2-1704934 LAA/WiFi sharing indication Apple CR 36.300 13.7.0 1022 B Rel-13 LTE_LAA-Core

=> Revised in R2-1706064

R2-1706064 LAA/WiFi sharing indication Apple CR Rel-13 36.300 13.7.0 LTE_LAA-Core 1022 1 B

- Nokia thinks there are stage 3 details in this CR and also thinks that eNB behaviour doesn't need to be included.
- Intel think description of expected eNB behaviour is useful. MediaTek agree and think that it is ok to describe eNB behaviour.
- Ericsson think we don't need a new section. Apple think the new section makes a clear distinction between the behaviour and we have a separate capability.

=> Revised in R2-1706091

R2-1706091 LAA/WiFi sharing indication Apple CR Rel-13 36.300 13.7.0 LTE_LAA-Core 1022 2 B

✉ **[98#xx][LTE/REl-13] LAA/WiFi sharing 36.300 CR (Apple)**

Discussion to focus on "the UE may expect eNB to deactivate the LAA SCell(s)" and the measurement part of the CR.

Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

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R2-1704935	LAA/WiFi sharing indication 14	LTE_LAA-Core	Apple	CR	36.300	14.2.0	1023		A	Rel-
	=> Revised in R2-1706065									
R2-1706065	LAA/WiFi sharing indication 1	A	Apple	CR	Rel-14	36.300	14.2.0	LTE_LAA-Core		1023
	=> Revised in R2-1706092									
R2-1706065	LAA/WiFi sharing indication 2	A	Apple	CR	Rel-14	36.300	14.2.0	LTE_LAA-Core		1023
R2-1704930	LAA/WiFi sharing indication 13	LTE_LAA-Core	Apple	CR	36.306	13.5.0	1460		B	Rel-
	=> Revised in R2-1706060									
R2-1706060	LAA/WiFi sharing indication 1	B	Apple	CR	Rel-13	36.306	13.5.0	LTE_LAA-Core		1460
	=> Revised in R2-1706093									
R2-1706093	LAA/WiFi sharing indication 2	B	Apple	CR	Rel-13	36.306	13.5.0	LTE_LAA-Core		1460
	=> Agreed									
R2-1704931	LAA/WiFi sharing indication 14	LTE_LAA-Core	Apple	CR	36.306	14.2.0	1461		A	Rel-
	=> Revised in R2-1706061									
R2-1706061	LAA/WiFi sharing indication 1	A	Apple	CR	Rel-14	36.306	14.2.0	LTE_LAA-Core		1461
	=> Revised in R2-1706094									
R2-1706094	LAA/WiFi sharing indication 2	A	Apple	CR	Rel-14	36.306	14.2.0	LTE_LAA-Core		1461
	=> Agreed									
R2-1704932	LAA/WiFi sharing indication 13	LTE_LAA-Core	Apple	CR	36.331	13.5.0	2829		B	Rel-
	=> Revised in R2-1706062									
R2-1706062	LAA/WiFi sharing indication 1	B	Apple	CR	Rel-13	36.331	13.5.0	LTE_LAA-Core		2829
	=> Revised in R2-1706095									
R2-1706095	LAA/WiFi sharing indication 2	B	Apple	CR	Rel-13	36.331	13.5.0	LTE_LAA-Core		2829

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=> Revised in R2-1706146

R2-1706146 LAA/WiFi sharing indication 2 B — Apple — CR — Rel-13 — 36.331 — 13.5.0 — LTE_LAA-Core — 2829

=> Agreed

R2-1704933 LAA/WiFi sharing indication 14 LTE_LAA-Core — Apple — CR — 36.331 — 14.2.2 — 2830 — A — Rel-

=> Revised in R2-1706063

R2-1706063 LAA/WiFi sharing indication 1 A — Apple — CR — Rel-14 — 36.331 — 14.2.2 — LTE_LAA-Core — 2830

=> Revised in R2-1706096

R2-1706096 LAA/WiFi sharing indication 2 A — Apple — CR — Rel-14 — 36.331 — 14.2.2 — LTE_LAA-Core — 2830

R2-1706147 LAA/WiFi sharing indication 3 A — Apple — CR — Rel-14 — 36.331 — 14.2.2 — LTE_LAA-Core — 2830

=> Agreed

R2-1705587 IDC simplification LTE_LAA-Core — Ericsson — CR — 36.331 — 13.5.0 — 2910 — F — Rel-13

R2-1705588 IDC simplification LTE_LAA-Core — Ericsson — CR — 36.331 — 14.2.2 — 2911 — A — Rel-14

R2-1706079 Extension of IDC-feature for WLAN/LAA RF-sharing — Ericsson — CR — Rel-13 — 36.300 — 13.7.0 — LTE_LAA-Core — 1036 — C

R2-1706080 Extension of IDC-feature for WLAN/LAA RF-sharing — Ericsson — CR — Rel-14 — 36.300 — 14.2.0 — LTE_LAA-Core — 1037 — A

R2-1706081 Extension of IDC-feature for WLAN/LAA RF-sharing — Ericsson — CR — Rel-13 — 36.306 — 13.5.0 — LTE_LAA-Core — 1481 — C

R2-1706082 Extension of IDC-feature for WLAN/LAA RF-sharing — Ericsson — CR — Rel-14 — 36.306 — 14.2.0 — LTE_LAA-Core — 1482 — A

R2-1706083 Extension of IDC-feature for WLAN/LAA RF-sharing — Ericsson — CR — Rel-13 — 36.331 — 13.5.0 — LTE_LAA-Core — 2955 — C

R2-1706084 Extension of IDC-feature for WLAN/LAA RF-sharing — Ericsson — CR — Rel-14 — 36.331 — 14.2.2 — LTE_LAA-Core — 2956 — A

R2-1705503 RRM Measurement Clarification on Discovery Signals for LAA — Qualcomm — CR — 36.331 — 13.5.0 — 2892 — F — Rel-13 — LTE_LAA-Core

- Intel wonder if it is already clear that these are for RRM purposes.
- Nokia think this is correct but not sure it needs clarification. Also wonder if DMTC is related to LAA.

=> Offline discussion to conclude (Qualcomm, offline discussion 6)

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R2-1705504 RRM Measurement Clarification on Discovery Signals for LAA Qualcomm CR
36.331 14.2.2 2893 A Rel-14 LTE_LAA-Core

- Nokia agree with the intent but would like more time to check details

=> Postponed

7.2 WI: LTE-WLAN Radio Level Integration

(LTE_WLAN_radio-Core, leading WG: RAN2, started: Mar. 15, closed: Mar. 16, WID: RP-152213)

7.2.0 In principle agreed CRs

R2-1705437 Clarification on polling HTC Corporation, LG Electronics CR 36.323 13.5.0 0195
2 F Rel-13 LTE_WLAN_radio-Core

R2-1705461 Clarification on polling HTC Corporation, LG Electronics CR 36.323 14.2.0 0199
A Rel-14 LTE_WLAN_radio-Core

=> CRs above are agreed

7.2.1 Other

7.3 WI: Further LTE Physical Layer Enhancements for MTC

(LTE_MTCe2_L1-Core, leading WG: RAN1, REL-13; started: Sep. 14, closed: Mar. 16, WID: RP-150492)

Documents in this agenda item will be handled in the NB-IoT Break Out session

Including output from email discussion [97bis#29][LTE/MTCe2] RAR reception (Ericsson)

Including output from email discussion [97bis#30][LTE/MTCe2] Preamble selection in CE (Ericsson)

Incoming LS

R2-1706055 LS on RAR window definition in CE mode B (R1-1709337; contact: Ericsson).

⇒ **noted**

7.3.0 In principle agreed CRs

R2-1704601 Correction on HARQ principles for eMTC Huawei, HiSilicon CR 36.300 14.2.0 0996
1 F Rel-14 LTE_MTCe2_L1-Core

⇒ **agreed**

R2-1704602 Correction on HARQ principles for eMTC Huawei, HiSilicon CR 36.300 14.2.0 0996
2 F Rel-14 LTE_MTCe2_L1-Core

⇒ **withdrawn**

R2-1704700 Correction to RACH CE level info list Ericsson CR 36.331 13.5.0 2772 1
F Rel-13 LTE_MTCe2_L1-Core

⇒ **agreed**

R2-1704701 Correction to RACH CE level info list Ericsson CR 36.331 14.2.2 2773 1
A Rel-14 LTE_MTCe2_L1-Core

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⇒ **agreed**

R2-1705276 Correction to downlink reception types for BL UEs and UEs in CE Sequans Communications
CR 36.302 13.5.0 0108 2 F Rel-13 LTE_MTCe2_L1-Core

⇒ **agreed**

R2-1705385 Correction to downlink reception types for BL UEs and UEs in CE Sequans Communications
CR 36.302 14.2.0 0109 1 A Rel-14 LTE_MTCe2_L1-Core

⇒ **agreed**

R2-1705464 Clarification on additionalSpectrumEmission for eMTC HTC Corporation CR
36.331 13.5.0 2753 1 F Rel-13 LTE_MTCe2_L1-Core

⇒ **agreed**

R2-1705689 Clarification on additionalSpectrumEmission for eMTC HTC CR 36.331 14.2.2 2919
A Rel-14 LTE_MTCe2_L1-Core

⇒ **agreed**

R2-1705465 Correction on terminology of SI for eMTC Huawei, HiSilicon CR 36.321 13.5.0 1046
2 F Rel-13 LTE_MTCe2_L1-Core

- Ericsson wonders if we need to add “other specs affected”

⇒ **agreed**

R2-1705466 Correction on terminology of SI for eMTC Huawei, HiSilicon CR 36.331 13.5.0 2800
1 F Rel-13 LTE_MTCe2_L1-Core

⇒ **agreed**

R2-1705467 Correction on terminology of SI for eMTC Huawei, HiSilicon CR 36.321 14.2.0 1114
A Rel-14 LTE_MTCe2_L1-Core

⇒ **agreed**

R2-1705468 Correction on terminology of SI for eMTC Huawei, HiSilicon CR 36.331 14.2.0 2879
A Rel-14 LTE_MTCe2_L1-Core

⇒ **agreed**

Above 2 CRs moved to 7.3.0 from 7.3.1

7.3.1 Other

RAR reception:

R2-1705570 Email discussion report on 97bis#29 RAR Reception Ericsson discussion Rel-13 LTE_MTCe2_L1-Core

Proposal 1 UE behaviour is changed to address the problem on the limitation of maximum number of repetitions that can be configured for MPDCCH and PDSCH.

Proposal 2 The UE shall receive M-PDCCH, which schedules RAR, during the RA response window, otherwise random access attempt fails.

Proposal 3 Send an LS to RAN1 to update their specifications with respect to the revised RAN2 agreement on RAR message reception.

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Proposal 4 RAN2 to discuss how to address the backwards incompatibility issue.

DISCUSSION

- Ericsson reports that RAN1 are discussing exactly this issue.
- QC wonders if we will make the change from Rel-13. Ericsson supports.

Awaiting RAN1 outcomes, RAN2 assumes the following:

⇒ **UE behaviour is changed to address the problem on the limitation of maximum number of repetitions that can be configured for MPDCCH and PDSCH, from Rel-13.**

RAN1 are discussing the same issue

Comeback after we receive more info from RAN1.

⇒ **No backwards compability problem except that if eNB or UE is not corrected it is likely that RACH in CE mode B will fail due to insufficient number of repetitions.**

R2-1705472 RAR reception for eMTC Huawei, HiSilicon CR 36.321 13.5.0 1115 F Rel-13 LTE_MTCe2_L1-Core

- Ericsson think we don't need this, it is redundant.
- Qualcomm think we need the clarification because there is text that could otherwise be conflicting.

⇒ **We keep the clarification but change to either integrate into the normative text or move the Note to after the relevant text.**

⇒ **Revised**

R2-1705928 RAR reception for eMTC Huawei, HiSilicon CR 36.321 13.5.0 1115 F Rel-13 LTE_MTCe2_L1-Core

- Ericsson think that the new text shold be conditional to Mode B. Intel think it can be general.

⇒ **should expand the abbreviation RAR, align the reason for change with the corresponding R1 CRs, use PDCCH instead of MPDCCH, make the new text conditional to CE mode B (no need to mention BL UEs specifically).**

⇒ **revised in R2-1706105 (rev 2)**

R2-1706105 RAR reception for eMTC Huawei, HiSilicon CR 36.321 13.5.0 1115 F Rel-13 LTE_MTCe2_L1-Core

⇒ **agreed**

R2-1705473 RAR reception for eMTC Huawei, HiSilicon CR 36.321 14.2.0 1116 A Rel-14 LTE_MTCe2_L1-Core

⇒ **Revised in R2-1706106**

R2-1706106 RAR reception for eMTC Huawei, HiSilicon CR 36.321 14.2.0 1116 A Rel-14 LTE_MTCe2_L1-Core

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⇒ **agreed**

R2-1705571	RAR message reception	Ericsson	discussion	Rel-13	LTE_MTCe2_L1-Core
R2-1705575	Draft LS on RAR reception	Ericsson	LS out	Rel-13	LTE_MTCe2_L1-Core To: RAN1
R2-1705576	RAR message reception for eMTC UEs - Option 2	Ericsson	CR	36.331	13.5.0 2908 F Rel-13 LTE_MTCe2_L1-Core
R2-1705577	RAR message reception for eMTC UEs - Option 2	Ericsson	CR	36.331	14.2.2 2909 A Rel-14 LTE_MTCe2_L1-Core
R2-1705572	RAR message reception for eMTC UEs - Option 1	Ericsson	CR	36.331	13.5.0 2906 F Rel-13 LTE_MTCe2_L1-Core
R2-1705573	RAR message reception for eMTC UEs - Option 1	Ericsson	CR	36.331	14.2.2 2907 A Rel-14 LTE_MTCe2_L1-Core
R2-1705574	RAR message reception for eMTC UEs - Option 1	Ericsson	CR	36.321	14.2.1 1126 F Rel-14 LTE_MTCe2_L1-Core

The 7 tdocs above not treated

ADDITIONAL OFFLINE REPORT

Offline discussion 306, DRAFT CR adding a separate RAR window for CE mode B.

- Ericsson reports that after further checking that we fortunately all parameters can be configured already per CE level

⇒ **No action required**

RACH Preamble selection in CE

R2-1704184 Summary of email discussion on preamble selection in CE Ericsson discussion Rel-13 LTE_MTCe2_L1-Core

Proposal 1 CE-level specific preamble ranges are not used at the same time as preamble group A and B (i.e. Alt. 2).

DISCUSSION

- QC wonders if we go with Alt 2 how to handle the backwards compatibility problem
- LG also think that Alt2 brings significant change.
- Sequans wonders if there is the intention to support group A and B, and suggest that we don't cange in TS by just say that group B isn't configured. Nokia think that group B is only for good coverage and large message size. Nokia think that only group A need to be used with groups a and B, but used for normal coverage. Docomo think that group A and B can be used without pathloss estimate, and is thus applicable to all CE levels.
- ZTE think that alt 1 and 2 are ok if we can accept the configuration restriction.
- Intel wonders if the valid configuration includes the case that if bot Group A/B is defined then the first preamble in the group need to be the first preamble of the resource.

⇒ **No backwards compatibility problem in Alt 2 (or Alt 1)**

⇒ **When a RACH reseource is shared for multiple CE-levels, and CE-level are differentiated by different preambles, Group A and Group B is not used for this RACH-resource.**

⇒ **We go with the majority, Alt2, as a baseline.**

⇒ **Can add some more guidelines on valid configurations in the CR, e.g. as Notes**

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R2-1704187 Configuration of preamble groups for CE levels and preamble groups A/B – Alt2 Ericsson
CR 36.321 13.5.0 1071 1 F Rel-13 LTE_MTCe2_L1-Core

⇒ **revised**

R2-1705901 Configuration of preamble groups for CE levels and preamble groups A/B – Alt2 Ericsson
CR 36.321 13.5.0 1071 2 F Rel-13 LTE_MTCe2_L1-Core

⇒ **Change the note to "When a PRACH resource is shared for multiple CE-levels, and CE-level are differentiated by different preamble indices, Group A and Group B is not used for this PRACH resource."**

⇒ **Revised in R2-1706107 (rev 3), which is agreed unseen.**

R2-1706107 Configuration of preamble groups for CE levels and preamble groups A/B – Alt2 Ericsson
CR 36.321 13.5.0 1071 3 F Rel-13 LTE_MTCe2_L1-Core

⇒ **agreed unseen**

R2-1704188 Configuration of preamble groups for CE levels and preamble groups A/B – Alt2 Ericsson
CR 36.321 14.2.0 1072 1 A Rel-14 LTE_MTCe2_L1-Core

⇒ **revised**

R2-1705902 Configuration of preamble groups for CE levels and preamble groups A/B – Alt2 Ericsson
CR 36.321 14.2.0 1072 1 A Rel-14 LTE_MTCe2_L1-Core

⇒ **Revised in R2-1706108 (rev 3), which is agreed unseen.**

R2-1706108 Configuration of preamble groups for CE levels and preamble groups A/B – Alt2 Ericsson
CR 36.321 14.2.0 1072 3 A Rel-14 LTE_MTCe2_L1-Core

⇒ **Agreed unseen**

R2-1706068 Configuration of preamble groups for CE levels and preamble groups A/B NTT Docomo CR
36.331 13.5.0 2951 F Rel-13 LTE_MTCe2_L1-Core

⇒ **Change to "When random access preambles group B is used, firstPreamble-r13 is set to 0 and lastPreamble-r13 is set to numberOfRA-Preambles-1"**

⇒ **Revise in R2-1706109 (rev 1).**

R2-1706109 Configuration of preamble groups for CE levels and preamble groups A/B NTT Docomo CR
36.331 13.5.0 2951 1 F Rel-13 LTE_MTCe2_L1-Core

⇒ **Agreed unseen.**

R2-1706069 Configuration of preamble groups for CE levels and preamble groups A/B NTT Docomo CR
36.331 14.2.2 2952 A Rel-14 LTE_MTCe2_L1-Core

⇒ **Revised in R2-1706110 (rev 1).**

R2-1706110 Configuration of preamble groups for CE levels and preamble groups A/B NTT Docomo CR
36.331 14.2.2 2952 1 A Rel-14 LTE_MTCe2_L1-Core

⇒ **Agreed unseen**

R2-1704185 Configuration of preamble groups for CE levels and preamble groups A/B – Alt1 Ericsson
CR 36.321 13.5.0 1069 1 F Rel-13 LTE_MTCe2_L1-Core

⇒ **not pursued**

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R2-1704186 Configuration of preamble groups for CE levels and preamble groups A/B – Alt1 Ericsson
CR 36.321 14.2.0 1070 1 A Rel-14 LTE_MTCe2_L1-Core

⇒ **not pursued**

Other

R2-1704561 Support for Contention Resolution ID for eMTC ModeB ROHDE & SCHWARZ discussion
Rel-13

Observation 1 In eMTC ModeB it is not possible to transmit MAC PDU with only Contention Resolution ID CE

Proposal 1 RAN2 shall discuss the support for eMTC ModeB of MAC PDU with only Contention Resolution CE

DISCUSSION

- Ericsson think that contention resolution ID is fized size and we could interpret the rest as padding without format change. QC agrees
- LG don't want another format. Rode and Schwartz is ok with this.

OFFLINE

- After offline discussion it was concluded that no spec impact is needed. QC would however support to capture something in a NOTE in the TS. Rohde & S proposes a Note in the Annex B.

⇒ **For the case where only Contention Resoution ID is carried, the resulting MAC PDU contents is fixed size, and the UE shall interpret the rest as padding without format change.**

⇒ **Will add a Note in Annex B, can have CR for the next meeting**

R2-1704821 Clarification to MIB repetitions Sony CR 36.331 13.5.0 2827 F Rel-13
LTE_MTCe2_L1-Core

- QC wonders what is the initial acquisition, and how the number of repetitions is firstly determined.
- LG think this could be a NOTE
- Sierra Wireless are not sure this is needed, and if so we make it a note.

⇒ **Change the text to "The UE may assume the scheduling of the MIB repetition does not change".**

⇒ **Put the text in a NOTE, correct the cover sheet (incl CR number)**

⇒ **Revised in R2-1705903/04 (rev 1)**

R2-1705903 Clarification to MIB repetitions Sony CR 36.331 13.5.0 2827 F Rel-13
LTE_MTCe2_L1-Core

⇒ **Agreed**

R2-1704822 Clarification to MIB repetitions Sony CR 36.331 14.2.2 2828 A Rel-14
LTE_MTCe2_L1-Core

⇒ **revised**

R2-1705904 Clarification to MIB repetitions Sony CR 36.331 14.2.2 2828 A 1 Rel-14 LTE_MTCe2_L1-Core

- Was first agreed unseen but had to be updated due to a mistake on the coversheet

⇒ **revised**

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R2-1705910 Clarification to MIB repetitions Sony CR 36.331 14.2.2 2828 A 2 Rel-14 LTE_MTCe2_L1-Core

- CR number corrected on the coversheet

⇒ **Agreed unseen**

R2-1705218 Correction on Cell Reservations and Access Restrictions HTC Corporation CR 36.304 13.5.0 0374 F Rel-13 LTE_MTCe2_L1-Core

- Intel think that even though SIB1-BR is not acquired the SIB1 may be acquired. HTC think this just clarifies behaviour described in 36.331. Intel think this need more discussion, and the Cell refers to both BR version and normal version of the cell.

⇒ **postpone**

R2-1705220 Correction on Cell Reservations and Access Restrictions HTC Corporation CR 36.304 14.2.0 0375 A Rel-14 LTE_MTCe2_L1-Core

⇒ **postpone**

R2-1705469 Discussion on the time of applying RRCConnectionReconfiguration in eMTC Huawei, HiSilicon discussion Rel-13 LTE_MTCe2_L1-Core

- Ericsson think this is the same for legacy, and we don't specify for legacy, and the network need to be handle this. Sequans agree with Ericsson, and if we change current UEs may not be implemented acc to the change.
- Huawei think that the UE may use old or new HARQ/PUCCH configuration.
- Sierra wireless wonders if this is a UE for which the UE communication fails. Huawein confirms this is a normal case.
- QC think there is no problem. eNB has to handle both.

AFTER OFFLINE

- Some companies want to check more. Huawei suggest to postpone to next meeting. Intel think the eNB can handle this by trying to receive both.
- Network vendors should check whether there is a problem.

⇒ **noted**

R2-1705470 Corrections on RRCConnectionReconfiguration applying for eMTC Huawei, HiSilicon CR 36.331 13.5.0 2880 F Rel-13 LTE_MTCe2_L1-Core

⇒ **postponed**

R2-1705471 Corrections on RRCConnectionReconfiguration applying for eMTC Huawei, HiSilicon CR 36.331 14.2.0 2881 A Rel-14 LTE_MTCe2_L1-Core

⇒ **postponed**

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7.4 WI: Narrowband IOT

(NB_IOT-Core; leading WG: RAN1; started: Sep. 15; target: Jun. 16; WID: RP-152284)

Documents in this agenda item will be handled in the NB-IoT Break Out session

Including output from email discussion [97bis#31][NB-IoT] Cell reselection for NB-IoT (Ericsson)

Including output from email discussion [97bis#32][NB-IoT/MTCe2] Ouit of range UEs (Sequans)

7.4.0 In principle agreed CRs

R2-1704489 Stop condition for the drx-RetransmissionTimer for NB-IoT LG Electronics CR 36.321 13.5.0 1095 F Rel-13 NB_IOT-Core

- Revision number should be changed if the same CR number was used.
- New CR number was used.
- QC: there are changemarks on the coversheet.

⇒ **Revised in R2-1705883 (Rev 1), remove changemark**

R2-1705883 Stop condition for the drx-RetransmissionTimer for NB-IoT LG Electronics CR 36.321 13.5.0 1095 1 F Rel-13 NB_IOT-Core

⇒ **R2-1705883 is agreed unseen**

R2-1705079 Correction on the UE AS context handling HTC Corporation, LG Electronics Inc. CR 36.331 13.5.0 2718 2 F Rel-13 TEI13, NB_IOT-Core

- Ericsson point out that format should be B3 not B2 as now

⇒ **Revised in R2-1705884 (rev 3).**

R2-1705884 Correction on the UE AS context handling HTC Corporation, LG Electronics Inc. CR 36.331 13.5.0 2718 3 F Rel-13 TEI13, NB_IOT-Core

⇒ **R2-1705884 is agreed unseen.**

R2-1705080 Correction on the UE AS context handling HTC Corporation, LG Electronics Inc. CR 36.331 14.2.2 2848 A Rel-14 TEI13, NB_IOT-Core

- HTC point out that coversheet has been commented on by the secretary, cat should be A, rel should be rel-14.
- Same comment as above, buttle format to be updated as well.

⇒ **Revised in R2-1705885 (Rev 1), is agreed unseen.**

R2-1705885 Correction on the UE AS context handling HTC Corporation, LG Electronics Inc. CR 36.331 14.2.2 2848 1 A Rel-14 TEI13, NB_IOT-Core

⇒ **R2-1705885 is agreed unseen.**

R2-1705081 Correction on attach without PDN connectivity HTC Corporation CR 36.331 13.5.0 2719 1 F Rel-13 NB_IOT-Core

- Ericsson: MS Word format for the bullets are wrong.

⇒ **Revised in R2-1705886 (rev 2)**

R2-1705886 Correction on attach without PDN connectivity HTC Corporation CR 36.331 13.5.0 2719 2 F Rel-13 NB_IOT-Core

⇒ **R2-1705886 is agreed unseen**

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R2-1705085 Correction on attach without PDN connectivity HTC Corporation CR 36.331 14.2.2 2849 A Rel-14 NB_IOT-Core

- Ericsson: MS Word format for the bullets are wrong.

⇒ **Revised in R2-1705887 (rev 1)**

R2-1705887 Correction on attach without PDN connectivity HTC Corporation CR 36.331 14.2.2 2849 1 A Rel-14 NB_IOT-Core

⇒ **R2-1705887 is agreed unseen.**

R2-1705690 Clarification on additionalSpectrumEmission for NB-IoT HTC CR 36.331 13.5.0 2754 1 F Rel-13 NB_IOT-Core

- Ericsson wonders if we should have some field description. HUawei think we might not need it for this one. Ericsson are ok to remove.

⇒ **agreed**

R2-1705691 Clarification on additionalSpectrumEmission for NB-IoT HTC CR 36.331 14.2.2 2920 A Rel-14 NB_IOT-Core

⇒ **agreed**

7.4.1 Other

Out of range UEs

R2-1705773 Report of [97bis#32][NB-IoT/MTCe2] Out of range UEs discussion Sequans Communications

Proposal 1: the inconsistency related to connEstFailOffset-r13 infinity value is clarified / corrected from Rel-13

Proposal 2: it should be possible to configure "infinity Qoffsettemp" for NB-IoT, from Rel-13

Proposal 3: RAN2 to discuss and agree between the following alternatives

- *Alt 1: redefine codepoint "15 dB" to mean infinity value is configured*
- *Alt 2: absence of connEstFailOffset-r13 IE means infinity is configured*

DISCUSSION

P2

- ZTE think that Inifinity is not good for NB-IoT. ZTE think that there is a risk that if the UE cannot find a good cell there may be a problem. ZTE think that 15dB is enough. LG agrees.
- Huawei think that the UE will go to cell selection if there is no other cell available, and then the UE can access again. Huawei also point out that the value is configurable by the network.
- Nokia think this is needed, and think that the solution is already in the field deceription.
- ZTE think that we could leave the time to UE implementation.

P3:

- Nokia think that Alt 2 is already in the TS. Huawei think that some UEs have implemented Alt 2.
- Ericsson think that the normal way of activation deactivation should be possible. Huawei think that the network can broadcast zero and this means that the feature is not used. Ericsson don't want to be forced to implement this in order to explicitly disable.
- Sequans think that the situation is difference between LTE and NB-IoT, bec in LTE the IE in included in a superior IE with parameters that would be there and be used for this function.
- Huawei point out that there is two UE implementations that implement this by Alt 2.

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- Sony wonders if there is a possibility to disable this, as it is in the first release for NB-IoT. Huawei think this in mandatory in the UE, and thus there would not be any particular reason to disable this.
- Vodafone don't want any non-backwards compatible changes.

OFFLINE

- Ericsson think that the procedure text say that the IE is used when present and the current semantics note means that the current TS is not consistent. Nokia think the current semantics description is clear and cannot accept using 15dB as infinity.
- Intel propose to leave it ambiguous for rel-13 and proposes to clarify for Rel-14.
- Nokia need to check

⇒ **It should be possible to configure "infinity Qoffsettemp" for NB-IoT, from Rel-13.**

⇒ **There is a backwards compatibility issue (w.r.t. behaviour, not protocol, i.e. it is not critical). And 2 known UE implementations according to alt A and 2 known UE implementation according to alt B**

⇒ **We leave it as it is for Rel-13 and specify for Rel-14**

⇒ **Cannot converge. Postpone.**

R2-1705042 Temporary offset in NB-IoT Ericsson discussion Rel-14 NB_IOTenh-Core

Moved to 7.4 from 8.11.2

R2-1705774 Correction to connEstFailOffset Sequans Communications CR 36.331 13.5.0 2787 1 F Rel-13 NB_IOT-Core

R2-1705775 Correction to connEstFailOffset Sequans Communications CR 36.331 14.2.2 2933 A Rel-14 NB_IOT-Core

R2-1705299 Correction for connEstFailOffset Nokia CR 36.331 13.5.0 2857 F Rel-13 NB_IOT-Core

R2-1705306 Correction for connEstFailOffset Nokia CR 36.331 14.2.2 2858 A Rel-14 NB_IOT-Core

R2-1705021 Correction to temporary offset in NB-IoT Ericsson CR 36.331 13.5.0 2839 F Rel-13 NB_IOT-Core

R2-1705025 Correction to temporary offset in NB-IoT Ericsson CR 36.331 14.2.1 2843 A Rel-14 NB_IOT-Core

7 tdocs above not treated

Cell reselection with SIntrasearch

R2-1705031 Email report [97bis#31][NB-IoT] Cell reselection for NB-IoT Ericsson report Rel-13 NB_IOT-Core

Proposal 1: Solutions 1, 3, 4, 6 and 7 are no further explored as a solution in REL-13 for "too late re-selection" in NB-IoT.

Extending the value range received quite some support, but also the use of RSRQ measurements received significant support. Extending the value range is a more straightforward solution compared to the use of RSRQ measurements, however the RSRQ measurement have the potential to avoid unnecessary measurements. It is proposed to keep both options open and follow a two-track approach for RAN2#98 meeting: based on stage 3 contributions to use RSRQ measurement then this option can be further discussed in RAN2#98. Otherwise extending the value range seems to be an agreeable and feasible solution for REL-13:

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Proposal 2a: RAN2 to discuss stage 3 contributions to use RSRQ measurements for "too late re-selection"

Proposal 2b: RAN2 to discuss stage 3 contributions for extending the value range of SIntraSearchP, i.e. introduce an extended range in the ASN.1.

Q for Clarification

- Gemalto wonders whether taking RSRQ into account means. Ericsson think that there are two solutions on the table, either a drop in value or just use RSRQ.

DISCUSSION

- Ericsson proposes to also agree on RSRQ. Sony think RSRQ measrurements works for outdoor UEs but not for indoor. CMCC has concern on RSRQ. Nokia think that RSRQ is not very stable as it depends on load. Mediatek has a similar concern

⇒ **We need methods beyond Sxsearch method to limit power consumption for neighbour cell search and measruements for UEs (e.g. UEs that are stationary or deep indoor)**

Continue discussion (offline discussion number 300) first offline (and possibly later by by email) on which solution(s) can be agreeable (Ericsson),

OFFLINE DISCUSSION

- Ericsson think that there are indeed concerns on power consumption, especially due to introduction of this extended range.
- Many companies agree to continue this
- Veolia think that the priority should be on stationary device and time is important. LG agrees that stationary device is important. Chair think that this was agreed already but there was no followed up in R4.
- QC think that stationary might need to be more clearly defined. Nokia agrees that if we have as stationary devices we need to specify what this means to AS.
- Sierra Wireless think that infrequent mobility is also important.
- Chair think that "stationary" mean that the UE can ignore certain requirements, and can also include low/infrequent mobility cases.
- Vodafone point out that it is good to involve RAN4 people as this may have impoact on R4 specifications.

⇒ **We aim to specify some solution in TEI14 that is early implementable, the solution(s) covering at least stationary devices.**

✉ **Email discussion, Power consumption for RRM, to continue discussion, with the goal to find solutions (simple) to reduce power consumption for detection and measurements of neighbour cells (Ericsson), for next meeting.**

R2-1705786 Solutions for too late reselection issue in NB-IoT CMCC discussion Rel-13 NB_IOT-Core

Proposal 1: Extend SIntraSearchP range from (0…31)x2 to (0…63)x2 for Rel-13 NB-IoT.

Proposal 2: RSRQ based solution is not recommended for Rel-13.

Proposal 3: Mobility state based solution can be considered for Rel-14 and further releases.

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DISCUSSION

P1:

- Chair proposes that we decide on the range first and then go to other solutions.
- Gemalto think this is ok, and the main problem is that the measurement is started too late.
- Sony think that UE could resolve this by UE implementation, similar to Gemalto solution in tdoc below. Sony think we should have coverage levels in NB-IoT and apply the feMTC behaviour.
- Mediatek think that the range need to be updated. Huawei support proposal 1, Vivio as well. QC agrees, but think further solutions are needed as well, as UEs in deep indoor coverage need some ZTE support as well.
- Veolia think that there should be UE freedom to go beyond P1, and with this understanding they support P1.
- Ericsson are ok to extend the range, but think this should be complemented. Nokia also think that the range need to be extended.

DISCUSSION on the 4 CRs below (only the extension of range)

- Ericsson and Sony have slight preference for the HUawei way. CMCC are also OK to go with Huawei CRs for the range extension,
- ZTE prefers CMCC option B as it requires less bits ..
- Sony think this should be optional for the UE.

⇒ **Extend SIntraSearchP range for Rel-13 NB-IoT**

⇒ **Extend the range of SIntraSearchP according to R2-1705763 and R2-1705764, and the extended range of the SIntraSearchP is mandatory for the UE.**

⇒ **Revise R2-1705763 and R2-1705764 in R2-1705888 (Rev1) / 5889 (rev 1)**

R2-1705763 Extension of SIntraSearchP value range and introduction of SIntraSearchQ Huawei, HiSilicon
CR 36.331 13.5.0 2930 F Rel-13 NB_IOT-Core

⇒ **revised**

R2-1705888 Extension of SIntraSearchP value range Huawei, HiSilicon CR 36.331 13.5.0 2930 1 F Rel-13 NB_IOT-Core

- NOTE that title is changed
- CMCC think that S-noninrasearch should be changed as well, and think that their CR is better.
- Ericsson think that S-nonintraserch need to be updated. Gemalto think that it is not needed.
- QC think that we don't need to say in the field description that we say that we exclude and don't include. QC think we usually say that we should align better with other cases for SIB.

⇒ **Revised, in R2-1705940 (rev 2)**

R2-1705940 Extension of SIntraSearchP value range Huawei, HiSilicon CR 36.331 13.5.0 2930 2 F Rel-13 NB_IOT-Core

⇒ **agreed**

R2-1705764 Extension of SIntraSearchP value range and introduction of SIntraSearchQ Huawei, HiSilicon
CR 36.331 14.2.2 2931 A Rel-14 NB_IOT-Core

⇒ **revised**

R2-1705889 Extension of SIntraSearchP value range and introduction of SIntraSearchQ Huawei, HiSilicon
CR 36.331 14.2.2 2931 1 A Rel-14 NB_IOT-Core

⇒ **revised, in R2-1706104 (rev 2), agreed unseen**

R2-1706104 Extension of SIntraSearchP value range and introduction of SIntraSearchQ Huawei, HiSilicon
CR 36.331 14.2.2 2931 1 A Rel-14 NB_IOT-Core

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⇒ **agreed unseen**

R2-1705787 Correction to inter-cell measurement parameter for NB-IoT - Option A CMCC CR
36.331 13.5.0 2934 F Rel-13 NB_IOT-Core

⇒ **Not pursued**

R2-1705788 Correction to inter-cell measurement parameter for NB-IoT - Option B CMCC CR
36.331 13.5.0 2935 F Rel-13 NB_IOT-Core

⇒ **Merged into R2-1705888**

R2-1705131 NB-IoT Cell reselection enhancement LG Electronics Inc. discussion Rel-13
LTE_LAA-Core

R2-1705036 Late cell reselection in NB-IoT Ericsson discussion Rel-13 NB_IOT-Core

R2-1705013 Introduction of RSRQ monitoring in NB-IoT Ericsson CR 36.304 13.5.0 0371
B Rel-13 NB_IOT-Core

R2-1705022 Introduction of RSRQ monitoring in NB-IoT Ericsson CR 36.331 13.5.0 2840
B Rel-13 NB_IOT-Core

R2-1704301 Cell re-selection for NB-IoT Gemalto N.V. discussion

R2-1705765 Cell re-selection for NB-IoT Huawei, HiSilicon, Neul Limited discussion Rel-13
NB_IOT-Core

R2-1705761 Introduce of SIntraSearchQ for NB-IoT Huawei, HiSilicon CR 36.304 13.5.0 0381
F Rel-13 NB_IOT-Core

R2-1705762 Introduce of SIntraSearchQ for NB-IoT Huawei, HiSilicon CR 36.304 14.2.0 0382
A Rel-14 NB_IOT-Core

8 tdocs above not treated

Other

R2-1704942 Clarification on contention based random access for NB-IoT NTT DOCOMO INC. CR
36.331 13.5.0 2832 F Rel-13 NB_IOT-Core

- Nokia think that this change is not meaningful for NB-IoT as it doesn't impact any behaviour.
- Huawei think that docomo are correct, as PDCCH order can use the other preambles as well.
- QC think that the set is not exclusive for UE initiated

⇒ **Agree with the intention to clarify**

⇒ **revised**

R2-1705890 Clarification on contention based random access for NB-IoT NTT DOCOMO INC. CR
36.331 13.5.0 2832 1 F Rel-13 NB_IOT-Core

⇒ **Agreed**

R2-1704943 Clarification on contention based random access for NB-IoT NTT DOCOMO INC. CR
36.331 14.2.2 2833 A Rel-14 NB_IOT-Core

⇒ **Revised**

R2-1705891 Clarification on contention based random access for NB-IoT NTT DOCOMO INC. CR
36.331 14.2.2 2833 A Rel-14 NB_IOT-Core

⇒ **Agreed**

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R2-1704952 Editorial correction on ab-Barring parameter NTT DOCOMO INC. CR 36.331 13.5.0 2835 F Rel-13 NB_IOT-Core

- QC think that it could be better to change the procedure text. Intel agrees.
- After discussion found agreeable

⇒ **agreed**

R2-1704953 Editorial correction on ab-Barring parameter NTT DOCOMO INC. CR 36.331 14.2.2 2836 A Rel-14 NB_IOT-Core

⇒ **agreed**

R2-1705812 Clarification of UE-AMBR support for NB-IoT NTT DOCOMO INC. CR 36.300 13.7.0 1033 F Rel-13 NB_IOT-Core

- QC think that past tense “was enabled” is not usually used

⇒ **Change “was” to “is”**

⇒ **Revised, with this update, agreed unseen in R2-1705892 (rev 1)**

R2-1705892 Clarification of UE-AMBR support for NB-IoT NTT DOCOMO INC. CR 36.300 13.7.0 1033 1 F Rel-13 NB_IOT-Core

⇒ **Agreed**

R2-1704962 Clarification of UE-AMBR support for NB-IoT NTT DOCOMO INC. CR 36.300 14.2.0 1024 A Rel-14 NB_IOT-Core

⇒ **Change “was” to “is”**

⇒ **with this update, agreed unseen in R2-1705893 (rev 1)**

R2-1705893 Clarification of UE-AMBR support for NB-IoT NTT DOCOMO INC. CR 36.300 14.2.0 1024 A Rel-14 NB_IOT-Core

⇒ **Agreed unseen**

R2-1704963 LS on UE-AMBR support for NB-IoT UE NTT DOCOMO INC. LS out NB_IOT-Core To: RAN3, SA2

- docomo think that “was” shall then be changed to “is” in 2 places
- intel think we should attach the CRs.
- Action shold be to RAN3
- Ericsson wonders if there is an impact. Huawei think there is impact on RAN3 specs. Ericsson this that we then can omit SA2 in the actions.
- We should add a small clarification that the change was due to alignment to SA2 TS.

⇒ **Revised**

⇒ **modify: “was” change to “is”, attach final CRs, action to RAN3 only, add small clarification that the change was due to alignment to SA2 TS**

R2-1705894 LS on UE-AMBR support for NB-IoT UE NTT DOCOMO INC. LS out NB_IOT-Core To: RAN3, SA2

⇒ **approved, final version in R2-1706111**

R2-1705221 Clarification on logicalChannelSR-ProhibitTimer for NB-IOT MediaTek Inc. CR 36.331 13.5.0 2852 F Rel-13 NB_IOT-Core

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- Ericsson think we should remove the original line of text (the previous sentence).
- The SR prohibit behaviour will anyway not be applied until the first RRC message has been reveiced by the UE. For NB-IoT, this need to be configured in the first message or disabled,
- Change the text to “If logicalChannelSR-Prohibit is configured (i.e. indicates value TRUE), E-UTRAN also configures logicalChannelSR-ProhibitTimer.” Otherwise the configuration is considered inconsistent.
- QC think this is not essential as there is no change in behaviour, do we need to do this CR to Rel-13?
- There is no interoperability issue.
- The understanding of RAN2 is
    - ALT A that the logicalChannelSR-ProhibitTimer function is not used until logicalChannelSR-ProhibitTimer is configured, and the network is allowed to not configure it. Or
    - ALT B “If logicalChannelSR-Prohibit is configured (i.e. indicates value TRUE), E-UTRAN also configures logicalChannelSR-ProhibitTimer.” Otherwise the configuration is considered inconsistent.

⇒ **Change to “If logicalChannelSR-Prohibit is configured (i.e. indicates value TRUE), E-UTRAN also configures logicalChannelSR-ProhibitTimer.”, remove the sentence preceeding the new text, change the interoperatibility statement to be more neutral (no problem foreseen as this is a clarifcation).**

⇒ **Revised in R2-1705908 (Rev1), R2-1705895 (Rev1)**

R2-1705908 Clarification on logicalChannelSR-ProhibitTimer for NB-IOT MediaTek Inc. CR
36.331 13.5.0 2852 1 F Rel-13 NB_IOT-Core

⇒ **Agreed**

R2-1705224 Clarification on logicalChannelSR-ProhibitTimer for NB-IOT MediaTek Inc. CR
36.331 14.2.2 2853 A Rel-14 NB_IOT-Core

⇒ **revised**

R2-1705895 Clarification on logicalChannelSR-ProhibitTimer for NB-IOT MediaTek Inc. CR
36.331 14.2.2 2853 1 A Rel-14 NB_IOT-Core

⇒ **Agreed**

R2-1705294 Miscellaneous corrections for NB-IoT Huawei, HiSilicon CR 36.300 13.7.0 1026
F Rel-13 NB_IOT-Core

⇒ **agreed**

R2-1705295 Miscellaneous corrections for NB-IoT Huawei, HiSilicon CR 36.300 14.2.0 1027
A Rel-14 NB_IOT-Core

⇒ **agreed**

R2-1705449 Problem of Non-uniform C-DRX in NB-IoT Qualcomm Incorporated discussion NB_IOTenh-Core

Observation 1: Un-even C-DRX cycle durations are possible in NB-IoT.

Observation 2Un-even C-DRX cycle duration has the potential for UE and eNB to be out of sync.

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DISCUSSION

- Ericsson disagrees that there is ambiguity, but agrees that there could be DRX cycles could be different length and we could do a fix. LG agrees. Huawei agrees, and think this could be finxed in Rel-14.
- Ericsson would prefer option 2.1. Huawei would prefer to just a new IE.
- The nework can avoid using problemtic values, just adding new values seems straightforward.
- Mediatek think we should just keep the current values and add new values and leave for network implementation which one to use. LG agrees.
- Q: We should check this also for SC-PTM and update? Ericsson think this happens very seldomly fro SC-PTM and the uneven DRX is not a problem there. QC share this opinion.

⇒ **We conclude that there is no ambiguity problem between the UE and the eNB.**

⇒ **We Acknowledge that the current range has several values that result in uneven DRX periods, which might not be intended.**

⇒ **For Rel-13 (and rel-14) we rely on the network to provide a sensible configuration.**

⇒ **We add new values, and keep existing values, for REl-14.**

R2-1705450 Long DRX values with regular wake-up cycle – Option 1 Qualcomm Incorporated CR
36.331 13.5.0 2875 F Rel-13 NB_IOTenh-Core

⇒ **Not pursued**

R2-1705451 Long DRX values with regular wake-up cycle – Option 1 Qualcomm Incorporated CR
36.331 14.2.2 2876 A Rel-14 NB_IOTenh-Core

- We don't need a capability, this can be mandatory for rel-14 UEs. Update coversheet, change category to F, update reason for change, parameter name need to indicate rel 14.

⇒ **Revised in R2-1705896 (rev 1)**

R2-1705896 Long DRX values with regular wake-up cycle – Option 1 Qualcomm Incorporated CR
36.331 14.2.2 2876 1 F Rel-14 NB_IOTenh-Core

- Nokia wondes if we need the "option 1" in the title.

⇒ **Agreed**

R2-1705452 Long DRX values with regular wake-up cycle – Option 1 Qualcomm Incorporated CR
36.306 13.5.0 1471 F Rel-13 NB_IOTenh-Core

R2-1705453 Long DRX values with regular wake-up cycle – Option 1 Qualcomm Incorporated CR
36.306 14.2.0 1472 A Rel-14 NB_IOTenh-Core

R2-1705454 Long DRX equation with regular wake-up cycle - option 2 Qualcomm Incorporated CR
36.321 13.5.0 1111 A Rel-13 NB_IOTenh-Core

R2-1705455 Long DRX equation with regular wake-up cycle - option 2 Qualcomm Incorporated CR
36.321 14.2.0 1112 B Rel-14 NB_IOTenh-Core

R2-1705456 Long DRX equation with regular wake-up cycle - option 2 Qualcomm Incorporated CR
36.331 13.5.0 2877 A Rel-13 NB_IOTenh-Core

R2-1705457 Long DRX equation with regular wake-up cycle - option 2 Qualcomm Incorporated CR
36.331 14.2.2 2878 B Rel-14 NB_IOTenh-Core

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R2-1705458 Long DRX equation with regular wake-up cycle - option 2 Qualcomm IncorporatedCR 36.306 13.5.0 1473 A Rel-13 NB_IOTenh-Core

R2-1705459 Long DRX equation with regular wake-up cycle - option 2 Qualcomm IncorporatedCR 36.306 14.2.0 1474 B Rel-14 NB_IOTenh-Core

⇒ **Above 8 CRs Not pursued**

Ext RSRP Range

R2-1706070 Discussion on extension of RSRP range for eMTC Huawei, HiSilicon Discussion

R2-1706071 Extension of RSRP range for eMTC Huawei, HiSilicon CR 36.331 13.5.0 2953 F Rel-13 NB_IOTenh-Core

R2-1706072 Extension of RSRP range for eMTC Huawei, HiSilicon CR 36.331 14.2.2 2954 A Rel-13 NB_IOTenh-Core

R2-1706073 [DRAFT] LS reply on RSRP range Huawei, HiSilicon LSout to:RAN4

GENERAL DISCUSSION

Huawei would really like to have this in Rel-13 and suggests a short email discussion.

- The provided documents can be the baseline for the email discussion

✉ **Email discussion, Extended RSRP Range, to decide if Rel-13 or Rel-14 and agree CR and Reply LS (Huawei)**

R2-1705045 RB release in RRC connection resumption fallbackMediaTek Inc. CR 36.331 13.5.0 2846 F Rel-13 NB_IOT-Core

⇒ **withdrawn**

R2-1705046 RB release in RRC connection resumption fallbackMediaTek Inc. CR 36.331 14.2.2 2847 A Rel-14 NB_IOT-Core

⇒ **withdrawn**

Withdrawn:

R2-1704959 Clarification of UE-AMBR support for NB-IoT NTT DOCOMO INC. CR 36.331 13.5.0 2837 F Rel-13 NB_IOT-Core

R2-1705368 Problem of Non-uniform C-DRX in NB-IoT Qualcomm Incorporateddiscussion 2745 1 NB_IOTenh-Core

R2-1705369 Long DRX values with regular wake-up cycle – Option 1 Qualcomm IncorporatedCR 36.331 13.5.0 2860 F Rel-13 NB_IOTenh-Core

R2-1705370 Introduce of SIntraSearchQ for NB-IoT Huawei, HiSilicon CR 36.304 13.5.0 0377 F Rel-13 NB_IOT-Core

R2-1705370 Long DRX values with regular wake-up cycle – Option 1 Qualcomm IncorporatedCR 36.331 14.2.2 0377 F Rel-14 NB_IOTenh-Core

R2-1705371 Introduce of SIntraSearchQ for NB-IoT Huawei, HiSilicon CR 36.304 14.2.0 0378 A Rel-14 NB_IOT-Core

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R2-1705371 Long DRX values with regular wake-up cycle – Option 1 Qualcomm Incorporated CR 36.306 13.5.0 0378 A Rel-13 NB_IOTenh-Core

R2-1705372 Extension of SIntraSearchP value range and introduction of SIntraSearchQ Huawei, HiSilicon CR 36.331 13.5.0 2863 F Rel-13 NB_IOT-Core

R2-1705372 Long DRX values with regular wake-up cycle – Option 1 Qualcomm Incorporated CR 36.306 14.2.0 2863 F Rel-14 NB_IOTenh-Core

R2-1705373 Extension of SIntraSearchP value range and introduction of SIntraSearchQ Huawei, HiSilicon CR 36.331 14.2.1 2864 A Rel-14 NB_IOT-Core

R2-1705373 Long DRX equation with regular wake-up cycle - option 2 Qualcomm Incorporated CR 36.321 13.5.0 2864 A Rel-13 NB_IOTenh-Core

R2-1705374 Cell re-selection for NB-IoT Huawei, HiSilicon, Neul Limited discussion 1107 Rel-13 NB_IOT-Core

R2-1705374 Long DRX equation with regular wake-up cycle - option 2 Qualcomm Incorporated CR 36.321 14.2.0 1107 B Rel-14 NB_IOTenh-Core

R2-1705375 Long DRX equation with regular wake-up cycle - option 2 Qualcomm Incorporated CR 36.331 13.5.0 2865 A Rel-13 NB_IOTenh-Core

R2-1705376 Long DRX equation with regular wake-up cycle - option 2 Qualcomm Incorporated CR 36.331 14.2.2 2866 B Rel-14 NB_IOTenh-Core

R2-1705377 Long DRX equation with regular wake-up cycle - option 2 Qualcomm Incorporated CR 36.306 13.5.0 1468 A Rel-13 NB_IOTenh-Core

R2-1705378 Long DRX equation with regular wake-up cycle - option 2 Qualcomm Incorporated CR 36.306 14.2.0 1469 B Rel-14 NB_IOTenh-Core

7.5 Other LTE Rel-13 WIs

(LTE_LAA-Core, leading WG: RAN1, REL-13; started: June 15, closed: Dec. 15, WID: RP-151045)

(LTE_CA_enh_b5C-Core, leading WG: RAN1, REL-13; started: Dec. 14, closed: Dec. 15, WID: RP-151984)

(LTE_SC_PTM-Core, leading WG: RAN2, REL-13; started: June 15, closed: Dec. 15, WID: RP-151110)

(LTE_eD2D_Prox-Core, leading WG: RAN2, REL-13; started: Dec. 14, closed: Mar. 16, WID: RP-150441)

(LTE_MC_load-Core, leading WG: RAN2, started: Mar. 15, closed: Dec. 15, WID: RP-152181)

(LTE_dualC_enh-Core, leading WG: RAN2, started: Mar. 15, closed: Dec. 15, WID: RP-151739)

(LTE_extDRX-Core; leading WG: RAN2; started: Mar. 15; closed: Mar. 16; WID: RP-150493)

(LTE_EBF_FDMIMO-Core; leading WG: RAN1; started: June. 15; closed: Dec. 15; WID: RP-151085)

(LTE_eMDT2-Core; leading WG: RAN2; started: Sep. 15; closed: Dec 15; WID: RP-151611)

(UTRA_LTE_iPos_enh-Core; leading WG: RAN2; started: Sep. 15; closed: Dec 15; WID: RP-152251)

(LTE_WLAN_radio_legacy-Core; leading WG: RAN2; started: Sep. 15; closed: Mar 15; WID: RP-151615)

7.5.0 In principle agreed CRs

R2-1704598 Correction on radio protocol architecture for DC Huawei, HiSilicon CR 36.300 13.7.0 0994 2 F Rel-13 LTE_dualC_enh-Core

R2-1704599 Correction on radio protocol architecture for DC Huawei, HiSilicon CR 36.300 14.2.0 0995 2 A Rel-14 LTE_dualC_enh-Core

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R2-1704764 Correction for eDRX Hashed ID Nokia CR 36.304 13.5.0 0369 2 F Rel-13 LTE_extDRX-Core

R2-1704819 Correction for eDRX Hashed ID Nokia CR 36.304 14.2.0 0370 2 A Rel-14 LTE_extDRX-Core

R2-1704948 Correction on WLAN connection status report monitoring for LWIP Huawei, HiSilicon, HTC Corporation CR 36.331 13.5.0 2710 3 F Rel-13 LTE_WLAN_radio_legacy-Core

R2-1704949 Correction on WLAN connection status report monitoring for LWIP Huawei, HiSilicon, HTC Corporation CR 36.331 14.2.2 2711 3 A Rel-14 LTE_WLAN_radio_legacy-Core

R2-1704991 Miscellaneous corrections to CA enhancements Intel Corporation CR 36.331 13.5.0 2717 1 F Rel-13 LTE_CA_enh_b5C-Core

R2-1704752 Miscellaneous corrections to CA enhancements Intel Corporation CR 36.331 14.2.2 2826 A Rel-14 LTE_CA_enh_b5C-Core

R2-1705546 Corrections to Sidelink Discovery Gap for Transmission Ericsson CR 36.321 13.5.0 1079 2 F Rel-13 LTE_eD2D_Prox-Core

R2-1705547 Corrections to Sidelink Discovery Gap for Transmission Ericsson CR 36.321 14.2.1 1123 A Rel-14 LTE_eD2D_Prox-Core

=> All CRs above are agreed

Withdrawn

R2-1704947 Correction on WLAN connection status report monitoring for LWIP Huawei, HiSilicon, HTC Corporation CR 36.331 13.5.0 2834 F Rel-13 LTE_WLAN_radio_legacy-Core

R2-1704621 Correction on WLAN connection status report monitoring for LWIP Huawei, HiSilicon CR 36.331 13.5.0 2710 2 F Rel-13 LTE_WLAN_radio_legacy-Core

R2-1704622 Correction on WLAN connection status report monitoring for LWIP Huawei, HiSilicon CR 36.331 14.2.2 2711 2 A Rel-14 LTE_WLAN_radio_legacy-Core

7.5.1 Other

R2-1704196 Clarification to PUCCH-ConfigDedicated Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-13 LTE_CA_enh_b5C-Core

- Intel agree that the fallback for format 3 should be supported but not sure if it always needs to be configured. Nokia think it is never possible today but agree we should check if it is always needed.

=> Noted

R2-1704197 Clarification to PUCCH-ConfigDedicated Nokia, Alcatel-Lucent Shanghai Bell CR 36.331 13.5.0 2806 F Rel-13 LTE_CA_enh_b5C-Core

- Samsung think this is a dirty approach to have a critical extension but still include the old version.
- Ericsson thinks that SCell also needs to be configured in this way.

=> Offline discussion to check with RAN1 whether the fall back to format 3 always needs to be configured, and also to discuss the general approach to the ASN.1 change.

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=> Revised in R2-1705943 (Offline discussion 7)

- agree email discussion

R2-1705943 Clarification to PUCCH-ConfigDedicated Nokia, Alcatel-Lucent Shanghai Bell CR
36.331 13.5.0 2806 1 F Rel-13 LTE_CA_enh_b5C-Core

✉ **[98#xx][LTE/Rel13] PUCCH-ConfigDedicated (Nokia)**

Intended outcome: Agreeable CRs

Deadline: Thursday 2017-08-03

R2-1704198 Clarification to PUCCH-ConfigDedicated Nokia, Alcatel-Lucent Shanghai Bell CR
36.331 14.2.2 2807 F Rel-14 LTE_CA_enh_b5C-Core

=> Revised in R2-1705944 (Offline discussion 7)

R2-1705944 Clarification to PUCCH-ConfigDedicated Nokia, Alcatel-Lucent Shanghai Bell CR
36.331 14.2.2 2807 1 F Rel-14 LTE_CA_enh_b5C-Core

R2-1704199 Bandwidth combination sets and differentFallbackSupported Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-13
LTE_CA_enh_b5C-Core

- Ericsson think the problem is that we have not really agreed what is a fallback combination.
- DOCOMO wonders how the UE can report a different BCS if it is not included. Does it means the UE has to support every BCS. Nokia think from SCell release point of view it doesn't matter whether the BCS is different.

=> Offline discussion to progress (Nokia, Offline discussion 08)

- Update from offline. There is a draft LS to RAN4 available.

✉ **[98#xx][LTE/Rel-13] LS on BCS and fallback combinations (Nokia)**

Intended outcome: Approved LS

Deadline: Thursday 2017-05-25

R2-1704200 Clarification to BCS support (option 1) Nokia, Alcatel-Lucent Shanghai Bell CR
36.331 13.5.0 2808 F Rel-13 LTE_CA_enh_b5C-Core

R2-1704201 Clarification to BCS support (option 1) Nokia, Alcatel-Lucent Shanghai Bell CR
36.331 14.2.2 2809 F Rel-14 LTE_CA_enh_b5C-Core

R2-1704202 Clarification to BCS support (option 2) Nokia, Alcatel-Lucent Shanghai Bell CR
36.331 13.5.0 2810 F Rel-13 LTE_CA_enh_b5C-Core

R2-1704203 Clarification to BCS support (option 2) Nokia, Alcatel-Lucent Shanghai Bell CR
36.331 14.2.2 2811 F Rel-14 LTE_CA_enh_b5C-Core

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R2-1704214 Signalling the fallback mode for PUCCH SCell ROHDE & SCHWARZ discussion
Rel-13

=> Covered by earlier discussion of R2-1704196

=> Noted

R2-1704132 Setting of FGI 107 and 108 in case of TDD-FDD CA Qualcomm Incorporated CR
36.331 13.5.0 2803 F Rel-13 TEI13

- DOCOMO suggest to change the table for TDD FDD carrier aggregation table. Qualcomm explained they just followed the approach already used for periodic reporting.

=> Offline discussion to conclude (Offline discussion 9)

=> Change to "either ... or"

=> CR can be for rel-12

=> Revised in R2-1706097

=> Rel-12 to be provided in R2-1706098 CR 2957

R2-1706098 Setting of FGI 107 and 108 in case of TDD-FDD CA Qualcomm Incorporated CR
36.331 13.5.0 2957 F Rel-12 TEI12

=> Agreed

R2-1706097 Setting of FGI 107 and 108 in case of TDD-FDD CA Qualcomm Incorporated CR
36.331 13.5.0 2803 1 A Rel-13 TEI12#

=> Agreed

R2-1704133 Setting of FGI 107 and 108 in case of TDD-FDD CA Qualcomm Incorporated CR
36.331 14.2.2 2804 A Rel-14 TEI12

=> Revised in R2-1706099

R2-1706099 Setting of FGI 107 and 108 in case of TDD-FDD CA Qualcomm Incorporated CR
36.331 14.2.2 2804 1 A Rel-14 TEI12

=> Agreed

R2-1705559 Data Stall due to logical Channel SR Prohibit Timer Qualcomm discussion
36.321 Rel-13

- MediaTek think this is a problem of timers not being configured correctly. A reasonable eNB would not set the timers in this way. Qualcomm explain this problem has been seen in networks.

- LG think we want to avoid a SR triggered by a lower priority logical channel. Qualcomm think the original intent was to aggregate the SRs that occur in a window but with the change previously agreed it just delays the SRs.

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- Samsung think it is a poor eNB implementation to set timers in this way.

=> Noted

=> RAN2 understand that the issue should be taken care of by eNB implementation.

R2-1705560 Data Stall due to logical Channel SR Prohibit Timer Qualcomm CR 36.321 13.5.0 1124 F Rel-13 TEI13

R2-1705561 Data Stall due to logical Channel SR Prohibit Timer Qualcomm CR 36.321 14.2.1 1125 A Rel-14 TEI13

R2-1704945 SFN mismatch due to eNB reset NTT DOCOMO INC. discussion LTE_extDRX-Core

- BlackBerry think the eNB reset is a rare issue but the UE requirement to acquire SI has a significant impact.
- Samsung think that the eNB could indicate the SI change to the UEs.
- Qualcomm thinks that paging for SI change cannot solve the problem as the UE is not able to receive paging. But also concerned about power consumption. Nokia think that the eNB would have to send paging in all occasions.
- Qualcomm wonder if the PCI could be changed after the reset. DOCOMO PCI changing is not easy to do.

=> Offline discussion how to address the issue (DOCOMO, offline discussion 10)

- Update from offline: Some companies still have doubts about the problem so it can be discussed again next time.

R2-1705489 Clarification on UE capability and early feature support Samsung Telecommunications CR 36.331 13.5.0 2766 2 F Rel-13 LTE-L23, TEI13

- Qualcomm would like to add something clear that an eNB does not block a Rel-13 UE implementing a Rel14 feature. Samsung explain the intent of the CR was just to clarify the UE and not the eNB. Nokia think the CR just clarifies how the UE implements early implementable feature.

=> We will add the text in an Annex

=> Based on this CR there is no change to the approach for deciding which features can be implemented early.

=> Agreed in R2-1705965

=> Rel-14 agreed in R2-1705966 CR 2943

R2-1705490 Clarifications on eFD-MIMO (REL-13) Samsung Telecommunications CR 36.331 13.5.0 2767 2 F Rel-13 LTE_EBF_FDMIMO-Core

- Ericsson think that the order in the list should be clarified for both TM9 and TM10.
- Nokia

=> Revised in R2-1705967 (offline discussion 11)

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=> Rel-14 can be provided in R2-1705968 CR 2944

R2-1705967 Clarification regarding eFD-MIMO configuration (REL-13) Samsung Telecommunications CR 36.331 13.5.0 2767 3 F Rel-13 LTE_EBF_FDMIMO-Core

=> Agreed

R2-1705968 Clarifications on eFD-MIMO (REL-14) Samsung Telecommunications CR 36.331 14.2.2 2944 A Rel-14 LTE_EBF_FDMIMO-Core

=> Agreed

R2-1705610 Generic clarification of "first bit" as leftmost bit Qualcomm CR 36.331 13.5.0 2913 F Rel-13 TEI13, LTE_EBF_FDMIMO-Core

- Nokia ask if Rel-14 was also checked. Qualcomm explain it was only checked for Rel-13.
- Intel wonder whether it is needed from Rel-14.

=> Agreed

=> Rel-14 CR can be provided in R2-1705969 CR 2945. To be checked offline that this is valid for new Rel-14 fields as well.

R2-1705969 Generic clarification of "first bit" as leftmost bit Qualcomm CR 36.331 14.2.2 2945 A Rel-14 TEI13, LTE_EBF_FDMIMO-Core

=> Agreed

R2-1705704 Usage of spare in system information Huawei, HiSilicon discussion TEI13, LTE-L23

- Nokia wonders what the UE has to deduce from the spare bits.
- Ericsson suggest that we can specify that the UE ignores spare values.
- Samsung thinks there is nothing that is not clear today.

=> RAN2 confirms: the spare in MIB shall be handled by early release UE (before rel-13) as “not comprehended field”, and follow 5.7.5 early release UE only ignore the spare instead of the whole MIB message;

R2-1705705 clarification on the usage of the extension in section 8.4 Huawei, HiSilicon CR 36.331 13.5.0 2924 F Rel-13 TEI13, LTE-L23

=> Not pursued

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8 LTE Rel-14

8.1 WI: Enhanced LAA for LTE

(LTE_eLAA-Core; leading WG: RAN1; REL-14; started: Dec. 15; closed: Mar. 17; WID:RP-162229)

This agenda item is for correction CRs to the closed WI.

Documents in this agenda item will be handled in the LTE Break Out session

8.1.0 In principle agreed CRs

R2-1704623 Correction on UE capabilities for eLAA Huawei, HiSilicon CR 36.306 14.2.0 1437 1 F Rel-14 LTE_eLAA-Core

=> The CR is agreed

R2-1704624 Correction on UE capabilities for eLAA Huawei, HiSilicon CR 36.331 14.2.2 2709 1 F Rel-14 LTE_eLAA-Core

=> The CR is agreed

R2-1704993 Clarification on the UE behaviour when the validity of PUSCH trigger A expires Intel Corporation CR 36.321 14.2.1 1076 2 F Rel-14 LTE_eLAA-Core

=> The CR is agreed

8.1.1 Other

R2-1705692 Correction to eLAA configuration HTC CR 36.331 14.2.2 2921 F Rel-14 LTE_eLAA-Core

- Nokia doesn't see why the sentence forces the nw to send the IE. Huawei thinks that the sentence is necessary as there is no UE behaviour if the IE is absent.

=> The CR is postponed

8.2 WI: Support for V2V services based on LTE sidelink

(LTE_SL_V2V-Core; leading WG: RAN1; started: Dec. 15; closed: Sept 16; WID: RP-161603)

This agenda item is for correction CRs to the closed WI.

Documents in this agenda item will be handled in the LTE Break Out session

8.2.0 In principle agreed CRs

R2-1704446 Leap second change for DFN timing Qualcomm Incorporated CR 36.331 14.2.2 2771 1 F Rel-14 LTE_SL_V2V-Core

=> The CR is agreed

R2-1705564 Introducing a new resource reselection trigger for V2X sidelink communication Huawei, HiSilicon CR 36.321 14.2.1 1038 3 F Rel-14 LTE_SL_V2V-Core

=> The CR is agreed

R2-1705565 Correction to exceptional pool usage in TS 36.331 Huawei, HiSilicon CR 36.331 14.2.2 2705 2 F Rel-14 LTE_SL_V2V-Core

=> The CR is agreed

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8.2.1 Stage 2

R2-1704036 CR to cell reselection for V2X in TS 36.300 Huawei, Samsung, HiSilicon CR
36.300 14.2.0 1017 F Rel-14 LTE_SL_V2V-Core

=> Move/merge the sentence one paragraph above

=> The CR Is revised in R2-1705841

R2-1705841 CR to cell reselection for V2X in TS 36.300 Huawei, Samsung, HiSilicon CR
36.300 14.2.0 1017 F Rel-14 LTE_SL_V2V-Core

=> Change from “target cell” to “reselected” cell

=> The CR is agreed in R2-1705858

R2-1704447 Indication of in proximity of CEN DSRC Qualcomm IncorporatedCR 36.300 14.2.0 1009
1 F Rel-14 LTE_SL_V2V-Core

- ZTE would like to add some context about the co-existance (e.g. to support co-existance between V2V and DSCR, the UE would…”

=> Clarify that it is upper layer of the UE

=> Add a little introductory sentence “on order to support co-existance...”

=> The CR is revised in R2-1705842

R2-1705842 Indication of in proximity of CEN DSRC Qualcomm IncorporatedCR 36.300 14.2.0 1009
2 F Rel-14 LTE_SL_V2V-Core

=> The CR is agreed

8.2.2 User plane

8.2.3 Control plane

R2-1704448 Correction of RRCConnectionReconfiguration reception for V2X Qualcomm IncorporatedCR
36.331 14.2.2 2813 F Rel-14 LTE_SL_V2V-Core

=> Update “:” to “;”

=> The CR is agreed in R2-1705843 with the editorial change above

8.3 Void

8.4 Void

8.5 WI: Enhanced LTE-WLAN Aggregation (eLWA)

(LTE_WLAN_aggr-Core; leading WG: RAN2; REL-14; started: Mar. 16; closed: Mar. 17; WID: RP-160923)

This agenda item is for correction CRs to the closed WI.

8.5.0 In principle agreed CRs

R2-1704205 UE capabilities for eLWA Nokia, Alcatel-Lucent Shanghai Bell CR 36.331 14.2.2 2714
2 F Rel-14 LTE_WLAN_aggr-Core

R2-1704206 Clarification of the end marker solution for eLWA Nokia, Alcatel-Lucent Shanghai Bell CR
36.300 14.2.0 1014 2 F Rel-14 LTE_WLAN_aggr-Core

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R2-1704625 Correction on eLWA Huawei, HiSilicon CR 36.300 14.2.0 0997 2 F Rel-14 LTE_WLAN_aggr-Core

R2-1704633 Correction on eLWA Huawei, HiSilicon CR 36.331 14.2.2 2712 3 F Rel-14 LTE_WLAN_aggr-Core

R2-1705102 Clarifications to eLWA HTC Corporation CR 36.331 14.2.2 2720 2 F Rel-14 LTE_WLAN_aggr-Core

=> All above CRs are agreed

8.5.1 Other

R2-1704204 UE capabilities for eLWA Nokia, Alcatel-Lucent Shanghai Bell CR 36.306 14.2.0 1439 2 F Rel-14 LTE_WLAN_aggr-Core

- Ericsson think in R13 the WiFi capabilities were generic and could be supported by any UE. Now they are only applicable to LWA.

=> Offline time to check that it is correct to include conditional mandatory features with a capability bit in section 7.

=> " Only applicable if the UE supports LWA " should be removed

=> Revised in R2-1705971 (Offline discussion 12)

R2-1705971 UE capabilities for eLWA Nokia, Alcatel-Lucent Shanghai Bell CR 36.306 14.2.0 1439 3 F Rel-14 LTE_WLAN_aggr-Core

=> Agreed

R2-1705820 ASN.1 corrections for eLWA Intel Corporation CR 36.331 14.2.2 2942 F Rel-14 LTE_WLAN_aggr-Core

=> Remove unchanged section

=> Agreed in R2-1706101

8.6 WI: Further mobility enhancements in LTE

(LTE_eMob-Core; leading WG: RAN2; REL-14; started: Mar. 16; closed: Mar. 17; WID:RP-162503)

This agenda item is for correction CRs to the closed WI

Documents in this agenda item will be handled in the LTE Break Out session

8.6.0 In principle agreed CRs

R2-1705360 Clarification of intra-frequency applicability of makeBeforeBreak HO Nokia, Alcatel-Lucent Shanghai Bell CR 36.331 14.2.2 2741 2 F Rel-14 LTE_eMob-Core

=> Withdrawn

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R2-1705365 Clarification of intra-frequency applicability of makeBeforeBreak HO Nokia, Alcatel-Lucent Shanghai Bell CR 36.331 14.2.2 2741 3 F Rel-14 LTE_eMob-Core

=> Withdrawn

R2-1705399 Clarification of intra-frequency applicability of makeBeforeBreak HO Nokia, Alcatel-Lucent Shanghai Bell CR 36.331 14.2.2 2741 4 F Rel-14 LTE_eMob-Core

=> CR is agreed in R2-1706014.

R2-1705420 Corrections to RACH-less handover and SCG change HTC Corporation CR 36.331 14.2.2 2752 2 F Rel-14 LTE_eMob-Core

=> Change to “for the target MCG”

=> Change to “for the target SCG”

=> With the changes, CR is agreed in R2-1706015.

R2-1705485 Corrections to make before break mobility Ericsson CR 36.331 14.2.2 2760 1 F Rel-14 LTE_eMob-Core

=> Agreed

R2-1705975 Clarification for the UE Contention Resolution Identity MAC Control Elemen Samsung CR 36.321 14.2.0 1053 2 F Rel-14 LTE_eMob-Core

=> Agreed

8.6.1 RACH-less handover

R2-1705129 Miscellaneous RRC corrections on mobility enhancement ZTE Corporation CR 36.331 14.2.2 2851 F Rel-14 LTE_eMob-Core

=> Remove the changes of the description of makeBeforeBreak and makeBeforeBreakSCG.

CBF: => Revised in R2-1706016 [1001]

R2-1704207 Clarification to rach-Skip Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-14 LTE_eMob-Core

=> Noted

R2-1704208 Clarification to rach-Skip Nokia, Alcatel-Lucent Shanghai Bell discussion 36.331 Rel-14 LTE_eMob-Core

=> Withdrawn

R2-1704744 Clarification to rach-Skip Nokia, Alcatel-Lucent Shanghai Bell CR 36.331 14.2.2 2825 F Rel-14 LTE_eMob-Core

=> Not pursued.

R2-1705805 Correction of RACH-less handover Kyocera CR 36.300 14.2.0 1032 F Rel-14 LTE_eMob-Core

- Samsung see some value on this change.
- Nokia seem it is necessary.

CBF: => Revised in R2-1706017.[1002]

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8.6.2 Make before break handover

8.6.3 Other

8.7 WI: Further Indoor Positioning enhancements for UTRA and LTE

(UTRA_LTE_iPos_enh2-Core; leading WG: RAN2; REL-14; started: Mar. 16; closed: Dec. 16; WID: RP-162026)

This agenda item is for correction CRs to the closed WI

Documents in this agenda item will be handled in the LTE Break Out session

8.8 WI: L2 latency reduction techniques for LTE

(LTE_LATRED_L2-Core; leading WG: RAN2; REL-14; started: Mar. 16; closed: Sep. 16; WID: RP-160667)

This agenda item is for correction CRs to the closed WI

Documents in this agenda item will be handled in the LTE Break Out session

R2-1705404 Correction of L2 latency reduction in 36.321 Huawei, HiSilicon CR 36.321 14.2.1 1108 F Rel-14 LTE_LATRED_L2-Core

=> The CR is agreed

8.9 Void

8.10 WI: eMBMS enhancements for LTE

(MBMS_LTE_enh2-Core; leading WG: RAN1; REL-14; started: Mar. 16; target: Jun. 17; WID:RP-162231)

This agenda item is for correction CRs to the WI that is completed from RAN2 point of view.

Documents in this agenda item will be handled in the LTE Break Out session

R2-1706042 Miscellaneous feMBMS corrections and clarifications resulting from ASN.1 review Ericsson Nokia, Alcatel-Lucent Shanghai Bell CR 36.331 14.2.1 2873r1 F Rel-14 MBMS_LTE_enh2-Core

=> Agreed

R2-1704323 Missing MBSFN subframes configurations Nokia, Alcatel-Lucent Shanghai Bell CR 36.331 14.2.2 2812 F Rel-14 MBMS_LTE_enh2-Core

=> Not treated

R2-1705421 Miscellaneous feMBMS corrections and clarifications resulting from ASN.1 review Ericsson CR 36.331 14.2.1 2873 F Rel-14 MBMS_LTE_enh2-Core

=> Not treated

R2-1705424 UE capabilities for feMBMS Ericsson CR 36.331 14.2.1 2874 B Rel-14 MBMS_LTE_enh2-Core

CBF: => Revised in R2-1706018.[1003]

R2-1705422 SI-RNTI number correction for feMBMS Ericsson CR 36.321 14.2.0 1109 F Rel-14 MBMS_LTE_enh2-Core

=> Agreed

R2-1705423 Introduction of FeMBMS to 36.306 Ericsson CR 36.306 14.2.0 1470 B Rel-14 MBMS_LTE_enh2-Core

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CBF: => Revised in R2-1706019.[1003]

R2-1705740 Correction to Downlink Reception Type Combinations for FeMBMS Qualcomm CR
36.302 14.2.0 1112 F Rel-14 MBMS_LTE_enh2-Core

CBF: => Revised in R2-1706020.[1004]

R2-1705741 Correction to Reselection priorities handling for FeMBMS Qualcomm CR 36.304
14.2.0 0380 F Rel-14 MBMS_LTE_enh2-Core

CBF: => Revised in R2-1706021.[1005]

8.11 WI: Enhancements of NB-IoT

(NB_IOTenh-Core; leading WG: RAN1; REL-14; started: June 16; target: Jun. 17; WID: RP-161901

This agenda item is for correction CRs to the WI that is completed from RAN2 point of view.

Note: SC-PTM for eNB-IoT is handled under 8.12.1

Documents in this agenda item will be handled in the LTE Break Out session

Incoming LS

R2-1704023 LS response on positioning for NB-IoT (R4-1704297; contact: Ericsson) RAN4 LS in Rel-14 NB_IOTenh-Core RAN2 SA2, RAN1

- Take into account, there is a CR for this meeting.

⇒ **noted**

R2-1704110 LS reply Positioning for NB-IoT (R1-1706859; contact: Ericsson, Intel) RAN1 LS in Rel-14 NB_IOTenh-Core RAN2 RAN4

⇒ **noted**

R2-1705813 LS to RAN2 and RAN3 on security for RLFs for DoNAS UEs (S3A0009; contact: Vodafone) SA3 LS in Rel-14 CIoT RAN2, RAN3

- Nokia wonders if this is just for NB-IoT or in general. Vodafone think this is only for NB-IoT, as for all other cases there is security.

⇒ **noted**

8.11.0 In principle agreed CRs

R2-1704181 Correction to paging carrier selection formula in Rel-14 NB-IoT Ericsson CR
36.304 14.2.0 0363 2 F Rel-14 NB_IOTenh-Core

⇒ **agreed**

R2-1704437 Correction to NPRS Qualcomm Incorporated CR 36.355 14.1.0 0175 1 F
Rel-14 NB_IOTenh-Core

- Ericsson are OK with the current proposal, but would like to add additional RAN1 agreements in the filed description

OFFLINE

- After offline checking Ericsson are ok with the CR, no revision is needed.

⇒ **agreed**

R2-1704490 Stop condition for the drx-RetransmissionTimer for NB-IoT LG Electronics CR 36.321
14.2.1 1096 F Rel-14 NB_IOTenh-Core

⇒ **agreed**

R2-1704492 Correction to maximum number of HARQ processes for NB-IoT LG Electronics, Ericsson
CR 36.321 14.2.1 1097 F Rel-14 NB_IOTenh-Core

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- spelling mistake plus a carriage return added compared to the endiresed CR from previous meeting.

⇒ **Agreed**

R2-1705291 Introduction of Overload Control for Control plane data only Huawei, HiSilicon CR 36.331 14.2.0 2746 1 C Rel-14 NB_IOTenh-Core, TEI14

- Bullet format is wrong and should be corrected.
- Ericsson would like to improve the wording in the field description, “data access .. “ to change to “data transfer ..”, change “control plane” to “Control Plane CIOT EPS optimization”

⇒ **Revised to R2-1705897 (Rev2), Agreed unseen.**

R2-1705367 Small corrections to random access procedure and DRX for REl-14 NB-IoT Enhancements Huawei, HiSilicon CR 36.321 14.2.0 1062 1 F Rel-14 NB_IOTenh-Core

⇒ **revised**

R2-1705391 Small corrections to random access procedure and DRX for REl-14 NB-IoT Enhancements Huawei, HiSilicon CR 36.321 14.2.0 1062 2 F Rel-14 NB_IOTenh-Core

- Huawei explains that there is a dependency to ASN.1 CR.

⇒ **Revised in R2-1705925**

R2-1705925 Small corrections to random access procedure and DRX for REl-14 NB-IoT Enhancements Huawei, HiSilicon CR 36.321 14.2.0 1062 3 F Rel-14 NB_IOTenh-Core

⇒ **Agreed**

R2-1705759 Correction to the value range of ce-AuthorisationOffset Huawei, HiSilicon CR 36.331 14.2.2 2928 F Rel-14 NB_IOTenh-Core

- This is a CR that was in–princkiple agreed at last meeting, contents updated in R2-1705392 with new CR number.

⇒ **Not pursued**

R2-1705392 Correction to the value range of ce-AuthorisationOffset Huawei, HiSilicon CR 36.331 14.2.1 2745 2 F Rel-14 NB_IOTenh-Core

- Huawei explains that the range in SIB3 and SIB5 was also wrong and updated in this revision.
- QC think we could have a spare as well. LG think we don’t need. We don’t have a spare.
- ON the coversheet RAN2#9 should be RAN2#97bis

⇒ **Revised in R2-1705899 (Rev 3), Agreed unseen**

R2-1705899 Correction to the value range of ce-AuthorisationOffset Huawei, HiSilicon CR 36.331 14.2.1 2745 3 F Rel-14 NB_IOTenh-Core

⇒ **agreed**

Withdrawn

R2-1705368 Correction to the value range of ce-AuthorisationOffset Huawei, HiSilicon CR 36.331 14.2.1 2745 1 F Rel-14 NB_IOTenh-Core

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8.11.1 Mobility enhancements

Submission deadline for documents submitted to this agenda item is extended to Tuesday 2017-05-09 23:59 Pacific time.

R2-1704709 RRC re-establishment for CP Qualcomm Incorporateddiscussion Rel-14

Observation 1: RRC Connection reestablishment using S-TMSI does not involve source eNB until UE is authenticated by MME.

Observation 2: RRC Connection reestablishment using S-TMSI does not require X2 interface.

Observation 3: RRC Connection reestablishment eNB validation requires eNB to support security function that is not present in CP solution. This solution requires X2 interface.

Qforclarification

- Huawei think that from RRC point of view this is more like an RRC establishment than a reestablishment, but think the difference is not that big.
- Intel think that critical extenstion for MSG3 is a problem. Huawei think this is not a problem.
- QC confirms that all 40 bits of S-TMSI is proposed to be sent.
- LG think there is no benefit of excluding the X2 and that using MME in reestablishment is new ,.

⇒ **noted**

R2-1705393 Comparison of the different solutions for RRC connection Re-establishment for the control plane Huawei, HiSilicon, Neul Limited discussion Rel-14 NB_IOTenh-Core

Observation 1: AS Token solution and NAS token solution A reuse the general principles of the RRC Connection Re-estblishment procedure, while NAS token solution B introduces a completely different procedure.

Observation 2: AS Token solution introduces a new security key and a new security function, while NAS token solutions A and B reuse NAS security function and introduce a new S1 procedure for UE verification.

Q for clarifications

- QC think all of the solutions uses different flows anyway, and that the newness is not a significant factor. Huawei agrees that all of the procedures has some impact ..
- Ericsson think that we keep RLF handling in RAN as much as possible, and e.g. there could be cases where we stay in the same eNB.
- Chair think that the mobility procedure would be used also for changing “coverage level”.
- Vodafone think still change of coverage level by RLF is not a normal case for UEs.

⇒ **noted**

R2-1705800 Reestablishment for CP CIOT EPS Optimisation Ericsson discussion

⇒ **Revised before presentation**

R2-1705816 Reestablishment for CP CIOT EPS Optimisation Ericsson discussion

- *Approaches 2, 3 and 4 add 1 UL transmission over Uu compared with Rel-13 (approach 1).*
- *Approach 2 can reduce S1 signalling compared to Rel-13.*
- *Approach 3 can increase S1 signalling compared to Rel-13 due to connection verification in MME and need for MME to keep RAN informed about S-TMSI reassignments.*
- *Approach 4 can be on par with Rel-13 w r t S1 signalling.*
- *Approach 1 has no protocol impact.*

Proposal 1 Rel-13 behaviour is used for recovery after RLF in Rel-14; i.e., RRC connection reestablishment is not introduced for DoNAS (approach 1).

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In case Proposal 1 is not agreed, it is proposed that:

Proposal 2 If Proposal 1 is not agreed, AS token based RRC connection reestablishment for DoNAS (approach 2) as described in S3A0007 is used for recovery after RLF in Rel-14 .

GENERAL DISCUSSION on the 3 tdocs above

- Question: What is the gain of the AS token approach if there is recovery in another eNB. Ericsson think the gain is limited.
- QC think that for option 4 the path switch is combined with other procedure.
- Chair wonders how retransmissions is handeld in NAS revcoery if we would do “nothing”. Huawei think that in all cases the retransmissions need to be done by MME as eNB do not know what to retransmit.
- Huawei think we gain for the UE as the UE would otherwise trigger the tracking area update procedure, and e.g. we don’t need a TAU response message if we don’t trigger the TAU ..
- Huawei think that MME need to be involved in all cases due to involvement in re-transmissions. Chair think that this is corrent unless MME indicate per PDU if the PDU is possible to retransmit.
- Ericsson think that if we need to involve the MME there is no gain in the reestablishment procedures.
- QC think that MME requesting undelivered PDUs report is part of approach 4.
- Nokia support the proposal 1 from Ericsson.
- Vodafone would like to do some enhancement, at least provide retransmission.
- QC point out that the NAS message is large and there is difference in power consumption.

⇒ **All suggested approaches, including NAS recovery (no reestablishment) can allow support of retransmission functions in MME.**

Show of hands (incl retransmissions in MME), round 1

0)	NAS recovery (no reestablishment)	3
1)	Reest. with AS security verification	3
2)	Reest. with MME security verification (with X2)	3
3)	Reest. with MME security verification STMSI (without X2)	2

Show of hands (incl retransmissions in MME), round 2

0)	NAS recovery (no reestablishment)	3
1)	Reest. with AS security verification	3
2)	Reest. with MME security verification (with X2)	3

Show of hands (incl retransmissions in MME), round 3

0)	NAS recovery (no reestablishment)	4
1)	Reest. with security verification, with by MME or by AS	8

Show of hands (incl retransmissions), amoung the reest proposals

1)	Reest. with AS security verification	5
2)	Reest. with MME security verification (with X2)	3
3)	Reest. with MME security verification STMSI (without X2)	3

- Ericsson think that we are too late to go with reestablishment, also as trhe gains are not clear.
- Nokia think we cannot exclude NAS recovery now as it would be the default.

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- Huawei and Vodafone think we can continue work during this week.
- Huawei think that AS security solution is unacceptable. Ericsson think that the algorithm is the same as already supported in the UE.
- QC wonders if this is a new function in the eNB. Ericsson think it is not, especially if eNB also support UP solution, LTE etc ..

⇒ **We make an attempt to converge on a Reestablishment solution.**

Offline Vodafone, attempt to converge on a reestabloishment solution, comeback tomorrow 11.00

R2-1705905 Notes from offline discussion Vodafone

DISCUSSION

- Ericsson don't want to agree now (strongly), and suggest a WA to prepare CRs.
- Nokia wonders if we need multiple sets of CRs, e.g. also for NAS recovery, for which RAN3 CR is needed (for triggering of retransmissions)
- QC think that the R3 CRs for the NAS recovery may be the same as for the Reestablishment solution without X2. Nokia would like to check this. Huawei agrees with Qualcomm.
- Nokia point out that we need to inform SA3, but we assume we do this on Friday.

Friday Continuation

- It seems that the working assumption can be confirmed and converted into an agreement

⇒ **Woking Assumption (WA): we go with reestablishment with MME security verification S-TMSI (without X2) , and will prepare the CRs accordingly.**

⇒ **RAN3 will use this WA to prepare CRs as well.**

⇒ **The WA above is agreed**

R2-1704707 Introduction of RRC connection re-establishment for NB-IoT control plane Qualcomm Incorporated CR 36.331 14.2.2 2823 B Rel-14 NB_IOTenh-Core

⇒ **revised**

R2-1705906 Introduction of RRC connection re-establishment for NB-IoT control plane Qualcomm Incorporated CR 36.331 14.2.2 2823 1 B Rel-14 NB_IOTenh-Core

- Nokia wonders if this is optional for the UE in Rel-14. Huawei think it is optional without capability indication for rel-14. A 36.306 CR is needed.
- Huawei think that RAN3 has a consistent set of CRs.
- Chair wonders if this has impact on NAS.
- Intel think that "has been activated" etc is used, but prefers to use present tense. QC and Huawei think that in the particular case for security past tense is correct.
- 5.3.7.4, inconsistent use of italics font for a parameter
- 5.3.7.5, use single quote instead of double quote,
- Intel: The table of NB-IoT supported messages need to be updated.
- Cat is B due to an exception in the WI.

⇒ **A 36.306 CR is needed, LS out is needed.**

⇒ **A small modification to 36.300, if needed**

✉ **Email discussion, RRC reestablishment DoNAS to finalise CRs, 36.300 and 36.306 (small changes), 36.331 check inter-group alignment and include corrections to minor issues (Qualcomm), 1 week**

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R2-1705936 DRAFT Reply LS on security for RLFs for DoNAS UEs Vodafone LSout

- Title need to be updated
- No attachment
- To SA2 as well
- WI code should be NB_IoTenh-Core

⇒ **Revised in R2-1705937**

R2-1705937 DRAFT Reply LS on security for RLFs for DoNAS UEs Vodafone LSout

- CT1 shall be in the to:-list

⇒ **With this change the LS is approved, final version in R2-1705939**

R2-1705394 RRC impact of Connection Re-establishment based on NAS solution A Huawei, HiSilicon, Neul Limited discussion Rel-14 NB_IOTenh-Core

R2-1705265 Enhanced RRC Connection Re-establishment in NB-IoT LG Electronics Finland discussion NB_IOTenh-Core

R2-1705395 Introduction of RRC Connection Re-establishment for the Control Plane Huawei, HiSilicon CR 36.331 14.2.1 2867 C Rel-14 NB_IOTenh-Core

Above 3 tdocs not treated

8.11.2 Other

Including output from email discussion [97bis#33][eNB-IoT] Positioning (Ericsson)

Including output from email discussion [97bis#34][eNB-IoT] CE authorisation (Ericsson)

Positioning

R2-1705032 Email report [97bis#33][eNB-IoT] Positioning Ericsson report Rel-14 NB_IOTenh-Core

Proposal 1: RAN2 not to pursue ASN.1 enhancements OTDOA signalling using cell indices in REL-13.

Proposal 2: RAN2 to discuss to introduce a new IE OTDOA-SignalMeasurementInformation without extension additions groups in the neighbour cell list.

DISCUSSION

P2

- Huawei support this.
- QC think that the benefit is not enough, but are ok if the group want this.

⇒ **introduce a new IE OTDOA-SignalMeasurementInformation without extension additions groups in the neighbour cell list.**

R2-1705030 ASN.1 enhancement for OTDOA in NB-IoT Ericsson discussion Rel-14 NB_IOTenh-Core

⇒ **noted**

R2-1705028 Compact Signal Measurement Information for OTDOA Ericsson CR 36.355 14.1.0 0169 1 C Rel-14 NB_IOTenh-Core

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- QC indicate that the CR is based on the wrong version of the specification.
- Huawei wonders about an IE TP-id that should be there. Qualcomm think this is due to the problem above.
- Category should be F
- QC think that we should combine ARFCN and its extension into one field instead of referring to the old IE.

⇒ **Revised, take comments into account, in R2-1705911 (rev 2)**

R2-1705911 Compact Signal Measurement Information for OTDOA Ericsson CR 36.355 14.1.0 0169 2 C Rel-14 NB_IOTenh-Core

- Conditional field description should be updated, first part kept and the rest deleted (a deletion)
- QC wonder if we should take into account the new SystemFrameNumber change in another CR. Otherwise we need new CRs at the next meeting. Update the semantics description in this CR to avoid the clash.

⇒ **Revised to take comments into account, in R2-1705839 (rev 3), agreed unseen.**

R2-1705292 Signalling overhead optimization on LPP parameters Huawei, HiSilicon, Neul Limited discussion Rel-14 NB_IOTenh-Core

⇒ **Noted**

R2-1705293 Signalling optimisation for NB-IoT Enhancements Huawei, HiSilicon CR 36.355 14.1.0 0181 F Rel-14 NB_IOTenh-Core

- QC think that the assumptions for ths optimization need to be refected in LPP and it need to be checked that it works.
- QC wonders what f is, is it Hertz of what?
- Ericsson are ok with this, but wonders if the bandwidth need to be added to make it work. Huawei think it doesn't need to be used.

⇒ **Revised**

R2-1705912 Signalling optimisation for NB-IoT Enhancements Huawei, HiSilicon CR 36.355 14.1.0 0181 1 F Rel-14 NB_IOTenh-Core

⇒ **agreed**

R2-1705040 Positioning measurements in idle mode for NB-IoT Ericsson discussion Rel-14 NB_IOTenh-Core

Proposal 1: When the UE is in idle mode to perform positioning measurements, as specified in section 7.1.3 in TS 36.305, the UE shall use SIntraSearchP and SnonIntraSearchP equal to infinity.

Proposal 2: When the UE is in Idle mode to perform positioning measurements, as specified in section 7.1.3 in TS 36.305, it is assumed that the UE performs these measurements using the defaultPagingCycle in SIB2-NB.

DISCUSSION

- LG wonders if this means that UE in Idle always need to perform the measurements. Ericsson think that the use case is just positioning. Huawei think there is no requirement to do measurement e.g. in PSM mode. Ericsson think that a) the UE receives the LPP request, b) goes to Idle c) goes back to connected to report.
- QC think we are mixing two features and think that the response time in the LPP request should be honoured. Huawei agrees that the UE measurements do not need to be specified in detailed.

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- LGs understanding is that the purpose is to make the UE measure immediately after going to Idle mode. LG think this should not be realted to Sintrasearch.
- Chair wonder if there is any support for this. ZTE think that measurement configuration may be dependent on the eDRX configuration
- Ericsson wonders what the UE will do if the UE will measure or not what the UE goes to Idle. QC think that the request in LPP will be honoured regardless the RRM configuration. Mediatek agrees.

⇒ **Chair summary: no support to assume certain RRM configuration related to positioning, but the UE is expected to follow LPP requests, regardless RRM configuration.**

⇒ **noted**

R2-1705016 Clarification to positioning measurement in idle state Ericsson CR 36.305 14.1.0 0069 F Rel-14 NB_IOTenh-Core

- QC can agree to the first change
- Nokia point out that there is a lot of text on the cover page related to the other changes

⇒ **the first change is agreed, and the cover page need to updated accordingly.**

⇒ **revised, in R2-1705913 (rev 1)**

R2-1705913 Clarification to positioning measurement in idle state Ericsson CR 36.305 14.1.0 0069 1 F Rel-14 NB_IOTenh-Core

- Nokia wonders what the UE is supposed to do, if he is now required to perform measurements. To Ericsson, this is a minimum update and would like to further specify what the UE is supposed to do in later meetings.
- Vodafone are ok with this direction
- Nokia are ok with the CR.
- Chair: summary of previous discussion: The UE should follow the LPP request. This is the intended direction.

⇒ **agreed**

R2-1705029 DRAFT LS on positioning measurements in idle mode for NB-IoT Ericsson LS out Rel-14 NB_IOTenh-Core To: RAN4

- We don't need to send this LS

⇒ **noted**

R2-1704438 Corrections to number of NPRS carriers and ECID measurements for NB-IoT Qualcomm Incorporated CR 36.355 14.1.0 0177 F Rel-14 NB_IOTenh-Core

⇒ **agreed**

R2-1704439 Removal of FFS for retransmission timer in LPP Qualcomm Incorporated CR 36.355 14.1.0 0178 F Rel-14 NB_IOTenh-Core

- QC think that right now there is not good proposal for a value
- Ericsson proposes to change "For NB-IoT.." to "In addition, for NB-IoT .. "

⇒ **Change "For NB-IoT.." to "In addition, for NB-IoT .. "**

⇒ **Revised in R2-1705914 (rev 1) which is agreed unseen.**

R2-1705914 Removal of FFS for retransmission timer in LPP Qualcomm Incorporated CR 36.355 14.1.0 0178 1 F Rel-14 NB_IOTenh-Core

⇒ **agreed**

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R2-1705186 Positioning measurement and reporting in NB-IoT LG Electronics Inc. discussion Rel-14 NB_IOTenh-Core

Observation 1: For NB-IoT UE, the RAN2 discussion assumes that LPP measurement is performed in idle mode only.

Observation 2: If the measurement is requested via dedicated signaling, as it was agreed not to support autonomous release, UE doesn't know when it will move back to idle mode.

Proposal 1: If we still assume that the positioning measurement is performed in idle mode only, broadcasting the LPP measurement configuration (including request) can be considered.

Proposal 2: If the LPP measurement configuration is broadcasted, the procedure how to receive and report it by the UE shall be FFS.

DISCUSSION

- QC think that location request need to be dedicated but think that broadcast of assistance data may make sense.
- LG think that the most important gain is that the UE can be configured without going to Connected, .e. a configuration that is realted to an address of a single or group os UEs.
- QC think that the broadcast is anyway addressed in Rel-15, and we should discuss there.
- no support for this rel.

⇒ **noted**

36.306

R2-1705018 Corrections to capabilities for NB-IoT Ericsson CR 36.306 14.2.0 1464 F Rel-14 NB_IOTenh-Core

- ASN.1 review Issue number I.041

⇒ **agreed**

36.331

R2-1705760 Miscellaneous NB-IoT corrections and clarifications resulting from ASN.1 review Huawei CR 36.331 14.2.2 2929 F Rel-14 NB_IOTenh-Core

- Huawei explains that not all open issues are in this list, there are still a number of issues opan for the ASN.1 session.
- *sibType22X-NB-v14xy* clashes with another CR and can be removed here.
- sc-mcch-SchedulingInfo: remove the second dot in the end in the field descr
- SIB22 is a major change. HUawei would lke other companies to verify correctness.
- NPRACH-ProbabilityAnchor-NB-r14,need to check the font
- Ericsson comments that formatting can be fixed in the CR implementation.
- ue-Category-NB: The word "include" is missing.
- SCPTM-NeighbourCellList-NBB should be SCPTM-NeighbourCellList-NB
- There are change marks on the cover page

⇒ **Merge also changes from discussion on R2-1705410 below**

⇒ **Revised in R2-1705900 (rev 1)**

R2-1705900 Miscellaneous NB-IoT corrections and clarifications resulting from ASN.1 review Huawei CR 36.331 14.2.2 2929 1 F Rel-14 NB_IOTenh-Core

- H.087, I.057, and a SIB1/3/5 naming correction in the parameter QoffsetAuth was done.
- There is a clash with another CR, update this CR to avoid the clash with toher agreed CR.
- Can also allow further detail checking

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✉ **Email Discussion, NB-IoT ASN.1 review, primarily to fix clashes, can also address if there are further detailed comments (Huawei)**

R2-1705410 Review issue list for ASN.1 freeze Ericsson, Samsung discussion

This document was partially treated, issues related to NB-IoT only

M.028:

- Not clear why many weight is a problem. Chair recalls that the weight resolution was due to potentially many carriers.

⇒ **Stick with the current range.**

I.057:

⇒ **UE-RadioPagingInfo-NB-r13, Conclusion: no need to update the IE, but update the field description, e.g. "this field is always included for this version fo the specification"**

H.087:

- Huawei think that the value cannot be release if the presence is conditional, without modification.

⇒ **We add text in the presence descr that if the IE is absent but was previously configured then it is released.**

R2-1705044 SIB type in NB-IoT REL-14 Ericsson discussion Rel-14 NB_IOTenh-Core

- Huawei support this.
- QC wonders why other SIB scheuling IEs would not have similar problem/solution.

⇒ **Use all spare bits in *SIB-Type-NB-r13* and introduce a SIB type extension in a later release when needed.**

⇒ **noted**

R2-1705020 Correction to SIB-Type-NB Ericsson, Huawei, HiSilicon CR 36.331 14.2.1 2737 1 F Rel-14 NB_IOTenh-Core

⇒ **Agreed**

R2-1705676 Access barring for CE level (NB-IoT) LG Electronics discussion

- Intel point out that this is in the scope of the Rel-15 NB_IOT (already in the WID).
- HUawei think the impact is too big.

⇒ **Noted**

R2-1705673 NB-IoT UE state transition to the idle state LG Electronics discussion

- LG clarifies that the intention is that dataInactiveTimer shall ONLY be started when it co-incides with BSR=0.
- Ericsson think that if BSR=0 is not sent then the UE expects data, and if there indeed is more data then the DataInactivity timer would be reset, and there is no problem.
- QC think the two features are complementary, and BSR=0 would result in immediate release.
- Chair think it is obvious that we need more time to understand if this can be helpful or not.

⇒ **noted**

R2-1705754 Remaining issues of autonomous RRC connection release in NB-IoT and eMTC ZTE Corporation discussion Rel-14 NB_IOTenh-Core

- Proposes to use the DataInactivity timer for normal RRC release and to add the possibility to do suspend by the timer trigger.

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- Chair think this also need mode discussion.
- Nokia tink this is an optimization.
- QC think we cannot use resume for the CP solution only for the UP solution. Furthermore the Extended Wait timer is a dynamic parameter and it is not clear that it can be provided beforehand

⇒ **Noted**

R2-1705755 Correction to the issues of autonomous RRC connection release in NB-IoT and eMTC ZTE Corporation CR 36.331 14.2.2 2926 F Rel-14 NB_IOTenh-Core

⇒ **Not pursued**

R2-1705756 Correction to CarrierConfigDedicated-NB ZTE Corporation CR 36.331 14.2.2 2927 F Rel-14 NB_IOTenh-Core

- QC wonders why we need impact analysis

⇒ **agreed**

CE authorization

R2-1705033 Email report [97bis#34][eNB-IoT] CE authorisation Ericsson report Rel-14 NB_IOTenh-Core

Proposal 1: Qoffsetauthorization and Poffset are not "added up" when both are valid.

Proposal 2: RAN2 to discuss whether only the maximum value of Poffset and Qoffsetauthorization should be used or Poffset is zero, when both are valid.

DISCUSSION

- Huawei think the max of the two values cannot be used as they are applied to different parameters, and suggests to use Poffset = 0 when Qoffsetauthorization is used
- Ericsson think that the max value can be used.

Show of hands:

a) Poffset = 0 2
b) MAX 0
c) We don't do anything: Both are applicable 4

⇒ **We don't do anything. The offsets will add up.**

R2-1705015 Cell ranking when both Poffset and Qoffsetauthorization are valid Ericsson CR 36.304 14.2.0 0373 F Rel-14 NB_IOTenh-Core

⇒ **Not pursued**

RAI

R2-1705484 Definition of "the near future" for RAI procedure Nokia discussion Rel-14 NB_IOTenh-Core

⇒ **Noted**

R2-1705039 Open issues RAI Ericsson discussion Rel-14 NB_IOTenh-Core.

Discussion on two docs above

- Intel supports the ericsson proposal. LG too, but LG would like to relate this to NAS RAI. QC support the Ericsson proposal.

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- SW think that 100s is too long time, in the magnitude of 10s would be more reasonable.
- Chair wonders if we will make a small stage-2 description. QC think this is ok.
- Nokia think that we must and have already agreed to specify what is near future.
- Ericsson wonders if we can describe the “near future” in the same way as for the NAS indication.
- Intel think that for the NAS indication there is no specific time defined, and that it can work anyway.

⇒ **Keep the wording “UE may have more data to send or receive in the near future” for the AS RAI procedure. Remove FFS on further specification on “near future”.**

R2-1705757 Definition of “the near future” for RAI procedure Nokia CR 36.321 14.2.1 1132 F Rel-14 NB_IOTenh-Core

⇒ **Not pursued**

R2-1705672 Clarification on AS release assistance indication LG Electronics CR 36.321 14.2.1 1131 F Rel-14 NB_IOTenh-Core

- Proposes that near future is determined by “upper layer”.

- many companies nodding negatively

⇒ **Not pursued**

R2-1705460 Prohibit timer with Release Assistance Indicator Qualcomm Incorporated discussion LTE_feMTC-Core

R2-1705670 AS release assistance indication handling LG Electronics discussion

R2-1705671 [Draft] LS on upper layer information delivery of user data transmission for AS release assistance indication handling LG Electronics LS out Rel-14 NB_IOT-Core to: SA2; Cc: CT1

3 tdocs above not treated

36.304

R2-1705012 Clarification to offsets used with cell ranking Ericsson CR 36.304 14.2.0 0366 1 F Rel-14 NB_IOTenh-Core, LTE_feMTC-Core

- LG think we should clarify how it works if several frequencies applies the infinite offsets.

- Ericsson think we just do normal ranking between those.

- Huawei think this CR clash with another CR

⇒ **Merged with R2-1705927**

36.321

R2-1705297 Random access procedure triggered by PDCCH order Huawei, HiSilicon, Neul Limited discussion Rel-14 NB_IOTenh-Core

Proposal 1: RAN2 to agree on having either random selection or deterministic selection for both carrier and sub-carrier.

Proposal 2: RAN2 to consider introducing contention-free random access in Rel-14.

⇒ **noted**

R2-1705417 Discussion on resources selection for PRACH triggered by a PDCCH order in eNB-IoT ZTE Corporation discussion Rel-14 NB_IOTenh-Core

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Proposal 1: Deterministic selection of carrier and subcarrier index for PRACH initiated by a PDCCH order should be supported.

Proposal2: RAN2 is requested to discuss the two alternatives for deterministic selection of PRACH resources for PRACH initiated by a PDCCH order.

⇒ **noted**

R2-1704180 Carrier selection for PDCCH-ordered random access in Rel-14 NB-IoT Ericsson CR 36.321 14.2.0 1093 F Rel-14 NB_IOTenh-Core

⇒ **noted**

DISCUSSION on three tdocs above

- LG think that CFRA in order to get determinism is strange.
- Huawei think that we should choose resrouce and carrier according to the same principle. Sequans agrees. Intel agrees
- ZTE think we should detemininstacly select all PRACH resrouces at PDCCH order. Intel agrees.
- LG would prefer the baseline / random selection of Carrier at CE level change.
- LG think it is too late for CFRA.
- Chair: There is significant support to do something deterministic
- Chair: It seems between the deterministic alternativesm, CFRA has strongest support

SOH1, At CE level change (each company can have two preferences)

Alt0 CFRA	4
Alt1 deterministic carrier selection and deterministic resrouce selction	5
Alt2 random carrier selection and deterministic resrouce selction (default)	3

SOH2, At CE level change (each company 1 preferences)

Alt0 CFRA	4
Alt1 deterministic carrier selection and deterministic resrouce selction	2

⇒ **Agree that we support CFRA for PDCCH order.**

R2-1705462 Resources selection for PRACH triggered by a PDCCH order in eNB-IoT(Option2) ZTE Corporation CR 36.321 14.2.1 1113 B Rel-14 NB_IOTenh-Core

⇒ **Revised in R2-1705929**

R2-1705929 Resources selection for PRACH triggered by a PDCCH order in eNB-IoT(Option2) ZTE Corporation CR 36.321 14.2.1 1113 B Rel-14 NB_IOTenh-Core

- QC comments that the cover sheet need to be changed, category should be F.
- Related CRs should be updated on the coverpage
- Chair comments that the changes as described in the cover sheet seems consistent with the agreement and the discussion for the agreement. However companies have not had time to review.

✉ **Email review, RACH handling at PDCCH order (ZTE) to arrive at an agreed CR, 1 week**

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R2-1705463 Resources selection for PRACH triggered by a PDCCH order in eNB-IoT(Option2) ZTE Corporation CR 36.300 14.2.0 1028 B Rel-14 NB_IOTenh-Core

⇒ **Revised in R2-1705930**

R2-1705930 Resources selection for PRACH triggered by a PDCCH order in eNB-IoT(Option2) ZTE Corporation CR 36.300 14.2.0 1028 B Rel-14 NB_IOTenh-Core

- Category should be F
- Related CRs should be updated on the coverpage

⇒ **Contents is agreed**

⇒ **Revised in R2-1706114 (rev 2), agreed unseen**

R2-1705483 Resources selection for PRACH triggered by a PDCCH order in eNB-IoT(Option2) ZTE Corporation CR 36.306 14.2.0 1477 B Rel-14 NB_IOTenh-Core

⇒ **Not pursued**

R2-1705487 Resources selection for PRACH triggered by a PDCCH order in eNB-IoT(Option2) ZTE Corporation CR 36.331 14.2.2 2886 B Rel-14 NB_IOTenh-Core

⇒ **Not pursued**

R2-1705439 Resources selection for PRACH triggered by a PDCCH order in eNB-IoT(Option1) ZTE Corporation CR 36.321 14.2.1 1110 F Rel-14 NB_IOTenh-Core

⇒ **Not pursued**

R2-1704183 Editorial corrections for MAC Ericsson CR 36.321 14.2.0 1068 1 D Rel-14 NB_IOTenh-Core, LTE_feMTC-Core

LG think we should change “or for NB-IoT..” to “or except for NB-IoT ..” in 5.1.2

⇒ **Revised in R2-1705931**

R2-1705931 Editorial corrections for MAC Ericsson CR 36.321 14.2.0 1068 1 D Rel-14 NB_IOTenh-Core, LTE_feMTC-Core

⇒ **agreed**

R2-1705230 Clarification for the UL grant or DL assignment after Msg3 ZTE Corporation CR 36.321 14.2.1 1104 F Rel-14 NB_IOTenh-Core

⇒ **Not pursued**

R2-1704510 RA failure handling in NB-IoT LG Electronics Inc. discussion Rel-14 NB_IOTenh-Core

Proposal 1. When the RA procedure is unsuccessfully completed, a UE in RRC_IDLE state should go back to the anchor carrier and a UE in RRC_CONNECTED state should go back to the configured carrier.

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Proposal 2. When the NB-IoT UE moves back to the anchor carrier or the configured carrier after unsuccessful completion of RA procedure, the NB-IoT UE should stop RA Preamble transmission.

DISCUSSION

P1

- Huawei think MAC just report to RRC and RRC sedn the UE to Idle triggered by RLF. Chari agrees. When UE goes to Idle, the UE will go to a suitable cell for camping, i.e. not normally an non-anchor carrier.

P2

- Huawei think that in NB-IoT MAC stops at RACH failure, different to LTE.

⇒ **Intented behaviour seems correct, but no need for clarification.**

⇒ **noted**

R2-1704511 RA failure handling in NB-IoT LG Electronics Inc. CR 36.321 14.2.1 1098 F Rel-14 NB_IOTenh-Core

⇒ **not pursued**

36.300

R2-1705290 Corrections to NB-IoT Enhancements Huawei, HiSilicon CR 36.300 14.2.0 1006 1 F Rel-14 NB_IOTenh-Core

⇒ **agreed**

R2-1705011 Miscellaneous corrections NB-IoTenh and feMTC Ericsson CR 36.300 14.2.0 1003 1 F Rel-14 NB_IOTenh-Core, LTE_feMTC-Core

- Nokia think the change in 6.1.1. should be in the same section as PPI is specified, i.e. where it was.

⇒ **the change in 6.1.1 should be un-done**

⇒ **Merged into R2-1704994**

Withdrawn

R2-1705369 Miscellaneous NB-IoT corrections and clarifications resulting from ASN.1 review Huawei CR 36.331 14.2.1 2860 F Rel-14 NB_IOTenh-Core

8.12 WI: Further Enhanced MTC for LTE

(LTE_feMTC-Core, leading WG: RAN1; REL-14; started: June 16; target: Jun. 17; WID: RP-170532)

This agenda item is for correction CRs to the WI that is completed from RAN2 point of view.

Documents in this agenda item will be handled in the LTE Break Out session

Incoming LS

R2-1704020 LS on measurement capability for R14 Cat-M1/M2 UE (R4-1704163; contact: Intel) RAN4 LS in Rel-14 LTE_feMTC-Core RAN2 RAN1

- Intel thinks we have tdocs addressing everything in the LS and we probably don't need to reply.

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- Ericsson wonders what are the measurement capabilities of a UE of other CAT that support CE. Intel think it is celar form the LS that such UEs have this capability.
- Ericsson then wonders if we need to change the 36.306 to make the signalled capability aplciate to other CAT UEs.

⇒ **Noted**

8.12.0 In principle agreed CRs

R2-1704705 CE mode configuration/deconfiguration without handover Ericsson CR 36.300 14.2.0 1010 1 C Rel-14 LTE_feMTC-Core

⇒ **Agreed**

R2-1704706 CE mode configuration/deconfiguration without handover Ericsson CR 36.306 14.2.0 1452 1 C Rel-14 LTE_feMTC-Core

⇒ **Agreed**

R2-1704708 CE mode configuration/deconfiguration without handover Ericsson CR 36.331 14.2.2 2775 1 C Rel-14 LTE_feMTC-Core

- Change “if the UE was not in enhanced coverage in the beginning of this procedure” to “If ce-Mode is not currently configured”.

- Change “if ce-Mode was configured in the beginning of this procedure” to “if ce-Mode is currently configured”.

- IN normal-CE-SwitchWithoutHo: Change to ce-SwitchWithoutHO, change also field description

⇒ **Revised in R2-1705916 (rev 2), agreed unseen**

R2-1705916 CE mode configuration/deconfiguration without handover Ericsson CR 36.331 14.2.2 2775 2 C Rel-14 LTE_feMTC-Core

⇒ **agreed**

8.12.1 Multicast for feMTC and eNB-IoT

Including output from email discussion [97bis#35][eNB-IoT/feMTC] SC-MTCH parameters (Huawei)

Including output from email discussion [97bis#36][eNB-IoT/feMTC] SC-PTM offset (Huawei)

Delta configuration

R2-1705280 Summary of email discussion [97bis#35][LTE/eNB-IOT/feMTC] Delta configuration Huawei report Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

- Huawei are not sure any longer. Ericsson agrees, and this it is not worth it. Intel and LG agrees the gains are small ..
- QC think the existing design is perfect ☺

⇒ **We don’t attempt the detla configuration.**

R2-1705281 Correction to SC-MCCH and SC-MTCH configuration without delta configuration Huawei, HiSilicon CR 36.331 14.2.1 2854 F Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

- Huawei are not sure that we need to signal the TBS (Ericsson to check w RAN1)
- For mpdcch-PDSCH-MaxBandwidth-SC-MTCH-r14it shold be defined as n6, n24 (if not combined with previous)

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- There may be a clash on IE naming with ASN.1 review CR. If not problematic we follow the ASN.1 CR(s).

⇒ **Revised in R2-1705924 (rev 1)**

R2-1705924 Correction to SC-MCCH and SC-MTCH configuration without delta configuration Huawei, HiSilicon CR 36.331 14.2.1 2854 1 F Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

- Chair wonders if the bandwidth should be bw5, bw 20 etc or n24 etc, we have changed this twice now.

⇒ **Change to bw1dot4 and bw5, and do consistency update to field description and coversheet.**

⇒ **Revised in R2-1706115 (rev 2), agreed unseen**

R2-1705282 Correction to SC-MCCH and SC-MTCH configuration with delta configuration Huawei, HiSilicon CR 36.331 14.2.1 2855 F Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

⇒ **Not pursued**

SC-PTM offset

R2-1705283 Summary of email discussion [97bis#36][LTE eNB-IOT feMTC] SC-PTM offset Huawei report Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

⇒ **noted**

R2-1705284 Correction to usage of SC-PTM offset in NB-IoT and FeMTC Huawei, HiSilicon CR 36.304 14.2.0 0376 F Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

⇒ **revised before presentation**

R2-1705927 Correction to usage of SC-PTM offset in NB-IoT and FeMTC Huawei, HiSilicon CR 36.304 14.2.0 0376 1 F Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

- ZTE think that “another frequency” is maybe not the best. Ericsson think that this is deliberate in order to disperse UEs.
- General confusion on the text .. the intentions seems ok, e.g. to disperse the UEs to other frequency.

✉ **Email discussion, SC-PTM offset, to refine the wording(s), to arrive at an agreed CR (Huawei), 1 week**

R2-1705041 SC-PTM offset Ericsson discussion Rel-14 NB_IOTenh-Core, LTE_feMTC-Core

R2-1705014 Corrections for SC-PTM offset Ericsson CR 36.304 14.2.0 0372 F Rel-14 NB_IOTenh-Core, LTE_feMTC-Core

Above 2 tdocs not treated

Other

R2-1705475 Correction on cell reselection for SC-PTM in FeMTC Huawei, HiSilicon CR 36.304 14.2.0 0379 F Rel-14 LTE_feMTC-Core

- LG think that BL UE is needed in the sentence. Ericsson think that maybe we should say BL UE and non BL UE in CE ..
- Chair think that in principle the proposal is correct.
- Nokia wonder if we the should mention also BR version of SIB15 etc, as it is applicable to CE.
- Discuss for which UEs this applies ..

⇒ **Merge into R2-1705927, and include in email discussion.**

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R2-1705288 Remaining Issues on SC-PTM Reception Huawei, HiSilicon, Neul Limited discussion Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

⇒ **Noted**

R2-1705289 Introduction of SC-MRB suspension and resumption Huawei, HiSilicon CR 36.331 14.2.1 2856 F Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

- Chair wonders why this is needed. Intel think this is not critical.

⇒ **Not pursued**

R2-1705296 Action upon reception of SC-PTM stop indication Huawei, HiSilicon CR 36.321 14.2.0 1105 F Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

- Ericsson wonders if the text on informing upper layer is needed.
- LG think the intention is ok.

⇒ **Revised in R2-1705933 (rev 1), Ericsson to propose contents (Huawei)**

R2-1705933 Action upon reception of SC-PTM stop indication Huawei, HiSilicon CR 36.321 14.2.0 1105 F Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

⇒ **agreed**

R2-1705285 SC-MCCH information change notification for FeMTC and NB-IoT enhancements Huawei, HiSilicon CR 36.331 14.2.1 2748 1 F Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

- Ericsson think we should have this specified as “direct indication”. Huawei think that was rejected at previous meeting.
- Ericsson think that the first bit should indicate change of configuration provided in SC-MCCH.
- Intel think there are three bits in the DCI format.
- We should refer to RAN1 specification such that it is clear what is meant.

✉ **Email discussion, SC-MCCH information change (Huawei), 1 week**

R2-1705286 Alignment of the parameter names for SC-PTM DRX for SC-MCCH and SC-MTCH Huawei, HiSilicon CR 36.331 14.2.1 2749 1 F Rel-14 LTE_feMTC-Core, NB_IOTenh-Core, TEI14

⇒ **agreed**

R2-1705287 Alignment of the parameter names for SC-PTM DRX for SC-MCCH and SC-MTCH Huawei, HiSilicon CR 36.321 14.2.0 1063 1 F Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

⇒ **agreed**

R2-1704182 Correction to SC-MCCH and SC-MTCH reception type Ericsson CR 36.302 14.2.0 0105 1 F Rel-14 LTE_feMTC-Core

- Should refer to Note 7 in the first table.

⇒ **Revised in R2-1705934 (rev 2), agreed unseen**

R2-1705474 Correction on parallel reception of SC-PTM for FeMTC Huawei, HiSilicon CR 36.302 14.2.0 0111 F Rel-14 LTE_feMTC-Core

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Moved to 8.12.1 from 8.12.2

- Ericsson think “or” should be used in the second table. Intel and LG agrees.

⇒ **Merged in R2-1704182**

8.12.2 Other

Including output from email discussion [97bis#37][LTE/feMTC] Enhanced RLC (Ericsson)

Positioning

R2-1704440 Correction to PRS Subframe Offset Qualcomm Incorporated discussion Rel-14 LTE_feMTC-Core

- Ericsson think that if there is frequency hopping, there is only frequency hopping for one configuration, according to RAN1 agreements. QC think that the configurations is flexible.
- ZTE think the proposal is correct. LG also agrees with this.

⇒ **agreed**

R2-1704441 Correction to PRS Subframe Offset Qualcomm Incorporated CR 36.355 14.1.0 0171 1 F Rel-14 LTE_feMTC-Core

⇒ **agreed**

R2-1704443 Correction to SFN time stamp in OTDOA Signal Measurement Information Qualcomm Incorporated CR 36.355 14.1.0 0173 1 F Rel-14 LTE_feMTC-Core

⇒ **agreed**

R2-1705578 LPP corrections for MTC Ericsson discussion Rel-14 LTE_feMTC-Core

⇒ **noted**

R2-1705579 LPP corrections for MTC Ericsson CR 36.355 14.1.0 0168 1 F Rel-14 LTE_feMTC-Core

⇒ **Merged with R2-1705225**

R2-1704442 Clarification of PRS Occasion Group Length field description Qualcomm Incorporated CR 36.355 14.1.0 0172 1 F Rel-14 LTE_feMTC-Core

- ZTE think that the product should be prsOccGroupLen × prsOccationInterval rather than prsOccGroupLen × TPRS. QC think that the description between the CRs are equivalent, and that TPRS is the same as prsOccationInterval.
- Huawei think that this depends on the definition of TPRS in the light of pre occation group, an has the same understanding as Qualcomm, and Huawei think that a PRS occasion group should be considered equivalent to Rel-9 PRS occasion from concept and terminlogiy point of view.
- Chair wonders if we need a stage-2 figure. It seems we don’t.

⇒ **Merged with R2-1705225**

R2-1705225 Clarification for prsOccGroupLen IE in OTDOA PRS-Info for FeMTC ZTE Corporation CR 36.355 14.1.0 0180 F Rel-14 LTE_feMTC-Core

- QC agrees that the range of applicable values should be in the field description.

⇒ **postponed**

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R2-1705938 Offline discussion notes ZTE

- QC think the questions are wrong.
- Intel think R1 are confused, and we can decide, but we can also ask R1.
- ZTE think that R1 has discussed in detail the hopping interval and which values are applicable, but this is not reflected in R2 specifcations. ZTE think that Alt1 is most consistent with the R1 agreements. QC point out that frequency hopping is not discussed at all in these cases.
- QC think that we don't need 2 TPRS parameters.
- Ericsson think that the Qualcomm understanding is correct.
- ZTE think that RAN1 cannot make a change due to LPP
- Chair point out that RAN1 should specify how L1 works and ask R2 to support this by signalling, not the other way around.
- Intel think this is just a definition confusion.

⇒ **Focus on clarity**

✉ **Email discussion, PRS Occasion Group, clarify whether there is a problem or not, and if so, arrive at a solution (ZTE), next meeting**

R2-1704444 Correction to OTDOA capabilities Qualcomm Incorporated CR 36.355 14.1.0 0174 1 F Rel-14 LTE_feMTC-Core

- Huawei is wondering if we should incporporate the densePRS and additionPRSconfig capabilities should be merged into one. Huaweis understanding is that densePRS configuration can handle all cases.

⇒ **Agreed**

R2-1705037 Measurement gaps for intra-frequency RSTD measurements in feMTC Ericsson discussion Rel-14 LTE_feMTC-Core

Proposal 1: Introduce new IntraFreqRSTDMeasurementIndication message to request measurement gaps for intra-frequency RSTD measurements.

Proposal 2: Extend InterFreqRSTDMeasurementIndication message to enable the UE to request measurement gaps for both intra-frequency and inter-frequency RSTD measurements.

Proposal 3: Introduce PRS occasion periodicity and PRS length in IntraFreqRSTDMeasurementIndication and InterFreqRSTDMeasurementIndication message.

DISCUSSION

- ZTE think that we can use only the exsiting procedure, we don't need a new one.QC agrees and also think that inter-intre frequency language is confusing as we have frequency hopping also for intra-frequency.
- Huawei think that UE just requests gaps.
- Huawei think that the figure may need to be updated.
- The chair wonders if the UE need to explain why gaps are needed (intra-frequency, inter-frequency). Ericsson explains that the UE signals this in order for the eNB to know which confuration the UE uses.

⇒ **Noted**

R2-1705026 Introduction of IntraFreqRSTDMeasurementIndication message Ericsson CR 36.331 14.2.1 2844 F Rel-14 LTE_feMTC-Core

- Ericsson think that the frequency information is not needed for the intra-frequency case, and there is additional overhead.
- QC, ZTE and LG think that a new message is not needed.

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- Ericsson think that in this case we need to discuss the parameters. QC think that no parameters are needed in addtition to the offset as the measrument gaps are anyway fixed 40ms period and 6ms length.

⇒ **Don't need any ASN.1 update, only update of the procedure text.**

⇒ **Revision in R2-1705907 (rev 1)**

R2-1705907 Introduction of IntraFreqRSTDMeasurementIndication message Ericsson CR 36.331 14.2.1 2844 1 F Rel-14 LTE_feMTC-Core

⇒ **agreed**

R2-1705580 Management of OTDOA resources for feMTC Ericsson discussion Rel-14 LTE_feMTC-Core

Proposal 1: Introduce a PRS configuration identifier for each PRS configuration of a cell.

Proposal 2: The UE reports used PRS configurations in case less than all PRS configurations have been used, and the UE has been configured with PRS configuration identifiers in the assistance data.

DISCUSSION

- QC think that R1 has already decided that this was not needed. QC think that the UE doesn't choose freely, and that the UE capabilities gove the same information, as the UE always chooses the best configuration from this set. Huawei agrees on QC assumptions. Intel also agrees
- No support.

⇒ **Noted**

R2-1705581 Management of positioning resources for further enhanced MTC Ericsson CR 36.355 14.1.0 0167 1 C Rel-14 LTE_feMTC-Core

⇒ **Not pursued**

Enhanced RLM

R2-1705034 Email report [97bis#37][LTE/feMTC] Enhanced RLM Ericsson report Rel-14 LTE_feMTC-Core

Proposal 1: Introduce a (simple) L3 filtering scheme for enhanced RLM

Proposal 2: Introduce a prohibit timer with enhanced RLM

Proposal 3: The UE shall only report RLM information (i.e. recommended MPDCCH repetitions, recommended MPDDCH aggregation level and recommended CE mode) when configured.

Proposal 4: Enhanced RLM is an optional feature indicated via UE capability signalling. There is an additional UE capability (one) which indicates whether the UE can report RLM information.

DISCUSSION

P1:

- LG wonders why we need to use L3 filtering, why can't we use CQI reporting, then we don't need to filter? Ericsson think that the use case is an early warning for RLF so this is why Qout Qin are used. Intel think that R4 has discussed the cqi reporting and it is not available for CE mode B.
- Chair wonder how we can determine if we need L3 filter or not. Nokia think that there has not been any simulations in R4.

P2:

- Ericsson think that prohibit timer is needed.

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- Chair wonders how many “levels” we have in this mechanism. Kyocera think it is 4. Ericsson are not sure. LG agrees with Kyocera.
- Nokia think prohibit timer is not needed, and assumes that Qin is just reported once
- LG think that we should discuss prohibit timer separately for Qin and Qout.
- Intel think that prohibit timer is needed and only one is needed.
- Nokia wonders if we need a configurable prohibit timer. Ericsson propose to use the same mechanism as for the UE indication.
- LG wonders if we have only one prohibit timer, if it is running due to Qin would it then prevent early Qout indication.
- Chair: there seems to be support for at least Qin
- Chair: 4 companies also support for Qout.
- Interl are ok with separate timers
- Intel assumes that RLM is relative to Rmax.

P4

- LG think only one capability is sufficient.
- QC wonders if a signalled capability is needed or if it can be optional anyway.
- Ericsson think that if there is network configuration it need to be mantaory for the releas or signalled optional.
- Intel think that whether we havce two or one capability depend on RAN4.
- LG wonders what the eNB should do is the UE only indicate one capability? Ericsson think this is up to the eNB.

Qin

- The assumption is that early Qin indication is generated repeatedly by L1 as long as Early Qin criterion is fulfilled with repect to current configured Rmax.

General

- Intel would prefer to have CRs this meeting.
- Nokia wonders if we can use measurement reporting instead, and asks whether security is needed. QC think that this is not mobility and no neighbour cell measurement and security is not needed. LG support.
- Ericsson think that for the UE assistance information security is needed.

⇒ **noted**

⇒ **Introduce a (simple) L3 filtering scheme for enhanced RLM**

⇒ **Introduce separate prohibit timers with enhanced RLM for early Qin and early Qout indications**

⇒ **R2 assumes that early Qin indication is generated repeatedly by L1 as long as Early Qin criterion is fulfilled with repect to current configured Rmax, i.e. all the time when Rmax is configured “ok” with repect to current radio conditions.**

⇒ **The UE optionally reports recommended MPDCCH repetitions, recommended MPDDCH aggregation level and recommended CE mode.**

⇒ **Enhanced RLM is an optional feature indicated via UE capability signalling.**

⇒ **RAN2 assumes two capabilities is signalled. There is an additional UE capability (one) which indicates whether the UE can report RLM information.**

R2-1705806 Enhanced RLM reporting Kyocera discussion Rel-14 LTE_feMTC-Core

Proposal 1: A new notification counter and a new timer associated with the Early Qout Cat M1 threshold shall be included in the Layer 3 specification.

Proposal 2: The timer associated with the Early Qout Cat M1 threshold shall be reset after receiving N311 consecutive “in-sync” indications from lower layers and upon T310 expiry.

Proposal 3: A new notification counter and a new timer associated with the Early Qin Cat M1 threshold shall be included in the Layer 3 specification.

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Proposal 4: The timer associated with Early Qin Cat M1 should be reset for after receiving N311 consecutive "in-sync" indications from lower layers.

DISCUSSION

- Proposal: the L3 filter parameters are separate from the RLF one for Early Qin Qout.
- Ericsson think that Early Qout must use the same L3 filter values as for RLF. LG agrees with this.
- Ericsson support P4

⇒ **The L3 filter timer associated with Early Qin should be reset for after receiving N311 consecutive "in-sync" indications from lower layers.**

R2-1705035 Enhanced RLM Ericsson discussion Rel-14 LTE_feMTC-Core

⇒ **noted**

R2-1705027 Introduction of enhanced RLM reporting Ericsson CR 36.331 14.2.1 2845 B Rel-14 LTE_feMTC-Core

- LG agrees in general but the separate prohibit timers need to be considered
- The L3 filter timer associated with Early Qin to be reset for after receiving N311 consecutive "in-sync" indications from lower layers.
- QC wonders why there is CE mode reporting. Ericsson think that this it the recommendation from the UE to the network. QC point out that this is only applicable if the UE support CE mode B.
- QC wonders if the repetition and aggregation level is not sufficient? Ericsson are not sure.
- Nokia wonders what optionally in our agreement means. Ericsson think that once configured the reporting is not optional but the feature itself is optional.

⇒ **The CR is endorsed, with comments, as a baseline for work during this meeting**

⇒ **revised**

R2-1705917 Introduction of enhanced RLM reporting Ericsson CR 36.331 14.2.1 2845 B Rel-14 LTE_feMTC-Core

- Ericsson indicates that they have taken into account agreements in RAN4. We have not received the LS yet. Nokia wonders if we can have this for email approval
- Category should not be B. Use F.

✉ **Email approval, Enhanced RLM, to check consistency with RAN4 and details, (Ericsson), one week**

R2-1705716 Introduction of enhanced RLM measurement capabilities Ericsson CR 36.306 14.2.0 1479 B Rel-14 LTE_feMTC-Core

⇒ **The CR is endorsed as a baseline for work during this meeting.**

⇒ **revised**

R2-1705918 Introduction of enhanced RLM measurement capabilities Ericsson CR 36.306 14.2.0 1479 1 B Rel-14 LTE_feMTC-Core

- Category should not be B. Use F.

⇒ **for email approval (above)**

R2-1705807 Introduction of enhanced RLM reporting Kyocera CR 36.331 14.2.2 2941 B Rel-14 LTE_feMTC-Core

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⇒ **Merged (partially) with R2-1705027**

36.331

R2-1705407 Miscellaneous feMTC corrections and clarifications resulting from ASN.1 review Ericsson

Moved from 8.26 to 8.12

H.030: sc-mcch-ModificationPeriod-BR: Check if redundant with procedure text. If so we can trim the field description.

H.031: sc-mcch-Offset: same comment as above

C.012: “The max bandwidth can by configured to 5MHz for BL UEs and 5MHz or 20MHz for UEs in CE” is a bit misleading and should be removed.

ce-PDSCH-MaxBandwidth-r14: Need code shold be OP, field description: “is not signalled” should be changed to “is absent”.

ce-HARQAckBundling-r14 should have a hyphen after HARQ

- Ericsson think that RAN1 has changed the 5MHz from 25 to 24 RBs ..

L.026: we use the wording bw5, bw20. ce-PDSCH-MaxBandwidth-r14 field description: remove “n25 corresponds to 25 resource blocks, n100 to 100 resource blocks.”

Edit: ce-PDSCH-TenProcess change to ce-PDSCH-TenProcesses

pucch-NumRepetitionCE-Msg4-Level0, pucch-NumRepetitionCE-Msg4-Level1, pucch-NumRepetitionCE-Msg4-Level2, pucch-NumRepetitionCE-Msg4-Level3: Change is signalled to is included

L.026: ce-PUSCH-MaxBandwidth-r14: change back to bw5 and make the corresponding update to the field description

ce-PUSCH-MaxBandwidth-r14: Need code should be OP

fdd-Add-UE-EUTRA-Capabilities-v1320 and tdd-Add-UE-EUTRA-Capabilities-v1320: suffix should be –v14xy

UE-EUTRA-CapabilityAddXDD-Mode-v1320: suffix should be –v14xy

L.023: ce-PDSCH-PUSCH-MaxBandwidth-r14: we should use bw5 and bw20

ce-HARQAckBundling-r14: should have a hyphen

SRSEnhancement: should have a hyphen

Wrong font configN (in MIMO-CA-ParametersPerBoBCPerTM)

C.006: Section 5.8a.1.3: The sentence ”a NB-IoT UE interested to receive MBMS services transmitted using SC-PTM acquires the new SC-MCCH information according to the schedule information in PDCCH” is applicable also to BL UE and UE in CE, but is covered in another CR. Can be removed here.

- chair think there is an issue that UEs in normal coverage can now be configured with reduced bandwidth, such UEs are neither “BL UE” or “CE UE” .. potentially many updates ..

⇒ **Revised in R2-1705915 (rev 1), (Ericsson)**

R2-1705915 Miscellaneous feMTC corrections and clarifications resulting from ASN.1 review Ericsson

- All changes from above has been implemented.

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✉ **Email checking, feMTC ASN.1 review, mainly for clashes (Ericsson), 1 week**

R2-1705772 Maximum PDSCH/PUSCH BW preference indication handling for handover Apple CR 36.331 14.2.2 2932 F Rel-14 LTE_feMTC-Core

- QC think that the current PPI mechanism is somewhat odd.
- Nokia think that this was put there so that the information is fresh.
- Chair think this will be triggered rarely .. but ok anyway ..

⇒ **agreed**

R2-1705043 SFN indication in handover message Ericsson discussion Rel-14 LTE_feMTC-Core

Proposal 1: Introduce SFN indication in IE MobilityControlInfo in RRCConnectionReconfiguration message in REL-14 for the handover within E-UTRA use case

Proposal 2: Clarify in 36.331 for REL-14 that the BL UE and UE in CE is not required to acquire MIB during handover when the SFN indication is included in handover message.

DISCUSSION

P1

- LG wonders if it would be better to provide an offset instead.
- Ericsson clarifies that this is a RAN1 agreement.

⇒ **Introduce SFN indication in IE MobilityControlInfo in RRCConnectionReconfiguration message in REL-14 for the handover within E-UTRA use case**

⇒ **Clarify in 36.331 for REL-14 that the BL UE and UE in CE is not required to acquire MIB during handover when the SFN indication is included in handover message.**

⇒ **noted**

R2-1705019 Introduction of SFN indication in handover message Ericsson, Qualcomm Incorporated CR 36.331 14.2.1 2734 1 F Rel-14 LTE_feMTC-Core

- Change “cell has same the SFN” to “cell has the same SFN”
- Docomo wonders if we need a UE capability.
- QC think the UE would just follow legacy behaviour (i.e. the UE can just ignore) so we can decide later if this would be optional or not for Rel-14 MTC UEs.

⇒ **Revised in R2-1705919 (rev 2), which is agreed unseen**

R2-1705919 Introduction of SFN indication in handover message Ericsson, Qualcomm Incorporated CR 36.331 14.2.1 2734 2 F Rel-14 LTE_feMTC-Core

⇒ **Agreed**

R2-1704720 Draft Reply LS on SFN indication in handover message Qualcomm Incorporated LS out Rel-14 LTE_feMTC-Core To: RAN1, RAN4

⇒ **Approved, Final version in R2-1705920**

R2-1705038 Measurements for feMTC in REL-14 Ericsson discussion Rel-14 LTE_feMTC-Core

5a/b:

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- Ericsson think that there is an impact that the existing measurement capabilities should be updated, and that a CR to 36.306 is needed.
- Ericsson think it is FFS if LPP need update.

⇒ **On proposal 5a, we attempt to make a CR to 36.306 for this meeting on measurement capabilities in Rel-14.**

R2-1706125 Correction to ceMeasurements-r14 measurement capability Ericsson CR 36.306 14.2.0 1483 F Rel-14 LTE_feMTC-Core

⇒ **CR is agreed**

R2-1705023 Configuration of measurement gap sharing in feMTC Ericsson CR 36.331 14.2.1 2841 F Rel-14 LTE_feMTC-Core

⇒ **Merged in R2-1706004**

R2-1705479 Measurent gap sharing for FeMTC intra- and inter-frequency measurement Huawei, HiSilicon CR 36.331 14.2.0 2883 F Rel-14 LTE_feMTC-Core

⇒ **Revised**

R2-1706004 Measurent gap sharing for FeMTC intra- and inter-frequency measurement Huawei, HiSilicon CR 36.331 14.2.0 2883 1 F Rel-14 LTE_feMTC-Core

- Ericsson would prefer to refer also to the tables in the field description.
- Ericsson think we might need to describe the behvour of the UE, depending on how clearly RAN4 has described this.
- Action Point: Check with the secretary whether Category should be F or something else like C.

⇒ **Revised in R2-1705921 (rev 2), update acc to comment**

R2-1705921 Measurent gap sharing for FeMTC intra- and inter-frequency measurement Huawei, HiSilicon CR 36.331 14.2.0 2883 2 F Rel-14 LTE_feMTC-Core

- Ericsson think we may need to change the semantics description. Not sure the references are correct and would like to check those.
- References for CE mode B is missing.

✉ **Email approval, Measurent gap sharing (Huawei), 1 week**

R2-1705024 Correction to FGI 25 Ericsson, NTT DOCOMO INC. CR 36.331 14.2.1 2842 F Rel-14 LTE_feMTC-Core

- LG agrees with this CR, but think that the CR baseline should be 14.2.2. Huawei clarifies that 14.2.1 are equivalent with 14.2.2, and the secretary has verified this.

⇒ **Agreed**

R2-1705476 Correction on the description of ce-srsEnhancement for FeMTC Huawei, HiSilicon CR 36.306 14.2.0 1475 F Rel-14 LTE_feMTC-Core

⇒ **Agreed**

R2-1705477 Correction on the description of ce-srsEnhancement for FeMTC Huawei, HiSilicon CR 36.331 14.2.0 2882 F Rel-14 LTE_feMTC-Core

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- Should update the CR to be based on RRC version 14.2.2
- QC think that the acronym srs is used in a way that violates our rules (not fixed)

⇒ **Revised in R2-1706037 (rev 1), Agreed unseen**

R2-1706037 Correction on the description of ce-srsEnhancement for FeMTC Huawei, HiSilicon CR 36.331 14.2.0 2882 1 F Rel-14 LTE_feMTC-Core

⇒ **agreed**

R2-1705480 Minor correction in TS 36.331 for feMTC Huawei, HiSilicon CR 36.331 14.2.0 2884 F Rel-14 LTE_feMTC-Core

- Should update the CR to be based on RRC version 14.2.2

⇒ **Revised in R2-1705922 (rev 1), Agreed unseen**

R2-1705922 Minor correction in TS 36.331 for feMTC Huawei, HiSilicon CR 36.331 14.2.0 2884 F Rel-14 LTE_feMTC-Core

⇒ **agreed**

R2-1705481 Discussion on reconfiguration between CE mode and normal mode in eMTC Huawei, HiSilicon discussion Rel-14 LTE_feMTC-Core

Observation1: the radio resource configuration required by the UE is only provided in SystemInformationBlockType2 and MobilityControlInfo.

Observation2: during the switch between normal mode and CE mode without handover, the UE cannot acquire radio resource configuration via RRCConnectionReconfiguration or SystemInformationBlockType2.

Based on the discussion and observations above, we propose

Proposal: Include SystemInforationBlockType2 into RRCConnectionReconfiguration for switch between normal mode and CE mode without handover.

DISCUSSION

- LG agrees with the intention. Wonder if there is a size problem for the reconfiguration message. Huawei think this is a dedicated message so size shold not be a problem.

⇒ **Include BR version of SystemInforationBlockType2 into RRCConnectionReconfiguration for switch between normal mode and CE mode without handover.**

R2-1705482 Corrections on reconfiguration between CE mode and normal mode in eMTC Huawei, HiSilicon CR 36.331 14.2.0 2885 F Rel-14 LTE_feMTC-Core

- Should update the CR to be based on RRC version 14.2.2
- Change “This field is used to configure SystemInformationBlockType2 to UEs in CE.” To “This field is used to transfer BR version of SystemInformationBlockType2 to UEs in CE”
- Change the procedure text to say “BR version of SystemInformationBlockType2”

⇒ **Revised in R2-1705923 (rev 1).**

R2-1705923 Corrections on reconfiguration between CE mode and normal mode in eMTC Huawei, HiSilicon CR 36.331 14.2.0 2885 F Rel-14 LTE_feMTC-Core

- Ericsson think “UEs in CE” should be changed to “BL UEs or UEs in CE” (field description)

⇒ **Revised in R2-1706117 (rev 2)**

R2-1706117 Corrections on reconfiguration between CE mode and normal mode in eMTC Huawei, HiSilicon CR 36.331 14.2.0 2885 2 F Rel-14 LTE_feMTC-Core

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⇒ **Agreed unseen**

R2-1705675 Access barring for CE level (FeMTC) LG Electronics discussion

Not treated

36.306

R2-1704990 Miscellaneous corrections to TS 36.306 Intel Corporation CR 36.306 14.2.0 1443 1 F Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

- Ericsson think there is overlap with the Ericsson CR and are fine to merge to handle the overlap.
- General view to split into WI. Revise this CR to be about NB-IoT only.
- QCthink that the hyphen change is a problem that exist in several places. Ericsson think this paricualr change is just to align with 36.33`

⇒ **Move part about feMTC into R2-1705926, and include parts about NB-IoT from that CR.**

⇒ **Revised into R2- 1706112 (rev 2), agreed unseen**

R2-1705017 Corrections to capabilities for feMTC Ericsson CR 36.306 14.2.0 1448 1 F Rel-14 LTE_feMTC-Core

⇒ **Align with above CR to make this only about feMTC, on the cover sheet there is a redundant number "4".**

⇒ **Revised in R2-1705926 (rev 2), agreed unseen**

R2-1705926 Corrections to capabilities for feMTC Ericsson CR 36.306 14.2.0 1448 2 F Rel-14 LTE_feMTC-Core

R2-1705478 Minor correction on TS 36.306 for FeMTC Huawei, HiSilicon CR 36.306 14.2.0 1476 F Rel-14 LTE_feMTC-Core

⇒ **agreed**

36.300

R2-1704994 Corrections to stage 2 description of FeMTC and eNB-IoT Intel Corporation CR 36.300 14.2.0 0999 1 F Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

- QC think that NPRS should be kept. Huawei agrees
- RAI text in 16.3 should be kept.
- 15.1: the formatting has disappeared and is strange and need to be changed. The proposed deletion is ok.
- Include changes from the merged CR in R2-1705011

⇒ **Revised in R2-1705935 (rev 2)**

R2-1705935 Corrections to stage 2 description of FeMTC and eNB-IoT Intel Corporation CR 36.300 14.2.0 0999 1 F Rel-14 LTE_feMTC-Core, NB_IOTenh-Core

- RAI text in 6.1.1 should not be introduced there, no change needed in 6.1.1
- Track-changes in 15.1 are missing for the formatting changes.

⇒ **Revised in R2-1706113 (rev 2), agreed unseen**

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General

R2-1705413 Release Assistance Indication for CAT-M Gemalto N.V. discussion

- Gemalto point out that there is a signalling efficiency difference, and point out that we should have the same mechanism as eNB and UEs for LTE and NB-ioT are partly based on similar platforms.
- Intel would be support to have this for MTC. Sierra Wireless Sequans and QC agrees, LG agrees but don't want a prohibit timer .. Sierra wireless think that if we can do it without prohibit timer for NB-IoT we can also do it for MTC.
- Ericsson think we then need a prohibit timer. Nokia think this need a work item, and that prohibit timer might be needed.
- Intel don't think a prohibit timer is needed but could accept it for MTC/LTE.
- Nokia think that prohibit timer may be needed also for NB-IoT, unless the near future is further specified.
- Ericsson point out that the prohibit timer need to be able to run in Idle. QC has concerns about this. Ericsson point out that UE only would be prohibited from reporting BSR=0.
- Sierra Wireless think the prohibit timer is ok, to prevent bad application behaviour.

⇒ **Chair: There seems to be sufficient interest to go forward, but it is not clear the complexity of the prohibit timer. Can not agree now.**

⇒ **Could be a candidate for TEI14 or Rel-15**

⇒ **Noted**

8.13 WI: LTE-based V2X Services

(LTE_V2X-Core, leading WG: RAN1; REL-14; started: June 16; closed: Mar. 17; WID: RP-162519)

This agenda item is for correction CRs to the closed WI

Documents in this agenda item will be handled in the LTE Break Out session

R2-1704215 Response LS to on V2x Sidelink Cross-Carrier Configuration (S2-172305; contact: Ericsson)
SA2 LS in Rel-14 V2XARC, LTE_V2X-Core RAN2, CT1

=> Noted

8.13.0 In principle agreed CRs

R2-1704324 Corrections for CBR measurements procedures Nokia, Alcatel-Lucent Shanghai Bell, Ericsson, ZTE CR 36.331 14.2.1 2770 3 F Rel-14 LTE_V2X-Core

=> The CR is agreed and merged in R2-1705844

R2-1704626 CR on V2X miscellaneous RRC corrections ZTE, Qualcomm Incorporated, Nokia, Alcatel-Lucent Shanghai Bell CR 36.331 14.2.2 2820 F Rel-14 LTE_V2X-Core

=> The CR is agreed

R2-1705563 Introducing a new SL master information block for V2X sidelink communication Huawei, HiSilicon CR 36.331 14.2.2 2715 2 B Rel-14 LTE_V2X-Core
=> The CR is agreed

R2-1705632 Correction to Sidelink UE information for P2X related V2X sidelink communication LG Electronics CR 36.331 14.2.2 2915 F Rel-14 LTE_V2X-Core

=> The CR is agreed and merged in R2-1705844

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R2-1705983

=> The CR is agreed

8.13.1 Stage 2

Including output from email discussion [97bis#17][LTE/V2X] – V2X UE capabilities – LG

R2-1704037 Miscellaneous correction to V2X in TS 36.300 Huawei, HiSilicon CR 36.300 14.2.0 1018 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1704038 Correction to V2X descriptions in TS 36.302 Huawei, HiSilicon CR 36.302 14.2.0 0110 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1704450 Correction of CBR Measurement of V2X pool Qualcomm Incorporated CR 36.300 14.2.0 1019 F Rel-14 LTE_V2X-Core

- Nokia thinks that the SA and data pools should be aligned with the usual terminology we use in other specs. Also the adjacent and non-adjacent terminology needs to be clarified.

=> The CR is postponed

R2-1704565 Correction for V2X in TS 36.300 CATT CR 36.300 14.2.0 1020 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1704603 CR for the V2X sidelink communication in 36.300 ZTE Corporation CR 36.300 14.2.0 1021 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1705359 Various V2X Stage 2 corrections Nokia, Alcatel-Lucent Shanghai Bell CR 36.300 14.2.0 1005 1 F Rel-14 LTE_V2X-Core

=> Withdrawn

R2-1705364 Various V2X Stage 2 corrections Nokia, Alcatel-Lucent Shanghai Bell CR 36.300 14.2.0 1005 2 F Rel-14 LTE_V2X-Core

=> Withdrawn

R2-1705398 Various V2X Stage 2 corrections Nokia, Alcatel-Lucent Shanghai Bell CR 36.300 14.2.0 1005 3 F Rel-14 LTE_V2X-Core

=> Not treated

8.13.2 User plane

R2-1704039 Correction to UL and V2X SL prioritization Huawei, HiSilicon CR 36.321 14.2.1 1087 F Rel-14 LTE_V2X-Core

Petitioners' Exhibit 1008, p. 342
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- Ericsson thinks that this CR would add ambiguity as it assumes that UEs can't do both discover and V2X.
- Huawei wonders if we would like to discuss priority between discovery and V2X
- Nokia thinks that we can't exclude the case
- Huawei thinks that if they are configured simultaneously they will likely be configured in different frequencies.

=> It is possible for the UE to do both legacy discovery and V2X. Prioritization rules are FFS.

=> The CR is postponed

R2-1705531 Corrections to UL/SL Prioritization Ericsson CR 36.321 14.2.1 1121 F Rel-14 LTE_V2X-Core

=> The CR is postponed

R2-1704040 Miscellaneous corrections to V2X in TS 36.321 Huawei, HiSilicon CR 36.321 14.2.1 1088 F Rel-14 LTE_V2X-Core

=> Change the sentences to "according to the amount of selected frequency resources".

=> The changes discussed in 5640 as per chairman minutes will be merged into this CR

=> The CR is updated in R2-1705857

R2-1705857 Miscellaneous corrections to V2X in TS 36.321 Huawei, HiSilicon CR Rel-14 36.321 14.2.1 LTE_V2X-Core 1 F

[CBF]

R2-1704041 Correction on congestion control for V2X sidelink communication in TS 36.321 Huawei, HiSilicon CR 36.321 14.2.1 1089 F Rel-14 LTE_V2X-Core

=> The CR is postponed

R2-1704048 Correction on congestion control in TS 36.321 Guangdong OPPO Mobile Telecom. CR 36.321 14.2.1 1091 F Rel-14 LTE_V2X-Core

=> Fix editorial "resutls"

=> The CR is agreed and merged in R2-1705857

R2-1704081 Correction on congestion control in TS 36.321 Guangdong OPPO Mobile Telecom. CR 36.321 14.2.1 1092 F Rel-14 LTE_V2X-Core

=> Withdrawn

R2-1704042 Correction to P2X related procedures in TS 36.321 Huawei, HiSilicon CR 36.321 14.2.1 1090 F Rel-14 LTE_V2X-Core

=> Not treated

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R2-1704043 Correction to P2X related procedures in TS 36.331 Huawei, HiSilicon CR 36.331 14.2.2 2802 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1704521 CR for resource selection for P-UE in TS 36.321 Samsung Electronics Co., Ltd CR 36.321 14.2.1 1099 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1704522 CR for resource selection for P-UE in TS 36.331 Samsung Electronics Co., Ltd CR 36.331 14.2.2 2817 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1704564 Correction on V2X in TS 36.321 CATT CR 36.321 14.2.1 1100 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1704620 CR for the V2X sidelink communication in 36.321 ZTE Corporation CR 36.321 14.2.1 1101 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1704627 Out of Sequence Reception of V2V Data ZTE Corporation discussion Rel-14 LTE_V2X-Core

- Ericsson is wondering what the use case is for the problem to occur as V2X traffic is periodic

=> Noted

R2-1704628 CR on Out of Sequence Reception of V2V Data ZTE Corporation CR 36.321 14.2.1 1102 F Rel-14 LTE_V2X-Core

=> The CR is postponed

R2-1705528 Corrections to Multiple SPS Collisions Handling Ericsson CR 36.321 14.2.1 1118 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1705529 Corrections to SL SPS Grant Reception Ericsson CR 36.321 14.2.1 1119 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1705530 Corrections to SPS confirmation Ericsson CR 36.321 14.2.1 1120 F Rel-14 LTE_V2X-Core

=> Not treated

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R2-1705539 Handling Collisions Between Multiple SPS Configurations Ericsson discussion Rel-14 LTE_V2X-Core

- Huawei thinks that the network can avoid such configuration where collision occur. Ericsson think that it cannot always be avoided
- Nokia thinks that this problem can be more severe for TDD, and periodicity can be multiple of each other and therefore may overlap. Something may need to be done but we need to think more.
- LG thinks that the issue should be handled and the UE should just select one but don't want to specify the details. Ericsson thinks that the UE has to select one so there is no problem and knowing which one the UE will select helps the network.
- ZTE shares Huawei's opinion. ZTE thinks that the network can just provide a dynamic grant for the UE to transmit all the data. Ericsson thinks that we want to avoid a dynamic grant.
- CATT thinks that we can leave it up to UE implementation. Intel shares the view.
- Intel thinks that for TDD the eNB can observe that there are many overlapping resources and change
- Nokia thinks that it would be more optimal if the eNB is aware of the resource the UE is using. Ericsson is ok to do something simple.

=> Noted

R2-1705541 SPS confirmation for V2X Ericsson discussion Rel-14 LTE_V2X-Core

On SL SPS

- Huawei and ZTE think that for SL SPS we agreed that the eNB implementation can handle it and we don't need to introduce anything.

On UL SPS

- Nokia thinks that this is not critical and the eNB can determine based on UE transmission. Ericsson clarifies that the there is cases where the UE has no UL transmission so the eNB is not aware, and is related to latency reduction WI and UL skipping.
- Intel thinks that the eNB can send multiple orders. Ericsson thinks that the eNB wouldn't know which one was confirmed.
- Ericsson would like to note that if we don't anything we will have a latency issue related to activating/deactivating resources.

=> Noted

R2-1705633 Correction to CBR based TX parameters LG Electronics discussion Rel-14 LTE_V2X-Core

=> We will fix the problem in the MAC and no changes are needed in ASN.1. FFS on the best way to capture this in the MAC

- Ericsson is concerned that we have a problem with speed related and cBR related values. LG and Huawei think that the network can handle this with configuration.

=> Noted

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R2-1705634 Correction to CBR based TX parameters LG Electronics CR 36.321 14.2.1 1127 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1705635 Correction to CBR based TX parameters LG Electronics CR 36.331 14.2.2 2916 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1705636 Correction to SPS resource collision LG Electronics CR 36.321 14.2.1 1128 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1705637 Corrections to random selection for P2X related V2X sidelink communication LG Electronics CR 36.321 14.2.1 1129 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1705638 Corrections to random selection for P2X related V2X sidelink communication LG Electronics CR 36.331 14.2.2 2917 F Rel-14 LTE_V2X-Core

=> Not treated

8.13.3 Control plane

R2-1705412 Summary of 97bis#17 V2X UE capabilities LG Electronics France discussion LTE_V2X-Core

Further discuss whether to have one list which includes Tx/Rx configuration together (option 2-1) or to have separate list for Tx and Rx configuration (option 2).

- Qualcomm thinks that 2-1 is better as it is similar to legacy. Oppo, Samsung and Intel agree and don't see why we have to apply something different.
- Huawei, Nokia, LG and Ericsson think that option 2 is better and doesn't see why rx and tx cannot be independent to each other.
- Huawei explains that for D2D we had separate. Qualcomm thinks that D2D was very inflexible but it is not a big issue as there was a single carrier but for V2X we should be more flexible. Ericsson is concerned with the overhead as there is a risk that the capabilities may have to be repeated a few times.
- CATT thinks that we should ask RAN1 and RAN4. LG thinks that we can discuss and determine and we tell them.

=> Option 2-1 will be implemented in the specification

=> It is not necessary to introduce a bit to indicate whether the UE supports simultaneous sidelink TX on all the sidelink band combinations in which the UE supports simultaneous sidelink RX in this release.

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On 2.1.2

- Ericsson would like to ensure that this option is not precluded if we go for option 2.1. LG thinks that is not needed for this release

=> It is not necessary to introduce a bit per Uu band combination to indicate whether the UE supports simultaneous TX (or RX) on Uu and all the sidelink band combinations in this release.

=> Introduce per-UE capability signalling for SLSS transmission and reception

=> Not to introduce capability signalling for “no sensing capability”

=> Not to introduce capability signalling for “receiving sidelink mode 3 and 4”

On UL SPS

- Ericsson thinks that the UL SPS is missing. LG explains that we are waiting for the TEI14 discussion as this capability might be general. Intel thinks that we should agree for V2X.

=> UL SPS capability for V2X will be added

=> Noted

R2-1705400 V2X UE capabilities – ultimate view Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-14 LTE_V2X-Core

- Qualcomm doesn’t think further granularity is needed for reception. Nokia explains that in one band the UE can transmit and measure on that band, but doesn’t have to fully decode.

=> Noted

R2-1705548 Introduction of UE capability for V2X in 36.331 (Option 2) LG Electronics Inc. CR 36.331 14.2.2 2902 B Rel-14 LTE_V2X-Core

=> Not treated

R2-1705549 Introduction of UE capability for V2X in 36.331 (Option 2-1) LG Electronics Inc. CR 36.331 14.2.2 2903 B Rel-14 LTE_V2X-Core

=> The CR is revised in R2-1705855

R2-1705855 Introduction of UE capability for V2X in 36.331 (Option 2-1) LG Electronics Inc. CR Rel-14 36.331 14.2.2 LTE_V2X-Core 1 B

[CBF 214]

R2-1705550 Introduction of UE capability for V2X in 36.306 LG Electronics Inc. CR 36.306 14.2.0 1478 B Rel-14 LTE_V2X-Core

=> The CR is revised in

R2-1705856 Introduction of UE capability for V2X in 36.306 LG Electronics Inc. CR Rel-14 36.306 14.2.0 LTE_V2X-Core 1 B

[CB 214]

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R2-1705551 Correction on synchronization and CBR in 36.300 LG Electronics Inc. CR 36.300 14.2.0 1030 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1704046 Congestion control on exceptional pool Guangdong OPPO Mobile Telecom. discussion LTE_V2X-Core

- LG indicates that we have an agreement that already covers the proposal. Nokia wonders if there is any additional specification.
- LG explains for proposal 2 that if there are measurements available the UE will use measurements otherwise if it doesn't the UE will use the NW signalled values.

=> Noted

R2-1704079 Congestion control on exceptional pool Guangdong OPPO Mobile Telecom. discussion Rel-14

=> Withdrawn

R2-1704080 Congestion control on exceptional pool Guangdong OPPO Mobile Telecom. discussion Rel-14

=> Withdrawn

R2-1704451 Clarification of UE behavior for CBR measurement Qualcomm Incorporated CR 36.331 14.2.2 2815 F Rel-14 LTE_V2X-Core

On issue 1:

- Huawei and Ericsson think that this is obvious and not needed. Ericson also thinks that CBR should only be done on tx frequency. Qualcomm is concerned that we can measure pools other than tx pools, like P-UE. Intel agrees with Ericsson. Nokia understand that the P-UE pool should be on the V2X frequency otherwise the network shouldn't configure the UE to measure.
- Intel explains that the measurement should consider the UE's capabilities.

=> First change not needed, the network should take into account UE capabilities.

Issue 2:

a. *Option A: the UE report both cbr-PSSCH and cbr-PSCCH as two separate but identical values in adjacent case. The benefit of this approach is to have the same signaling in both adjacent and non-adjacent case.*
b. *Option B: change the "cbr-PSSCH" IE description to explain this value is for both PSSCH and PSCCH for adjacent case. The problem with this approach is that the IE name and its content are not always matching.*

- Ericsson considers that we can make the control channel IE optional and data channel description should be updated to be able to signal same for control and data. Nokia has the same view.
- Huawei thinks no change is needed, the current IE structure is sufficient. Nokia thinks that at least the field description cbr-PSSCH should be updated. Ericsson thinks that it can be beneficial to clarify.

=> Update the field description

=> The CR is revised in R2-1705845

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R2-1705845 Clarification of UE behavior for CBR measurement Qualcomm Incorporated CR Rel-14 36.331 14.2.2 LTE_V2X-Core 1 F

=> The CBR field description will be captured in R2-1705844

=> The CR is not pursued

R2-1704519 Further considerations on CBR range Samsung Electronics Co., Ltd discussion Rel-14 LTE_V2X-Core

- ZTE, Huawei, Ericsson, think that the networks are very smart so this is not an issue
- Ericsson agrees that the CBR range needs a bit of clarification.
- LG and Intel think that something should be captured in the specification for issue 1
- Huawei thinks that in the past we have clarified using an editors note.

=> The network should not configure non-overlapping thresholds. FFS if there is something to change in ASN.1 or if it is up to network implementation to ensure that non-overlapping thresholds are configured.

=> Noted

R2-1704520 CR for further considerations on CBR range in TS 36.331 Samsung Electronics Co., Ltd CR 36.331 14.2.2 2816 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1705537 Miscellaneous corrections to CBR Ericsson CR 36.331 14.2.2 2899 F Rel-14 LTE_V2X-Core

- LG thinks that we cannot remove SL-CBR as we refer to it in other section.

=> The CR is revised in R2-1705859

R2-1705859 Miscellaneous corrections to CBR Ericsson CR Rel-14 36.331 14.2.2 LTE_V2X-Core 1 F

=> IE SL-CBR-r14 is moved to the upper IE structure

=> The changes are agreeable and merged in R2-1705844

R2-1705495 Corrections on V2x issue related to ASN.1 review a.o. merging of CBR with regular measurement info Samsung Telecommunications CR 36.331 14.2.1 2888 F Rel-14 LTE_V2X-Core

=> *sl-MeasConfig is missing and*

=> *measConfig-SL-CBR and* SL-CBR-MeasConfig-r14 are not aligned

=> cbr-measconfig cannot be removed as it is used for idle mode UEs

=> *Check if there is impact in preconfiguration*

- Ericsson agrees with the intention to move the frame to the normal measurement framework.

=> The CR is revised in R2-1705846

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R2-1705846 Corrections on V2x issue related to ASN.1 review a.o. merging of CBR with regular measurement info Samsung Telecommunications CR Rel-14 36.331 14.2.1 LTE_V2X-Core 1 F

=> add tx-ResourcePoolToRemoveList-r14 and tx-ResourcePoolToAddList-r14 directly to measurement object

=> sl-TxPoolsToMeas will be deleted

=> change from maxFreqV2X-r14 to “maxFreq-r14” in sidelineUEinformation

=> With the changes above the CR is merged in R2-1705844

R2-1704449 Correction of mbsfn-AreaInfoListV2X Qualcomm Incorporated CR 36.331 14.2.2 2814 F Rel-14 LTE_V2X-Core

=> We will add a new field description - *mbsfn-AreaInfoListV2X* - Indicates the information required to acquire the MBMS control information associated with one or more MBSFN areas defined for V2X communication via Uu interface In *SystemInformationBlockType13* field descriptions

=> field description for SC-PTM will be updated in the next meeting

=> The first agreement above and editorials will be merged in R2-1705844

=> Not pursued

R2-1705533 Corrections to MBMS for V2X Ericsson CR 36.331 14.2.2 2895 F Rel-14 LTE_V2X-Core

- Huawei is concerned with removal of this IE as it was introduced for legacy UEs so that the legacy UEs can continue receiving the old IE.
- Huawei and Oppo explain that the parameters are need for MCCH reception

=> The IE will be not be deleted

=> The CR is not pursued

R2-1704557 Discussion on Synchronization Reference Type Configuration CATT discussion

- CATT explain that this IE is only used for dedicated configuration.
- Oppo thinks that this the IE is used for two different purposes that have different definition. The best way is to maybe introduce two IEs.
- Huawei thinks it is not feasible to remove as it is used in pre-configuration so we have to look at this more.
- Qualcomm thinks that the name is wrong and needs to be fixed anyways.

=> Noted

R2-1704560 Correction on synchronization procedure in 36.331 CATT CR 36.331 14.2.1 2818 F Rel-14 LTE_V2X-Core

=> The first two changes on “else if” are removed

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- Huawei thinks that there is no priority within a group

=> The third and fourth changes are removed

=> The last changes are agreeable and will be merged in R2-1705844

R2-1705552 Correction on synchronization reference source for the frequency in 36.331 LG Electronics Inc. CR 36.331 14.2.2 2904 F Rel-14 LTE_V2X-Core

=> The CR is agreed and is merged in R2-1705844

R2-1704562 Delete the value “ue” in the type SL-TypeTxSync-r14 CATT CR 36.331 14.2.2 2819 F Rel-14 LTE_V2X-Core

[CB]

R2-1704558 Discussion on Message Size of SIB21 CATT discussion

- Nokia thinks that this is an important issue and CBR TX is quite heavy. - Qualcomm thinks that common CBR config goes against RAN1 agreement. Maybe one way is to have common CBRs for different pools for the zone.

- Intel thinks that at this point it should be left to eNB to just broadcast less CBR list.
- Ericsson we can consider some optimizations, like for cr-Limit-r14, we can reduce the values and have it in %.
- Oppo thinks that we should address this issue.
- Nokia wonders if changing cr-Limit-r14 to enumerated would reduce granularity. Ericsson thinks we should just change it to 100 since it is a percentage.
- Qualcomm suggests that we should configure a list and then refernce the list via index wherever necessary.
- Ericsson indicates that another optimization is to configure priorityList-r14 with a range instead of a list.
- Ericsson thinks that the solution to this problem is to have it per UE.
- Nokia thinks that the Qualcomm way is a good way to proceed

=> We will configure an independent list SL-CBR-PSSCH-TxConfigList and reference with an index for each pool.

=> Noted

[Check with RAN1 collegues]

Number of sub-channels to replace with number of RBs

cr-Limit-r14 – change from 10000 to 100

R2-1704559 discussion on support multiple UL SPS for non-V2X service CATT discussion

=> Not treated

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R2-1705534 Corrections to Multiple SPS Configurations Ericsson CR 36.331 14.2.2 2896 F Rel-14 LTE_V2X-Core

=> The changes are agreed and are merged in R2-1705844

R2-1705536 Corrections to SPS confirmation Ericsson CR 36.331 14.2.2 2898 F Rel-14 LTE_V2X-Core

=> The CR is not pursued

R2-1704600 Parameter configuration for UEs in exceptional cases ZTE Corporation discussion Rel-14 LTE_V2X-Core

- Huawei supports
- LG thinks that the signalling already covers this case, if the UE doesn't have CBR measurements then V2X UEs can use the values.

=> CBR value can be used by V2X UEs that do not have CBR measurements available, similar to P-UEs

=> Noted

R2-1704629 CR on multiple issues in V2X ZTE Corporation CR 36.331 14.2.2 2821 F Rel-14 LTE_V2X-Core

- Ericsson wonders why *subframeAssignmentSL* and *reserved* are not put in *v2x-InterFreqInfoList*. Oppo explains that it is related to the interference scenario.

=> The first change is agreeable and will be merged in R2-1705844

R2-1704630 CR on MasterInformationBlock-SL-V2X ZTE Corporation CR 36.331 14.2.2 2822 F Rel-14 LTE_V2X-Core

=> The CR is agreed and merged R2-1705844

R2-1704710 Corrections on cell reselection in TS 36.304 Huawei, HiSilicon CR 36.304 14.2.0 0362 1 F Rel-14 LTE_V2X-Core

=> Not treated

R2-1704711 Discussion on cell reselection problem for V2X sidelink communication Huawei, HiSilicon discussion Rel-14 LTE_V2X-Core

=> No support for the change

=> Noted

R2-1704712 Correction on zone-based resource selection for P2X in 36.331 Huawei, HiSilicon CR 36.331 14.2.2 2824 F Rel-14 LTE_V2X-Core

=> Fix editorial "inlcuded" and "communications"

=> the last changes in the last two paragraphs are removed

=> The CR is agreeable and will be merged in merged R2-1705844

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R2-1705361 V2X UE capabilities – ultimate view Nokia, Alcatel-Lucent Shanghai Bell discussion
Rel-14 LTE_V2X-Core

=> Withdrawn

R2-1705366 V2X UE capabilities – ultimate view Nokia, Alcatel-Lucent Shanghai Bell discussion
Rel-14 LTE_V2X-Core

=> Withdrawn

R2-1705532 Corrections to DFN Offset Handling Ericsson CR 36.331 14.2.2 2894 F
Rel-14 LTE_V2X-Core

- ZTE is concerned that the changes do not reflect the original intention of the formula and think that it should be "- DFNoffset"

=> Confirm that the formula is updated from *+offsetDFN* to *-offsetDFN*

=> The CR will be merged in R2-1705844

R2-1705535 Corrections to Speed-Dependent Configuration Ericsson CR 36.331 14.2.2 2897
F Rel-14 LTE_V2X-Core

- Huawei and Oppo explain that there is a single threshold per TxSynchType
- Ericsson thinks that the current ASN.1 is in the list and we should take it out of the list at least. Nokia agrees.

=> Only clarification that only one SL-PSSCH-TxConfig-r14 is provided per TxSynchType

=> The rest of the changes are not need

=> The changes will be done directly in R2-1705844

=> The CR is not pursued

R2-1705538 Miscellaneous corrections to V2X Ericsson CR 36.331 14.2.2 2900 F Rel-14 LTE_V2X-Core

=> Update the field description to put "shall be ignored before for transmission pool "*v2x-ResourceSelectionConfig* "shall be ignored" for transmission on this pool in both instances

=> LG will add "List" in other instances of IEs

=> The CR is agreed and merged in R2-1705844

R2-1705540 On TX normal pool for CBR report Ericsson discussion Rel-14 LTE_V2X-Core

=> Not treated

R2-1705553 Correction on V2X behavior in 36.331 LG Electronics Inc. CR 36.331 14.2.2 2905
F Rel-14 LTE_V2X-Core

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- CATT thinks that the condition in 5.2.2.4 is not correct as the concerned frequency is not frequency in which V2X communication takes place. LG explains that it covers both cases. Huawei agrees.
- Huawei wonders what case we are trying to exclude. LG explains that it is excluding the frequency of the SL V2X communication.

=> [CB] if the condition in 5.2.2.4 is needed

=> This CR will include other CRs with have ASN.1 impacts

=> The CR is revised in R2-1705844

R2-1705844 Correction on V2X behavior in 36.331 LG Electronics Inc. CR 36.331 14.2.2 2905 1 F Rel-14 LTE_V2X-Core

=> Moved to email discussion

✉ **[LTE V2X] – CR to 36.331 – LG**
- Agree to final CR capturing all agreed CRs and changes in R2-1705844
- one week after the meeting

R2-1705854 CR on reduction of SIB21 size Qualcomm IncorporatedCR Rel-14 36.331 14.2.2 LTE_V2X-Core F

[CB]

8.14 WI: SRS switching between LTE component carriers

(LTE_SRS_switch; leading WG: RAN1; REL-14; started: Mar.16: closed: Dec. 16; WID: RP-160935)

This agenda item is for correction CRs to the closed WI

Documents in this agenda item will be handled in the LTE Break Out session

R2-1705403 Correction of SRS switching in 36.331 Huawei, HiSilicon CR 36.331 14.2.2 2869 F Rel-14 LTE_SRS_switch-Core

=> Revised in R2-1705814

R2-1705814 Correction of SRS switching in 36.331 Huawei, HiSilicon CR 36.331 14.2.2 2869 1 F Rel-14 LTE_SRS_switch-Core

- Samsung wonders if the intention to changing *typeA-SRS-TPC-PDCCH-Group-r14* from configured to present. Qualcomm thinks that we should understand the intention before agreeing. Samsung indicates that if the intention was to keep configured then it has to be done in a different way, by changing field description rather than having it as condition.

[CBF 206]

R2-1705497 Merging of retuningTimeBandPairList with regular supported BC capabilites (ASN.1 review issue S.059) Samsung Telecommunications CR 36.331 14.2.1 2890 F Rel-14 LTE_SRS_switch, TEI14

- Qualcomm wonders if the changes are also impacting functionality

=> The CR is revised in R2-1705847

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R2-1705847 Merging of retuningTimeBandPairList with regular supported BC capabilites (ASN.1 review issue S.059) Samsung Telecommunications CR Rel-14 36.331 14.2.1 LTE_SRS_switch, TEI14 1 F

[CBF 207]

8.15 WI: Measurement Gap Enhancement for LTE

(LTE_meas_gap_enh-Core; leading WG: RAN4; REL-14; started: Mar. 16; target: Jun. 17; WID: RP-160912)

This agenda item is for correction CRs to the WI that is completed from RAN2 point of view.

R2-1704022 LS on measurement gap enhancement (R4-1704277; contact: Intel) RAN4 LS in Rel-14 LTE_meas_gap_enh-Core

- Intel explain we will need to be able to configure NCSG for non-CA case and the new Nfreqeffective introduced.

=> CR to add the Nfreqeffective in R2-1705972 CR 2946 (offline discussion 13)

=> LS noted

R2-1705972 [CR on measurement gap enhancement] Intel CR 36.331 14.2.2 2946 A Rel-14 LTE_meas_gap_enh-Core

=> Merged into R2-1706137

8.15.0 In principle agreed CRs

R2-1704971 CR for introduction of non-uniform gap in measurement gap enhancement Intel Corporation CR 36.306 14.2.0 1445 1 F Rel-14 LTE_meas_gap_enh

=> Agreed

Revised

R2-1705488 Corrections to per-CC measurement gap configuration Ericsson, Intel CR 36.331 14.2.2 2759 2 F Rel-14 LTE_meas_gap_enh

revised to R2-1705501

Withdrawn

R2-1704758 CR for introduction of non-uniform gap in measurement gap enhancement Intel Corporation CR 36.306 14.2.0 1459 F Rel-14 LTE_meas_gap_enh

8.15.1 Other

Non CA case

R2-1704285 NCSG applicability for non-CA case Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-14 LTE_meas_gap_enh-Core

- Nokia is not clear if this is the case that RAN4 was requesting us to add in their LS.
- Nokia think that no CR would be needed to enable this.

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- Intel wonders how the network will know what the UE supports if it doesn't report NCSG for the non CA case. Nokia think that the existing NCSG support bit plus the band combinations is sufficient to tell the network about support for NCSG in the non CA cases.

=> Noted

R2-1705498 NCSG when UE has spare RF chain Ericsson discussion
Rel-14 LTE_meas_gap_enh-Core

- Intel explain that their CR takes the approach of option A in this paper.
- For option B, Intel wonders why a UE that support per CC gaps it would not be able to indicate the NSCG for the non CA case. Ericsson think RAN4 explicitly request us to support this case of a UE that supports NCSG for non CA case but not per CC gaps.

=> Offline discussion to conclude (Nokia, offline discussion 14)

- Update from offline: Discussion is still ongoing. Network vendors preferred to support the non CA case without the UE preference mechanism.

=> Postponed

R2-1704989 CR for introduction of enhanced measurement gap Intel Corporation CR 36.331
14.2.2 2727 1 F Rel-14 LTE_meas_gap_enh

- Not treated

Other

R2-1705500 Consistent gap pattern configuration for serving cells Ericsson CR 36.331
14.2.2 2891 F Rel-14 LTE_meas_gap_enh

=> Agreed

R2-1705501 Corrections to per-CC measurement gap configuration Ericsson CR 36.331
14.2.2 2759 3 F Rel-14 LTE_meas_gap_enh

- Intel ask why separating between uniform gap and non-uniform. Ericsson thinks it doesn't work between the text when we add uniform patterns.
- Intel explains there is some overlap with the Intel CR but with different ASN.1 issue numbers.

=> Double check whether the Note is required

=> Merge any changes agreed from R2-1705718 into this CR

=> Revised in R2-1705973 (offline discussion 15)

R2-1705973 Corrections to per-CC measurement gap configuration Intel, Ericsson CR 36.331
14.2.2 2759 4 F Rel-14 LTE_meas_gap_enh

=> ASN.1 issue 902 to be added to the cover sheet

=> Content from the CR related to offline discussion 13 will be merged into this CR.

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=> Revised in R2-1706102

R2-1706102 Corrections to per-CC measurement gap configuration Intel, Ericsson CR 36.331 14.2.2 2759 4 F Rel-14 LTE_meas_gap_enh

=> Revised to R2-1706137

R2-1706137 [CR on measurement gap enhancement] Intel CR 36.331 14.2.2 2946 A Rel-14 LTE_meas_gap_enh-Core

=> Agreed

R2-1705718 Corrections to per-CC measurement gap configuration Intel Corporation CR 36.331 14.2.2 2925 F Rel-14 LTE_meas_gap_enh

=> Merged into revision of R2-1705501

R2-1705611 Support NCSG in more scenarios Qualcomm CR 36.331 14.2.2 2914 C Rel-14 LTE_meas_gap_enh

- Qualcomm explain the motivation to add the resume case if that we now have NCSG for non-CA case.
- Intel thinks whether we need this depends on which solution we pick for the NCSG in non CA case.

=> Can be further discussed as part of offline discussion 14.

R2-1705693 Release per CC measuremetn gap HTC CR 36.331 14.2.2 2922 F Rel-14 LTE_meas_gap_enh-Core

- Nokia wonder why it is needed for this case but not for normal measurement gaps.
- HTC thinks it needs to be clear whether the UE keeps the configuration or not. Tried to follow the autonomous removal of measurement ID.
- Qualcomm think the eNB must explicitly remove the SCells and this gives the UE the chance to provide a new gap preference to the eNB. When one SCell is removed then the UE might want to give another preference.
- Intel think Qualcomm is correct that the UE might have a different preference but the existing configuration can still be valid.

=> Offline discussion to conclude (Offline discussion 16)

- Update from offline: One company still had a preference to keep the per CC configuration.
- Nokia thinks there is nothing broken if we do nothing. Intel feel it is cleaner if the measurement configuration is released when the SCell is not there.

=> Postponed to next meeting

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8.16 Void

8.17 WI: Performance enhancements for high speed scenario in LTE

(LTE_high_speed-Core; leading WG: RAN4; REL-14; started: Dec. 15. 16; closed: Dec. 16; WID: RP-160172)

This agenda item is for correction CRs to the closed WI

Documents in this agenda item will be handled in the LTE Break Out session

8.17.0 In principle agreed CRs

8.17.1 Other

R2-1705401 Introduction of High Speed Features in 36.306 Huawei, HiSilicon CR 36.306 14.2.0 1454 1 B Rel-14 LTE_high_speed-Core

=> The CR is revised in R2-1705850

R2-1705850 Introduction of High Speed Features in 36.306 Huawei, HiSilicon CR Rel-14 36.306 14.2.0 LTE_high_speed-Core 2 B

[CBF 209]

R2-1705402 Correction of high speed in 36.331 Huawei, HiSilicon CR 36.331 14.2.2 2868 F Rel-14 LTE_high_speed-Core

=> The CR is revised in R2-1705851

R2-1705851 Correction of high speed in 36.331 Huawei, HiSilicon CR Rel-14 36.331 14.2.2 LTE_high_speed-Core 1 F

[CBF 210]

R2-1705779 Consideration on early implementation on the feature of performance enhancements for high speed scenarios CMCC discussion Rel-14 LTE_high_speed-Core

- Nokia wonders if there is a need for a capability. CMCC thinks that is not needed. Nokia is concerned that this is the first time we have dedicated signalling without capability. Qualcomm indicates that for rel-14 we agreed that it is not needed.
- Nokia thinks that the commonconfigSCell is only configured with dedicated signalling so there may be a problem.
- Samsung thinks that the commonconfigSCell has only common information and doesn't take into account UE capabilities. Nokia indicates that this IE configs things such as UL that depend on UE capability.
- Huawei asks if we should have a single capability bit. Qualcomm thinks that there are two independent features, maybe we should have two capability bits.

=> From RAN2 perspective, the feature of performance enhancement for high speed scenario can be supported by Rel-13 UEs without specification change

=> Three high-speed capability bits will be added, one for measurement, one for demodulation, and one for PRACH for Rel-14. [Pending confirmation that how common config SCell takes into account UE dedicated capalities - CB]

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=> Noted

R2-1705848 Reply LS on supporting Rel-14 feature of performance enhancement for high speed scenarios from Rel-13 UEs CMCC

=> The LS is revised in R2-1705849

R2-1705849 Reply LS on supporting Rel-14 feature of performance enhancement for high speed scenarios from Rel-13 UEs Huawei

=> The LS is approved in R2-1705861

8.18 WI: Voice and Video enhancement for LTE

(LTE_VoLTE_ViLTE_enh; leading WG: RAN2; REL-14; started: Sep. 16; closed: Mar. 17: WID: RP-161856)

This agenda item is for correction CRs to the closed WI.

Documents in this agenda item will be handled in the LTE Break Out session

R2-1704018 Reply LS on Reply LS to RAN3 on support of redirection for VoLTE (R3-171408; contact: Ericsson) RAN3 LS in Rel-14 LTE_VoLTE_ViLTE_enh-Core SA2 RAN2

=> Noted

R2-1704111 Reply LS on RAN-Assisted Codec Adaptation (S4-170430; contact: Intel) SA4 LS in Rel-14 LTE_VoLTE_ViLTE_enh-Core RAN2, CT3 RAN3, SA2, RAN

=> Noted

R2-1705799 Correction of issues N.050, S.011, M.016, N.045 and E.135 for eVoLTE CMCC CR 36.331 14.2.2 2937 F Rel-14 LTE_VoLTE_ViLTE_enh-Core

=> Not pursued

R2-1705323 Delay budget reporting corrections Nokia, Alcatel-Lucent Shanghai Bell CR 36.331 14.2.2 2859 F Rel-14 LTE_VoLTE_ViLTE_enh-Core

=> Not treated

R2-1705322 Delay budget reporting corrections Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-14 LTE_VoLTE_ViLTE_enh-Core

=> Noted

R2-1705496 Changes to delay budget reporting related to ASN.1 review Samsung Telecommunications CR 36.331 14.2.1 2889 F Rel-14 LTE_VoLTE_ViLTE_enh, TEI14

- CMCC is fine with each way.
- Intel and Qualcomm prefer to use separate IE.

CBF: => Revised in R2-1706022.[1006]
=> Merge the changes except budget reporting part of R2-1705799.

=> Move ASN.1 commence to field descriptions of type 1 and type 2.

R2-1705798 Modification of function for eVoLTE for addressing issue S.004 for eVoLTE CMCC CR 36.331 14.2.2 2936 C Rel-14 LTE_VoLTE_ViLTE_enh-Core

=> Not pursued

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8.18.0 In principle agreed CRs

R2-1705405 FDD TDD difference for VoLTE capability Huawei, HiSilicon CR 36.331 14.2.2 2797 1 F Rel-14 LTE_VoLTE_ViLTE_enh-Core

=> Agreed

8.18.1 Other

R2-1705717 Corrections to stage 2 description for voice and video enhancements for LTE Intel Corporation CR 36.300 14.2.0 1000 1 F Rel-14 LTE_VoLTE_ViLTE_enh-Core

=> Agreed

8.19 New UE category with single receiver based on Category 1 for LTE

LTE_UE_cat_1Rx-Core; leading WG: RAN4; REL-14; started: Sep. 16; target: Jun. 17: WID: RP-162570

This agenda item is for correction CRs to the WI that is completed from RAN2 point of view.

Documents in this agenda item will be handled in the LTE Break Out session

8.20 Uplink Capacity Enhancements for LTE

LTE_UL_CAP_enh-Core; leading WG: RAN1; REL-14; started: Mar. 16; closed: Mar. 17: WID: RP-162488

This agenda item is for correction CRs to the closed WI.

Documents in this agenda item will be handled in the LTE Break Out session

8.20.0 In principle agreed CRs

R2-1704950 Correction on the data modulation of Uplink Shared Channel NTT DOCOMO INC. CR 36.302 14.2.0 0107 1 F Rel-14 LTE_UL_CAP_enh-Core

=> The CR is agreed

8.20.1 Other

R2-1705321 UL 256QAM capability clarification Nokia, Alcatel-Lucent Shanghai Bell CR 36.306 14.2.0 1465 F Rel-14 LTE_UL_CAP_enh-Core

=> Check if category should be C? [CB]

=> The CR is agreed

8.21 WI: Enhancements on Full-Dimension (FD) MIMO for LTE

(LTE_eFD_MIMO-Core; leading WG: RAN1; REL-14; started: Mar. 2016; closed: Mar. 17: WID: RP-160623)

This agenda item is for correction CRs to the closed WI.

Documents in this agenda item will be handled in the LTE Break Out session

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R2-1704011 LS reply on TM10 / FD-MIMO UE capability signalling (R1-1706856; contact: Intel) RAN1 LS in Rel-14 LTE_EBF_FDMIMO-Core RAN2, RAN4

=> Noted

R2-1704336 Remaining issues in Activation/Deactivation of CSI-RS resources MAC CE for eFD-MIMO LG Electronics Inc., Samsung CR 36.321 14.2.1 1094 F Rel-14 LTE_eFDMIMO-Core

=> The CR is revised in R2-1705853

R2-1705853 Remaining issues in Activation/Deactivation of CSI-RS resources MAC CE for eFD-MIMO LG Electronics Inc., Samsung CR Rel-14 36.321 14.2.1 LTE_eFDMIMO-Core 1 F

[CB 212]

R2-1705492 Clarification regarding eFD-MIMO CSI-RS activation bit mapping Samsung Telecommunications CR 36.321 14.2.0 1117 F Rel-14 LTE_eFDMIMO

=>The CR is withdrawn

R2-1705493 Resolution of eFD-MIMO related ASN.1 issues Samsung Telecommunications discussion Rel-14 LTE_eFDMIMO

Proposal 1: Divide the size of the bit strings of the triggers in CSI-RS-ConfigEMIMO-Hybrid by maxCSI-Proc (4) to reflect that the information covers what is provided per CSI process (as required for TM9 and TM10 and in accordance with the current information structure).

- Ericsson thinks that 8 bits is per configuration.
- Ericsson is not sure 32 bits is correct

Proposal 2 *Introduce clarifications regarding the NZP CSI RS configurations that are controlled by the MAC CE for activation/ deactivation i.e. that this concerns the configurations specified by field csi-RS-ConfigNZP-ApList-r14*

- Ericsson thinks that there is an alternative to have a single list that can be either periodic or aperiodic. Samsung thinks that they tried to use existing IEs.
- Ericsson thinks that we should use semi-persistent instead of multi-shot.

=> Introduce clarifications regarding the NZP CSI RS configurations that are controlled by the MAC CE for activation/ deactivation i.e. that this concerns the configurations specified by field csi-RS-ConfigNZP-ApList-r14.

=> Clarify that the network doesn't configure both list for the same process

=> Noted

R2-1705494 Corrections on eFD-MIMO including ASN.1 review related issues Samsung Telecommunications CR 36.331 14.2.1 2887 F Rel-14 LTE_eFDMIMO

=> The CR is revised in R2-1705494

R2-1705852 Corrections on eFD-MIMO including ASN.1 review related issues Samsung Telecommunications CR Rel-14 36.331 14.2.1 LTE_eFDMIMO 1 F

[CB 211]

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8.22 Void

8.23 WI: Downlink Multiuser Superposition Transmission for LTE

(LTE_MUST-Core; leading WG: RAN1; REL-14; started: Mar. 16; closed: Dec. 16: WID: RP-161019)

This agenda item is for correction CRs to the closed WI

Documents in this agenda item will be handled in the LTE Break Out session

8.24 Other LTE Rel-14 WIs

This agenda item may be used for documents relating to Rel-14 WIs with no allocated RAN2 time but which might have minor RAN2 impact.

8.25 LTE TEI14 enhancements

Small Technical Enhancements affecting LTE Rel-14 that do not belong to any Rel-14 WI.

Note: A TEI enhancement proposal should be treated for only one meeting cycle and involve only one WG. Otherwise, a WI should be proposed at RAN plenary!

This agenda item is for items already discussed under TEI14. New proposals should be submitted to TEI15 which is planned to be included on the agenda from RAN2#100.

8.25.0 In principle agreed CRs

Including the technically endorsed CRs from RAN2#97bis

R2-1704436 LPP clean-up Qualcomm Incorporated CR 36.355 14.1.0 0176 2 F Rel-14 TEI14

R2-1704938 UE Capabilitites to enable Uplink-Only RoHC operations Apple, MediaTek Inc. CR 36.306 14.2.0 1463 B Rel-14 TEI14

R2-1704939 Enable Uplink-Only RoHC operations Apple, MediaTek Inc. CR 36.323 14.2.0 0198 B Rel-14 TEI14

R2-1704940 Enable Uplink-Only RoHC operations Apple, MediaTek Inc. CR 36.331 14.2.2 2831 B Rel-14 TEI14

R2-1705491 UE capability retrieval fallback BCs with differences Samsung Telecommunications CR 36.331 14.2.1 2768 2 F Rel-14 LTE_CA_enh_b5C-Core, TEI14

Moved from 8.15.0 to 8.25.0

R2-1705702 Introduction of new Transport Block Size for DL 256QAM Qualcomm Incorporated CR 36.306 14.2.0 1438 2 B Rel-14 TEI14

R2-1705703 Introduction of new Transport Block Size for DL 256QAM Qualcomm Incorporated CR 36.331 14.2.2 2713 2 B Rel-14 TEI14

=> All above CRs are agreed

R2-1704970 Introduction of a new UL UE category for 300Mbps with 64QAM Intel Corporation CR 36.306 14.2.0 1446 1 B Rel-14 TEI14

=> Technically endorsed

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R2-1704992 Introduction of a new UL UE category for 300Mbps with 64QAM Intel Corporation CR
36.331 14.2.2 2728 1 B Rel-14 TEI14

=> New category should be enumerated instead of integer

=> Revised to R2-1705974

R2-1705974 Introduction of a new UL UE category for 300Mbps with 64QAM Intel Corporation CR
36.331 14.2.2 2728 2 B Rel-14 TEI14

=> Technically endorsed

8.25.1 Other

Including output from email discussion [97bis#07][LTE/TEI14] UE overheating problem (Huawei)

Overheating problem

R2-1705512 Report of email discussion [97bis#07][LTE/TEI14] UE overheating problem Huawei discussion

R1

- LG think the exact configuration should be determined by the network.

R3

- Ericsson would not want to exclude that the UE just report it has less data available for transmission. Sony think this is one option, e.g. fake BSR, but others could be considered.
- OPPO think solution 5 is just implementation so what is the spec impact. LG think if solution 5 is pursued it would have to be specified that UE is allowed to do this.
- Vivo think option 5 is not feasible by implementation as it would not pass conformance tests.
- Ericsson think that this could be done by implementation about the modem. Sony agree with this but think it would be good if the eNB was aware.
- Sony think option 5 could be considered for NR if not for LTE.
- Ericsson would prefer to specify a solution based on throttling above PDCP etc but not sure what the spec impact is.
- BlackBerry think we should not have to rely on application to reduce the rate by not sending TCP ACKs.
- Qualcomm think it is not clean to be faking parameters defined for other purposes. Would be better to have explicit indication.
- Intel think it is not good to rely on proprietary solutions. In addition in NR we are discussing temporary restriction in NR. So support a 3GPP solution.
- Ericsson think the UE must implement something as the network may not respond as the network desires.
- Nokia think we are taking about a case where both UE and network supports something and for this we should not look at solutions relying on faking things.

R4

- LG think we need to consider signalling overhead in the solution.

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Agreements

1: To alleviate the UE's overheating problem, a specification based solution for eNB to reconfigure e.g. reduced number of activated component carriers, reduced MIMO layer capability, reduced modulation order of the UE is supported.

2: It is not considered to specify Option 1 (temperature report) as a solution to address UE overheating problem.

3 The solution will be based on option 3. (Report UE temporary category/capability) or option 4 (Assistance information for parameter re-configuration) or some combination. This does not exclude an indication to the eNB that the cause is due to overheating.

=> Offline discussion to progress on the solution (Huawei, offline discussion 17)

R2-1706074 Report of offline discussion #17 on UE overheating problem Huawei, HiSilicon, OPPO, LGE, Coolpad, Xiaomi, Samsung, vivo, SONY, Lenovo, Motorola Mobility, MediaTek, Xinwei, CMCC, CUC, CTC, Spreadtrum discussion

- Ericsson think this approach has not yet been fully thought through.
- TCL don't see the point to provide the overheating bit.
- Nokia thinks the paper presents one option and the CRs are a very extensive solution.

=> Noted

✉ **[98#xx][LTE/TEI14] Overheating problem (Huawei)**

Progress the solution to address the UE overheating problem, building on the agreements from this meeting. If progress is made on the solution then draft CRs can be discussed.

Intended outcome: Email discussion report and potentially agreeable CRs to the next meeting.

Deadline: Thursday 2017-08-03

R2-1706075 Introduction of the overheating indication Huawei, HiSilicon draftCR Rel-14 36.331 14.2.2 TEI14 B

R2-1706076 Introduction of the overheating indication Huawei, HiSilicon draftCR Rel-14 36.300 14.2.0 TEI14 B

R2-1704823 Discussion and proposal to UE Overheat issue Sony discussion Rel-14 TEI14

R2-1705499 Way forward for UE overheating problem Ericsson discussion Rel-14 TEI14

R2-1705386 On the UE overheating problem Xiaomi Communications discussion

Multiple SPS configurations

R2-1705639 Support of multiple UL SPS configurations for non-V2X LG Electronics discussion Rel-14 TEI14

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Proposal 1: Option 3 is agreed, i.e. multiple UL SPS can be configured for any UE supporting multiple SPS (based on UE capability, regardless of V2X authorization) and used for non-V2X traffic as well as V2X traffic.

Proposal 2: If proposal 1 is agreed, we propose to change 'UL SPS V-RNTI' to 'UL SPS RNTI' and send a LS on this change to RAN1.

Proposal 3: RAN2 confirms that the uplink part of the SPS assistance information is supported for uplink SPS transmissions of non-V2X services as well as V2X services in REL-14.

R2-1705542 On Multiple SPS configurations Ericsson discussion
Rel-14 TEI14

R2-1704559 Support of multiple UL SPS for non-V2X service CATT

- Discussion jointly with previous contribution 2 papers.
- Ericsson think CATT and Ericsson position is very close. The difference in CATT is that they would also like to restrict the multiple SPS to only V2X services but Ericsson think this is difficult for the network to ensure. Lenovo have same understanding and think CATT approach would actually require additional effort in MAC spec.
- LG think previous agreement is rules out the CATT approach. LG would be ok with the Ericsson approach.
- Nokia think there is no authorisation from the core for V2X over the Uu. Ericsson think there is no reason for the UE to be authorised for this as this is Uu operation but we can just clarify that only V2X UEs can support this capability. Nokia think this will actually mean all UEs can implement it as there is no definition of V2X UE, and authorisation over S1 might be clearer.
- Intel think that if the UE is not authorised then there is no reason for the UE to set this bit to true.
- Samsung agree with Ericsson view.

=> Clarify in specifications, that multiple SPS configurations can be supported only by UEs capable of V2X communication, regardless of the specific LTE service they are operating.

R2-1705640 Support of multiple SPS configurations for non-V2X service LG Electronics CR
36.321 14.2.1 1130 F Rel-14 TEI14

=> We will not change the name of the RNTI

=> Title and WI code to be changed

=> Can also be considered whether there is an appropriate CR in which it can be merged.

=> Revised in R2-1705977 (offline discussion 19)

R2-1705977 Support of multiple SPS configurations for non-V2X service LG Electronics CR
36.321 14.2.1 1130 1 F Rel-14 TEI14

=> Withdrawn as captured in another V2X MAC CR.

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R2-1705641 Support of multiple SPS configurations for non-V2X service LG Electronics CR
36.331 14.2.2 2918 F Rel-14 TEI14

=> Not pursued

R2-1705543 Support for Multiple SPS Configurations Ericsson CR 36.331 14.2.2 2901
F Rel-14 TEI14

=> Wording of the field description of the capability can be progressed offline

=> Merge with V2X capability CR to 331

=> Corresponding change also to be merged into V2X capability CR to 306

R2-1705544 Support for Multiple SPS Configurations Ericsson CR 36.321 14.2.1 1122
F Rel-14 TEI14

=> Not pursued

R2-1705545 Support for Multiple SPS Configurations Ericsson CR 36.300 14.2.0 1029
F Rel-14 TEI14

=> Offline discussion to improve the text

=> Title and WI code to be checked if still appropriate

=> Revised in R2-1705976 (offline discussion18)

R2-1705976 Support for Multiple SPS Configurations Ericsson CR 36.300 14.2.0 1029 1
F Rel-14 TEI14

=> Agreed

Other

R2-1705409 Miscellaneous general corrections and clarifications resulting from ASN.1 review Ericsson
CR 36.331 14.2.2 2872 F Rel-14 TEI14

moved from 8.26 to 5.1

- Ericsson explain that this contains clashes with other CR and there are still more ASN.1 open issues to be added.

=> Offline discussion to progress (Offline discussion number 20)

=> Revised in R2-1705978

R2-1705978 Miscellaneous general corrections and clarifications resulting from ASN.1 review Ericsson
CR 36.331 14.2.2 2872 1 F Rel-14 TEI14

✉ **[98#xx][LTE/TEI14] ASN.1 review correction (Ericsson)**

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Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

R2-1704751 Enhancements of TM-10 and FD-MIMO UE capability signaling discussion Intel Corporation Rel-14 TEI14

- MediaTek think that RAN4 are still discussing and think there are more capabilities that should also be covered. Intel understand that this RAN4's release 14 FDMIMO capability is also baseband capability and can be added to this framework.
- Qualcomm think the optimisation where the UE can be requested to report certain BC means that UE capability size is no longer an issue. Intel think this was addressed in last email discussion. The BC signalling increased due to the repetition of the same BC for different baseband capabilities. Qualcomm think this case is a rare case. Intel think the issue will be more serious in case of FD MIMO.
- Samsung wonder whether the intent is still to do something for Rel-14.
- Qualcomm would like to address this but have other proposals. Think we can wait for NR discussion to conclude.
- Intel think the issue comes up due to Rel-13 FD-MIMO but we deferred to Rel14 but now some people want to defer again. There will also be more FD MIMO capabilities to be added in R14.
- Ericsson support the separate of baseband and BCs.

=> Offline discussion to try to conclude on the release we want to target for solutions to this problem (not restricted to the solution in this paper) and what level of alignment with NR we would like. (Intel, offline discussion 21)

R2-1705612 Optimization of capability signalling Qualcomm other Rel-14 TEI14

=> Noted

R2-1705589 EUTRAN Sharing enhancement Ericsson, Spidercloud, Qualcomm, Comcast discussion

- Nokia wonder if we need to ask SA2/RAN3 is there are any S1, X2 impacts.
- Ericsson think from their analysis there is no impact
- Vodafone support the enhancement and think we can send LS to SA2.
- Ericsson think it is raised here as it is a SIB indication.

=> Draft LS to SA2/RAN3/RAN to ask if there are any issues and request them to reply before RAN plenary. R2-1705979 (Ericsson, offline discussion 22)

R2-1705979 [DRAFT] [LS on EUTRAN Sharing enhancement] Ericsson CR Rel-14 TEI14 To: SA2; RAN, RAN3

=> Change useful to used

=> Approved in R2-1706003

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R2-1705590 EUTRAN Sharing enhancement Ericsson, Spidercloud, Qualcomm, Comcast CR 36.331 14.2.2 2912 B Rel-14 TEI14

- Samsung think there is a PLMN list per PLMN. Also it doesn't follow normal conventions.
- Huawei ask if this applies to NB-IoT

=> Revised in R2-1705980 (Ericsson, offline discussion 23)

=> Stage 2 CR to be provided in R12-1705981 CR 1035 (Ericsson, offline discussion 23)

R2-1705980 EUTRAN Sharing enhancement Ericsson, Spidercloud, Qualcomm, Comcast CR 36.331 14.2.2 2912 1 B Rel-14 TEI14

R2-1705981 EUTRAN Sharing enhancement Ericsson, Spidercloud, Qualcomm, Comcast CR 36.300 14.2.0 1034 B Rel-14 TEI14

✉ **[98#xx][LTE/TEI14] E-UTRAN sharing (Ericsson)**

Finalise CRs to 36.300 and 36.331

Intended outcome: Technically endorsed CRs

Deadline: Thursday 2017-05-25

R2-1704134 Radio capabilities for eCall Only Mode Qualcomm IncorporatedCR 36.331 14.2.2 2805 F Rel-14 TEI14

=> Withdrawn

R2-1704936 Update of ROHC profile reference Apple CR 36.306 14.2.0 1462 F Rel-14 TEI14

- Nokia ask if the new profiles are backward compatible. Qualcomm has the same concern.
- Apple think there is no backward compatibility issue

=> Offline time to check for any backward compatibility issues (Apple, offline discussion 24)

=> Revised in R2-1706066

R2-1706066 Update of ROHC profile reference Apple CR Rel-14 36.306 14.2.0 TEI14 1462 1 F

=> Agreed

R2-1704937 Update of ROHC profile reference Apple CR 36.323 14.2.0 0197 F Rel-14 TEI14

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=> Offline time to check for any backward compatibility issues (Apple, offline discussion 24)

=> Revised in R2-1706067

R2-1706067 Update of ROHC profile reference Apple CR Rel-14 36.323 14.2.0 TEI14 0197 1 F

=> Agreed

R2-1705694 Clarification on LWIP aggregation HTC CR 36.331 14.2.2 2923 F Rel-14 TEI14

- MediaTek agree these cases should be specified but wonder if the changes are correct. If the configuration changes to false then any outstanding packets should still be processed by upper layers.

=> Revised in R2-1705982 (offline discussion number 24)

R2-1705982 Clarification on LWIP aggregation HTC CR 36.331 14.2.2 2923 1 F Rel-14 TEI14

=> Postponed

R2-1705695 Clarification on LWIP aggregation HTC CR 36.361 14.0.0 0006 F Rel-14 TEI14

=> Agreed

R2-1705744 Support of RLC UM for LWA and Dual Connectivity split bearer Qualcomm CR 36.300 14.2.0 1031 C Rel-14 TEI14

- LG think we need to decide whether we do this or not after seeing the stage 3 CRs and see lots of issues in the PDCP CRs. There are also parameters provided for RLC-AM that would not be provided for RLC-UM.
- Nokia think this was discussed previously and none of the issues identified and addressed. There are a more issues for DC than LWA.

=> Offline discussion to identify all the stage 3 issues to be addressed and to conclude whether we want to go ahead of this. Can be discussed separately for LWA and DC. (Qualcomm, offline discussion 25)

=> Revised in R2-1706087

R2-1706087 Support of RLC UM for LWA and Dual Connectivity split bearer Qualcomm CR Rel-14 36.300 14.2.0 TEI14 1031 1 C

=> Fix typo

=> Add Rel-13 LWA WI code

=> To be discussed in email discussion to next meeting

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R2-1705745 Support of RLC UM for LWA and Dual Connectivity split bearer Qualcomm CR 36.323 14.2.0 0200 C Rel-14 TEI14

=> Revised in R2-1706088

R2-1706088 Support of RLC UM for LWA and Dual Connectivity split bearer Qualcomm CR Rel-14 36.323 14.2.0 TEI14 0200 1 C

✉ **[98#xx][LTE/TEI14] RLC-UM for LWA (Qualcomm)**

Progress all CRs for RLC-UM for LWA

Intended outcome: Agreeable CRs to next meeting

Deadline: Thursday 2017-08-03

R2-1704495 UE Wi-Fi MAC Address in WLAN Measurement Information Comtech Telecommunications Cor discussion Rel-14

moved from 8.7 to 8.25

- AT+T think this was discussed in the past and more info was requested. This addresses that and we support the proposal.
- Nokia thinks the external location server duplicates the functionality of SMLC. If we provide the MAC address to SMLC then 3GPP should specify which positioning method will be used.
- BlackBerry ask if this is to be confined for ongoing emergency call. Comtech confirm this is or ongoing emergency call only to address the privacy concerns.
- Qualcomm think that LPP is not aware that an emergency call is ongoing. Also wonders why the SMLC cannot locate the UE and why it has to outsource the location request. Comtech think the enterprise may have more info to determine the location.
- Intel share concerns about the privacy issue of providing the MAC address to an external entity.
- Qualcomm think there is an issue of missing interface in the network. LPP change would be the final step. Comtech clarify the external interface would be defined in ATIS. Qualcomm think we can add it when ATIS have done their part.
- AT+T confirm that ATIS is working on this.

=> Wait for input from other groups (SA2/ATIS) that this information is required. Once this is confirmed it should be straight forward for us to add it to LPP

R2-1704497 Adding UE Wi-Fi MAC Address to WLAN Measurement Information Comtech Telecommunications Cor CR 36.355 14.1.0 0179 C Rel-14 TEI14

moved from 8.7 to 8.25

Withdrawn

R2-1704135 Introduction of new Transport Block Size for DL 256QAM Qualcomm Incorporated CR 36.331 14.2.2 2729 2 B Rel-14 TEI14

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R2-1704136 Introduction of new Transport Block Size for DL 256QAM Qualcomm Incorporated CR 36.306 14.2.0 1447 2 B Rel-14 TEI14

8.26 Rel-14 LTE ASN.1 review

This agenda item is for documents from the ASN.1 review coordinators, and for documents from others that address a specific issue(s) within the ASN.1 issue list (please include the issue number(s) that is addressed within the title of the document).

Documents in this agenda item will be handled in the LTE Break Out session

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9 LTE Rel-15

9.1 SI: Further Enhancements to LTE Device to Device, UE to Network Relays for IoT and Wearables

(FS_feD2D_IoT_relay_wearable; leading WG: RAN2; REL-15; started: Mar. 16; target: Sept. 17; SID: RP-170295)

Time budget: 1.5TU

Documents in this agenda item will be handled in the LTE Break Out session

9.1.1 Organisational

Including incoming LSs, running TR, etc

R2-1704002 LS on access control mechanism for REAR (C1-171929; contact: LGE) CT1 LS in Rel-15 REAR RAN2, SA2, SA1

=> Noted

R2-1704009 LS on RAN1 agreements for FeD2D study item (R1-1706843; contact: Intel) RAN1 LS in Rel-15 FS_feD2D_IoT_relay_wearable RAN2, RAN4

=> The TP is agreed and will be merged in the TR

=> Noted

9.1.2 UE-to-Network Relay enhancements

9.1.2.1 User plane architecture aspects

Impacts of layer 2 relaying. Bearer modelling, traffic management and need for adaptation layer for PC5.

Not treated

R2-1704097 TP on Layer-2 relay data identification Guangdong OPPO Mobile Telecom. discussion Rel-15

R2-1704325 Bearer modelling and E2E QoS support for layer-2 relaying Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 FS_feD2D_IoT_relay_wearable

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R2-1704544 Consideration of Bearer configuration in FeD2D LG Electronics Inc. discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704553 Discussion on Signaling Radio Bearer Mapping for L2 Relay UE Shenzhen Coolpad Technologies discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704632 Considerations on remaining issues on adaptation layer ZTE Corporation discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704635 Bearer Configuration at Relay UE in feD2D ZTE Corporation discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704753 Procedure for user plane data relaying Intel Corporation discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1705124 Latency Reduction in L2 relay Architecture Sequans Communications discussion

R2-1705304 Discussion on the Relay indication Huawei, HiSilicon discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1705758 Discussion on Relay Traffic Identification and Corresponding TP Proposal Coolpad discussion

R2-1705766 Corresponding TP Proposal for Relay Traffic Identification Coolpad pCR 36.746 0.5.0 Rel-14 FS_feD2D_IoT_relay_wearable

9.1.2.2 Control plane aspects

Connection establishment/setup, potential conclusion on which paging mechanism to use, and system information

Including output from email discussion [97bis#18][LTE/FeD2D] System Information – LG

R2-1705767 Summay of email discussion 97bis#18 LTEFeD2D_System Information LG Electronics Inc. report Rel-15 FS_feD2D_IoT_relay_wearable

Proposal 2: One of the following two configuration options can be used for SIB acquisition of linked in-coverage remote UE.

Option 1: The linked in-coverage remote UE need to be configured by network whether to receive via the linked relay UE or not

Option 2: The linked in-coverage remote UE unconditionally receives the system information from the linked relay UE

- Oppo thinks that choice between option 1 and 2 is not straight forward as it depends on scenario.
- Nokia thinks that option 1 should be supported and it should be up to the operator whether it does it or not.
- Huawei thinks that for the linked UE we should have consistent behaviour and the UE should receive from PC5.
- Sony thinks the options should be phrased differently, it should be a configuration for the relay UE. If the remote UE doesn't receive it from relay UE the UE acquires it from Uu.
- Intel would like to have power saving in the UE and the UE should rely on the relay UE.
- Ericsson and Samsung supports option 1

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- LG thinks the remote UE always has to monitor the Uu for system information change so it would be preferable to do option 2
- Intel is concerned that with option 1 the remote UE will never know whether the relay UE is configured for SI relaying and it will force it to always have to monitor the Uu. If we do Option 1 we should have the possibility to tell the remote UE.
- Sony explains that the UE only has to monitor the relay UE for SI changes.
- LG thinks that in the case that remote UE and relay UE are in different cells would have a problem with Option 1.

Proposal 3: Essential SIBs are required to be relayed from relay UE to all linked remote UEs commonly. Following SIBs can be considered to essential SIBs.

MIB: SFN, bandwidth

SIB1: PLMN, cell information

SIB2/14: Access Barring information

SIB18/19: Sidelink discovery/communication

- ZTE wonders why the DL bandwidth is required to be relayed. Nokia thinks the bandwidth is needed.
- Intel thinks that the simplest option is to just forward the SI.
- Ericsson asks if SIB18/19 SL discovery/communication needs to be fully relayed or only parts of information that are necessary. Intel thinks that we should postpone the discussion as RAN1 is still discussing. Nokia explains that we have to support both PS and Commercial so we should relay the full SIB.

Proposal 4

- ZTE asks why UE SIB13/15 is needed. Huawei thinks that some UEs may be interested in MBMS.
- Intel is concerned that this is complicated. The relay UE would need to know about the remote UEs interests and capability. Qualcomm indicates that the UE has to indicate anyways what it is interested in (e.g. V2X, communication).

Proposal 5

- Nokia is concerned if this as we may have remote UEs with different capabilities and relay UEs that have to understand which part of SIB to forward.
- Intel shares the concerns
- Ericsson agrees with Nokia but thinks agreement 3 also has the same problem.

Proposal 6

- ZTE wonders how the different remote UEs will receive the information if they have differnet DRX.

Proposal 9

- Coolpad and Oppo think that we can just use the RRC configuration to configure the UE with dedicated information instead of doing SIB unicast. Intel thinks that for idle mode we should support the unicast as we don't have a RRC connection.
- Qualcomm thinks that we can simplify but removing the option of MBMS.

=> Noted

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Agreements

1. System information relaying is supported for linked in-coverage remote UEs. We will capture both options in the TR 1) The eNB can configure the relay UE whether it can forward the system information to linked UEs and 2) the relay UEs is expected to forward the system information to the remote UE. The linked remote UE relies on the relay UE for the system information of the serving cell.
2. Essential SIBs are required to be relayed from relay UE to all linked remote UEs commonly. At least the following SIBs can be considered to essential SIBs, MIB: SFN, bandwidth, SIB1: PLMN, cell information, SIB2: Access Barring information, FeD2D SIB related info (e.g. SIB18/19 or new SIBs)
3. Relay UE can optionally relay other SIBs (e.g., SIB10/11/12/13/14/15) depending on the linked remote UEs. FFS which SIBs and what information is provided to the relay UE.
4. We will capture two options –1) the relay UE is expected to purely forward the SIBs without changing the information and formation and 2) the relay UE can only forward a subset of information to the remote UE. Recommend in the TR that we do Option 1 and FFS if there is a use case for Option 2.
5. A relay UE relays system information over SL using broad(multi-cast). FFS if it can also do unicast transmissions.
6. The relay UE can determine that SIB delivery is deemed necessary for remote UE when system information is updated. Other reasons are left for WI phase.

R2-1704636 Remote UE SRB forwarding at Relay UE in feD2D ZTE Corporation discussion Rel-15 FS_feD2D_IoT_relay_wearable

- Coolpad thinks that we should also capture that the adaptation layer includes SRB ID

=> The remote UE SRBs are carried in relay UE SRB and a SRB ID needs to be included in the adaptation layer for the non-3GPP case.

=> Noted

R2-1705301 RRC Connection establishment and bearer setup via L2 Relay Huawei, HiSilicon discussion Rel-15 FS_feD2D_IoT_relay_wearable

=> Noted

R2-1704045 Connection establishment via L2 UE-to-Network relay Guangdong OPPO Mobile Telecom. discussion FS_feD2D_IoT_relay_wearable

=> Not treated

R2-1704756 Initiation of connection and access control Intel Corporation discussion Rel-15 FS_feD2D_IoT_relay_wearable

- LG supports
- Huawei thinks that it should be the relay UE performing access control as it is the one doing the RACH. Intel explains that the access class barring is not only linked to RACH also to other congestion control in the network. Nokia agree and CT1 sent us an LS.
- Sony asks if the relay UE is expected to also do the access class barring.

=> RAN2 to agree that access control check is performed at Evolved ProSe Remote UE using the parameters of the cell it intends to access (e.g. via the Evolved ProSe Relay UE).

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=> The relay UE does not perform access class check for the remote UEs data

=> Noted

R2-1705554 Access control mechanism LG Electronics Inc. discussion Rel-15 FS_feD2D_IoT_relay_wearable

=> Not treated

R2-1705555 [Draft] response LS on access control mechanism for REAR LG Electronics Inc. LS out Rel-15 FS_feD2D_IoT_relay_wearable To: SA1, SA2, CT1

=> The LS is revised in R2-1705860

R2-1705860 [Draft] response LS on access control mechanism for REAR LG Electronics Inc. LS out Rel-15 FS_feD2D_IoT_relay_wearable

=> The LS is approved in R2-1705863

R2-1705302 Further discussion on the paging receiving via Relay UE Huawei, HiSilicon discussion Rel-15 FS_feD2D_IoT_relay_wearable

=> The TR will capture that potential downscoping of the paging options is left to WI phase.

=> Similar to system information we will capture the network configurability option for paging relaying for in-coverage UEs in the TR and keep it FFS.

=> Noted

Not treated

R2-1704824 Paging via Relay Sony discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704044 Discussion on RRC state of remote UE Guangdong OPPO Mobile Telecom. discussion FS_feD2D_IoT_relay_wearable

R2-1704047 TP on RRC state of remote UE Guangdong OPPO Mobile Telecom. discussion FS_feD2D_IoT_relay_wearable

R2-1704073 Discussion on Authorization of FeD2D Guangdong OPPO Mobile Telecom. discussion Rel-15

R2-1704075 Discussion on RRC state of remote UE Guangdong OPPO Mobile Telecom. discussion Rel-15

=> Withdrawn

R2-1704077 TP on RRC state of remote UE Guangdong OPPO Mobile Telecom. other Rel-15

=> Withdrawn

R2-1704078 Connection establishment via L2 UE-to-Network relay Guangdong OPPO Mobile Telecom. discussion Rel-15

=> Withdrawn

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R2-1704096 TP on remaining issues and down selection for paging relay Guangdong OPPO Mobile Telecom. discussion Rel-15

R2-1704326 Paging and System Information relaying for in-coverage remote UEs Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704327 Further discussion on Paging relaying Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704637 Discussion on the system information delivery ZTE Corporation discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704638 Further consideration on the paging of remote UE ZTE Corporation discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704716 Further discussion on the system information acquisition of Remote UE Huawei, HiSilicon discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704719 Discussion on Relay Unicast the SIB to Remote UE Over Sidelink Shenzhen Coolpad Technologies, Guangdong OPPO Mobile Telecom discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704756 Initiation of connection and access control Intel Corporation discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704825 Support for Suspend/Resume for Relay Sony discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704996 Discussion on system information acquisition for remote UE Guangdong OPPO Mobile Telecom, Shenzhen Coolpad Technologies discussion FS_feD2D_IoT_relay_wearable

R2-1705126 Sidelink maintenance for evolved L2 relay Sequans Communications discussion

R2-1705556 Further discussion on SI message delivery for remote UE LG Electronics Inc. discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1705769 Further consideration on paging solutions LG Electronics Inc. discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1705771 RRC connection establishment for idle and connected relay UE LG Electronics Inc. discussion Rel-15 FS_feD2D_IoT_relay_wearable

9.1.2.3 Service continuity

Aspect related to service continuity and mobility, including path selection and network involvement with main focus on Uu and PC5 path switch

Aspects related to group mobility

Including output from email discussion [97bis#19][LTE/FeD2D] – Group handover – Huawei

R2-1705300 Report of email discussion [97bis#19][LTE/FeD2D] – Group handover Huawei, HiSilicon discussion Rel-15 FS_feD2D_IoT_relay_wearable

- ZTE indicates that RAN3 is discussing these procedures and is concerned with overlap
- ITL wonders if this is applicable for non-3GPP cases as well. Intel thinks it is.
- Coolpad asks how the relay UE will forward the message if it cannot decode
- ZTE thinks that the relay UE should not decode the message. Huawei explains the relay UE has to decode the message for itself anyways. Intel would like to keep open the possibility

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that the relay UE decodes the message. Sony thinks that we can just use containers for the part that shouldn't be decodable for the relay UE for security purposes.

- Qualcomm thinks that it is possible to run the PC5-S over non-3GPP case.

=> We will capture all four options in the TR.

=> For the first option remote UE should only receive its own configuration. Clarify that the messages between the relay UE and remote UE are PC5-S messages for SL. FFS if it carries RRC reconfiguration message via transparent or new message is defined.

=> We will not capture the benefits/drawbacks of each option. A sentence will be added to clarify that RAN2 did not discuss the detailed impacts of each option.

=> Considering the identified drawbacks and complexities, RAN2 agrees not to pursue further the group handover complete.

=> Noted

R2-1705862 TP for group mobility Huawei, HiSilicon discussion Rel-15 FS_feD2D_IoT_relay_wearable

[CB 217]

R2-1704328 Path switch between direct and indirect communications Nokia, Alcatel-Lucent Shanghai Bell, Ericsson discussion Rel-15 FS_feD2D_IoT_relay_wearable

- Huawei wonders if we need to send the full RRC message if the UE moves back to the eNB. Nokia thinks that the UE needs to be configured with the eNB configuration. Huawei and Sony think that maybe it is not needed and the UE can keep some of this information and not delete it.

- Oppo would like to clarify what current event-based framework means. Huawei asks if the remote UE has to report measurements of the serving cell. Nokia explains that the main event is the SL quality and the remote UE can also report the measurements of cells.

- Intel thinks that the main question should be whether we allow some pre-condition configuration.

=> UE switches path from direct to/from indirect communications based on RRC Reconfiguration message from its serving eNB. Path switch based on "pre-condition" will be considered as a possible optimisations and captured in the TR.

=> Some optimization to avoid sending the full RRC configuration message for the cases in which the UE moves from relay to Uu on the same cell will be considered. The understanding is that there is some eNB involvement but details of the procedures are left FFS.

=> Both options will be captured in the TR.

=> Noted

Not treated

R2-1704074 Consideration on Solutions for Path Switch between PC5 and Uu Guangdong OPPO Mobile Telecom. discussion Rel-15

R2-1704329 Data lossless path switch Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 FS_feD2D_IoT_relay_wearable

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R2-1704537 Options for path switching LG Electronics Inc. discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704631 Service continuity for the Evolved ProSe Remote UE ZTE Corporation discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704715 Path switch procedure between Uu and PC5 Huawei, HiSilicon discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704754 Path selection options and service continuity Intel Corporation discussion Rel-15 FS_feD2D_IoT_relay_wearable

=> Withdrawn

R2-1704995 Discussion on group mobility procedure Guangdong OPPO Mobile Telecom. discussion FS_feD2D_IoT_relay_wearable

R2-1705557 Idle mode task of linked remote UE LG Electronics Inc. discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1705562 Considerations on group handover ITL discussion Rel-15 FS_feD2D_IoT_relay_wearable

9.1.2.4 Additional scenarios

Scenarios for consideration

R2-1704445 Unidirectional Relay Support Qualcomm Incorporated discussion FS_feD2D_IoT_relay_wearable

- Nokia would like to understand how the UE discovers the relay if it doesn't support SL reception.
- Qualcomm thinks that we would have to change the discovery procedure, as the relay UE has to discover the remote UE.

Proposal 1: For unidirectional relaying, RAN2 design should focus on Type-2 UEs and assume no SL reception capability at any time and/or for any sidelink procedure (discovery and/or communications).

- Nokia is not quite sure how this works and has some impact on SA2

=> We can capture in the TR "RAN2 did not have the chance to fully analyse the impact of unidirectional relay"

=> Noted

Not treated

R2-1705768 Consideration on inter-eNB relay connection LG Electronics Inc. discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1705770 QoS support for FeD2D LG Electronics Inc. discussion Rel-15 FS_feD2D_IoT_relay_wearable

9.1.2.5 Other

Not treated

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R2-1705303 Establishment of end to end security Huawei, HiSilicon discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704538 Consideration on the sidelink RAT Type LG Electronics Inc. discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1704717 Resource allocation for PC5 in Layer 2 evolved UE-to-NW relay Huawei, HiSilicon discussion Rel-15 FS_feD2D_IoT_relay_wearable

R2-1705808 Discussion on Radio Resource Allocation for Out-of-Coverage eRemote UE Coolpad discussion

9.1.3 LTE sidelink enhancements

RAN2 enhancements related to discontinuous RX. Enhancements related to QoS depend on SA2 answer.

As per RAN2 agreements the primary objective should be to address power efficiency for the wearable device (this is applicable to all UE categories).

R2-1704330 Power efficient relay discovery and reselection Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 FS_feD2D_IoT_relay_wearable

=> Not treated

R2-1704634 Discussion on PC5 DRX ZTE Corporation discussion Rel-15 FS_feD2D_IoT_relay_wearable

=> Not treated

R2-1704718 Some considerations about DRX on PC5 Huawei, HiSilicon discussion Rel-15 FS_feD2D_IoT_relay_wearable

Proposal 2

- Huawei would like to keep this for both idle and connected
- Ericsson thinks that the Idle mode depends on the option we select for paging.

Agreements

1. DRX on PC5 should be supported for the Remote UE in L2 Relaying for all states.
2. DRX on PC5 can be supported for the Relay UE for all states.
3. For RRC connected, capture in the TR Option 2 as the general PC5 DRX procedure for L2 Relaying. The PC5 DRX configuration is configured by eNB and is transmitted via the Relay UE to the Remote UE. Details of PC5 DRX configuration are FFS (e.g. if explicit DRX configuration or configuration based on pool configuration)
4. The details for IDLE mode depends on paging mechanism/option chosen

Discussion on Conclusions of SI

- Nokia and Ericsson would like to clarify that there are quite a few FFS.

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=> Bi-directional Layer 2 UE-NW relay is feasible from a RAN2 perspective.
=> DRX enhancements were considered
=> RAN2 considers the SI complete with the understanding that there are still details to be discussed in WI phase.

R2-1704755 Further considerations for discontinuous Rx for PC5 Intel Corporation discussion Rel-15 FS_feD2D_IoT_relay_wearable

=> Noted

✉ **[LTE/FeD2D] – TP – LG**
- Capture agreements reached up to RAN2#98
- [Captured agreed TPs from other WGs – RAN1 and RAN3]
- Capture conclusions
- one week after the meeting

9.2 WI: Shortened TTI and processing time for LTE

(LTE_STTIandPT-core; leading WG: RAN1; REL-15; started: June 16; target: Sep. 17; WID: RP-170113)

Time budget: 0.5 TU

Documents in this agenda item will be handled in the LTE Break Out session

Including output from email discussion [97bis#20][LTE/sTTI] Running 36.300 CR

Including output from email discussion [97bis#21][LTE/sTTI] Running 36.321 CR

Including output from email discussion [97bis#22][LTE/sTTI] Running 36.331 CR

✉ **[LTE/sTTI] – Running 36.300 CR - Ericsson**
- Agreable running CR capturing agreements up to RAN2#98
- Before next meeting

✉ **[LTE/sTTI] – Running 36.321 CR - Ericsson**
- Agreable running CR capturing agreements up to RAN2#98
- Before next meeting

✉ **[LTE/sTTI] – Running 36.331 CR - Ericsson**
- Agreable running CR capturing agreements up to RAN2#98
- Before next meeting

9.2.1 Processing time reduction for legacy 1ms TTI

R2-1704726 Open issue on UL HARQ RTT Timer Ericsson discussion Rel-15 LTE_sTTIandPT

- Nokia thinks we shudl wait for the end of the session and maybe include more.

=> Noted

Petitioners' Exhibit 1008, p. 380
AT&T et al v. Asustek Technology
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=> Send an LS to RAN1

1. Asking them for values of UL HARQ RTT for TDD for short processing time and short TTI.

R2-1704727 Draft LS on UL HARQ RTT for TDD Ericsson discussion Rel-15 LTE_sTTIandPT

=> The LS is revised in R2-1705865

R2-1705865 Draft LS on UL HARQ RTT for TDD Ericsson discussion Rel-15 LTE_sTTIandPT

[CB 220]

Not treated

R2-1704567 HARQ handling during UE processing time reconfiguration CATT discussion Rel-15 LTE_sTTIandPT-Core

R2-1704723 HARQ processes with fallback, asynchronous to synchronous HARQ Ericsson discussion Rel-15 LTE_sTTIandPT

9.2.2 Short TTI aspects

Common aspects of short TTI and processing time reduction should be submitted under this AI

R2-1704731 Running CR for introduction of shortened TTI and processing time for LTE Ericsson draftCR 36.331 14.2.0 B Rel-15 LTE_sTTIandPT

- LG thinks that the CR is not properly capturing the TTI type per logical channel.

=> The CR is endorsed

R2-1704732 Running CR for introduction of shortened TTI and processing time for LTE Ericsson draftCR 36.321 14.2.1 B Rel-15 LTE_sTTIandPT

=> The CR is endorsed

R2-1704733 Running CR for introduction of shortened TTI and processing time for LTE Ericsson draftCR 36.300 14.2.0 B Rel-15 LTE_sTTIandPT

- Huawei and Nokia think that we should not add anything here yet until RAN1 provides some input.

=> Sections 5x and 5y are removed for now

=> With the deletion the CR is endorsed

R2-1704721 DRX impacts of sTTI Ericsson discussion Rel-15 LTE_sTTIandPT

- Qualcomm clarifies that we still configure two timers without a second DRX state machine
- Nokia wonders if there a common active timer. Ericsson clarifies that when sDRX timer are running we monitor sPDCCH and when legacy DRX timer we monitor PDCCH.

Petitioners' Exhibit 1008, p. 381
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- CATT would like to leave it RAN1 and no RAN2 enhancements are needed.
- LG thinks this is quite complex and we would need to discuss all the cases.
- Huawei thinks the gains are limited
- LG and Huawei think that one timer can be enough

=> Noted

R2-1705071 DRX for sTTI Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 LTE_sTTIandPT

Proposal 2: DRX Cycle and onDurationTimer are common for sTTI and legacy TTI and counts legacy TTI length, i.e. no need to have sTTI specific DRX cycle and onDurationTimer configuration.

- Ericsson and Qualcomm thinks that monitoring of sPDCCH for the full onDuration is needed. Nokia wonders how much power savings there are.
- Qualcomm thinks that microsleep is possible. Nokia thinks that they still need to decode the PDCCH.
- LG supports Nokia's proposal
- Huawei thinks that monitoring should be left to RAN1 discussions.
- Qualcomm explains that there are optimization where the UE should only monitor the first sPDCCH occasion with onDuration

=> A single drx-InactivityTimer, DRX Cycle is configured.

=> FFS whether sPDCCH has to be monitored for the full onDuration timer or multiple on duration or nothing

=> Noted

R2-1705747 Connected mode DRX for short TTI Qualcomm discussion

=> Noted

R2-1704466 Definition of DRX timer in short TTI LG Electronics Mobile Research discussion Rel-15 LTE_sTTIandPT-Core

- Ericsson wonders what happens when the scheduling changes. LG clarifies that this related to retransmission timers only
- Qualcomm understood interpretation 1. Intel thinks that drx-retransmission timers are not related to RAN1 and interpretation 2 is good.

=> *drx-RetransmissionTimer*, and *drx-ULRetransmissionTimer* for sTTI can be configured independently

=> Noted

R2-1704729 SPS operation on sTTI Ericsson discussion Rel-15 LTE_sTTIandPT

- LG thinks that there are many issues and we don't have time to have sTTI

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- Huawei thinks that SPS for sTTI will be useful and be supported
- Ericsson thinks that to simplify SPS we shouldn't use the bitmap
- Nokia and CATT thinks that 1ms TTI SPS is enough

=> RAN2 aims to support SPS with a simple and converged solution

=> Noted

R2-1705233 Support of SPS with sTTI LG Electronics Inc. discussion Rel-15 LTE_sTTIandPT

=> Noted

R2-1705002 Support of SPS for sTTI Huawei, HiSilicon discussion Rel-15 LTE_sTTIandPT-Core

=> Noted

R2-1705748 Logical Channel Multiplexing and Prioritization for short TTI Qualcomm discussion

RAN2 to select either single or individual or both PBR and BSD parameters across TTIs

- Hauwei thinks that Bj should be increment according to sTTI. Lenovo thinks it should be left up to implementation when it is incremented. LG thinks the specification is unclear now as to how it is updated.
- Nokia thinks that if the UE is only configured with sTTI it should use the sTTI otherwise it should use the longest TTI.
- Lenovo explains that you just take into account the time since it last elapsed.

=> Noted

Agreements
1. A single priority is assigned for multiplexing a logical channel which is configured to use multiple TTIs
2. Single PBR across TTIs
3. It is up to UE implementation to properly update the Bj using the correct TTI lengths. FFS if and/how this is specified.

R2-1705003 LCP procedure for sTTI Huawei, HiSilicon discussion Rel-15 LTE_sTTIandPT-Core

=> Noted

R2-1705070 SR on sPUCCH or PUCCH Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 LTE_sTTIandPT

Proposal 1: Default configuration should be that a LCH can use all the TTI lengths unless some restriction is otherwise configured.

- LG considers default as only 1ms TTI and there is an ambiguity during a re-configuration

Proposal 2: Multiple SR configurations can be configured to the UE on PUCCH and sPUCCH separately, and which SR configuration is used depends on the LCH that triggers the SR.

- LG wonders if we will have multiple PUCCH for a single cell.

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- Ericsson thinks that we don't need to optimize, the eNB can just give the UE with a short grant even if the SR is sent on the long SR. Nokia and Qualcomm thinks that this should be done as fast as possible.
- Ericsson thinks that it may be important for coverage purposes to send SR on the long TTI to reach.

=> Noted

Agreement
=> Both sPUCCH and PUCCH can be configured for a UE for a single cell. FFS which resource it uses to send the SR and under which conditions if both are configured.

Not treated

R2-1705749	SR and BSR for short TTI	Qualcomm	discussion		
R2-1705235	HARQ aspect of sTTI	LG Electronics Inc.	discussion	Rel-15	LTE_sTTIandPT
R2-1705001	Impacts of sTTI on L2 Timers	Huawei, HiSilicon	discussion	Rel-15	LTE_sTTIandPT-Core
R2-1704725	Signalling of allowed TTI length	Ericsson	discussion	Rel-15	LTE_sTTIandPT
R2-1704463	LCP for sTTI	LG Electronics Mobile Research	discussion	Rel-15	LTE_sTTIandPT-Core
R2-1704464	Default TTI type for sTTI	LG Electronics Mobile Research	discussion	Rel-15	LTE_sTTIandPT-Core
R2-1704568	SR and BSR for sTTI	CATT	discussion	Rel-15	LTE_sTTIandPT-Core
R2-1704569	Impacts of TTI length switching	CATT	discussion	Rel-15	LTE_sTTIandPT-Core
R2-1704722	HARQ process handling with different TTIs lengths	Ericsson	discussion	Rel-15	LTE_sTTIandPT
R2-1704724	Impact of sTTI on L2 timers	Ericsson	discussion	Rel-15	LTE_sTTIandPT
R2-1704728	RRC impacts of short TTI	Ericsson	discussion	Rel-15	LTE_sTTIandPT
R2-1704730	SR and BSR operation with short TTIs	Ericsson	discussion	Rel-15	LTE_sTTIandPT
R2-1705004	DRX for sTTI	Huawei, HiSilicon	discussion	Rel-15	LTE_sTTIandPT-Core
R2-1705005	TTI Switching between sTTI and legacy TTI	Huawei, HiSilicon	discussion	Rel-15	LTE_sTTIandPT-Core
R2-1705094	SR and BSR Procedure in Short TTI	Huawei, HiSilicon	discussion	Rel-15	LTE_sTTIandPT-Core
R2-1705232	Support of switching between different TTI length within one HARQ procedure	LG Electronics Inc.	discussion	Rel-15	LTE_sTTIandPT
R2-1705234	BSR/SR with sTTI	LG Electronics Inc.	discussion	Rel-15	LTE_sTTIandPT

Petitioners' Exhibit 1008, p. 384
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9.3 Study on UL data compression in LTE

(FS_LTE_UDC; leading WG: RAN2; REL-15; started: Dec. 16; target: Jun. 17: SID: RP-170403)

Time budget: 2 TU

Documents in this agenda item will be handled in the LTE Break Out session

9.3.1 General

(work plan and TR skeleton)

Including output from email discussion [97bis#27][LTE/UDC] Running TR of UDC (CATT)

R2-1704697 Running TR 36.754 of UDC FS_LTE_UDC CATT draft TR 36.754 0.0.2 Rel-15

=> Change to “some of applications do not compress data”

=> TR is agreed in version 0.0.2

R2-1704685 Summary of [97bis#28][LTE/UDC] Continued simulation and comparison of solutions on UDC (CATT) CATT report Rel-15 FS_LTE_UDC

Agreements:
Capture the following conclusions into TR 36.754 1 Mixed traffic, representing a nature of traffic in a practical system could also be compressed using UDC solution and a significant compression gain can be achieved. 2 Compression gain of UL RoHC depends on the size of TCP/IP header ratio and depending on the traffic input, RoHC could achieve significant compression gain up to 80%. For sip signalling the compression gain of RoHC is around 5%. 3 Significant compression gain of ftp input traffic profile can be achieved with UDC solutions. Capture additional results provided in R2-1704685 for each solution in the TR 36.754.

R2-1705309 Mix Traffic Evaluation Using UDC Ericsson discussion Rel-15 Move from 9.3.3

=> Noted

9.3.2 Use cases and simulation assumptions

(summary of the email discussion, other use cases and simulation assumptions)

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R2-1704686 TP to Capture the Use Case of Mixed Traffic Flows and New Simulation Results CATT pCR 36.754 0.0.1 Rel-15 FS_LTE_UDC

=> Agreed.

R2-1705316 Fundamentals that impact UDC Ericsson discussion Rel-15

=> Indicate in the technical report showing current status from different regions w.r.t. encryption and existing compression methods at higher layers.

9.3.3 Compression/decompression solutions and evaluations

(details about the compression/decompression and the simulation outcome)

Including output from email discussion [97bis#28][LTE/UDC] Continued simulation and comparison of solutions on UDC (CATT)

R2-1704687 Consideration on Supporting Pre-defined Dictionary for UDC CATT, CMCC discussion Rel-15 FS_LTE_UDC

- Qualcomm support considering the pre-defined dictionary for UDC.

Agreements:
1 Pre-defined dictionary could be used for SIP signalling compression in UDC. The buffer impact and authentication should be FFS.
2 Potential gain for using pre-defined dictionary for SIP signalling compression is expected.

R2-1705010 TP to Capture Pre-defined Dictionary CATT, CMCC pCR 36.754 0.0.1 Rel-15 FS_LTE_UDC

=> Add “example”

=> Wording can be improved through email discussion.

=> Agreed as the baseline to capture pre-defined dictionary.

R2-1704688 Details of UDC Solution 3 CATT discussion Rel-15 FS_LTE_UDC revised in R2-1705834

R2-1705834 Details of UDC Solution 3 CATT discussion Rel-15 FS_LTE_UDC

- Huawei wonder how to solve the bit alignment issue.

Agreement:
1 Replace the description on Deflate based solution of R2-1705834 into TR 36.754 (Section 7.2.3.1) with the change that PDCP format to UDC header which above PDCP layer.

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R2-1705312 Text Proposal for UL ROHC Ericsson discussion Rel-15

Agreement:

1 Include the description from section 2 of R2-1705312 in the TR study item as proposed in the Annex with the changes:

1) removing the last sentence.

2)The description on UL RoCH should be further clarified.

R2-1705613 Updated details on APDC compression and decompression solution Qualcomm other Rel-15 FS_LTE_UDC

Agreements

Capture the Section 3 TP as updated descriptions for Solution 4 APDC of R2-1705613 into the UDC TR with the changes:

1) Remove annex B

R2-1705942 Review Comments on Adaptive Packet Data Compression MediaTek Inc.

=> Noted

R2-1705615 Details on APDC decompression algorithm Qualcomm discussion Rel-15 FS_LTE_UDC

=> Noted

R2-1704690 Comparison of UDC Solutions CATT discussion Rel-15 FS_LTE_UDC Revised in R2-1706000

R2-1706000 Comparison of UDC Solutions CATT discussion Rel-15 FS_LTE_UDC

- After offline discussion CATT report down selection is not the target of the SI. Regarding complexity CATT indicate that it is hard to qualified.
- Nokia prefer to have one solution for WI phase.

Agreements:

Capture the following observations into TR 36.754

Observation 1: The compression gain of RoHC depends on the TCP/IP header occupancy ratio. The higher TCP/IP header occupancy ratio is, the higher the compression efficiency of RoHC is.

Petitioners' Exhibit 1008, p. 387
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Observation 2: For the cases that RoHC doesn't achieve high compression efficiencies, all other solutions provide comparable compression gains with compression efficiencies in the range from 60%-88%.

Observation 3: some cases, solution 3 has better compression efficiencies, and some cases, solution 4 has better compression efficiencies.

Observation 4: for SIP signaling cases, solution 3 (deflate) has the best compression efficiencies.

Observation 5: Solution 2 and solution 3 can be merged to one UDC solution (deflate solution).

R2-1705314 Comparison of different UDC algorithms Ericsson discussion Rel-15

Agreements:

Capture the following observations in TR:

1 ROHC is designed to fully exploit the traffic type and would need to be updated should a new type of internet header emerge.

2 Zlib is an abstraction of the DEFLATE algorithm where a header and trailer bytes are added to the raw DEFLATE data.

3 Zlib adds some extra overhead to the DEFLATE protocol, as header and trailer bytes are added to the raw DEFLATE data.

4 The possibility to manage the compression context memory as proposed in Adaptive Packet Data Compression could be expected to increase compression gain as packets with no or low level of redundancy could be excluded from the buffer.

R2-1705614 Comparison of UDC candidate solutions under agreed metrics Qualcomm, Sprint other Rel-15 FS_LTE_UDC

- CATT think we should not down select solution only depending on complexity.
- CMCC concern whether the same performance gain can be achieved by different vendors for APDC. Qualcomm think this concern is unrealistic.
- Intel think we cannot implement UDC according to TR. Qualcomm and Huawei think define head format in TS is enough. MTK think specifying format is not enough for implementation.

=> Capture Table 4-1 and Table 4-2 into TR.

R2-1705941 Review comments on R2-1705614 MediaTek Inc. Discussion FS_LTE_UDC 15 Discussion FS_LTE_UDC 15

=> Noted

R2-1705419 Performance Cross-Checking on Public Domain Compression Methods for UDC MediaTek Inc. discussion Rel-15

Agreements:

Petitioners' Exhibit 1008, p. 388
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Capture the observation: For Zlib/Deflate compression methods, multiple vendors achieve consistent compression performance with the same configuration.

R2-1704966 Considerations on impacts to specifications due to UDC solutions Huawei, HiSilicon discussion Rel-15 FS_LTE_UDC

=> Not treated

R2-1705629 Consideration on controllability of UDC SoftBank discussion

=> Not treated

9.3.4 Others

(procedure etc.)

R2-1704689 Signalling Procedures for UDC CATT discussion Rel-15 FS_LTE_UDC

- Nokia think the proposals are stage-2 and 3.

=> Noted

R2-1706051 Way forward for R15 LTE UDC SI Qualcomm, China Telecom, KDDI, Sprint, Softbank, Kyocera, Sharp, Sony

=> Not treated

- Ericsson think we can do down selection in the very beginning of WI phase.
- CATT think we need more time to understand the solutions before down selection.

=> Conclude that RAN2 recommend only one solution for specification in the WI phase if we have WI.

✉ **[98#xx][LTE/UDC] Running TR 36.754**
- Capture the agreements from this meeting

Intended outcome: Agreed TR for one step approve in RANP

Deadline: TBD

=> **CBF try to down selection [1000]**

9.4 Study on Enhanced Support for Aerial Vehicles

(FS_LTE_Aerial; leading WG: RAN2; REL-15; started: Mar. 17; target: Dec. 17: SID: RP-170779)

Time budget: 1.5 TU

Documents in this agenda item will be handled in the LTE Break Out session

9.4.1 General

(work plan and TR skeleton)

Petitioners' Exhibit 1008, p. 389
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R2-1704316 Work plan for study on enhancement support for Aerial Vehicles NTT DOCOMO INC. discussion Rel-15 FS_LTE_Aerial

=>Noted

R2-1704317 TR Skeleton for Study on enhancement support for Aerial Vehicles NTT DOCOMO INC. discussion FS_LTE_Aerial

=> Endorsed

R2-1704318 TP on TR skeleton for Study on enhancement support for Aerial Vehicles NTT DOCOMO INC. discussion Rel-15 FS_LTE_Aerial

- QC think we first should identify the problem.

=> Change “Potential problem statements” to “Identified problems”.

=> Section should not be changed.

R2-1704319 Working progress of Study in Aerial Vehichle in RAN1 NTT DOCOMO INC. discussion Rel-15

- Ericsson think channel model should be the outcome of RAN1.

=> Noted.

R2-1705658 Consideration of Aerial traffic LG Electronics Inc. discussion FS_LTE_Aerial

- QC wonder the meaning of all types of aerial UE.

Agreements:

1 Study uplink/downlink traffics for aerial UE.

R2-1704153 Scenarios for Aerial Vehicles Qualcomm Incorporated discussion Rel-15 FS_LTE_Aerial

- Ericsson wonder is P1 means prioritizing command and control.

Agreements:

1 Both command and control and application data of drones using LTE connectivity are within the scope of the SI. The traffic characteristics are FFS.

2 Potential enhancements for aerial vehicles in RRC idle and connected modes will be considered.

9.4.2 Requirements and parameter identification

(Identify the heights, speeds, latency, reliability, data rate, positioning accuracy, etc , taking into account the regulation viewpoints)

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R2-1704999 Potential Deployment scenario for Drones Huawei, HiSilicon discussion Rel-15 FS_LTE_Aerial Move from 9.4.3

=> Noted

R2-1705425 On the requirements of connectivity services for drones Ericsson discussion Rel-15 FS_LTE_Aerial

=> Noted

R2-1704332 Requirements and parameter identification for Aerial Vehicles study NTT DOCOMO INC. discussion Rel-15 FS_LTE_Aerial

=> The study item on enhanced support for aerial vehicles considers adopting the requirements listed in the following table for the connectivity services for drones. The requirements are independent of simulation assumptions.

Requirement Items	**Value**
Data type	1. Command and Control (C&C). This includes telemetry, waypoint update for autonomous UAV operation, real time piloting, identity, flight authorization, navigation database update, etc. 2. Application Data . This includes video (streaming), images, other sensors data, etc.
Heights	Target up to 300 m AGL
Speeds	Horizontal: up to 160km/h for all the scenarios (Urban, Rural)
Latency	1. FFS: C&C: 50ms (one way from eNB to UAV) 2. Application data: similar to LTE UE (ground user)
DL/UL data rate	1. C&C: [60-100] kbps for UL/DL 2. Application data: up to 50 Mbps for UL
C&C Reliability	Up to 10^{-3} Packet Error Loss Rate

=> Draft LS to RAN1 in R2-1706012 (DCM) to inform our agreements on the requirements in the table above.

=> Indicates in the LS that position accuracy will not be evaluated in RAN2.

R2-1706012 RAN2 agreement on UAV requirements NTT DOCOMO INC. LS out Rel-15 FS_LTE_Aerial

=> Change to “RAN2 did not discuss any requirement for Positioning Accuracy and understand this can be further discussed in RAN1 if time allows.”

=> Change to “Up to 10^{-3} Packet Error Loss Rate”

=> With the changes LS is approved in R2-1706013.

R2-1704322 Traffic models and performance metrics Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 FS_LTE_Aerial

Petitioners' Exhibit 1008, p. 391
AT&T et al v. Asustek Technology
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=> Noted

R2-1704154 Drone Regulations, Requirements and Parameters Qualcomm Incorporated discussion Rel-15 FS_LTE_Aerial

=> Not treated

9.4.3 Potential enhancements for UAV interference problem

(Solutions to detect whether UL signal from an air-borne UE increases interference in multiple neighbour cells and whether an air-borne UE incurs interference from multiple cells)

R2-1705426 Potential enhancements for UAV interference problem Ericsson discussion Rel-15 FS_LTE_Aerial

- LG and QC think interference detection is RAN1 issue.

Agreements:

1 Study if RSRP measurement report can be used for detecting both UL interference from air-borne UE and the DL interference air-borne UE might incur. Other solutions are not excluded.

R2-1704998 Interference mitigation for Drones Huawei, HiSilicon discussion Rel-15 FS_LTE_Aerial

- LG wonder whether configuring proper offset to decrease the number of strong neighbour cells.

Agreements

1 Study the enhancement of measurement report mechanism to address the issue of increased number of strong neighbour cells.

R2-1704333 Initial views on potential problems and solutions for aerial vehicles NTT DOCOMO INC. discussion Rel-15

=> Not treated

9.4.4 Potential enhancements for handover

(Identify if enhancements in terms of cell selection and handover efficiency as well as robustness in handover signalling can be achieved)

R2-1704321 Potential mobility issues for air-borne UEs Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 FS_LTE_Aerial

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Agreements:

1 Study whether the current mobility solutions are sufficient for airborne vehicles.

2 Simulate RLF and HOF rates for airborne vehicles. Reuse the simulation assumptions in RAN1.

R2-1705427 Potential enhancements for HO Ericsson discussion Rel-15 FS_LTE_Aerial

- Intel think we need interference model for simulation.

=> Noted

R2-1704155 Handover Results for Aerial Vehicles Qualcomm Incorporated discussion Rel-15 FS_LTE_Aerial

- Intel think UAV UEs should move up and down…

R2-1705669 Proposal of potential LTE enhancements for Aerial Vehicles KDDI discussion Revised in R2-1705999

R2-1705999 Proposal of potential LTE enhancements for Aerial Vehicles KDDI discussion Revision of R2-1705669

=> Noted

✉ **[98#xx][LTE/UAV] Common RAN2 parameters for RLF and HOF simulation (Qualcomm)**
- Based on the simulation assumption in R2-1704155 and RAN1 agreements

- Figure out the additional parameters needed by RAN2

Intended outcome: Agreeable Report

Deadline: 31/05/2017

R2-1705781 Intra-frequency Measurement Triggering of the Aerial UEs for Cell Reselection CMCC discussion Rel-15 FS_LTE_Aerial

- Nokia and QC think we should identify the problem first.

=> Noted

The following papers are not treated:

R2-1704334 Requirements, potential problems and solutions on idle and connected mobility for Aerial Vehicles NTT DOCOMO INC. discussion Rel-15 FS_LTE_Aerial

R2-1705000 Identification of Air-borne Drones Huawei, HiSilicon discussion Rel-15 FS_LTE_Aerial

R2-1705661 Handover Failure Handling of Aerial UE LG Electronics Inc. discussion FS_LTE_Aerial Moved from 9.4.5

9.4.5 Identify certification

(Identification of an air-borne UE that does not have proper certification for connecting to the cellular network while air-borne)

Petitioners' Exhibit 1008, p. 393
AT&T et al v. Asustek Technology
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R2-1705659 Aerial UE Identification LG Electronics Inc. discussion FS_LTE_Aerial Move from 9.4.4

=> Noted

R2-1705428 Identify certification for drones Ericsson discussion Rel-15 FS_LTE_Aerial

- Nokia wonder the meaning of certification.

Agreements:
Study how to identify air-borne UE causing interference.
FFS: Study the RAN2 impact on how to identify proper certification for a drone capable UE.

The following papers are not treated.

R2-1704156 Identification of Aerial Vehicles Qualcomm Incorporated discussion Rel-15 FS_LTE_Aerial

R2-1704320 Non-certified air-borne UE detection Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 FS_LTE_Aerial

R2-1704335 Aerial Vehicle UE identification NTT DOCOMO INC. discussion Rel-15 FS_LTE_Aerial

R2-1704997 Mobility enhancement for Drones Huawei, HiSilicon discussion Rel-15 FS_LTE_Aerial

9.4.6 Others

R2-1705660 Aerial Traffic Handling using Positioning Identification LG Electronics Inc. discussion FS_LTE_Aerial Move from 9.4.3

=> Not treated

✉ **[98#xx][LTE/UAV] Running TR of Study on enhancement support for Aerial Vehicles (DCM)**

- Capture the agreements from this meeting and RAN1 agreements

  Intended outcome: Running TR

  Deadline: TBD

9.5 Further video enhancements for LTE

(LTE_ViLTE_enh2-Core; leading WG: RAN2; REL-15; started: Mar. 17; target: Dec. 17: WID: RP-170781)

Time budget: 0.5 TU

Documents in this agenda item will be handled in the LTE Break Out session

9.5.1 General

(work plan)

Petitioners' Exhibit 1008, p. 394
AT&T et al v. Asustek Technology
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R2-1705789 Work Plan on further enhancements on Video for LTE Rel-15 CMCC, Huawei, Intel Work Plan

=> Noted

9.5.2 L2 differentiated handling for critical data

R2-1704757 Video signaling enhancements LTE_ViLTE_enh2-Core Intel Corporation discussion Rel-15

Agreements:
1 Provide solutions to make UE access stratum be aware of upper layer critical data within DRB of one user.
2 FFS: Provide mechanisms for the eNB to be made aware whether the UE has upper layer critical data.

✉ **[96#xx][LTE/ViLTE] Solutions for critical data identification (Intel)**

- Detailed solutions to make UE access stratum be aware of upper layer critical data within DRB of one user
- Solution through UE implementation is not excluded for email discussion.
- Clarify the FFS : Provide mechanisms for the eNB to be made aware whether the UE has upper layer critical data.

Intended outcome: Report

Deadline: TBD

The following papers are not treated.

R2-1705582 L2 differentiated handling for critical data LTE_ViLTE_enh2-Core Ericsson discussion Rel-15

R2-1704964 Discussion on L2 differentiated handling for upper layer critical data discussion Rel-15 LTE_ViLTE_enh2-Core Huawei, HiSilicon

R2-1704060 Discussion on open issues of the eVideo Guangdong OPPO Mobile Telecom. Discussion

9.5.3 Awareness of critical data in UE buffer

R2-1704965 Discussion on critical data buffer LTE_ViLTE_enh2-Core Huawei, HiSilicon discussion Rel-15

=> Not treated

R2-1705583 Awareness of critical data in UE buffer LTE_ViLTE_enh2-Core Ericsson discussion Rel-15

=> not treated

9.5.4 Others

R2-1705244 UE assistance for local caching Qualcomm Incorporated discussion Rel-15

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- CMCC, Qualcomm, Huawei and Intel support to do working assumptions without RAN3 input for this meeting.
- Ericsson and Nokia would like to wait the input of RAN3.

CBF: [96#xx][LTE/ViLTE] Identify the benefits of UE assistance information and corresponding solutions (CMCC)
Intended outcome:

Deadline: TBD

R2-1705797 Discussion on UE assisted local cache CMCC discussion Rel-15 LTE_ViLTE_enh2-Core

=> Not treated

9.6 QoE Measurement Collection for streaming services in E-UTRAN

(LTE_QMC_Streaming; leading WG: RAN2; REL-15; started: Dec. 17; target: Jun. 17: WID: RP-170786)

Time budget: 0.5 TU

Documents in this agenda item will be handled in the LTE Break Out session

9.6.1 General

(work plan)

R2-1704165 Work Plan for LTE WI QMC China Unicom Work Plan Rel-15

=> Noted

9.6.2 QoE measurement collection solutions

R2-1704960 A summary on solutions for UMTS WI QMC Huawei, HiSilicon discussion Rel-15 LTE_QMC_Streaming-Core

=> Noted

R2-1704734 User Plane Solution for QoE Measurements Ericsson discussion Rel-15 LTE_QMC_Streaming

=> Noted

R2-1704961 Discussion on solutions for LTE WI QMC Huawei, HiSilicon discussion Rel-15 LTE_QMC_Streaming-Core

=> Noted

- China Telecom and Huawei prefer to use control plane solution for both DL and UL.
- Huawei wonder whether dedicated DRB is used in Ericsson's solution.
- Nokia think UL reporting should use user plane solution.
- Huawei indicate that there will be user privacy issue for UP solution.
- Huawei indicate that UP solution will change the current structure of QoS.
- Huawei wonder which QCI will be used for UP solution and how to charge UE for the data from reports. Ericsson think the report is control information. Nokia think QCI can be chosen through UE implementation.

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- Kyocera would like to understand the size of the report.
- China Unicom think UP solution has many issues to be addressed.

R2-1705110 QMC agreements analysis in E-UTRAN Nokia, Alcatel-Lucent Shanghai Bell discussion

Agreements:
1 Both signalling based QMC initiation and management based QMC initiation should be supported in E-UTRAN.
2 QMC is only active in E-UTRAN RRC_CONNECTED mode and no need to consider the suspending and recovering in other state (such as light connection).
3 FFS: QoE measurement will be continued in case of intra-eNB HO and inter-eNB HO, if no explicitly released by the eNB, and both source and target cell belong to defined same measurement reporting area.

✉ **[98#xx][LTE/QMC] Solutions for QoE Measurements**
- Figure out the details of CP and UP solutions and include the open issues, e.g., charging, user privacy, et al.

  Intended outcome: report

  Deadline: TBD

9.6.3 Others

R2-1705115 QMC open issues discussion in E-UTRAN Nokia, Alcatel-Lucent Shanghai Bell discussion

- China Telecom think proposal 1 is not needed.
- China Unicom wonder the meaning of RAN triggered reporting.

=> Noted.

9.7 LTE connectivity to 5G-CN

(LTE_5GCN_connect-Core; leading WG: RAN2; REL-15; started: Mar. 17; target: Jun. 18: WID: RP-170840)

Time budget: 1.5 TU

At this meeting, due to the commonality with NR, this WI will be handled in the main sesssion.

9.7.1 Organisational

Including incoming LSs, rapporteur inputs, running CRs

Principles on what to specify in which specs, terminology, etc

R2-1705708 How to specify E-UTRA connected to 5GC Huawei, HiSilicon discussion

- China Telecom think mobility for NR to LTE should be in 38.300 and handover from LTE to NR in 36.300.
- Huawei think we are discussing stage 2 here. For stage 2 there could be a general description of handover in 36.300 but the CN part should be described in 38.300.

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- DOCOMO think NR to LTE is not in scope of this WI. Only handover between LTE connected to 5GC and EPC is in scope of this WI. Huawei agree but for this we will rely on handover between NR and LTE.
- Nokia think the stage 2 should be in the same series as stage 3.
- Huawei think duplication should be avoided and we should have a pointer. Ericsson agreed with Huawei and think it is still good to have an overall view in 36.300.
- Nokia think it is too early to conclude where things will be captured until we have a better idea of what will be added. It is difficult to agree principles now.
- Intel think that 36.300 should be complete for someone to read and understand even if there are pointers to 38.300
- LG prefer to capture most parts in 36.300.
- ZTE support the Huawei view how to capture things in stage 2. We should not put some NG-RAN parts in 36.300.

=> Noted

R2-1704209 Capturing LTE on 5GC in Stage-2 Nokia, Alcatel-Lucent Shanghai Bell discussion

- ZTE think this spec should never refer to the 5GC. Nokia think that the 36,300 covers the E-UTRA radio access and for that we need a second on 5GC.
- ZTE agree that radio interface changes should be in this specification.

Agreements
1: Introduce a dedicated section to TS36.300 for LTE connected to 5GC.
2: Wherever possible, do not update existing text in TS36.300 that refers to EPC or EPC-specific entities (MME, S-GW, PGW, HSS, etc.). If required, use the term “CN” (used to denote both EPC/5GC) instead of “EPC” where changes are required.
3: The inter-RAT handover chapter should be updated to cover new cases of 'inter-RAT' handovers between LTE connected to EPC and LTE connected to 5GC.

9.7.2 Stage 2 aspects

Impact on E-UTRA due to slicing, new QoS, potentially different ACB, CN type selection, mobility (e.g. between E-UTRA/5GC and E-UTRA/EPC), etc

R2-1705707 Supported features by 5G CN for E-UTRA connected to 5GC Huawei, HiSilicon discussion

moved from 9.7.1 to 9.7.2

- Intel agree we should have confirmation from SA2 on these features but a related question is what does the UE do it wants these features but they are not provided.
- Vodafone wonder if we need to ask SA2 all these questions. Huawei think the R15 5GC will not support most of these features.
- Nokia think we should not give the impression that we can support these for free.

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- Ericsson think for some of these might not have much impact on CN and hence we should have a view whether we want to support them.
- ZTE think we can decide whether we want to support these features for LTE /5GC.
- Ericsson think for some of the features that were RAN2 driven in the first place it would be good to have a recommendation whether we would like to support it.

P4

- LG prefer to reuse existing access control if possible and is not sure if there are new requirements from SA1.
- ZTE think that anyway the legacy access parameters will also be broadcast and so we should look from the UE point of view which set of parameters it will use.
- LG ask if the UE can be attached to both EPC and 5GC.

P6

- Qualcomm think we should try to make it as uniform as possible and hence try to support inactive.
- Ericsson would like to have some kind of inactive otherwise we would have light connection for EPC but not for 5GC.
- Intel support to have the feature but the question is whether it is in the WID and for this it should be discussed in RAN.
- LG agree with Ericsson.
- Samsung have similar view to Qualcomm but also want to leverage the light connection work and avoid duplication of discussion.
- Ericsson think this WI should be updated to support inactive, or in another WI.
- LG think from UE perspective there should be commonality between light connection and inactive.
- Huawei agree that we should have commonality but we should wait until RAN has discussed. Think we are discussing something that is not in LTE AS today and so it is too early to discuss adding this to LTE/5GC.

=> LS (R2-1706001) to be sent to ask SA1/SA2/SA5 (cc RAN3, CT1) asking what features they will support in 5GCN in Rel-15. Can also discuss offline whether there are any features that from RAN2 perspective we would recommend are supported. (Huawei, offline discussion 33)

R2-1706001 [DRAFT] [LS on what features will be supported in 5GCN in Rel-15] Huawei LS out Rel-15 LTE_5GCN_connect-Core To: SA1, SA2, SA5; Cc: RAN3, CT1

=> Revised in R2-1706132

R2-1706132 [DRAFT] [LS on what features will be supported in 5GCN in Rel-15] Huawei LS out Rel-15 LTE_5GCN_connect-Core To: SA1, SA2, SA5; Cc: RAN3, CT1

=> Approved in R2-1706153

R2-1704803 Supporting 5GC features over E-UTRA Intel Corporation discussion

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revised to R2-1705832

R2-1705832 Supporting 5GC features over E-UTRA Intel Corporation discussion

P4

- Huawei think it is too early to ask this question to SA2 as both SA2 and RAN are still discussing the identifiers.
- Ericsson understand the CN ID is temp ID.
- Huawei think the key question is whether the address space for the 2 IDs is common or whether we need some extra bit in the connection request to differentiate them
- Qualcomm think that SA2 will anyway discuss this even without this LS. What point are we trying to provide. Intel agree this is largely SA2 domain but the point to understand the implication on our msg3 design.
- Huawei think we can wait for SA2 and then discuss the impacts to our spec.
- Ericsson think it may not be needed to know if the ID is related to EPC or 5GC until message 5.
- LG think the most important point for us is message 3 size. Samsung share this view and so the new ID should be same size as S-TMSI.

=> Noted

CN type selection

R2-1704177 CN selection when accessing Ericsson discussion

P1

- LG think LTE eNB should be backward compatible and hence the only 5GC option is not required. Asks how we can prohibit legacy UEs from camping on the cell.
- Huawei is not sure about the only 5GC option it should be allowed if an operator wants to do this.
- Qualcomm think that the 5GC case needs to be supported but we will need some way to stop legacy UEs to from camping but there are ways it can be done.
- CMCC think the 5GC only case might be possible in the future but this might not be possible in first deployment.

P2

Agreements
1 An LTE eNB can belong to multiple PLMNs and per PLMN the CN type can be: (1) EPC only, (2) both EPC and 5GC
FFS: Whether connectivity to 5GC only should be supported.
FFS: Whether the type of CN connectivity is uniform across a PLMN, or across a TA of the PLMN, or can be per eNB.

=> Send LS to SA2 to ask for input on the 2 FFS points. (Ericsson, offline discussion 34). Draft in R2-1706002

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R2-1706002 [DRAFT] [LS on input of the 2 FFS points in 4177] Ericsson LS out Rel-15 LTE_5GCN_connect-Cor SA2

=> Approved in R2-1706129

R2-1704804 Initial access in E-UTRA connected to 5GC Intel Corporation discussion

R2-1705709 Network selection for initial access in E-UTRA connected to 5GC Huawei, HiSilicon discussion

Slicing

R2-1704174 Slicing for LTE connected to 5G-CN Ericsson discussion

R2-1704678 Consideration on the impact of NW slicing on E-UTRA ZTE Corporation discussion

R2-1705711 Network slicing for E-UTRA connected to 5GC Huawei, HiSilicon discussion

QoS

R2-1705710 Flow based QoS framework for E-UTRA connected to 5GC Huawei, HiSilicon discussion

R2-1704173 QoS for LTE connected to 5G-CN Ericsson discussion

Access control

R2-1705712 Access Control for UE accessing 5GC via LTE Huawei, HiSilicon discussion

R2-1705642 Design principles for LTE connectivity to 5G-CN LG Electronics discussion

R2-1705677 Access control for LTE connected to 5G-CN LG Electronics discussion

R2-1704175 LTE access control when connected to 5G-CN Ericsson discussion

R2-1704677 Consideration on access barring for E-UTRAN connects 5G-CN ZTE Corporation discussion

Inter-RAT mobility

R2-1704178 Inter-system and inter-RAT mobility for LTE connected to 5G-CN Ericsson discussion

R2-1704827 Handover involving EPC and 5GC Sony discussion

R2-1705713 Discussion on Mobility scenario for E-UTRA connected to 5GC Huawei, HiSilicon discussion

Inactive

R2-1704176 Inactive state in LTE Ericsson discussion

R2-1704539 INACTIVE state in eLTE LG Electronics France discussion

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Other

R2-1705714 [DRAFT] response LS to SA2 (S2-172730) on E-UTRA in NG-RAN (5G System) Huawei LS out

R2-1705715 [DRAFT] LS on supported features by 5GC for E-UTRA connected to 5G CN Huawei, HiSilicon LS out

R2-1704172 Security aspects of supporting LTE connected to 5G-CN Ericsson discussion

R2-1705125 Consideration on LTE connected to 5G-CN China Telecom discussion

R2-1705356 Initial considerations on E-UTRAN connected to 5G CN Samsung discussion

R2-1705743 Considerations on LTE connectivity to 5G-CN Qualcomm discussion

Withdrawn

R2-1705261 Initial considerations on E-UTRAN connected to 5G CN Samsung discussion

9.8 Positioning Accuracy Enhancements for LTE

(LCS_LTE_acc_enh-Core; leading WG: RAN2; REL-15; started: Mar. 17; target: Jun. 17: WID: RP-170813)

Time budget: 1 TU

Documents in this agenda item will be handled in the LTE Break Out session

9.8.1 Organisational

Including incoming LSs, rapporteur inputs, running CRs

R2-1705508 Work plan for UE Positioning Accuracy Enhancements for LTE work item Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 LCS_LTE_acc_enh-Core

- *Nokia clarified that in June RANP, we may get clear guidance on how to support UE based OTDOA;*
- *E/// does not mean we do not need to discuss it? Nokia we can discuss it if time is allowed.*

⇨ *Noted;*

9.8.2 GNSS positioning enhancements

UE based? UE assisted;

-RTCM based container or translate RTCM to ASN.1 fields?

RTK techniques, SSR, VRS,PPP, etc?

Unicast: RRC or LPP?

LPPa is used to send the assistance data to RAN for broadcasting?

-data rate?

-New SIB or MBMS based or multiple SIBs?

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LS to SA3 on encryption requirement? Impact on SA2/RAN3 for architecture? RAN1?

R2-1705429 Requirements and initial solution design for precise positioning support of LTE using RTK Deutsche Telekom AG, Huawei, HiSilicon, Nokia, Alcatel-Lucent Shanghai Bell, ESA, Fraunhofer IIS discussion Rel-15

Moved from 9.8.5

P1

QC we should broadcast 3GPP info instead of RTCM container. If you want to broadcast multiple GNSS, the UE still need to select which one should be supported. Nokia think in QC paper discussed to use specific IE for LPP, but it does not preclude to use container for broadcast signalling. Huawei, we can agree to have transparent container design for SIB, but the details can be discussed later. QC, we still need to define SIB based content, we do not need to define what data inside it. E// see the benefit to encode it by the eNB.Huawei, anyway we need the tag to indicate the segmentation. But the eNB does not need to decode the data, only need the tag. The UE just choose to read the data which he want to read. QC, anyway we need to do ciphering, which is out of RTCM. DT, can we agree that eNB is not requested to decode the content. Intel RTCM is more beneficial. Nokia we should discuss what different correct information is needed, and then different SIBs.

E/// we need to discuss the bitrate we need. Huawei we need to allow the SIB to contain the maximum bitrate. QC in UMTS we can have multiple SIBs. For UP solution we do not care about the content of RTCM. But here we are discussing control plane solution; we should avoid to be data channel.

P4:

QC would to see if different SIBs for different information since the requirement may be different.

P6,

QC is not so sure how to implement it in standards.

P7

QC we are on the same page, SA3 should be involved.

Huawei, RTK server is collocated with ESMLC server, so we could reuse existing architecture. Nokia, maybe ESMLC could do some RTK functions, does not mean RTK server must be collocated with ESMLC. Ublox, we donot like this collocate. QC, we only see the data from ESMLC. Ublox, the ESMLC provides the data, but the data generated by RTK server. DT agree with QC, and it is not the scope of RAN2. Intel, it is RAN3 scope. Nokia, AGNSS, we do not specify how ESMLC get the data, we can do the same way.

- ⇨ **Correct data is provided by ESMLC. We will not discuss how ESMLC get this data in 3GPP.**
- ⇨ **Send LS to SA3 on the provision of an encryption solution for broadcast solution in** R2-1705989**. [Ericsson]**

R2-1705509 RTK GNSS positioning enhancement Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 LCS_LTE_acc_enh-Core

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P1:

ZTE: only UE based RTK should be supported; DT do not see the use case to let the UE to send back the measurement result to server. DT support UE based solution. QC support everything in this paper. QC understand it is standalone, but not UE based or UE assisted. QC it is CP solution, should be UE based or UE assisted. Standalone will be supported if we support UE based or UE assisted. Nokia UE based is more suitable. But for low cost, may need UE assisted. Huawei, support both UE based and UE assisted since A-GNSS also have these two. DT what feedback will be for UE assisted?QC UE could feedback carrier phase, etc. Intel how to define assisted; LG, can we use hybrid mode.

⇨ **To support both UE based and UE assisted for RTK GNSS. How to support them is FFS.**

P2

Huawei it has been specified in 36.214, so we do not need LS to RAN1. Nokia maybe we should consult RAN1 whether 36.214 should be updated or not.

⇨ **Let's discuss the details first and then see whether to send LS to RAN1 in next meeting.**

P6, QC we need to be aware of the correction data.

P10, Huawei, there is no TU in RAN3 next meeting, so we can wait a bit.

⇨ **FFS: whether the eNB shall broadcast the corrections data as a transparent payload in the SIB and is not aware of the contents of correction data.**

R2-1704759 Introduction of Real-Time Kinematic (RTK) Positioning Qualcomm Incorporated discussion
Rel-14 LCS_LTE_acc_enh-Core

P1,

huawei, it depends on which way we choose, transparent or not. RTCM is ok but open to other mechanisms.

QC, we just to say use RTCM as baseline. Would prefer to have same solution for broadcast and unicast.

P4, QC we do not need to decide it now.

P5, Ublox would like to support PPP/SSR. Nokia also support it. Intel PPP is not part of WID. Ublox, PPP is part of RTK. DT, it also depends on whether we use full transparent solution or not. QC, PPP is not complete part of RTCM. It has been partially supported by LPPe. Intel, if L5 is not part of RTCM, we may have problem. Ublox RTCM starts from 2007 but still in version 2. QC If we specify this in 3GPP, we do not need to wait for RTCM. E/// agree P5. Huawei it depends on whether transparent or not. We should decide it first.

Nokia it is too early to narrowdown what we support for RTK.

=>decide whether transparent first, and then decide whether support SSR and PPP.

R2-1704749 GNSS augmentation via cellular networks for accurate positioning Ericsson discussion
Rel-15 LCS_LTE_acc_enh-Core

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R2-1705308	Discussion on Support for RTK Corrections for High Precision GNSS Positioning	u-blox AG	discussion	Rel-15
R2-1705338	Discussion on positioning procedure for RTK	Huawei, HiSilicon	discussion	
R2-1705336	Discussion on architecture for RTK	Huawei, HiSilicon	discussion	
R2-1705341	Draft LS on RTK positioning architecture	Huawei, HiSilicon	LS out	To: SA2,RAN3

9.8.3 Support for IMU positioning

Can only be complement to other navigation methods?

UE based? UE assisted? ESMLC based? Standalone?

IMU,measurement results, movement of a UE during a location session? (angular for Accelerometer? Linear for gyroscope) velocity? orientation, and relative position??

R2-1704750	IMU sensor based positioning	Intel Corporation	discussion	Rel-15	LCS_LTE_acc_enh-Core

ZTE, these measurement should be sent as one measurement. Intel, that could be decided later. But measurement itself should be separated performed. QC, Do not see the benefit. What's the use case to send it to server. It is not positioning measure. Huawei, IMU is used for hybrid solution. Just a assisted data together with other positioning mechanisms. Can agree UE based as baseline and investigate UE assited. Intel, they do not propose to use accelerometer as standalone. Sony how to specify it in LPP specification? E/// can UE send IMU first, and then send result, do we call it as hybrid or not?

Intel UE assited is more make sense. Huawei, the important thing we allow the UE send result + IMU raw data.

- ⇨ **Only support hybrid positioning for IMU as mentioned in WID scope.**
- ⇨ **FFS on the details of IMU raw data;**

P1:to introduce accelerometer and gyroscope sensor measurements that measure linear acceleration and angular velocity respectively.

R2-1704743	IMU positioning support over LPP	Ericsson	discussion	Rel-15	LCS_LTE_acc_enh-Core

QC, only P3/8 are related IMU. Others are already there, not dependant on IMU.

P1

Intel probability of indoor is out of WID. If the parameters related to 3axis then it is IMU parameters. Nokia, if we provide the parameters of sensor how useful it will be for ESMLC? And how often you report it. E/// it would be nice to have email discussion on the parameters, and use casese. Intel it is should be RAN1? QC, would like to see the contribution on use case instead of email discussion. Sony support E/// proposal and see the benefit to have IMU assisted info. Intel the important thing is whether UE send assisted info to network. For UE based, UE already have it. QC, have no idea how ESMLC can behave on it.

Nokia, email discussion or contribution in next meeting either way is ok, but should show the benefit.

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Intel the benefit should be evaluated in RAN1. Nokia RAN1 cannot help, it is related to use case.

⇨ **Noted.**

R2-1704462 Discussion on hybrid positioning including IMU related estimates ZTE Corporation discussion Rel-15 LCS_LTE_acc_enh-Core

R2-1704761 IMU positioning Qualcomm Incorporated discussion Rel-15 LCS_LTE_acc_enh-Core

R2-1704826 Introduction to IMU for indoor positioning Sony discussion Rel-15 LCS_LTE_acc_enh-Core

Moved from 9.8.2

R2-1705340 Discussion on IMU positioning Huawei, HiSilicon discussion

9.8.4 UE-based OTDOA positioning

What additional assistance information is required?

R2-1704760 Introduction of UE-Based OTDOA Positioning Qualcomm Incorporated discussion Rel-14 LCS_LTE_acc_enh-Core

R2-1705339 Discussion on UE based OTDOA positioning Huawei, HiSilicon discussion

R2-1704468 Discussion on modifications of UE-based OTDOA positioning ZTE Corporation discussion Rel-15 LCS_LTE_acc_enh-Core

9.8.5 Broadcasting of assistance data

Broadcasting for A-GNSS, RTK, OTDOA?

R2-1704745 Positioning assistance data broadcasting Ericsson discussion Rel-15 LCS_LTE_acc_enh-Core

R2-1704746 Encryption of assistance data broadcasting Ericsson discussion Rel-15 LCS_LTE_acc_enh-Core

R2-1705337 Discussion on SIB design for assistance data broadcasting Huawei, HiSilicon discussion

R2-1704748 draft LS on encrypting broadcasted positioning data Ericsson discussion Rel-15 LCS_LTE_acc_enh-Core

10 WI: New Radio (NR) Access Technology

(NR_newRAT-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Jun. 18: WID: RP-170847)

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10.1 Organisational

Incoming LSs, work plan, status from other groups, etc.

LSs

R2-1704003 LS on network slicing and 5GS network selection (C1-171940; contact: Qualcomm) CT1 LS in

=> Noted

R2-1704004 Reply LS on security in E-UTRA-NR Dual Connectivity (C1-171941; contact: Ericsson) CT1 LS in

- Huawei understand this was a short discussion in CT1. Think CT1 and SA3 will continue to discuss so we can just wait and keep our original preference.

=> Noted

R2-1704007 LS on unified Access Control for 5G NR (C1-171965; contact: Intel) CT1 LS in

- MediaTek understand that CT1 think it is feasible to go in the direct we asked. Intel understand that both CT1 and RAN2 will progress this week.

=> Response LS in R2-1705984 (Intel, offline discussion 26)

=> Details of response to be determined after contributions are treated

R2-1705984 [DRAFT] [Response LS on unified Access Control for 5G NR] Intel LS out Rel-15 FS_NR_newRAT To: RAN2, SA2, SA1

=> Remove question 1.

=> SA2 CC

=> Revised in R2-1706135

R2-1706135 [DRAFT] [Response LS on unified Access Control for 5G NR] Intel LS out Rel-15 FS_NR_newRAT To: RAN2, SA2, SA1

=> Approved in R2-1706154

R2-1704012 LS reply to SA2 on maximum data rate (R1-1706857; contact: MediaTek) RAN1 LS in

- MediaTek thinks we need to response to address the part left to RAN2
- DOCOMO thinks the same question was asked to RAN1 and RAN2 so we can just confirm the RAN1 response.
- MediaTek think we need to discuss UE capabilities first.
- Ericsson think that the physical layer is the same for SA and NSA so the throughput is the same. MediaTek the difference is that the max bit rate may not be the combined rate of LTE and NR.

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- LG wonders if we need to give a rate for the combination of LTE and NR.

=> We can response to confirm the RAN1 answer and that peak rates for option 3 are the same as SA.

=> Response LS in R2-1705985 (MediaTek, offline discussion 27)

R2-1705985 [DRAFT] [Response LS on maximum data rate] MediaTek LS out Rel-15 5GS_Ph1, EDCE5 To: SA2; Cc: RAN1

=> Approved in R2-1706155

R2-1704016 LS regarding RAN support for NW slicing (R3-171394; contact: Huawei) RAN3 LS in

- Lenovo think we also have an LS from SA3 about sending the NSSAI unprotected.
- Huawei think it can be discussed separate from the security issue.
- DOCOMO ask how large it will be. Huawei think we don't yet know this. Ericsson think it could be a list of 8 S-NSSAIs of 32 bits each.

=> Details of response to be determined after contributions are treated

R2-1704017 Reply LS on N2 and N3 reference points for 5G system (R3-171401; contact: Qualcomm) RAN3 LS in

=> Noted

R2-1704021 LS on required NR parameters from RAN4 perspective (R4-1704216; contact: NTT DOCOMO) RAN4 LS in

- DOCOMO explain that action is a mistake and we are just cced with no action.

=> Noted

R2-1704025 LS on the need for EPS Bearer ID knowledge in NG-RAN for (inter-RAT) inter-system handover (S2-172864; contact: Intel) SA2 LS in

=> Details of response to be determined after contributions are treated

R2-1704026 LS on Dual Connectivity with 5GC (S2-172866; contact: NTT DOCOMO) SA2 LS in

- Vivo think we have an agreement from last meeting.
- Ericsson think this will cause more effort in the RAN-CN interface and from RAN2 point of view don't see the need for the feature.
- DOCOMO understand that the PDU session can be mapped to both but we need to discuss how to realise it
- ZTE think the question if for RAN3 and so we can wait for RAN3 to discuss.

=> Can decide whether to send a response based on the contributions to be discussed.

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=> Send LS response that RAN2 took agreement from RAN2 point of view that we would allow this (copy agreements from last meeting) and we leave SA2/RAN3 to consider whether it can be supported from network perspective.

=> LS in R2-1705988 (DOCOMO, offline discussion 30)

R2-1705988 [DRAFT] [Response LS on LS on Dual Connectivity with 5GC] NTT DOCOMO LS out Rel-15 5GS_Ph1 To: SA2, RAN3

=> Revised in R2-1706134

R2-1706134 [DRAFT] [Response LS on LS on Dual Connectivity with 5GC] NTT DOCOMO LS out Rel-15 5GS_Ph1 To: SA2, RAN3

=> Approved in R2-1706156

R2-1704216 LS on indication of PRACH resources for non-contention based Random Access (R1-1706716; contact: Intel) RAN1 LS in

=> Noted

R2-1705837 Reply LS on Data rates and Latency with NR, E-UTRA, EPS and 5GS (contact: Vodafone SA1

- LG ask for option 3 the LS indicates reduce CP latency to 5ms. This seems challenging for LTE.

=> Noted

R2-1705838 LS (S1-172168/C1-171940) on network slicing and 5GS network selection from CT1 SA1

- Qualcomm think in our email discussion many companies thought it would impact PLMN selection but this clarifies that is not needed.

=> Noted

R2-1706041 Response LS on CSI-RS for beam management and RRM measurements (R1-1709581; contact: ZTE) RAN1 LS in Rel-15 NR_newRAT-Core To: RAN2

- New LS in

=> Noted

R2-1706057 Reply LS on in-sync/out-of-sync indication for RLF (R1-1709705; contact: NTT DOCOMO) RAN1 LS in Rel-15 NR_newRAT-Core RAN2

=> Noted

Other

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R2-1704137 RAN WG's progress on NR WI in the April meeting 2017 NTT DOCOMO, INC. (Rapporteur) discussion

=> Noted

Withdrawn

R2-1704013 LS on Status of Higher-Layer Functional split between Central and Distributed unit (R3-171306; contact: AT&T) RAN3 LS in

- *Already handled at RAN2#97bis*

10.2 Stage 2 and common UP/CP aspects

10.2.1 Stage 2 TSs and running CR

Latest TS 38.300, TS 37.340 and running CR to 36.300

Including output from email discussion [97bis#08][NR] 38.300 (Nokia)

Including output from email discussion [97bis#09][NR] 37.340 (ZTE)

38.300

R2-1704296 TS 38.300-013 Rapporteur (Nokia) draft TS38.300 0.1.3

=> Noted

R2-1704298 TS 38.300-020 Rapporteur (Nokia) draft TS38.300 0.2.0

- revised to R2-1704452

R2-1704452 TS 38.300-021 Rapporteur (Nokia) draft TS38.300 0.2.1

- Captures the agreements from last meeting as output from email discussion
- Qualcomm think it captures an agreement on RLF on max retries in RLC but that is not agreed. MediaTek think this is agreed as one criteria.

=> Change max retries in RLC to RLC failure.

=> Endorsed as current status of the work in R2-1705994 v0.3.0

R2-1705330 TP for capturing RRM Model in Stage-2 Samsung discussion

- Samsung explains that this captures exactly the agreements from last time and is based on LTE text. The FFS is not reflected.

=> Noted

37.340

R2-1704898 37340-010 ZTE Corporation draft TS37.340 0.1.0

- Captures the agreements from last meeting as output from email discussion
- Nokia suggest to consider what terminology to use for S-KeNB

=> Endorsed as current status of work

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36.300 running CR

R2-1705569 Introduction of New Radio Access Technology in TS 36.300 NTT DOCOMO, INC. CR 36.300 14.2.0 0998 1 B Rel-15 NR_newRAT-Core

- ZTE wonders whether 36.300 needs to cover things specific to EN-DC in this spec. There is no duplication in 37.340 and 36.300

=> Remove "- Duplicate detection of lower layer SDUs in case of multi-connectivity as specified in TS 37.340 [xx]."

=> Add a generic point to 37.340 for differences relative to LTE.

=> Revised in R2-175995 (DOCOMO, offline discussion 31)

R2-1705995 Introduction of New Radio Access Technology in TS 36.300 NTT DOCOMO, INC. CR 36.300 14.2.0 0998 2 B Rel-15 NR_newRAT-Core

=> Endorsed as current running CR

10.2.2 User Plane

Architectural and stage 2 aspects of NSA and SA operation.

For more detailed aspects only impacting a single layer then please submit documents to the appropriate stage 3 agenda item. Note that UL bearer split for NSA will be handled in user plane as agreed during RAN2#97bis.

Split bearer definition for NSA, L2 handling at bearer type changes and mobility events, packet duplication

Including output from email discussion [97bis#12][NR] Bearer type change (Huawei)

Including output from email discussion [97bis#13][NR] Control of UL PDCP duplication (Huawei)

Split bearer defintion

R2-1704414 On the different bearer options Ericsson discussion Rel-15 NR_newRAT-Core

P1

- ZTE ask if this means that we adopt NR PDCP for LTE side as well. Ericsson agree that this means the network will have the flexibility to configure NR PDCP of LTE side for UEs that support it. ZTE also ask if it should be possible for an MCG bearer. Ericsson confirm this is their intention.
- Intel think that what we need is a common configuration of NR and LTE PDCP but not that we use NR PDCP in LTE.
- LG think these proposals assume there is only one type of PDCP.
- Samsung think it should be clear that the proposal is NR PDCP for both split bearer types.
- Intel think the objective could be achieved that NR PDCP has the same configuration as LTE PDCP.
- Qualcomm see benefit is reducing market fragmentation and can reduce testing efforts. Huawei also agree and support this but don’t see the point to use to use it for MCG bearer only.

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- ZTE think we agreed to keep the LTE PDCP on LTE and we should be careful before we change this.
- Ericsson think it is better to NR PDCP in LTE than to force NR PDCP to be able to behave as LTE PDCP.
- Vodafone think it is better to use NR PDCP in all cases and then reconfigure to LTE PDCP when UE moves to an area that does not support it.
- Samsung wonders whether we can decide now as we don't know what NR PDCP look like. CATT support Samsung's view. CATT think even if we use a common PDCP layer it is possible the configurations will be different.
- Nokia support Ericsson and think the aim is to unify bearers to it is transparent to UE where PDCP is located. DOCOMO support this view and thinks it is a matter of taste whether it is called NR or LTE PDCP.
- ZTE wonder about the security implications, which key is used for this bearer.
- CMCC is concerned about possible need to update LTE eNB to support NR PDCP.
- DOCOMO think we have already established that there is not much different between NR PDCP and LTE PDCP.

=> Discuss offline and comeback Friday to see it is possible to agree or take a working assumption that NR-PDCP layer is used for both MCG split bearer and SCG split bearer. (Ericsson, offline discussion 32)

- Update from offline: There was wide consensus to harmonise and desire to move in that direction. There do not seem to be big differences between NR and LTE PDCP based on progress this meeting. Companies wanted to check further offline and so it can be discussed next meeting

=> RAN2 aim to make a decision on bearer type unification at the next meeting

R2-1704798 RRC aspects of unifying split bearer types Intel Corporation discussion NR_newRAT-Core

R2-1704343 Further analysis of unified split bearer - UE procedure aspects NTT DOCOMO INC. discussion Rel-15 NR_newRAT-Core

R2-1704152 Further analysis of unified split bearer – NW aspects NTT DOCOMO, INC. discussion Rel-15 NR_newRAT-Core

R2-1704271 Possibilities to unify split bearer type options for LTE-NR DC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1705153 Merged bearer type for SCG and SCG split bearer Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704797 Support of SCG bearer Intel Corporation discussion NR_newRAT-Core

- Discussed jointly with previous paper.
- Huawei think there are 2 purposes, to reduce specification work and to reduce test cases. Think if UE passes test cases for split bearer then it will support SCG bearer. Intel see risk that they could test split bearer with a network that only puts traffic over SCG bearer and then later a network that routes traffic over both could cause problems.
- Qualcomm have strong concern with having to support SCG split bearer if the UE supports SCG bearer. So we need separate capabilities.

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- Nokia think the intention to remove SCG bearer from the spec. Think how the packets are scheduled should not impact IOT.
- DOCOMO think it is good to reduce UE options so SCG bearer is a network option whether the network schedules.
- CMCC don't see why we would remove SCG bearer as it has been in LTE DC for some time.
- MediaTek share the view of Qualcomm that capabilities will still be needed.
- BlackBerry also think there needs to be 2 capabilities but also that there should be separate bearers. A similar approach was taken in LWA and it was not a clean approach in the end.
- Nokia wonder what is the extra complexity of the split bearer. Qualcomm think initial deployments will rely on separate LTE and NR modem and for this it is easier to have SCG bearer.
- LG think there would be 2 types of bearer if we go this way, MCG bearer and split bearer, which would be non symmetric. So it makes sense to keep SCG bearer.
- Vivo support Qualcomm's concern and the split bearer will impact buffer requirements.

=> Noted

Bearer type change

R2-1705155 Summary of email discussion of Bearer type change Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704339 Reconfiguration between MCG split and SCG split NTT DOCOMO INC. discussion Rel-15 NR_newRAT-Core

R2-1705109 Avoiding L2 reset at bearer-type reconfigurations Nokia, Alcatel-Lucent Shanghai Bell discussion

R2-1704139 L2 entity handling at bearer type change LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1704415 Bearer type switching in dual connectivity Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704828 Bearer Type change Sony discussion Rel-15 NR_newRAT-Core

R2-1705154 Direct type change between MCG split bearer and SCG split bearer Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Packet duplication - UL control

R2-1704834 Summary of email discussion [97bis#13][NR] Control of UL PDCP duplication Huawei discussion Rel-15 NR_newRAT-Core

- Intel agree for DRB but think that it is not so useful for SRB. Concern is for LTE/NR DC case. Concern is that splitting transmission power will mean not much gain for reliability.
- Ericsson think that it will depend on the solution whether the transmit power will be split.
- Qualcomm wonder what is the difference between NR-NR case and EN-DC case.
-

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Agreements
1 UL PDCP duplication is configurable per DRB and, for NR-NR DC case, per SRB.
FFS whether the initial state of the UL PDCP duplication (duplication active or not active and if not active which leg is used) is a default or whether the initial state can be signalled by RRC
2 RAN2 will attempt to define at least one mechanism to start/stop PDCP duplication more quickly and with less signalling overhead compared to RRC reconfiguration.

R2-1704660 Consideration on the activation/deactivation of data duplication for CA ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1705056 Discussion on PDCP duplication control Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1704835 Dynamic Activation/Deactivation of Packet Duplication Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

- Discussed jointly with 2 previous contributions.
- Ericsson prefer this functionality to be localised in PDCP and hence prefer to use PDCP control PDU. LG also prefer PDCP control PDU. It allows duplication control per radio bearer whereas MAC CE would be for all radio bearers
- CATT support activation by MAC CE as it is faster than PDCP to reflect fast changing conditions. And don't see the need to be DRB specific control.
- Huawei would like to understand the triggers for changing the duplication.
- Nokia prefer MAC layer as it is fast and assume it is better to trigger it with a layer that is different from the one with the problem.
- Lenovo do not think there is a big delay difference and the network can control the prioritisation of the PDCP PDU.
- BlackBerry think that quick reaction to changes in channel conditions. We also can't assume the DL control will be received in time and hence we will need a UE based trigger and it has no signalling overhead.
- OPPO prefer the MAC CE.
- ZTE think the MAC CE approach enables the control to be sent via either leg.
- MediaTek share the view of BlackBerry. Of the 2 network control approaches then MAC CE works better.
- Vivo prefers the MAC CE case.

=> Offline discussion to try to conclude (Huawei, offline discussion 36)

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- Update from offline: No consensus in the discussion. More questions were identified than conclusions.
- DOCOMO think that at least RRC configuration whether the duplication is enabled or disabled could be agreed.

Solutions for control of UL duplication

- PDCP [10]
- MAC CE [15]

Agreement
=> MAC CE approach will be used for control of UL duplication. Optimisations to reliability of the MAC CE will not be introduced for this mechanism. No optimisations or additional interactions between network nodes are introduced for this mechanism.

R2-1705416 Activation and Deactivation of UL PDCP duplication ASUSTEK COMPUTER (SHANGHAI) discussion NR_newRAT-Core

R2-1704247 Configuration and activation/deactivation of duplication CATT discussion Rel-15 NR_newRAT-Core

R2-1704916 Control of PDCP duplication InterDigital discussion Rel-15 NR_newRAT-Core

R2-1704941 Enable/Disable PDCP Duplication SHARP Corporation discussion Rel-15

R2-1705266 Activation and Deactivation of UL PDCP duplication NEC discussion Rel-15 NR_newRAT-Core

R2-1705727 Discussion on Packet Duplication Samsung discussion

R2-1704374 PDCP Dynamic reconfiguration of split bearer or duplication Ericsson discussion Rel-15 NR_newRAT-Core

moved from 10.3.3.3 to 10.2.2

Packet duplication - other

R2-1704838 Further L2 aspects to support PDCP duplicates with the same carrier in CA case Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Proposal 1: Support PDCP duplicate within the same carrier in CA case.

Proposal 2: Enhance LCP rules to prevent the duplicates from being multiplexed in the same MAC PDU, i.e. when data from one logical channel is put in the MAC PDU, data from the duplicated logical channel will not be multiplexed in this MAC PDU.

R2-1705240 Packet duplication in CA LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

- Discussed jointly with previous contribution.

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- Nokia think it would be useful to support duplication in the same carrier. The use case if to avoid wasting grants. ZTE support this view and think this is motivated by delay. Vivo also support this approach,
- OPPO think it is better not to support the duplication on the same carrier.
- Samsung support LGs proposal and think ARQ provides sufficient time diversity. Qualcomm also support this view. CATT think that Phy can do a better job. Intel also share the view of LG, Samsung. Ericsson think this is not need and the eNB can also adjust the code rate to give sufficient reliability. Lenovo also support the LG view.
- Xiaomi support Huawei's proposal.
- AsusTek think that a URLLC service may need to be supported by a single carrier and so this option should be supported.
- BlackBerry think for grant free it should be a rule for the UE to transmit on different carriers but for grant based support the Nokia approach.
- MediaTek think duplication on the same carrier is not needed
- DOCOMO think we should avoid RAN1 impact and hence support the LG proposal.
- Interdigital think there would not be much macro diversity for the single carrier case.
- Nokia is concerns about fixing the mapping to carriers. It should be enough to ensure that 2 logical channels are not in the same TB.

Show of hands:

1 Support duplication on a single carrier [11]

2 Do not support duplication on a single carrier [21]

Agreements for duplication in CA case
1 Duplication on a single carrier will not be supported
2 RRC configured mapping of the 2 duplicate LCHs to different carriers will be supported (One carrier cannot have both of the duplicate LCHs mapped to it)
3 Duplicated PDCP PDUs are submitted to two different RLC entities

R2-1704836 Interaction between PDCP/RLC/MAC for Packet duplication Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704837 Packet Duplication for SRBs in DC and CA Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704249 PDCP and RLC enhancements in support of duplication CATT discussion Rel-15 NR_newRAT-Core

R2-1704246 Applicable RLC modes for duplication CATT discussion Rel-15 NR_newRAT-Core

R2-1704248 Mapping of logical channels onto CCs in CA with duplication CATT discussion Rel-15 NR_newRAT-Core

R2-1704578 Duplication data in CA vivo discussion

R2-1705055 Further details of PDCP duplication for CA case Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

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R2-1705418 PDCP Duplication on Single Cell scenario ASUSTEK COMPUTER (SHANGHAI) discussion NR_newRAT-Core

Other

R2-1705063 PDCP packet switching for split bearer Qualcomm Incorporateddiscussion Rel-15 NR_newRAT-Core

- Lenovo think this could be achieved by the threshold based approach. LG have the same understanding and think only proposal 3 is new. Nokia agree with LG.
- Qualcomm think the current DC approach allows this but thinks it is useful for the UE to know that the network intends to operate in this mode.
- Qualcomm explain this is with the understanding that the bearers are unified.
- BlackBerry think there should be SCG and MCG bearers and this discussion should only be for split bearer and in this case the functionality is already supported in DC.
- Intel understand that P1 and 2 are like LTE DC and the new part if proposal 3.

=> Noted

R2-1704416 Inconsistencies regarding the agreements on the split bearer handling in case of RLF Ericsson discussion Rel-15 NR_newRAT-Core

- LG have the same understanding as Ericsson and support the proposal. Nokia also have the same view.

=> Offline discussion to try to clarify or modify the previous agreements that appear to conflict. (Ericsson, offline discussion #37).

- Update from offline: Concluded it was possible to have a common UE behaviour for all SCG failure cases. Also agreed to ask SA3 the question about UE behaviour in integrity check failure on any DRB which is included in another LS.

=> Ask SA3 if it is ok for data from MCG to be sent over an SCG when there has been integrity check failure on SCG. Also ask SA3 if it is ok for data from SCG to be sent over MCG if there has been integrity check failure in SCG. Can be combined in other LS (related to offline discussion 42). Details of questions to be progressed by email

Agreement:
Working assumption (SCG integrity protection failure case is to be confirmed after SA3 response) : At SCG failure (all cases) only the SCG part of MCG/SCG split bearers should be suspended. (Already agreed for the SCG bearer and the SCG SRB)

R2-1704839 Further details of PDCP – RLC Mode Mapping Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Agreements
1 In NR, minimum SI, other SI (when broadcast), paging signalling and SRB0 is mapped on RLC TM.

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R2-1704368 On the addition of ECN support in PDCP Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704839 Further details of PDCP – RLC Mode Mapping Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705061 Reduce per packet processing Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1705156 L2 handling upon inter/intra RAT HO for LTE-NR DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705724 Discussion on PDCP SN Reconfiguration Samsung discussion

R2-1705794 Further considerations on DRB CMCC discussion Rel-15 NR_newRAT-Core

R2-1704157 Random Access Procedure for RRC INACTIVE State Samsung Electronics Co., Ltd discussion Rel-15

moved from 10.3.1.4 to 10.2.2

Withdrawn

R2-1705272 Numerology change and mixed numerologies SHARP Corporation discussion

=> Withdrawn

R2-1705273 Numerology change and mixed numerologies SHARP Corporation discussion

=> Withdrawn

10.2.3 MN/SN procedures for NSA

Continue to progress MN/SN procedures, MN/SN roles/responsibilities, information passed between nodes, etc.

MN/SN measurement coordination

Note that UE capability coordination will be discussed under 10.2.6 together with other UE capability topics.

Including output from email discussion [97bis#10][NR] MN/SN measurement coordination (DOCOMO)

MN/SN measurement coordination

R2-1704138 Summary of email discussion [97bis#10][NR] MN/SN measurement coordination NTT DOCOMO, INC. (Email discussion rapporteur) report Rel-15 NR_newRAT-Core

- Qualcomm think the number of events is a quite large number and the number of objects is the critical one.

P2

- Intel think we could first discuss if the two nodes are allowed to configure a measurement object on the same carrier. Qualcomm this this should be ok from the UE side and it should be considered as one object from the UE point of view.
- Samsung wonder if there is a need to configure a measurement object on the NR frequency to enable inter-RAT handover to the NR serving frequency. Huawei think we already agree to support the case that the MN can maintain a measurement object in the SN.
-

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Agreements

1: At least, the total number of measured carriers across LTE and NR needs to be coordinated between MN and SN so that it does not go beyond the UE capability.

FFS if there are any other UE capabilities related to measurements for which coordination is required across LTE and NR.

=> Ask RAN4 if they will specify requirements for number of measured carriers and number of events to be supported when UE is operating in EN-DC. Ask if they may specify other requirements that might need coordination.

=> Draft LS in R2-1706035 (DOCOMO, offline discussion 41)

Agreements:

2: If MN and SN both configure a measurement object on the same carrier frequency then the measurement objects need to be configured consistently.

FFS which parts of the object need to be configured the same and which can be allowed to differ.

3 For MCG and SCG, measurements (objects/ID/reportConfigs) can be configured independently by LTE RRC (inter-RAT measurement on NR) and NR RRC (intra-NR measurements on serving and non serving frequencies). (noting that for the objects will be configured consistently as described by agreement 2)

=> Ask RAN4 which parts of the objects (we can provide details for the object parameters) from MN and SN should be the same. If RAN4 response indicates further problems then we can reconsider these agreements.

=> Offline discussion to try to conclude whether we need to support the case that MN and SN are able to both configure measurements on the same NR frequency (relates to 2 FFS points from last meeting). Note agreement last time was that MN should be able to at least do inter-RAT HO to NR and consequence of this is that some measurements of the NR serving cell/frequency need to be available in MN. (Nokia, offline discussion 40)

- Udate from offline: Included in R2-1706139

R2-1706139 Offline discussion: 40 MN/SN measurements coordination

=> Potential agreements are confirmed

R2-1706035 [DRAFT] [LS to RAN4 on MN/SN measurement coordination] NTT DOCOMO LS out Rel-15 NR_newRAT-Core RAN4

=> Approved in R2-1706140

R2-1705133 Measurement Configuration coordination between MN and SN Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704655 Consideration on the measurement coordination in LTE/NR tight interworking ZTE Corporation discussion Rel-15 NR_newRAT-Core

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R2-1704344 LTE-NR DC measurement framework and coordination aspects Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1705068 Measurement Configuration for NR SCG Addition Samsung Electronics Co., Ltd discussion

R2-1705630 Clarification of inter/intra-frequency mobility in EN-DC NTT DOCOMO, INC. discussion Rel-15 NR_newRAT-Core

R2-1704217 Consideration on inter-RAT handover in case of IWK CATT discussion Rel-15 NR_newRAT-Core

R2-1704419 RRM measurement framework for EN-DC Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704657 Consideration on the SN RRC message forwarding ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704814 UE and network handling for NR measurement in EN DC Intel Corporation discussion NR_newRAT-Core

R2-1704951 Consideration on inter-RAT measurement in EN-DC China Telecom Corporation Ltd. discussion NR_newRAT-Core

R2-1705134 General considerations on LTE-NR DC measurement Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705135 Measurement Events for LTE NR-DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705222 [DRAFT] LS on UE measurement capabilities across LTE and NR NTT DOCOMO, INC. LS out Rel-15 NR_newRAT-Core To: RAN4

R2-1705223 Measurement report triggering events required for EN-DC LG Electronics Inc. discussion

R2-1705267 Measurement coordination in LTE-NR DC NEC discussion Rel-15 NR_newRAT-Core

R2-1705277 Measurement and reporting configuration coordination in EN-DC Guangdong OPPO Mobile Telecom. discussion Rel-15

R2-1705619 Measurement capability change in LTE-NR DC Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1705746 Inter-node measurements in EN-DC Qualcomm discussion

R2-1705790 Measurement report in LTE-NR DC CMCC discussion Rel-15 NR_newRAT-Core

Other MN/SN procedures

R2-1705345 EN DC inter-node interaction, overview and RAN2/ RAN3 scope Samsung Telecommunications discussion Rel-15

Agreements for all MR-DC options:

1) SN decides the PSCell

2) For SCG cell addition case MN provides measurements to SN (for deciding PSCell)

3) RRC inter node messages (outside of the UE configuration that is exchanged) are used for UE capability coordination related fields

FFS whether we have a concept of source and target, and if so whether SN/MN is considered as source/target for MR-DC.

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4) MN can initiate UE capability re-negotiation (as SN can do)

✉ **[98#xx][NR] SN/MN information exchange (Samsung)**

Progress the details of the radio related information exchanged in case of MR DC (related to proposal 4 in R2-1705345)

Intended outcome: Report to next meeting

Deadline: Thursday 2017-06-01

R2-1705069 Remaining Issues on SCG Release Procedure Samsung Electronics Co., Ltd discussion

Agreements for all MR DC options:

1: The SCG release message transmitted over SCG SRB will not be supported.

2: When SCG is released the network should have means to change the bearers back to MCG bearers, or move bearers to another SCG.

FFS: Further details will be discussed in stage 3.

R2-1705142 Direct SCG (Split) Bearer Setup in EN DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Agreement

1 For MR DC, it is allowed that all DRBs are configured in SCG (i.e. no DRBs configured in MCG) (assuming that a DRB was previously established in MCG.

R2-1704658 Consideration on the stage 2 signalling procedure for LTE/NR tight interworking ZTE Corporation discussion Rel-15 NR_newRAT-Core

=> Intention is that these 2 TPs will be discussed by email until the next meeting. Whether to have a common RAN2/3 discussion on one reflector to be discussed by chairs

✉ **[98#xx][NR] TP to 37.340 - option 3 (ZTE)**

Review to 37.340 on option 3 (provided in R2-1704659). RAN3 will review RAN3 relevant aspects and when their review is complete the outcome will be merged into this TP. RAN3 delegates are invited to participate in the continuing review on RAN2 reflector after this merge.

Agreements from this meeting are also to be included.

Intended outcome: Agreeable TP to next meeting

Deadline: Thursday 2017-06-12

✉ **[98#xx][NR] TP to 37.340 - option 4/7 (ZTE)**

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Review to 37.340 on option 4/7 (provided in R2-1705415).

RAN3 delegates are invited to participate in the review on RAN2 reflector.

Agreements from this meeting are also to be included.

Intended outcome: Agreeable TP to next meeting

Deadline: Thursday 2017-06-12

R2-1704659 Initial Stage2 TP for EN-DC procedures ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1705415 Initial Stage2 TP for MN/SN procedures for MR-DC with 5GC ZTE Corporation discussion Rel-15

R2-1704082 SN addition procedure Guangdong OPPO Mobile Telecom. discussion Rel-15

R2-1704083 SN management in suspend state Guangdong OPPO Mobile Telecom. discussion Rel-15

R2-1704283 Secondary node change procedure for 0ms interruption time in LTE-NR tight interworking TCL Communication Ltd. discussion Rel-15 NR_newRAT-Core

R2-1704347 Scenarios for MN and SN coordination in LTE NR DC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1704420 Addition, modification and release of DRBs in EN-DC Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704346 Further considerations for SCG SRB and RLF handling Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1704349 Comparison of RRC reconfiguration latency for SCG SRB with MCG routed SRB Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1704650 Consideration on the intra-MN handover without SCG change involved ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704651 Consideration on the counter check procedure in LTE/NR tight interworking ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704652 Consideration on the capability restriction update procedure in LTE/NR tight interworking ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704654 Discussion on data forwarding in LTE/NR tight interworking ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704656 Consideration on the LTE/NR tight interworking with NGC ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704702 RRM measurement configuration in case of EN-DC procedures Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704796 EN-DC procedures and network handling Intel Corporation discussion NR_newRAT-Core

R2-1704799 Inter-Node coordination signalling in EN-DC Intel Corporation discussion NR_newRAT-Core

R2-1704813 Network and UE handling of merging split bearer types Intel Corporation discussion NR_newRAT-Core

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R2-1704829 Intra SN mobility and MN involvement Sony discussion

R2-1705128 Transmission of SN RRC messages HTC Corporation discussion NR_newRAT-Core

R2-1705136 Inter-Node message design for LTE-NR DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705137 Consideration on SN change for LTE-NR DC option 4 and 7 Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705138 Intra SN change with or without MN involvement Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705139 Detailed procedure of Secondary Node change Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705140 TP for Secondary Node Change Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705141 S-KeNB related issues for LTE-NR interworking Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705143 DL Flow control for EN-DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705558 SN change for tight interworking between LTE and NR LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1705643 SN addition/release procedure with split SRB LG Electronics discussion Rel-15 NR_newRAT-Core

R2-1705791 MN handover to the serving SN frequency CMCC discussion Rel-15 NR_newRAT-Core

R2-1705804 Multi-Connectivity operations and text proposal HTC Corporation discussion NR_newRAT-Core

10.2.5 Other NSA specific aspects

Any remaining stage 2 aspects of SCG SRB, split SRB, SN/MN failure handling, system information, security, etc

SCG SRB

R2-1704919 Modeling of SCG SRB InterDigital discussion Rel-15 NR_newRAT-Core

P2

- Intel don't see the need for SCG SRB to be added in SCG modification. IDC think the intent was to cover the SN change case and agree this is covered without modification. CATT also agree.
- Nokia prefer to always have SCG SRB configured but the configuration might need to be modified.
- Huawei agree it is not needed in SCG modification. It should be done when SCG is added and no not need to do it when a configuration is change.
- Ericsson think there is no additional effort to support it in SCG modification.
- Nokia think that MN does not even need to know is SCG SRB exists.
- Intel think that even if SCG SRB is configured then the SN still as the choice to route messages via MN.

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- Qualcomm see some point to always configure SCG SRB.
- LG think adding SCG-SRB in SCG modification is not frequent case and so not needed.

Agreements for EN-DC and NGEN-DC:
1: SCG SRB is modelled as one of the NR SRBs defined in 38.331.
2: SCG SRB uses NR-DCCH logical channel type.
3: A UE can be configured with both split MCG SRB and SCG SRB simultaneously.
4: SCG SRB and the SCG leg of split SRB1/2 will be independently configured
5: SCG-SRB establishment and release can be done at SCG addition and SN change
6 SCG-SRB reconfiguration can be done at SCG modification procedure.
7 RRC PDUs on SCG-SRB are ciphered using NR PDCP.
8 RRC PDUs on SCG-SRB are integrity protected using NR PDCP.
9 Security keys for SCG-SRB are derived from S-KgNB.

R2-1705146 Security procedure for SCG RRC message via MCG SRB and SCG SRB Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

- Intel think for LTE we had a principle that the algorithm would be the same across all bearers but this would change that. Huawei think that for DC is it is allowed for them to be different.

Agreements for EN-DC and NGEN-DC:
1: Security is always activated for a SCG SRB
2: SCG RRC message sent via LTE MCG SRB is protected by LTE MCG SRB security, NR security is not used for this message.
3: When SgNB decides to add SCG, the SgNB selects cipheringAlgorithm and integrityProtAlgorithm for SCG SRB and includes them in NR RRC Container (SCG Configuration).

R2-1704221 Terminology of SCG SRB CATT discussion Rel-15 NR_newRAT-Core

- LG think the priorities can just be the same and don't need to be configured. Huawei agree that we can just have a default. Ericsson also agree that default is ok.
- CATT think it is necessary to select different priorities considering different slices.

Agreement for EN-DC and NGEN-DC:
1 The default scheduling priorities of MCG split SRB1 and SCG SRB are same

R2-1704348 Additional messages to be supported by direct RRC signalling from secondary node Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

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[moved from 10.2.3 to 10.2.5

- Ericsson think that NR is still discussing user plane IP and there is also MN counter check and hence counter check is nor needed. For capability we have agreed it is sent at the start of the connection and also it is not delay critical.
- Samsung understand that SA3 have agreed user plane IP. Also think the DC approach is sufficient.
- Huawei agree that the DC approach is sufficient where the MN performs to counter check.
- Nokia think that counter check can also be used to address HFN de sync.
- Qualcomm share the Nokia view that counter check for the case that UP IP is not configured.
- Huawei think anyway the MN has responsibility to contact the CN to solve the problem so it makes sense for the MN to do the counter check.
- Samsung think that it can be useful for the SN to request additional band information that was not originally requested by the MN. Ericsson agree this case might be needed but think it can still be done by MN as it is delay sensitive. DOCOMO think the network can ensure that the correct bands are requested by the MN.
- LG think we also need to consider whether the SN can trigger a UE capability enquiry.
- Ericsson assume the capability enquiry would be initiated by the SN but routed via the master.
- Samsung can agree that it is not critical and could be done via the MN.
- Intel think if the SN can send the enquiry transparently to the MN then why can it not be sent on the SCG SRB.
- LG thinks if SN requests additional capability then does this get provided back to the MN.

FFS Whether counter check should also be supported for on SCG SRB.

=> Send LS to SA3 to whether UP integrity protection is supported and whether counter check is needed for NR. Should explain that the question relates to all options including option 3. Also ask what network behaviour is expected when counter check detects a problem. Background should also be explained. (Nokia, offline discussion 42) R2-1706036

R2-1706036 [DRAFT] [LS on whether UP integrity protection is supported and whether counter check is needed for NR] Nokia LS out Rel-15 NR_newRAT-Core To: SA3

✉ **[98#xx][NR] LS to SA3 (Nokia)**

Intended outcome: Approved LS

Deadline: Thursday 2017-06-01

R2-1704098 MN requires the establishment of SCG SRB Fiberhome Technologies Group discussion

R2-1704220 Consideration on remaining issues of SCG SRB for IWK CATT discussion Rel-15 NR_newRAT-Core

R2-1704421 SCG SRB - Identification and mapping to logical channels Ericsson discussion Rel-15 NR_newRAT-Core

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R2-1704422 SCG SRB setup procedure Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704424 RRC race conditions in LTE-NR interworking Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704427 Transmission of NR RRC measurement configuration and reports in EN-DC Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704596 Discusion on the SCG RRC feedback after SCG SRB release vivo discussion

R2-1705144 Necessary RRC procedures and functionality for NSA and SCG SRB Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705145 Remaining issues on SCG SRB Configuration Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705149 Parallel handling of MCG split SRB and SCG SRB Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705151 Counter check for LTE-NR DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705152 Support SCG capability handling via SCG SRB Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705245 Remaining issues on SCG SRB Samsung Electronics Co., Ltd discussion

R2-1705795 The configuration issues of SCG SRB CMCC discussion Rel-15 NR_newRAT-Core

Split SRB

R2-1704789 UL split SRB in NR Intel Corporation discussion NR_newRAT-Core

- Qualcomm can see some benefit of the uplink split and would not like to preclude this option. Also thinks the same logic applies for DL.
- Ericsson wonder whether this is just duplication that is the concern. Intel is not convinced it is useful with LTE handover performance as ENDC will not help with most LTE handovers.
- Ericsson think it is difficult to have the DL SRB without the UL. Intel explain that the primary concern with duplication.
- Ericsson think it can help with robustness and delay and both UL and DL are important.
- Vodafone wonders what it the benefit of the UL split. It should be sufficient to just use the LTE link.
- Huawei see the benefit if the band is similar for LTE and NR. Vodafone think they are not similar in most cases .
- Samsung have sympathy with Intel. Don't see much gain and we should simplify the mechanisms.

=> Noted

R2-1704428 Split SRB: Remaining aspects Ericsson discussion Rel-15 NR_newRAT-Core

=> Noted

R2-1705147 UL handling for split SRB Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705246 SRB split and duplication for LTE-NR interworking Samsung Electronics Co., Ltd discussion

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R2-1705098	Split SRB: HO command duplication	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704423	Handling of split SRBs in LTE PDCP for LTE-NR interworking	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704426	Split SRB transport over X2	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704927	Split SRB and SRB duplication	InterDigital	discussion	Rel-15	NR_newRAT-Core
R2-1705108	Transmission Path for MCG Split SRB in Uplink	ITRI	discussion		NR_newRAT-Core
R2-1705148	Support of MCG split SRB in NR	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705751	Considerations on SRB split bearer and direct bearer	Qualcomm	discussion		

Other

R2-1705150	Management of DRB id in LTE-NR interworking	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core

Agreements

1 For MR-DC the DRB ID is uniquely assigned for one UE (independent of whether it is MCG or SCG DRB)

2 For EN-DC, MeNB assigns DRB ID.

R2-1704219	Transmission of NR Security Information in NSA	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1704222	Co-existence issue on NSA CP architecture	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1704341	Discussion on S-RLF	NTT DOCOMO INC.	discussion	Rel-15	NR_newRAT-Core
R2-1704425	Suspend resume in LTE-NR interworking scenarios	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704429	Measurements and signaling for fast setup	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1705062	SCG Failure Handling	Samsung Electronics Co., Ltd	discussion		
R2-1705160	SIBs needed for NSA	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705823	SN modification call flow: SCG DRB release case	Samsung	discussion		
R2-1705824	[DRAFT] LS on the support of SN modification call flow	Samsung	LS out		

10.2.6 UE capabilities

UE capabilities for both NSA and SA, including capability coordination for NSA

UE capability coordination for NSA

R2-1704223	Capability coordination for NSA	CATT	discussion	Rel-15	NR_newRAT-Core

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Agreements for capability coordination for EN-DC and NG-EN-DC
1: For each LTE BC in the UE capabilities at least the possible NR frequency bands that can operate with this LTE BC should be visible to the LTE MN.

✉ **[98#xx][NR] Capability coordination (DOCOMO)**

Capture the alternative approaches for capability coordination for EN-DC and NG-EN-DC. Focus should be on the coordination of the LTE and NR band combinations and baseband capabilities that may be dependent on the band combination (e.g. MIMO and CSI process capability). Aim is to provide clarity on the options to enable a decision to be made in the meeting. Aspects to consider: the UE capability information available to each node, and the information to be exchanged between the node in order to enable capability coordination.

Intended outcome: Report to next meeting

Deadline: Thursday 2017-06-08

R2-1704189 UE category and RF band combination for LTE-NR Dual Connectivity NTT DOCOMO, INC. discussion Rel-15 NR_newRAT-Core

- Qualcomm think this can be addressed by multiple categories per RAT and using the index approach. It can be grouped into one table that is used to coordinate the band combinations and category jointly.
- Intel think the main purpose of category is marketing and the BC is the main thing that identifies the data rate. Also do not want to coordinate the soft buffer size in this way.
- DOCOMO assume that the rate of the combined category will be less than the sum of the LTE and NR category.
- Qualcomm think with the index approach the UE can indicate various different splits but does have to support fully flexible splits.
- MediaTek is ok to add multiple EN-DC categories

=> Send LS to RAN to ask whether we will have UE categories defined for NR and for MR-DC. Background for question needs to be explained. (DOCOMO, offline discussion 43). R2-1706043

R2-1706043 [DRAFT] [LS on UE categories for NR and EN-DC/NR-EN-DC] NTT DOCOMO LS out Rel-15 NR_newRAT-Core To: RAN

=> Approved in R2-1706141

R2-1704345 UE capability structure and coordination aspects for LTE-NR DC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

moved from 10.2.3 to 10.2.6

R2-1704129 LTE/NR capabilities dependencies Qualcomm Incorporated discussion Rel-15

R2-1704433 UE capability coordination for tight interworking Ericsson discussion Rel-15 NR_newRAT-Core

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R2-1704653 Consideration on the capability coordination in LTE/NR tight interworking ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704714 On capability for different bearer configuration in EN-DC MediaTek Inc. discussion Rel-15 NR_newRAT-Core

R2-1704786 UE capabilities for LTE-NR DC Intel Corporation discussion NR_newRAT-Core

R2-1705158 Capability design for LTE NR DC- delegate Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705274 Capability Coordination in EN-DC LG Electronics Finland discussion NR_newRAT-Core

moved from 10.2.5 to 10.2.6

R2-1705346 EN DC UE capability coordination, general aspects Samsung Telecommunications discussion Rel-15

moved from 10.2.3 to 10.2.6

R2-1705350 EN DC UE capability coordination, further aspects Samsung Telecommunications discussion Rel-15

Temporary capability restriction

R2-1705505 Requirement to Capability Retrieval framework Vodafone, Deutsche Telekom, Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15

R2-1704787 Temporary UE capability restriction Intel Corporation discussion NR_newRAT-Core

=> Revised in R2-1706006

R2-1706006 Temporary UE capability restriction Intel Corporation discussion NR_newRAT-Core

R2-1704131 Temporary NR UE capability restriction Qualcomm Incorporated discussion Rel-15

R2-1705275 Assistance Information for Temporary Capability Restriction LG Electronics Finland discussion NR_newRAT-Core

R2-1704225 UE capablility temporary restrictions CATT discussion Rel-15 NR_newRAT-Core

R2-1704432 UE capability restrictions Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704588 UE radio access capabilities change vivo discussion

R2-1705351 Network control of UE capability suspension Samsung Telecommunications discussion Rel-15

R2-1705163 NR UE capability handling Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

UE capability report size reduction

R2-1704069 Discussion on Downsizing of UE Capability Report Guangdong OPPO Mobile Telecom. discussion Rel-15

R2-1704130 Reducing the size of UE capabilities Qualcomm Incorporated discussion Rel-15

R2-1704431 UE capability compression Ericsson discussion Rel-15 NR_newRAT-Core

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R2-1704788 UE capability signaling reduction Intel Corporation discussion NR_newRAT-Core

=> Revised in R2-1706007

R2-1706007 UE capability signaling reduction Intel Corporation discussion NR_newRAT-Core

R2-1705349 NR UE capabilities, size reduction and simplification Samsung Telecommunications discussion Rel-15

R2-1704430 UE capability signalling structure for NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1705162 Capability design for SA NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Other

R2-1705159 Security capability handling for LTE-NR DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704747 DRAFT LS reply to SA2 on maximum data rate MediaTek Inc. LS out Rel-15 NR_newRAT-Core To: SA2, RAN1; Cc: RAN3, SA1, CT1, CT4

R2-1704224 Consideration on NR static UE capability CATT discussion Rel-15 NR_newRAT-Core

Withdrawn

R2-1704193 Requirement to Capability Retrieval framework Vodafone, Deutsche Telekom, Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15

=> Withdrawn

10.2.7 Mobility mechanisms

Any remaining stage 2 aspects of handover in SA and SCG change in NSA (e.g. procedure to access the target cell, etc).

Note decisions at RAN2#97bis to progress the basic HO mechanism and only when stable to discuss conditional handover and potential optimisations to target close to 0ms or 0ms interruption.

Note that details of measurements on xSS and additional RS, cell quality derivation, filtering, events, etc are to be discussed under the appropriate stage 3 agenda item.

Basic handover, random access at handover

R2-1704840 Baseline handover procedure for inter gNB handover in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704841 TP for Baseline handover procedure for inter gNB handover in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704842 RACH resources for handover Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704085 Handover command and CSI-RS configuration of target cell Ericsson discussion Rel-15 NR_newRAT-Core

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R2-1704086 Controlling beam selection in NR handover Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704084 Further details of handover execution in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704297 General framework for the handover procedure in NR Samsung discussion Rel-15 NR_newRAT-Core

R2-1704525 Handover in NR Considering Multiple-beam Operation MediaTek Inc. discussion NR_newRAT-Core

R2-1704768 RACH procedure during handover in NR Intel Corporation discussion NR_newRAT-Core

R2-1704771 Basic handover in NR Intel Corporation discussion NR_newRAT-Core

R2-1704843 Allocation of appropriate RACH resources for handover Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704845 Some physical layer aspects of random access for handover Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705310 Consideration on details of NR handover Lenovo (Beijing) Ltd discussion Rel-15 NR_newRAT-Core

PDCP re-establishment at handover

R2-1704850 Further details of NR handover without PDCP reset Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704851 TP for NR handover without PDCP reset Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Other

R2-1704087 Conditional handover Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704088 Enhancing handover failure Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704093 Further issues on mobility related to beams Guangdong OPPO Mobile Telecom. discussion Rel-15

R2-1704107 Neighbor relation establishment in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704108 ANR for NSA NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704299 Mobility enhancements for NR Samsung discussion Rel-15 NR_newRAT-Core

R2-1704300 Mobility enhancements for NR NSA Samsung discussion Rel-15 NR_newRAT-Core

R2-1704310 Measurement report trigger condition Spreadtrum Communications discussion Rel-15

R2-1704313 Cell Identification in NR Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1704434 0 ms support during handover procedure with dual Tx_Rx Ericsson discussion Rel-15 NR_newRAT-Core

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R2-1704435	PCell change procedure for CA in NR	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1704488	Layer 2 based Inter-DU Mobility with Limited RRC Involvement	AT&T	discussion	
R2-1704523	QoS Flow to DRB Remapping during Handover	MediaTek Inc.	discussion	NR_newRAT-Core
R2-1704529	Mobility Enhancement for '0ms Interruption' HO	MediaTek Inc.	discussion	NR_newRAT-Core
R2-1704639	Discussion on single connected handover	ZTE Corporation	discussion	Rel-15 NR_newRAT-Core
R2-1704691	Problem of DC enhancement for 0 ms interruption time	Samsung	discussion	NR_newRAT-Core
R2-1704693	Introduction of UE autonomous handover	Samsung	discussion	NR_newRAT-Core
R2-1704694	Performance Evaluation of Conditional Handover	Samsung	discussion	NR_newRAT-Core
R2-1704844	Usage of CSI-RS for handover	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1704846	Support of NR Intra-cell handover	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1704852	Overview of Mobility enhancement for NR	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1704853	SgNB to MgNB reconfiguration for 0ms interruption handover	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1704854	Comparison of 0ms interruption solutions (DC-based, make before brake based).	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1704855	DC Operation to support robust handover	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1704856	L2 handling for 0ms interruption Mobility	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1704857	Intra-frequency handover based on TDM DC	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1704859	Mobility issues for support of jumbo packets	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1704865	ANR in NR	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1704868	Support for mutiple MAC in NR cell	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1705064	Discussion on Inter MN handover without SN change	Samsung Electronics Co., Ltd	discussion	
R2-1705087	Discussion on conditional handover	KT Corporation	discussion	
R2-1705347	Support of multiple MAC entities per cell	Samsung Telecommunications	discussion	Rel-15
R2-1705352	Reconfiguration beam management CSI RS config upon intra-cell mobility	Samsung Telecommunications	discussion	Rel-15

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R2-1705591 Conditional Handover: Event Design Aspects Samsung Electronics discussion Rel-15 NR_newRAT-Core

R2-1705599 Beam Refinement Considering RRM Measurement based on Idle Mode RS Samsung Electronics discussion Rel-15 NR_newRAT-Core

R2-1705728 NR mobility operations for TRxP and or DU change Samsung discussion

Late

R2-1704858 PDCP SN reconfiguration at handover Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Withdrawn

R2-1705091 Beam-aware Intra-NR mobility with RRC involvement Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

=> Withdrawn

10.2.8 Mobility - RLM,RLF

Any remaining stage 2 aspects of radio link monitoring procedure and criteria for declaring radio link failure.

R2-1704226 RLC failure and RLF CATT discussion Rel-15 NR_newRAT-Core

R2-1704532 RLM/RLF and Beam Failure Recovery MediaTek Inc. discussion NR_newRAT-Core

R2-1704089 RLM and RLF in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704227 Beam Recovery Failure and RLF CATT discussion Rel-15 NR_newRAT-Core

R2-1704350 S-RLF handling for LTE-NR DC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1704487 Beam Failure (BF) and Radio Link Interruption (RLI) AT&T discussion

R2-1704580 RLF with beam recovery vivo discussion

R2-1704695 RLM source in HF NR Samsung discussion NR_newRAT-Core

R2-1704808 The relationship between beam-level failure and radio link failure Intel Corporation discussion NR_newRAT-Core

R2-1704860 RLF for NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704861 Fast RLF recovery Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704867 RLF and PCell change for carrier aggregation Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704920 RLM/RLF for NR InterDigital discussion Rel-15 NR_newRAT-Core

R2-1705083 Discussion on RLC failure KT Corporation discussion

R2-1705089 Considerations of RLM/RLF and beam recovery in NR Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1705271 Enhanced RRC Connection Re-establishment in NR LG Electronics Finland discussion Rel-15 NR_newRAT-Core

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R2-1705525 NR RLF considering beamforming with control and data channel Huawei, HiSilicon discussion Rel-15

R2-1705592 RLF and Its Recovery Procedures in NR Samsung Electronics discussion Rel-15 NR_newRAT-Core

R2-1705622 Consideration on RLF due to RLF failure in NR Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1705729 NR beam recovery procedure Samsung discussion

Late

R2-1704091 Relation between beam recovery and RLF Ericsson discussion Rel-15 NR_newRAT-Core

Widthrawn

R2-1704210 S-RLF handling for LTE-NR Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

=> Withdrawn

R2-1705270 Enhanced RRC Connection Re-establishment in NR LG Electronics Finland discussion Rel-15 NR_newRAT-Core

10.2.9 Mobility without RRC involvement

Including RAN2 aspects of 'beam' level network controlled mobility, terminology, beam management, measurements for 'beam' level mobility, etc. Progress in RAN2 continues to be dependent on RAN1.

R2-1704864 CSI RS configuration aspects for beam management Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705440 Beam Management Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1705088 Beam recovery request Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1704102 NR Beam management Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704090 Beam recovery in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704228 Beam management CATT discussion Rel-15 NR_newRAT-Core

R2-1704533 Considerations on Beam Management Framework MediaTek Inc. discussion NR_newRAT-Core

R2-1704646 Discussion on beam link failure ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704862 Consideration on RAN2 impact of beam management Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704863 Considerations on beam management with C-DRX Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705084 Beam refinement after beam recovery or scheduling request Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

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R2-1705088 Beam recovery request Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1705090 Beam management and C-DRX operation Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1705093 Measurement reporting and beam refinement during RACH Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1705095 Measurement reporting and beam refinement during handover Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1705243 Roles of L1, L2 and L3 for beam management LG Electronics Inc. discussion

R2-1705344 Analysis on beam switch procedure Lenovo (Beijing) Ltd discussion NR_newRAT-Core

R2-1705442 Beam Recovery in NR Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1705730 Filtering for NR beam management Samsung discussion

R2-1705731 NR beam recovery Samsung discussion

R2-1705732 Downlink Beam Management in NR Samsung discussion

Withdrawn

R2-1704807 Further considerations for beam-level managements Intel Corporation discussion NR_newRAT-Core

=> Withdrawn

10.2.10 Mobility - Inter-RAT

Connected mode mobility between NR and E-UTRA, including RRM requirements for both NR and E-UTRA.

Inter-RAT handover

R2-1704800 Need for EPS bearer id in NR RAN for inter-RAT HO Intel Corporation discussion NR_newRAT-Core

=> RAN2 confirm that source NG RAN does not need the EPS bearer ID(s) for the inter-RAT HO procedure.

R2-1704818 Draft reply LS on the need for EPS Bearer ID knowledge in NG-RAN for (inter-RAT) inter-system handover Intel Corporation LS out NR_newRAT-Core To: SA2; Cc: RAN3

=> Approved in R2-1706047

R2-1704847 Inter RAT handover between LTE and NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705431 Lossless inter-RAT handover with 5GC Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704127 UE context handling during inter RAT handover Ericsson discussion Rel-15 NR_newRAT-Core

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R2-1704268 Response LS on the need for EPS Bearer ID knowledge in NG-RAN for (inter-RAT) inter-system handover CATT discussion Rel-15 NR_newRAT-Core

R2-1705052 Discussion on inter-system handover CATT discussion Rel-15 NR_newRAT-Core

Inter-RAT measurements

R2-1704218 Inter-RAT measurement CATT discussion Rel-15 NR_newRAT-Core

R2-1705430 Inter-RAT RRM measurements for NR and LTE Ericsson discussion Rel-15 NR_newRAT-Core

Inter-RAT mobility in Inactive

R2-1704126 Mobility between LTE and NR for inactive Ues Ericsson discussion Rel-15 NR_newRAT-Core

Withdrawn

R2-1705486 TP on Inter-RAT mobility from inactive state Intel Corporation discussion Rel-15 NR_newRAT-Core

=> Withdrawn

10.2.11 Slicing

How much slicing is visible to UE AS, partitioning of random access resources, separation of access control parameters, any impact to idle mobility, etc

Including output from email discussion [97bis#14][NR] Slicing (Xiaomi)

Email discussion

R2-1704128 Report of email discussion: [97bis#14][NR] Slicing Beijing Xiaomi Mobile Software report Rel-15

Idle mode behaviour

R2-1705379 Demerits of using Slice information for Cell selection Lenovo, Motorola Mobility discussion NR_newRAT-Core

R2-1704167 Slice availability Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704973 Slice Availability for Cell (Re-)Selection Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704500 Idle mobility aspects to support network slicing Samsung discussion Rel-15

R2-1704581 Cell selection/reselection with network slicing vivo discussion

Signalling of slice

R2-1705008 Network Slice Selection Assistance Informatino over RRC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

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Agreements:

1 RAN2 assumption is that MSG3 does not to deliver assistance information for AMF selection due to RRC size constraints as in LTE.

2 RAN2 assumption is that MSG5 is the earliest message that can be used to deliver assistance information for AMF selection.

R2-1705325 Slice Assistance Information over RRC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1704166 Signalling aspects of network slicing Ericsson discussion Rel-15 NR_newRAT-Core

R2-1705250 Slice Information in RRC Samsung Electronics Co., Ltd discussion

R2-1705674 Handling of NSSAI related information in intial access LG Electronics discussion

R2-1704170 Draft Reply LS on RAN support for network slicing Ericsson discussion Rel-15 NR_newRAT-Core

R2-1705009 [DRAFT] Reply LS on LS regarding RAN support for NW slicing Huawei, HiSilicon LS out Rel-15 NR_newRAT-Core To: RAN3; Cc: SA2, CT1

=> Second sentence to be clarified

=> Include our agreements

=> Rephrase final part saying that the size of MSG5 is still important for connection establishment delay, etc but we haven't concluded that any optimisation is needed.

=> Final wording to be concluded offline.

=> Revised in R2-1706049 (offline discussion 44)

R2-1706049 [DRAFT] Reply LS on LS regarding RAN support for NW slicing Huawei, HiSilicon LS out Rel-15 NR_newRAT-Core To: RAN3; Cc: SA2, CT1

=> Remove " RAN2 is yet to conclude on further optimisation of Msg5."

=> Approved in R2-1706142

R2-1705326 Draft Reply LS regarding RAN support for NW slicing Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

Other

R2-1704972 RRC Support of Network Slicing Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704070 Discussion on Network Slicing Priority Guangdong OPPO Mobile Telecom. discussion Rel-15

R2-1704168 Access control and resource isolation for slicing Ericsson discussion Rel-15 NR_newRAT-Core

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R2-1704179 Impacts of network slicing in RAN area Gemalto N.V. discussion

R2-1704551 Discussion on UE RRC modeling to support multiple slices Shenzhen Coolpad Technologies discussion Rel-15 NR_newRAT

R2-1704679 Consideration on the NW slice in RAN ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704713 Separate RACH or not for supporting different services/slices Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704974 UE Awareness of Network Slice Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705251 Draft LS on overall procedure to support network slicing Samsung Electronics Co., Ltd discussion

R2-1705253 Slice Awareness in Initial Access Samsung Electronics Co., Ltd discussion

R2-1705254 Review on Network Slicing Samsung Electronics Co., Ltd discussion

R2-1705268 Basics of network slicing discussion NEC discussion Rel-15 NR_newRAT-Core

R2-1705750 Support of Network Slicing in NG-RAN Qualcomm discussion

Late

R2-1705327 RRC messages for slicing assistance Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1705825 Connected mobility aspects to support network slicing Samsung discussion

Withdrawn

R2-1704169 Is UE AS slice agnostic or not? Ericsson discussion Rel-15 NR_newRAT-Core

=> Withdrawn

10.2.12 QoS

Any remaining stage 2 aspects (for detailed aspects please use appropriate stage 3 agenda item)

Including output from email discussion [97bis#15][NR] QoS message flows (Intel)

Including output from email discussion [97bis#16][NR] QoS parameters (Ericsson)

QoS parameters

R2-1704378 Email discussion report on additional QoS Parameters Ericsson (Rapporteur) report Rel-15 NR_newRAT-Core

Agreements
1: From RAN2 perspective the existing QoS parameters, and in particular the concept of QCI/5QI to abstract QoS requirements between CN and RAN should be maintained in NR/NGC.

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2	RAN2 sees a benefit in providing a “averaging window” as new QoS parameter via N2. The RAN may use in this parameter in its scheduling decision e.g. to enforce MBR and GRB.
3:	No additional parameters are recommendation to SA2.
4	RAN2 to ask SA2 to clarify the use and corresponding actions from CN related to the notification control to CN, if the QoS targets cannot be fulfilled in RAN

R2-1704377 Draft reply LS to SA2 on QoS Parameters Ericsson discussion Rel-15 NR_newRAT-Core

=> Removed '' or the “Preferred Minimum Bit Rate”"

=> Add QoS to '' flow ''

=> Add 'per GBR' after '' Averaging window ''

=> Reformulate the final sentence to word it as a definition of the averaging window.

=> Align terminology with that used in SA2.

=> Revised in R2-1706009 (offline discussion 38)

R2-1706009 [DRAFT] reply LS to SA2 on QoS Parameters Ericsson discussion Rel-15 NR_newRAT-Core

=> Remove '' per DRB ''

=> Change "flow" to "QoS flow"

=> Approved in R2-1706143

R2-1704976 QoS parameters Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704591 Slicing related QoS parameter vivo discussion

QoS message flows

R2-1704805 TP from [97bis#15][NR] QoS message flows Intel Corporation discussion NR_newRAT-Core

R2-1706010 TP from [97bis#15][NR] QoS message flows Intel Corporation discussion NR_newRAT-Core

- Samsung suggest to use RRC message names as much as possible. Intel explain there is an FFS on the message names.
- Samsung ask if the flow implies a reconfiguration that can include a NAS message. Intel think this aspect should be discussed in stage 3 and not inferred from this message flow.
- ZTE ask if we should capture the case of a new flow but without a new DRB setup by the network. Intel understand there will always be a new RRC signalling for a new flow but maybe not for DRB setup but to provide a new mapping.

=> Add FFS on whether the DRB parameters and NAS message are in same or different RRC messages.

=> Clarify that X.2 relates to a first packet for a QoS flow that is already configured the eNB.

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=> Revised in R2-1706011 (offline discussion 39)

R2-1706011 TP from [97bis#15][NR] QoS message flows Intel Corporation discussion NR_newRAT-Core

=> Agreed

R2-1704977 QoS Message Flows Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

- Intel think that bullet 2.1 of figure 1 is already covered in the TP. Huawei think it doesn't cover the modification and release case.
- DOCOMO think we should try to avoid duplication with SA2 captured flows. Nokia agree that we don't need to capture this.

=> Can be discussed offline to conclude whether these flows need to be merged into R2-1706011 and if so conclude how to capture them.

QoS support with for DC

R2-1704417 On the topic of PDU session termination points Ericsson discussion Rel-15 NR_newRAT-Core

moved from 10.2.2 to 10.2.13

R2-1704418 LS to SA2/RAN3: Reply LS on Dual Connectivity with 5GC Ericsson discussion Rel-15 NR_newRAT-Core

moved from 10.2.2 to 10.2.13

R2-1704270 Traffic Offloading in NR DC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

moved from 10.2.2 to 10.2.13

R2-1705348 NR + NR DC: QOS decision responsibilities Samsung Telecommunications discussion Rel-15

R2-1704980 QoS Support For NR/NR DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Other

R2-1704975 Flow Level QoS Control Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

- LG think that this can be implementation gNB or UE.
- Nokia think that we agreed not to optimise for the case or more than one GFBR bearer mapped to the same bearer so P2 and 3 are not needed.
- Qualcomm also share the view that we agreed not to optimise for the case they are merged onto a bearer. If it is necessary to guarantee the rates then a one to one flow to DRB mapping should be used.

=> Noted

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R2-1704269	Default QoS Profile NR_newRAT	Nokia, Alcatel-Lucent Shanghai Bell	discussion	Rel-15

10.2.13 Other

UE identities

Security

System information (any remaining stage 2 aspects, for detailed aspects please use appropriate stage 3 agenda item)

UE identities

R2-1704353	Text Proposal for Stage 2 on UE identities in NG-RAN	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704151	Radio network identifiers for NR	Samsung	discussion	Rel-15	NR_newRAT-Core

Security

R2-1704171	Key refresh in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704802	Forward compatibility for flexible security termination point	Intel Corporation	discussion	NR_newRAT-Core	
R2-1705328	NR Security: Support of Counter Check Procedure	Samsung	discussion	Rel-15	

NR-NR DC

R2-1705105	Control plane architecture for NR-NR dual connectivity	Nokia, Alcatel-Lucent Shanghai Bell	discussion		
R2-1705106	User plane architecture for NR dual connectivity	Nokia, Alcatel-Lucent Shanghai Bell	discussion		
R2-1704696	RLF Procedure for NR-NR Dual connectivity	Samsung	discussion	NR_newRAT-Core	

Other

R2-1704331	Cell global identity and ANR functionality	Nokia, Alcatel-Lucent Shanghai Bell	discussion	Rel-15	NR_newRAT-Core
R2-1704354	Public Warning system in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704501	Flexible BW supports in NR	Samsung	discussion	Rel-15	
R2-1704692	The feasibility of intra-freq DC in NR	Samsung	discussion	NR_newRAT-Core	
R2-1704790	System information to be provided in NR	Intel Corporation	discussion	NR_newRAT-Core	
R2-1704830	LTE-NR Coexistence	Sony	discussion	Rel-15	NR_newRAT-Core
R2-1705161	Consideration on LTE-NR co-existence	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core

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R2-1705248 RAN2 consideration on control plane latency enhancement Samsung Electronics Co., Ltd discussion

R2-1705256 Inter-RAT Mobility Fujitsu discussion Rel-15 NR_newRAT-Core

R2-1705390 Considerations on fast access inter-site small cells in NR Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1705448 Activation of SCells in NG-RAN Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1705523 NR Dual Connectivity between LF cell and HF cell Huawei, HiSilicon discussion Rel-15

R2-1705524 Multi-connectivity considering NR HF cell Huawei, HiSilicon discussion Rel-15

R2-1705602 Further discussion on Carrier Aggregation baseline Samsung Electronics discussion Rel-15 NR_newRAT-Core

R2-1705603 RAN2 aspect on Carrier Aggregation Samsung Electronics discussion Rel-15 NR_newRAT-Core

R2-1705604 NR PHR for EN-DC (LTE-NR DC) Samsung Electronics discussion Rel-15 NR_newRAT-Core

R2-1705606 Needs of Power Headroom enhancement considering beamforming Samsung Electronics discussion Rel-15 NR_newRAT-Core

R2-1705723 Mobility Evaluation Methodology for NR Samsung discussion

R2-1705733 NR Identities in the NR-SS and CSI-RS for RRM Measurement Samsung discussion

R2-1704607 Supported channels for inactive UE Huawei, HiSilicon discussion

moved from 10.2.1 to 10.2.13

R2-1705132 Support LTE Rel-14 eVoLTE for SA NR Huawei, HiSilicon discussion

moved from 10.2.1 to 10.2.13

R2-1705164 The support of Explicit Congestion Notification Huawei, HiSilicon discussion

moved from 10.2.1 to 10.2.13

10.3 Stage 3 user plane

Documents in this agenda item will be handled in the LTE Break Out session

R2-1704393 Impact of 1 ms subframe duration on UP timers Ericsson discussion Rel-15 NR_newRAT-Core

✉ **[NR/UP] – Running TS 38.321 - Samsung**
- Agreable running TS capturing agreements up to RAN2#98
- before next meeting

✉ **[NR/UP] – Running TS 38.322 – Mediatek**
- Agreable running TS capturing agreements up to RAN2#98
- before next meeting

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✉ **[NR/UP] – Running TS 38.323 – LG**
- Agreable running TS capturing agreements up to RAN2#98
- before next meeting

10.3.1 MAC

10.3.1.1 TS

Latest TS 38.321, rapporteur inputs, etc

Including output from email discussion [97bis#26][NR/UP] – Running 38.321 (Samsung)

R2-1704475 Draft TS 38.321 v0.0.3 Samsung (Rapporteur) draft TS38.321 0.0.3 Rel-15 NR_newRAT-Core

=> The TS is endorsed

R2-1704476 Small issues from email discussion [97bis#26] (running 38.321) Samsung discussion Rel-15 NR_newRAT-Core

Proposal 2: To describe two MAC entities (i.e. UE and NB) in clause 4 for single connectivity (as in LTE).

- Ericsson wonders if we really need to include gNB in clause 4. LG thinks we should focus on UE too.

Proposal 4: To list random access triggering events in the stage-3 specification (i.e. TS 38.321), instead of stage-2.

- Nokia thinks that we do not need to treat the events differently so no need to list them. Ericsson agrees.
- Lenovo thinks that the maybe the SI request will have a different behaviour.

Proposal 7: To confirm that the procedural text for the BSR cancellation in LTE is part of existing LTE BSR framework, and can be re-used for NR.

- Qualcomm thinks that we need to discuss first changing the BSR cancelling condition.

=> Keep editors note for now and we wait

Proposal 9: Short DRX cycle is optional (as in LTE).

- LG thinks this is dependent on DRX discussion

=> Noted

Agreements
1. To use the terminologies PTAG/STAG, instead of pTAG/sTAG. 2. We will describe only the UE MAC entities 3. To confirm that DCCH can be carried by SCG. The number of DCCH should be one (i.e. SRB3) 4. Random access triggering events are specified in stage 2

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5. drx-RetransmissionTimers are separately configured for DL and UL (as in LTE)
6. Short DRX cycle is optional (as in LTE)

10.3.1.2 MAC architecture

R2-1704399 Impact on MAC from PDCCH monitoring occasions Ericsson discussion Rel-15 NR_newRAT-Core

- Nokia asks what are these patterns, are they DRX. Ericsson explains is not related to DRX but rather how we do PDCCH monitoring in general.
- Lenovo thinks that this is related to RAN1 as well and how control channel monitoring will be designed.
- LG asks if we intent do differentiate between different PDCCHs. Ericsson says no.
- InterDigital thinks that it can be useful to refer to “PDCCH monitoring” in parts of the spec and the proposal 2 and 3 are related to DRX.
- Ericson thinks that we need to properply model the TTI length/normally. Lenovo agrees.
- Ericsson explains that it is more of a modelling problem rather than DRX. Nokia thinks we should try to keep it transparent in the MAC.
- Samsung agrees that it should be transparent and TTI is not suitable so we should carefully think of how to model.
- Oppo thinks that the complication is that TTI is quite flexible so we need to have good definition for TTI.

=> Noted

R2-1704502 MAC impacts from PHY indication for scheduling Samsung discussion Rel-15

=> moved from 10.2.2

=> Noted

Not treated

R2-1704606 MAC design to support intra-NR CA Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704661 Consideration on the MAC architecture for multiple numerology ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704908 MAC Specifications and Multiple Numerologies / TTI Durations for NR InterDigital discussion Rel-15 NR_newRAT-Core

R2-1705586 MAC layer architecture for multiple numerologies MediaTek Inc. discussion Rel-15 NR_newRAT-Core

R2-1705668 Numerology change and mixed numerologies Sharp discussion

=> moved from 10.2.2

R2-1705600 Draft LS to RAN1 on the time unit definition Samsung Electronics discussion Rel-15 NR_newRAT-Core

=> moved from 10.2.2

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R2-1705827 RAN2 aspect on different waveforms for uplink transmission Samsung discussion

=> moved from 10.2.2

10.3.1.3 MAC PDU format

Header and PDU format, placement of MAC CE for DL, MAC sub-header enhancements, etc

R2-1705073 MAC CE placement Nokia, Alcatel-Lucent Shanghai Bell, CATT, MediaTek Inc., NEC, NTT DOCOMO, INC., ZTE discussion Rel-15 NR_newRAT

=> Revised in R2-1705833

R2-1705833 MAC CE placement Nokia, Alcatel-Lucent Shanghai Bell, CATT, Fujitsu, MediaTek Inc., NEC, NTT DOCOMO, INC., ZTE discussion Discussion 10.3.1.3 R2-1705073 Rel-15 NR_newRAT

Proposal 1: UL MAC CEs are multiplexed after MAC SDUs and before the padding in the MAC PDU.

Proposal 2: DL MAC CEs are always placed before any MAC SDU and padding, i.e., are placed in front of the MAC PDU.

- Huawei doesn't see why we have to put the DL MAC CE at the beginning
- Ericsson thinks that you cannot do per code block decoding since you have to do CRC on the full TB
- Lenovo thinks that the same should apply for the UL.
- Qualcomm agrees with proposal 2 and for proposal 1 we think that MAC CE should be at the end
- Intel supports both proposals
- LG would like to have the same UL and DL format and put it at the end.
- Huawei thinks that the intention is to allow reading in advance of DL MAC CE
- Samsung thinks that the most important part is the UE processing for the DL MAC CE. The pre-processing of UL MAC CE is not very important.
- CATT thinks that the situation is different between the UE and eNB. The eNB can be smarter and implement more complex things so we shouldn't treat the UL and DL the same. Nokia and Samsung also think that the eNB have higher processing power. Intel doesn't see much gain.
- Lenovo agrees with Samnsung that the gains are only for large TB and we can maybe link the indication with TB size.
- NTT Docomo agrees with Samsung
- ZTE supports Nokia.
- Qualcomm indicates that we put the UL MAC CE before the padding then MAC CE would be at the beginning and we wouldn't have enough time to calculate.
- Ericsson suggests that we can simply just add a pointer.

=> Noted

Agreements

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1. The DL MAC CE is always placed before any MAC SDU and padding
2. FFS for UL MAC CE if we have a pointer and if it is before or after padding

Not treated

R2-1704363 MAC PDU design Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704608 MAC PDU format Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> Revised in R2-1705819

R2-1705819 MAC PDU format Huawei, HiSilicon discussion Decision 10.3.1.3 R2-1704608 Rel-15 NR_newRAT-Core

R2-1705051 MAC concatenation for new NR U-plane Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

Proposal 1: Introduce MAC concatenation subheader to allow packaging MAC SDUs

- LG and Intel explains that we removed concatenation from RLC for pre-processing purposes. Qualcomm explains that this still allows pre-proccesing.
- Oppo and CATT has a similar view as Qualcomm. CATT thinks that it comes at a very low cost.
- Samsung doesn't support the proposal.
- Lenevo is concerned with the proposal to put MAC SDU sequentially.
- Mediatek sees some benefits but we should really discuss where concentation is beneficial
- Nokia thinks that we should split optimizing headers and concatecation.
- Samsung and ZTE think that we consider header optimizations we should have some analysis and gains

=> MAC concatenation optimizations are not supported in Rel-15

=> Noted

R2-1705518 Out of order processing of MAC CEs MediaTek Inc. discussion Rel-15 NR_newRAT-Core

- LG doesn't see the problem since we have prohibit timers to prevent multiple MAC CEs. Also if they are out of order there isn't much a problem. Ericsson and Intel agrees with LG.

=> Out of order processing of MAC CEs is not considered a problem

=> Noted

R2-1705680 NR MAC header fields Samsung discussion Rel-15 NR_newRAT-Core

Proposal 1:

- *CATT thinks that E field should still be considered if we have MAC header optimizations.*

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Proposal 2: The F and F2 fields are not used in NR MAC sub-header.

- *Ericsson thinks that F can still be useful for variable length*

Proposal 3: The single L field with fixed size is used in NR MAC sub-header.

- Ericsson thinks that two L fields, 8 and 16 should be considered. CATT, Huawei, and Nokia would like a variable field size. Nokia thinks 7 and 15 is sufficient.
- Qualcomm thinks that the discussion depends on super jumbo frame support.
- LG thinks that we should consider the full header fields and we should design them to be byte aligned.
- Huawei thinks that more than two options are needed.

Proposal 5: The size of LCID field is 6 bit.

- Ericsson wonders why we should increase it. Samsung explains that even for LTE there has been proposals to increase it, but we couldn't so it would be good to be future proof for NR.
- Nokai thinks that we should first agree on how many logical channels we will have. LCID can be easily extended later if needed. Samsung doesn't think this is only for logical channels but also for MAC CE. Ericsson agrees and the R bits are always a pain.
- LG thinks that instead of increasing LCID we can separate LCID for MAC CE and MAC SDU.

Proposal 6: The L field is not required for the fixed-size MAC CE.

Proposal 7: The L field is required for variable-size MAC CE.

- Lenovo wonders if the L field is present for every MAC SDU. Nokia thinks that as long as there is no L field for padding we don't have a problem.
- CATT thinks that the L field doesn't need to be present for the last SDU.

=> Noted

Agreements

1. The E field is not present in NR MAC sub-header.
2. F2 fields are not present in NR MAC sub-header.
3. Variable L fields size with two values will be supported. The F field is included. Size is FFS
4. The size of LCID field is 6 bits
5. The L field is not present for the fixed-size MAC CE
6. The L field is present for variable-size MAC CE
7. The L field is present for every MAC SDU. FFS if no L field is present for padding

Not treated

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R2-1704061 Discussion on MAC sub-header Guangdong OPPO Mobile Telecom. discussion

R2-1704251 Analysis of the MAC sub-header fields CATT discussion Rel-15 NR_newRAT-Core

R2-1704252 The organization of MAC SDUs in MAC PDU CATT discussion Rel-15 NR_newRAT-Core

R2-1704253 Considerations on MAC CE CATT discussion Rel-15 NR_newRAT-Core

R2-1704394 MAC sub-header format Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704549 Placement of DL MAC CE, MAC subheader and Padding for NR PANASONIC R&D Center Germany discussion

R2-1704574 Placement of RLC segment in MAC PDU vivo discussion

R2-1704662 Consideration on the MAC PDU format ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704791 MAC PDU format in NR Intel Corporation discussion NR_newRAT-Core

R2-1705065 Uplink MAC CE indication and placement Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1705072 MAC PDU encoding Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1705114 Discussion of MAC sub-header enhancements ITRI discussion NR_newRAT-Core

R2-1705187 Common design for DL/UL MAC PDU format Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705236 MAC PDU format LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1705319 Placement of MAC CE within a TB Lenovo Mobile Com. Technology discussion Rel-15 NR_newRAT-Core

R2-1705320 Placement of MAC CE within a TB Lenovo Mobile Com. Technology discussion Rel-15 NR_newRAT-Core

R2-1705679 Padding in NR Samsung discussion Rel-15 NR_newRAT-Core

R2-1705721 Discussion on MAC Concatenation Samsung discussion

R2-1705722 MAC Subheader Processing Samsung discussion

R2-1705195 Extension of logical channel number in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> moved from 10.3.1.6

10.3.1.4 Random access

Including partitioning of RACH resources, impact of multiple numerology to RACH and prioritization of procedures, beam related aspects such as beam selection and RAR behaviour in case of multiple beams, etc. Progress in RAN2 may be dependent on RAN1.

R2-1704395 Further details on mixed numerologies Ericsson discussion Rel-15 NR_newRAT-Core

=> Moved from 10.2.2

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The configuration for random access in idle mode is either specified or provided in minimum system information (pending RAN1 decision), but does not depend on the UE capabilities

- Qualcomm asks if this mins that it random access will be performed with minimum UE bandwidth. Ericsson thinks that this is something to take into account but may RAN1 can discuss this. Huawei thinks we can discuss them separately and some impact from RAN1 is needed.
- CATT wonders if this is only for PRACH or the full random access procedure? CATT thinks that we should allow PRACH partitioning for different numerlogies.
- LG thinks that for idle mode the default numerology is sufficient.
- CATT asks if for connected there would be a different behaviour.
- Intel thinks that we should clarify whether this is applicable to all steps.
- Blackberry understands that the UE would not report capability between steps.

=> Noted

R2-1704901 Prioritized random access in NR Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

Discussion on service differentiation

- CATT thinks that some form of partitioning should be allowed for slicing purposes
- Samsung asks if this is for connected or IDLE. CATT, QC thinks it is for both. Lenovo wonders how the UE knows which PRACH to use. Qualcomm thinks that it can be configured which class it belong to.
- Nokia thinks this is related to slicing in main session. LG thinks that this is not only for slicing but other things. Lenovo doesn't think that partitioning is needed outside of slicing.
- InterDigital thinks that for connected mode partitioning can be useful for RA-SR for example.
- Intel thinks that service differentiation is useful for connected mode, but the preamble portioning may not be necessary. Qualcomm thinks that it is only one of the options.
- Lenovo thinks that we never differentiation resources betweek idle and connected.
- Huawei supports the Qualcomm proposal for connected mode.
- LG is interested in service differentiation but not partitioning, maybe just backoff parameters.
- Samsung thinks that the URLLC requirements cannot be met with random access anyways so no need to differentiate. Ericsson, Nokia and Lenovo agrees.
- Blackberry thinks this is similar to the multi-bit SR and we should be consistent.

=> Noted

R2-1704159 Random Access Response in NR Samsung Electronics Co., Ltd discussion Rel-15

Proposal 1: After transmitting the RACH preamble, UE monitors for RAR in RAR window.

- ZTE asks how the beams affects this.
- Xiaomi thinks that for on-demand may not have RAR. Samsung thinks that we can discuss that later and focus on normal RACH.

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Proposal 2: RAR window starts at fixed duration from the end of RACH transmission occasion. The value of fixed duration is FFS.

- Ericsson would like to have a configurable window start but can accept if it is shorter. LG also doesn't think that we need to fix the start timer, and the UE can start right away without waiting. Nokia thinks we can keep it fixed and RAN1 can decide the actual value.
- ZTE thinks that we need to think a bit more about this especially in view of beamforming and multiple RAR.
- InterDigital asks if the duration remains in TTI or will be it be related to numerology.
- LG thinks that it would be too complex to specify a starting point, so we can just do zero.
- ZTE would like to avoid the UE to receive on more than on RAR window.

=> Noted

Agreements

1. A single configuration for random access in idle mode is provided in minimum system information (pending RAN1 decision), but does not depend on the UE capabilities. This doesn't restrict multiple configuration for different purposes (e.g. for multiple beam). RAN2 understanding is that the numerology/physical layer configuration for each step is up to RAN1.

As in LTE:

2. After transmitting the RACH preamble, UE monitors for RAR in RAR window
3. RAR window starts at fixed duration from the end of RACH transmission occasion. The value of fixed duration is FFS and shorter than LTE.
4. The size of RAR window is configurable
5. RAR reception is successful if received RAR corresponds to both the RACH preamble transmitted by UE and RACH resource in which UE has transmitted the RACH preamble
6. As in LTE, random access procedure can be performed on PCell as well as SCell. In case of SCell (other than PSCell), only contention free random access procedure is performed. Random access procedure for SCell (other than PSCell) is only initiated by network.
7. When performing random access procedure on the PCell while CA is configured, UE transmits the RACH preamble on PCell and receives the corresponding RAR on PCell.
8. When performing contention free random access procedure on the SCell while CA is configured, UE transmits the RACH preamble on SCell and receives the corresponding RAR on PCell.
9. When performing random access procedure on the PCell or PSCell while DC is configured, UE transmits the RACH preamble and receives RAR on corresponding cell.
10. when performing contention free random access procedure on the SCell (other than PSCell) while DC is configured, UE transmits the RACH preamble on SCell and receives the corresponding RAR on PCell for MCG and PSCell for SCG.

Multibeam

R2-1705441 RACH in Multibeam System Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

Proposal 1: Allow association between the PRACH resources (PRACH occasions and preambles) and SS Block and CSI-RS (beams).

- NTT docomo asks which spec will cover this. Samsung thinks that at least the resource selection will be captured in the MAC.
- Samsung thinks that it has already agreed that there is association

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- LG asks what the UE behaviour is for the contention free. Nokia explains that the network will give configuration for a beam and if the UE can't use it then it goes to contention based.

Proposal 2: Allow both cell wide and SS-block specific PRACH configurations.

- Oppo indicates that RAN1 just agreed on SS-block specific PRACH configurations

=> Noted

R2-1704158 Random Access Procedure – Access Delay Minimisation Samsung Electronics Co., Ltd discussion Rel-15

For multi-beam operation, PRACH preamble transmission in multiple RACH transmission occasions before monitoring the RAR window should be supported for contention free random access procedure

- Qualcomm thinks RAN1 should discuss.
- LG thinks that a single RAR window is sufficient.
- InterDigital thinks that this should both contention free and non-contention free.
- Samsung thinks that we can focus for contention free as there are no collisions.
- Lenovo asks if the UE is expected to monitor multiple RA-RNTIs. Samsung says yes.
- Huawei asks how does the UE know about correspondance. Samsung thinks that the network will indicate, RAN1 is still discussing.
- Samsung explains that the msg 1 is sent on different tx beams to reduce the delays due to tx beam sweeping.

=> Noted

R2-1704783 NR random access multi-beam aspects Intel Corporation discussion NR_newRAT-Core

=> Not treated

Other aspects

R2-1704160 Random Access in NR – Flexible UE Bandwidth Aspects Samsung Electronics Co., Ltd discussion Rel-15

=> Not treated

R2-1704611 Considerations on TAG in HF Cell Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> Not treated

Enhancements

R2-1704058 Consideration on Random Access in NR Guangdong OPPO Mobile Telecom. Discussion

=> *Noted*

R2-1704405 Random Access Enhancements Ericsson discussion Rel-15 NR_newRAT-Core

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Proposal 3 *If the UE has retransmitted a preamble n times (including power ramping) without receiving the RAR, it shall regain downlink synchronization. The network may configure the value n.*

- Lenovo and HTC wonder what this regain of synchronizaiton. Ericsson explains that some UEs may not have proper DL synch. Mediatek also thinks this is not needed.

Discussion on different backoff values

- Qualcomm agrees with most proposals except Proposal 2. Mediatek would prefer to have good UE behaviour with UE backoffs.
- Asustek asks what prioirity is referring to. Oppo thinks that it can be SRB, or UL/DL priority, or the times the UE has failed.
- LG is fine with the proposals but we should focus on RAN2 specific aspects. Power ramping impacts system and RAN4 can discuss first.
- Lenovo asks if it is idle or connected or mainly linked to event. Mediatek thinks it is possible in idle. Ericsson thinks that it can be based on logical channel.
- InterDigital supports the ability to have different parameters/configuration. CATT also thinks it can be useful.
- Huawei also supports different prioritizations.
- Nokia thinks RACH storms can be handled by network dimensioning. Samsung disagrees with proposals and think this are optimizations. Nokia thinks that we haven't seen any problems in LTE and can handle high density scenarios quite well.
- Mediatek thinks that RACH storms should be supported as we are supporting high density in NR and we should not rely on the network to detect these scenarios.
- Nokia would like to avoid spending too much time. Most problems are from RACH processing rather than PRACH load.

=> Noted

Not treated

R2-1704099	Beamforming impact on random access	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704254	Consideration on RACH resource configuration and RACH reattempt	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1704255	Channel bandwidth and numerology for RACH	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1704403	Random Access in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704498	RA for initial access	LG Electronics	discussion	Rel-15	NR_newRAT-Core
R2-1704404	Indicating Message 3 size in NR Random Access	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704406	Multiple Preamble Transmissions in NR Random Access	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704477	LTE text/principles for NR: Random Access	Samsung	discussion	Rel-15	NR_newRAT-Core

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R2-1704486	Aspects related to beam indication in msg. 3	AT&T	discussion	Rel-15	
R2-1704499	RA procedure in NR	LG Electronics	discussion	Rel-15	NR_newRAT-Core
R2-1704579	Random Access in NR	vivo	discussion		
R2-1704609	TP on general RACH procedure	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1704610	Interaction Model for random access with beamforming	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1704672	Consideration on the 4-step random access procedure	ZTE Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1704781	Random Access in NR	Intel Corporation	discussion	NR_newRAT-Core	
R2-1704782	NR random access enhancements	Intel Corporation	discussion	NR_newRAT-Core	
R2-1704909	PRACH Resources for NR	InterDigital	discussion	Rel-15	NR_newRAT-Core
R2-1705117	Further discussion on prioritized RACH	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705188	Minimum UE supported bandwidth	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705189	LS to RAN1 on minimum UE supported bandwidth	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705190	RACH Backoff	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705191	Power Ramping for RACH	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705192	Analysis of RACH Procedural Steps	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705193	Signaling MSG3 size	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705194	Contention resolution for random access	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705313	Discussion on numerology of random access in NR	ASUSTEK COMPUTER (SHANGHAI)	discussion	NR_newRAT-Core	
R2-1705329	PRACH preambles and MSG3 size	Samsung	discussion	Rel-15	
R2-1705414	Discussion on RA backoff in NR	ASUSTEK COMPUTER (SHANGHAI), ITRI	discussion	NR_newRAT-Core	
R2-1705617	RA contention mitigation in NR	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT-Core
R2-1705623	Initial access with multiple numerologies	Huawei, HiSilicon	discussion		
R2-1705662	Service Differentiated Random Access	Convida Wireless	discussion	Rel-15	
R2-1705809	Access Backoff	Mediatek Inc.	discussion		

10.3.1.5 SR/BSR

How to differentiate "numerology/TTI type" of logical channel that triggered the SR. Dependency on RAN1.

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Including BSR content, BSR triggers and timers and any enhancements, etc.

SR

R2-1705074 SR for NR Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

=> Noted

R2-1704054 Discussion on SR and BSR enhancements Guangdong OPPO Mobile Telecom. Discussion

=> Noted

R2-1705625 SR enhancements with multiple numerologies Huawei, HiSilicon discussion

=> Noted

Discussion on on multiple SR configuration vs. 2 bits SR

- Ericsson thinks that it is beneficial to support multiple SR configuration. Samsung supports multiple SR and strong support single bit on/off. Multi-bit SR would increase overhead.
- Huawei thinks that we should focus on the multiple configuration
- CATT thinks that the numerology in which the SR is transmitted can be implicility carried.
- ZTE also thinks multiple SR configuration is more flexible and multi-bit SR may not be needed.
- QC thinks that we shouldn't exclude multi-bit.
- Intel thinks that for the low latency service multi-bit SR is not good.
- HTC wonders if configuration refers to the periodicity and/or resource. Nokia explains that it includes resource configuration and it is up to the network how to condigure it.

Discusson on whether SR will include more than numerology/TTI

- Samsung, Lenovo, Nokia, Convida don't think BS info is needed. The information is too coarse anyways. CATT agress and for eMBB latency is not critical. LG considers that this can be useful for URLLC. ZTE thinks that this is only useful for the first grant and for small cell it is not very beneficial. Blackberry agree and URLLC can also use grant-free so need to optimize further.
- Qualcomm thinks that indicating priority would be useful.

Agreements

1. Multiple SR configurations can be configured to the UE and which SR configuration is used depends on the LCH that triggers the SR. The granularity of SR configuration for a logical channel is FFS.
2. From RAN2 point of view a single bit SR with multiple SR configuration is sufficient to distinguish the "numerology/TTI length" of the logical channel that trigger the SR. RAN2 has not identified other use cases for which multibit SR is need with sufficient support.
3. RAN2 does not see the need to convey buffer status information.
4. Send LS to RAN1 to indicate to RAN1 that RAN2 doesn't see the need to support multi-bit SR.

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R2-1705864 [Draft] LS on need of multi-bit SR Samsung Telecommunications

=> Change on/off to “single-bit”

=> The LS is approved in R2-1705867

BSR

R2-1704576 Enhanced BSR report and timer configuration in NR vivo discussion

Proposal 1: In NR, to provide the finer granularity of the data priorities: (a) more number of BSR LCGs or (b) per logical channel BSR can be defined.

- HTC, QC, CATT supports to increase the LCG. Samsung thinks that since we only have two new services there is no need to increase the LCG.
- LG thinks that we need to increase to maybe 3 or 4 bits.
- NTT docomo asks how many logical channles can be configured. LG indicates that the important part is how many LCH can be used simultaneously. Ericsson agrees with LG. CATT and Lenovo also agrees.
- Intel, Mediatek, Nokia doesn’t see use case to increase the number. Nokia thinks that even if there are many LCH they can still be grouped together.
- Huawei thinks that now in LTE we have only two bits to differentiate priority but now we also have numerology.
- Oppo is concerned that with duplication LCH will be increased.
- Lenovo thinks that for LTE we have some shortage especially with new services such as V2x.
- Samsung thinks that this is increasing some complexity in the UE so we should really understand use cases. Lenovo thinks that LCP is one good example and the restrictions added. The eNB needs to know what type of data is available and this is a good motivation that is different from LTE. Nokia thinks that two groups would be enough.
- Nokia doesn’t think that more than 8 will be acceptable and we should make sure that short BRS remains 1 byte. Samsung thinks that if we change LCG to three bits the short and long BSR formats have to be rediscussed. Huawei thinks that the BSR size will depend on BS granularity.

=> Noted

R2-1704257 BSR enhancement CATT discussion Rel-15 NR_newRAT-Core

Proposal 1: The concept of periodicBSR-Timer and retxBSR-Timer are reused in NR.

- Vivo thinks that we should configure them per logical channel
- Qualcomm and HTC doesn’t thinks that periodic BSR needs to be per numerology, the periodicity can be based on the lowest periodicity of the logical channel.
- Huawei thinks that it should be per numerology/TTI length
- LG doesn’t see why as once the BSR is triggered all LCH are reported.
- Intel thinks that retx-BSRtimer that we can maybe have two timers. This is solving the BSR trigger problem.

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- Asustek thinks that it should be set per UE

Proposal 3: The logicalChannelSR-Maskis not required in NR. We can forbid a logical channel from triggering SR by configuring infinite logicalChannelSR-ProhibitTimer.

- LG thinks in principle it can be good to simplify but we should study it.
- Nokia and Lenovo doesn't think they can be merged together.
- CATT was looking to simplify with a single timer.
- LG thinks that the need for SR-ProhibitTimer should be revisited. NTT docomo thinks the timer is useful to prohibit SRs. Samsung and Nokia think it is very useful when we have frequent periodicity. Multiple SR configurations will not remove this motivation.
- Ericsson thinks we can take this as a baseline and we can revisit depending on multiple SR.

=> Noted

Agreements

1. The number of LCGs will be increased up to 8.
2. The concept of *periodicBSR-timer* and *retx-BSRtimers* are reused and are configured per MAC entity
3. As a baseline, the concept of logicalChannelSR-ProhibitTimer is reused in NR. It is allowed to configured infinite value for this timer.
4. The logicalChannelSR-Mask is supported

✉ **[NR/UP] – BSR triggers – Huawei**

- Discuss motivation of new BSR triggers on top of LTE (consider differences between NR and LTE)
- Discuss specific triggers for regular BSR based on company contribution proposals
- One week before next meeting

R2-1704340 NW requested BSR for NR discussion Rel-15 NTT DOCOMO INC., Nokia, Alcatel-Lucent Shanghai Bell

- LG thinks that we already have a mechanism, the eNB can give a grant and UE includes padding BSR. NTT explains that this is for the case where there is much data. LG and Ericsson understand that periodic BSR can be used.
- Ericsson thinks that the network would only like to know when there is a large change so a trigger with a threshold can be used. Nokia thinks that we should have this as it is more flexible.
- ZTE thinks that we can revisit after the email discussion.

=> Noted

Not treated

R2-1705682 Discussion on BSR triggers Samsung discussion Rel-15 NR_newRAT-Core

R2-1705201 BSR format Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

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R2-1704256 SR design in NR CATT discussion Rel-15 NR_newRAT-Core

R2-1704273 BSR and QoS Flows Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1704375 SR and BSR signalling content in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704376 BSR and SR triggering aspects Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704411 UL inter-UE puncturing with UE suspend Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704572 General considerations on numerology-specific Scheduling Request design options in NR Samsung R&D Institute UK discussion

R2-1704573 Scheduling Request design for multi-numerology support Samsung R&D Institute UK discussion

R2-1704575 BSR trigger for Qos flow in NR vivo discussion

R2-1704589 Enhanced SR in NR vivo discussion

R2-1704663 Consideration on the SR in NR ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704664 Consideration on the triggering of BSR ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704665 Consideration on the BSR for data duplication ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704784 enhancement of SR/BSR Intel Corporation discussion NR_newRAT-Core

R2-1704900 Enhancements to SR in NR Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1704902 Enhancements to BSR format Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1704904 Enhanced BSR triggering and cancellation conditions Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1704917 Aspects related to SR and BSR InterDigital discussion Rel-15 NR_newRAT-Core

R2-1704946 SR/BSR design for multiple numerology MediaTek Inc. discussion Rel-15 NR_newRAT-Core

R2-1705048 Draft LS to RAN1 on multi-bits SR Guangdong OPPO Mobile Telecom. discussion

R2-1705057 BSR for Multiple Numerology Operation Samsung Electronics Co., Ltd discussion

R2-1705097 Discussion on BSR for NR HTC Corporation discussion Rel-15 NR_newRAT-Core

R2-1705101 Discussion on SR for NR HTC Corporation discussion Rel-15 NR_newRAT-Core

R2-1705196 Enhancements for SR and BSR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705197 BSR triggering and cancellation Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705198 SR triggering and cancellation Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

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R2-1705199	Reliability enhancement for MAC CE	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705200	BSR procedure for data duplication	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705202	BSR reporting for the default DRB	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705238	SR enhancement for New RAT	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1705239	BSR enhancement for New RAT	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1705257	BSR accuracy	Fujitsu	discussion	Rel-15	NR_newRAT-Core
R2-1705311	Discussion on BSR in NR	ASUSTEK COMPUTER (SHANGHAI)	discussion		NR_newRAT-Core
R2-1705567	BSR for UL Split Bearer	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT-Core
R2-1705593	Potential Issues for BSR Latency Reduction	Samsung Electronics	discussion	Rel-15	NR_newRAT-Core
R2-1705626	BSR enhancements with multiple numerologies	Huawei, HiSilicon	discussion		
R2-1705663	Views on SR/BSR Enhanements	Convida Wireless	discussion	Rel-15	
R2-1705681	Discussion on BSR formats	Samsung	discussion	Rel-15	NR_newRAT-Core

10.3.1.6 LCP

Including numerology/TTI configuration, UL grant content, multiplexing of services, the need to treat logical channels different depending on numerology/TTI

R2-1705237	Awareness of numerology in MAC	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core

=> moved from 10.3.2

=> Noted

R2-1704504	Visibility of numerology for NR MAC functions	Samsung	discussion	Rel-15	

=> Noted

R2-1704397	Further aspects on LCP	Ericsson	discussion	Rel-15	NR_newRAT-Core

- LG wonders what the difference is. Ericsson thinks that this is very similar and the PHY indicates an index to MAC. Samsung clarifies that the difference is that PHY indicates only the numerology and in Ericsson there is more parameters.
- Mediatek wonders if we can hard code the profiles it in the spec. Ericsson is open to discuss.

=> Noted

On the need of MAC to be aware of numerology/TTI

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- Oppo thinks that the MAC doesn't know the exact meaning of these parameters so it doesn't need to be aware. Some abstraction would be preferred.
- LG thinks that if we have just TTI length then an index is not necessary
- Lenovo thinks that we should discuss the index after we discuss what the MAC needs to be aware. The numerology is also needed on top of TTI
- InterDigital, CATT agree on the abstraction approach. IDCC thinks we should notify RAN1.
- CATT supports that it should be captured in specification
- LG asks what we need to use for numerology. Nokia, Intel agrees with LG. Samsung clarifies that we don't want to design UL grant but just have means to understand the grant type. Intel agrees with LG
- Qualcomm, Huawei thinks that the MAC just needs some QoS profile and different parameters can be included for the MAC to understand what each numerology means.
- ZTE thinks that the UE should know which numerology as we have a mapping of numerology/TTI length
- Lenovo thinks TTI is not enough. Nokia thinks that numerology is not related to QoS. Ericsson thinks that TTI is not enough as there are other L1 parameters that provide a certain QoS. Transmission profile is just an extension of TTI duration.
- Mediatek sees the need that we need some mechanism to differentiate between numerology/TTI.
- Blackberry thinks that we just need to know how many numerologies to support and not the specific numerology.
- LG clarifies that the impact is for LCP only for multiplexing purposes.
- Convida wonders what we need more than the mapping. Ericsson explains that we need to know what restriction to use for the grant.
- CATT thinks that the numerology will also have impact on power headroom part.
- Huawei understands that RAN1 has the knowledge of numerology and for the same numerology ou can have the same TTI and RAN2 needs to know how to do the mapping and put the logical channel on the right numerology.

Agreements
1. For LCP and to know which restrictions to use the MAC needs to be aware of more information than just TTI length (e.g. numerology). An abstraction based on index or profiles can be supported. Exact parameters are FFS.

R2-1704398 Prioritization in MAC Ericsson discussion Rel-15 NR_newRAT-Core

=> moved from 10.3.1.6

=> Noted

R2-1704903 LCP with mulitple numerologies Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

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=> Noted

R2-1705624 Remaining issues on LCP with Multiple Numerologies Huawei, HiSilicon discussion

=> Noted

Discussion on PBR and Bj

- Samsung thinks that the Bj just has to be updated before transmission.
- Nokia thinks that it can be better to just refer to TTI. LG explains that this is similar to sTTI. Maybe we can just say that it is 1ms. Huawei thinks that we can say subframe.
- Qualcomm thinks that we should first decide whether it is per logical channel or TTI. Lenovo thinks that it should be per logical channel.
- Nokia thinks we should do the same as LTE. Mediatek strongly disagrees to have numerology specific parameters. Restriction is enough.
- Samsung asks how to ensure that eMBB doesn't take the URLLC space. Lenovo thinks that we just set PBR to infinity. Qualcomm thinks that if you set PBR to infity and you have more than two logical channels of the same priority then you cannot differentiate between them. InterDigital agrees and we should avoid setting PBR to infinity to solve this.
- Samsung thinks that we should have a common understanding that solve this we have to set PBR of URLLC to infinity.
- Ericsson and Huawei would like to look closer at the potential issues.

Discussion on UL grant processing

The MAC entity processes grants (e.g. perform LCP and build MAC PDU) in descending order of priority assigned to the transmission profile indicated in the grant. If the transmission profiles have the same priority or no priority is assigned to the transmission profile, the MAC entity may process grants in any order.

When UE receives multiple UL grants, it should perform the LCP procedure on one numerology at a time. The processing order for different numerologies should be configured by network.

- Nokia thinks it is enough to leave it up to UE implementation as long as the UE obeys to the restriction.
- Oppo asks when the UE can receive multiple grants.
- Lenovo ask if the intention is to do LCP sequentially. Qualcomm thinks that the grants should be processed sequentially. Lenovo is concerned with timing and do parallel processing. Ericsson doesn't think that we should restrict how the UE processes the grants.
- CATT thinks that there is a grant processing time k, that the UE should follow.
- Intel agrees with Lenovo and we should leave to UE implementation.
- Huawei supports that we should have some form of priority.

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- Samsung, HTC thinks that leaving it up to UE implementation makes sense. Most UEs will do eMBB anyways and for the small fraction of UEs it doesn't happen too often. LG thinks this is like CA
- ASustek thinks the network should configure.
- Huawei thinks we should specify something. Qualcomm thinks that this is just helpful to know which grant is more important.
- Lenovo is concerned with the case of retransmission across numerology. If the UE can do whatever it wants then the network may not know what data are put in TB.
- ZTE thinks that the UE can't do things in parallel anyways because different grants will have different processing times as indicated in the PDCCH.
- Ericsson would prefer some predictable UE behaviour and assign some priority.

On Logical Channel Priority

- Ericsson and Huawei would like to study this longer.

Agreements:

1. Logical Channel Priority is configured per MAC entity per logical channel
2. PBR is not configured per numerology, it is per "logical channel" as in LTE
3. Bj is calculated per logical channel. It is up to UE implementation to ensure that Bj is updated at the right time.
4. FFS if it is up to UE implementation how the UL grants are processed if multiple UL grants are received or some form of prioritization guidelines are specified.

Not treated

R2-1704052 Discussion on the uplink grant content Guangdong OPPO Mobile Telecom. discussion

R2-1704053 LCP considering multiple numerologies Guangdong OPPO Mobile Telecom. discussion

R2-1704258 LCP procedure for NR CATT discussion Rel-15 NR_newRAT-Core

R2-1704413 UL intra-UE puncturing Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704465 Consideration PBR with numerology_TTI duration LG Electronics Mobile Research discussion Rel-15 NR_newRAT-Core

R2-1704478 LTE text/principles for NR: LCP Samsung discussion Rel-15 NR_newRAT-Core

R2-1704605 PDCP duplication for CA case Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704666 Consideration on the LCP for data duplication ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704667 Consideratoin on the LCP for multiple numerology/TTI ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704907 Scheduling and Multiple Numerologies / TTI Durations for NR InterDigital discussion Rel-15 NR_newRAT-Core

R2-1704910 Mapping Between Logical Channels and New Transmissions for NR InterDigital discussion Rel-15 NR_newRAT-Core

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R2-1704911 Logical Channel Prioritization for NR Core InterDigital discussion Rel-15 NR_newRAT-

R2-1704954 Token Bucket accumulation for LCP Huawei, HiSilicon discussion

R2-1705049 Draft LS to RAN1 on numerology or TTI duration signalling Guangdong OPPO Mobile Telecom. discussion

R2-1705075 Logical channel to numerologies/TTI length mapping Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1705127 LCP priority: per UE or per numerology? MediaTek Inc. discussion Rel-15 NR_newRAT-Core

R2-1705307 Consideration on the details of LCP ASUSTEK COMPUTER (SHANGHAI) discussion NR_newRAT-Core

R2-1705317 LCP procedure with multiple numerologies Lenovo Mobile Com. Technology discussion Rel-15 NR_newRAT-Core

R2-1705519 Enhancements to logical channel prioritization MediaTek Inc. discussion Rel-15 NR_newRAT-Core

R2-1705566 Configuration of priority order between data and MAC CE Huawei, HiSilicon discussion

R2-1705597 Configuration of Logical Channel Priority in NR Samsung Electronics discussion Rel-15 NR_newRAT-Core

R2-1705664 Logical Channel Prioritization Procedure in NR Convida Wireless discussion Rel-15

R2-1705517 On the use of PBR concept in NR MAC MediaTek Inc. discussion Rel-15 NR_newRAT-Core

=> moved from 10.2.2

R2-1704504 Visibility of numerology for NR MAC functions Samsung discussion Rel-15

10.3.1.7 SPS/Grant-free

Including UL skipping for dynamic scheduling and SPS, L1 parameter configuration of SPS, activation/deactivation of SPS, etc.

RAN2 aspects related to grant-free depending on RAN1 progress

R2-1704496 Semi-persistent scheduling in NR LG Electronics discussion Rel-15 NR_newRAT-Core

Proposal 1. In NR, when the UE is configured with SPS, the UE should always skip SPS grant if there is no data to transmit, i.e., Skipping SPS grant is mandated in NR regardless of SPS periodicity.

- Samsung asks if this would also be mandated for dynamic grant. LG explains that this is only for SPS

Proposal 2. In NR, there is restriction in use of SPS resource depending on TIT length of SPS resource and logical channel.

- Ericsson thinks we should wait until we know more about the definition.
- LG thinks that the mapping restriction could be different restriction per SPS and dynamic grant. Samsung thinks that in that case we would have to do two different restrictions, one for SPS and for dynamic grant.

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- Ericsson thinks that having several layers of restrictions would make it complicated. Per cell is sufficient.
- LG explains that the SPS can be configured per numerology/TTI and logical channels that can use that "numerology/TTI" can transmit.
- Oppo understand that the UE would follow the LCP restrictions.
- Vivo would like to align SPS behavior with the LCP behavior.

Proposal 3. In NR, multiple SPS configuration needs to be supported in order to support different services simultaneously.

- Huawei asks if this is for UL or DL. LG thinks is for both
- Nokia thinks that this is only allowed for V2X and we don't need to discuss.
- LG explains that in NR we have a different situation. We may need more than on SPS as there may be more than one SPS with different numerology/TTI configured. This is a natural consequence of proposal 2.
- Samsung agrees that the situation is different for NR but we can create different SPS in different ways, for example one SPS, one grant free, etc.
- Ericsson thinks that it would be natural to have one SPS configuration per cell.
- Vivo thinks that we should at least have two, one for URLLC and one for eMBB like legacy.
- ZTE thinks that we should support two for different carrier to support duplication. Lenovo agrees. Nokia explains that for we only need to use SPS for the first packet transmission and subsequent trnasmissions can be transmitted via dynamic grant for duplication. Huawei agrees with Nokia.
- Asustek agrees with proposal.
- Qualcomm sees the need for numerology but not for duplication.
- Oppo asks what multiple configuration mean. LG thinks it can be numerology, TTI, periodicity, etc.

=> Noted

Agreements
1. In NR, when the UE is configured with SPS, the UE should always skip SPS grant if there is no data to transmit, i.e., Skipping SPS grant is mandated in NR regardless of SPS periodicity.
2. LCP is performed the same regardless whether the grant is dynamic or SPS. SPS is a "configured grant".
3. FFS is multiple SPS is supported for duplication or to support different numerologies
4. Implicit release of UL SPS resources is not supported

R2-1704698 Consideration on SPS ZTE Corporation discussion Rel-15 NR_newRAT-Core

For SPS configuration, we propose:

Proposal 1: MCS/frequency resources are configured by SPS activation command as in LTE.

- Intel thinks that these should be configured in RRC and not by PDCCH in the activation. Ericsson thinks that the activation should be similar to the dynamic grant.

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- Intel thinks that once configured the SPS is immediately activated and used. LG thinks that if that is that case then there is no difference between SPS and “grant-free”
- Ericsson thinks that for SPS it is based on LTE baseline so this should be supported for NR as well.
- Samsung asks if “numerology is part of the resources”. ZTE thinks that for that we can wait until RAN1 has progressed more.
- Nokia thinks that RAN1 is deciding.

=> Noted

Not treated

R2-1704382 SPS UL skipping in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704817 SPS enhancements for VoIP Intel Corporation discussion NR_newRAT-Core

R2-1705242 Grant free transmission in NR LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1704383 SPS enhancements in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704493 Clean up of SPS related terminology in NR LG Electronics discussion Rel-15 NR_newRAT-Core

R2-1704570 Considerations on main issues with Semi-Persistent Scheduling (SPS) in NR Samsung R&D Institute UK discussion

R2-1704699 Consideration on grant-free transmision ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1705047 Discussion on UL grant-free transmission for URLLC Potevio Company Limited discussion

R2-1705249 RAN2 consideration on user plane latency enhancement Samsung Electronics Co., Ltd discussion

R2-1705305 UL grant-free transmission vivo Mobile Com. (Chongqing) discussion

R2-1705118 Grant-free resource configuration Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> moved from 10.3.1

R2-1705594 Potential Issues for UL Transmision with Shared UL Grant among Multiple UEs Samsung Electronics discussion Rel-15 NR_newRAT-Core

=> moved from 10.3.1.5

10.3.1.8 HARQ

R2-1704407 HARQ feedback transmission schemes for NR Ericsson discussion Rel-15 NR_newRAT-Core

Proposal 1 Default HARQ configuration (including e.g. number of HARQ processes and ID(s), delays, feedback scheme), which can be supported by all UEs, should be predefined for random access procedure for those cases when the parameters cannot be configured in the UE (e.g. random access in idle mode).

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- Nokia is not sure what exactly needs to be configured. Oppo asks if we will have multiple HARQ config.
- Lenovo and Nokia think this depends on what is in msg2 (RAR).
- Ericsson ask where the UE sends the HARQ feedback for msg4.
- LG thinks that one thinks that needs to be specified is the HARQ process ID for async.

=> Noted

R2-1704408 Impact from multi-bit HARQ feedback Ericsson discussion Rel-15 NR_newRAT-Core

The multi-bit HARQ feedback and CBG-based retransmission scheme are transparent in the MAC specification, i.e. the MAC layer always uses 1 HARQ A/N bit per transport block

- Oppo agrees for the UE side it should be transparent but is concerned for the eNB case and there maybe resource wastage.
- Lenovo, Qualcomm, agree. Intel and CATT likes the intention but some changes might be need. Maybe there may be some impact on the combining part of the spec.
- Samsung agrees and explains that RAN1 is actually trying to keep it transparent from MAC

=> Noted

R2-1704479 The number of TBs per UL HARQ process Samsung discussion Rel-15 NR_newRAT-Core

Proposal 1: A single HARQ process supports one TB when the physical layer is not configured for downlink/uplink spatial multiplexing.

Proposal 2: A single HARQ process supports one or two TBs when the physical layer is configured for downlink/uplink spatial multiplexing.

- Samsung explains that in LTE only one HARQ process ID is signalled in LTE
- Lenovo asks how we would specify it for UL transmission buffer.
- CATT asks why we change it for UL. Lenovo explains that it is to keep DCI small

=> Noted

R2-1704912 HARQ Processing for NR InterDigital discussion Rel-15 NR_newRAT-Core

Proposal 3: A HARQ entity may have multiple ongoing HARQ processes concurrently.

- Oppo asks in what cases this would be true. InterDigital explains that this is for the case of eMMB and URLLC.
- Ericsson agrees but the wording needs to be different. Lenovo thinks this is invisible to MAC.

=> Noted

R2-1705628 HARQ with multiple numerologies Huawei, HiSilicon discussion

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Proposal 3: HARQ information for UL-SCH at least consists of NDI, TBS, RV and HARQ process ID.

- Samsung thinks that we should wait for more agreements and how to model it before agreeing to all these detailed.

=> Final HARQ information will be updated at a later stage once a number agreements in RAN1 are made

Proposal 4: UL grant for UL-SCH should also include numerology/TTI duration.

- Ericsson thinks this is related to the transmission profile and this can be an index and agrees with the principle.
- Oppo understands that RAN1 has some implicit link between BW and numerology for example.
- Lenovo thinks that this is not necessarily what is transmitted on DCI it's more the interface between PHY and MAC.

=> We will wait for the LCP final modelling

=> Noted

Agreements:

1. RAN2 aims to keep Multi-bit HARQ feedback and CBG-based retransmission transparent to the MAC for one TB
2. A single HARQ process supports one TB when the physical layer is not configured for downlink/uplink spatial multiplexing.
3. A single HARQ process supports one or multiple TBs when the physical layer is configured for downlink/uplink spatial multiplexing.
4. One HARQ entity should be supported in one carrier

Not treated

R2-1704337	Consideration on UL async HARQ for NR	NTT DOCOMO INC.	discussion	Rel-15	NR_newRAT-Core
R2-1704409	HARQ Processes for Spatial Multiplexing	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704410	HARQ configurations in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704412	DL puncturing HARQ considerations	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704505	HARQ for numerology multiplexing	Samsung	discussion	Rel-15	
R2-1704577	HARQ process for UL grant-free transmission	vivo	discussion		
R2-1704683	General HARQ aspects of SPS UL	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704684	Enhanced HARQ feedback mode in SPS	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1705059	HARQ Procedure for URLLC-eMBB Multiplexing	Samsung Electronics Co., Ltd	discussion		
R2-1705205	Impact of Asynchronous HARQ	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core

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10.3.1.9 DRX

Including changes relative to LTE operation, impacts of multiple numerologies, impacts due to beam operation etc

R2-1704785 C-DRX enhancement in NR Intel Corporation discussion NR_newRAT-Core

Proposal 1. A UE can be configured with multiple DRX configurations but only one DRX configuration is activated to use at a time.

- NTT Docomo asks if is this different than long and short DRX cycle. Intel explains that it is more just cycles.
- Samsung ask how much gain is achieved from multiple configuration.

=> Noted

R2-1704899 configuration of C-DRX in NR Qualcomm Incorporated discussion Rel-15 NR_newRAT-

- Intel wonders how service specific monitoring is done. Qualcomm would be ok to be per numerology or chain
- Mediatek ask if the UE is expected to monitor all numerologies. Qualcomm explains that it would only monitor the one linked to the configuration. Lenovo asks how the UE knows where the network is going to schedule the UE. InterDigital thinks that it should be per coreset (control channel region) rather than numerology.

=> Noted

R2-1704913 C-DRX for multiple numerology InterDigital discussion Rel-15 NR_newRAT-Core

configurations.

- Nokia thinks that LTE DRX is good. Interdigital thinks that this would ignore the RAN1 agreements on multiple control channel monitoring
- Qualcomm ask whether RAN1 is still discussing. Interdigital explains that it has been agreed already and the UE can have multiple ones with different regions and numerology.
- InterDigital explains that there are a number of things that we know, we may have different control channels with different monitoring occasions that the UE has to monitor.

=> Noted

R2-1705207 Numerology impacts on L2 timer for NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> Not treated

Discussion on multiple DRX parameters

- LG would like to understand what is multiple configuration
- CATT thinks that we can keep the current baseline.
- ZTE asks what configuration means.
- Ericsson thinks we can support multiple DRX configuration. DRX configuration means cycles, timers, etc. LG thinks we should focus on OnDuration and drxCycle. Inactivity timers should not be different. Nokia thinks that only drxCycle can be different.

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- Qualcomm thinsk that the inactivity timer and OnDuration should be per numerology
- CATT thinks that from the UE side we should keep a single timer.
- Nokia thinks that the re-transmission timer can be different per numerology. We shouldn't call it a configuration set.
- LG thinks that the understanding between companies is that some companies think that we should have multiple configurations active.

Are DRX configuration active at the same time or only one at a time

- ZTE would like to understand what parameters are linked to numerology.
- LG would like to have multiple DRX active at the same time, but the final state is one and it is a union
- InterDigital thinks that we should have multiple configuration and active at the same time. An important aspect of power saving is the blind decoding.
- Mediatek thinks that we should keep it simple and the union approach can be configured by the network directly. The most important is the cycle
- Intel thinks that changing between configuration is sufficient and by switching we are saving signalling overhead.
- Huawei thinks we should make it simple and one set is enough. The power saving with overlapping the power savings are not very large.
- Samsung thinks that one DRX cycle has to be running.
- Ericsson thinks that one configuration is active at a time and the important part is to save power at the UE.
- LG thinks that multiple configuration would enable proper DRX. Intel thinks that this non-uniform and no longer a cycle. We should just configure the shortest.
- Interdigital thinks that monitoring occasions for different numerologies will not be the same and not aligned, so it is not easy to have a single one.
- Qualcomm supports multiple active as if you have a single one you would end up with the shortest cycle and this doesn't help power savings.
- Ericsson is concerned with errors and if we have multiple configuration active we would have more error cases to handle. LG thinks that this errors wouldn't occur if we only different onduration and different cycles.
- Samsung thinks that companies should provide the gain when compared to single configuration.

Not treated

R2-1704057	DRX in NR	Guangdong OPPO Mobile Telecom.	discussion		
R2-1704259	DRX design in NR	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1704400	DRX enhancements for NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704401	DRX with Asynchronous HARQ	Ericsson	discussion	Rel-15	NR_newRAT-Core

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R2-1704402	Wake-up signaling in C-DRX	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704456	Way forward for NR C-DRX	Samsung Research America	discussion	NR_newRAT-Core	
R2-1704467	Consideration for DRX in NR	LG Electronics Mobile Research	discussion	Rel-15	NR_newRAT-Core
R2-1704592	Discussion on NR DRX configuration in RRC_CONNECTED state	vivo	discussion		
R2-1704613	DRX with Multiple Numerologies	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1704668	Consideration on DRX	ZTE Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1704906	Wake-up scheme for DRX in NR	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT-Core
R2-1704944	DRX configuration for NR	MediaTek Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1705119	UE power saving mechanism with beamforming	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705206	DRX configuration in NR	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705734	NR C-DRX operation with beamforming	Samsung	discussion		

10.3.1.10 Other

Including remaining aspects related to scheduling such as PHR, duplication, etc

R2-1704338	Activation/deactivation for NR	NTT DOCOMO INC.	discussion	Rel-15	NR_newRAT-Core

Proposal1: Activation/deactivation is supported for NR CA.

Proposal2: Activation/deactivation is controlled per CC by explicit indication and implicit mechanism for NR CA.

- Ericsson thinks that implicit is not really need and there is enough reliability in the MAC CE. NTT docomo would like to keep it as it impact inactivity timer when MAC CE is sent and power savings. Interdigl agees. Nokia also thinks that it is good to keep it to reduce the signalling. LG and Lenovo agrees with the intention with ericsson. LG and Lenovo thnks that the MAC CE will be more reliable in NR. Interdigital thinks that reliability does'nt come for free just because we have NR.
- Samsung, Futjistu and Qualcomm thinks we should keep what we have in LTE. Futjistu doesn't thinks reliability is improved in NR.

Proposal3: Configuration of implicit deactivation mechanism is per CC for NR CA.

- Samsung thinks that today the timer is maintained per carrier but only one value is configured.
- LG supports

Proposal4: PSCell can be deactivated for EN-DC.

- Vivo doesn't want inter-eNB interaction because there are delays between the eNBs. NTT docomo thinks that the MCG can send the command.

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- Intel ask why we would add the CG if it is disabled. NTT docomo thinks this is for keeping the configuration and doing power saving.
- ZTE doesn't see the need for this. LG explains that this is also linked to PUCCH transmission and there is impact.
- Samsung is interested in studying further.
- Lenovo would like to know what the difference is now for NR. NTT docomo thinks that in LTE DC we had backhaul delays but for NR the nodes may be collocated so the delay is no longer an issue.
- Nokia would like to understand which node is controlling and whether some X2 signaling is needed.

=> Noted

Agreements
1. Activation/deactivation is supported for NR CA 2. As in LTE, Activation/deactivation is controlled per CC by explicit indication and implicit mechanism for NR CA 3. Configuration of implicit deactivation mechanism is per CC for NR CA

Not treated

R2-1704866 CA Activation/deactivation in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> moved from 10.2.2

R2-1704396 Activation and Deactivation of Secondary Cells Ericsson discussion Rel-15 NR_newRAT-Core

=> moved from 10.2.2

R2-1704914 UE Power Savings and carrier aggregation InterDigital discussion Rel-15 NR_newRAT-Core

=> moved from 10.3.1.9

PHR

R2-1705606 Needs of Power Headroom enhancement considering beamforming Samsung Electronics discussion Rel-15 NR_newRAT-Core

=> moved from 10.3.1.4

R2-1704481 PHR triggering events for NR Samsung discussion Rel-15 NR_newRAT-Core

R2-1704482 Baseline PHR format for NR Samsung discussion Rel-15 NR_newRAT-Core

R2-1704483 Draft LS on PHR details for NR Samsung LS out Rel-15 NR_newRAT-Core To:RAN1, RAN4

R2-1704612 Considerations on PHR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704915 Power Headroom Reporting for NR InterDigital discussion Rel-15 NR_newRAT-Core

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R2-1705203	PHR report	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705204	LS on PHR report	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705406	PHR for NR CA	Lenovo, Motorola Mobility	discussion	NR_newRAT-Core	
R2-1705568	PHR for UL Split Bearer	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT-Core
R2-1705605	PHR triggering event in beamforming transmission	Samsung Electronics	discussion	Rel-15	NR_newRAT-Core
R2-1705627	Power control with multiple numerologies	Huawei, HiSilicon	discussion		

Other

R2-1704272	Duplication Impacts to MAC	Nokia, Alcatel-Lucent Shanghai Bell	discussion	Rel-15	NR_newRAT

R2-1704480	LTE text/principles for NR: BCH and PCH	Samsung	discussion	Rel-15	NR_newRAT-Core

=> Agree to additions in TS

Not treated

R2-1704503	RAN2 impacts from bandwidth part in NR	Samsung	discussion	Rel-15

R2-1704458	On the TTI and Subframe in NR	Samsung Research America	discussion	NR_newRAT-Core
R2-1704459	[Draft] LS on the TTI definition	Samsung Research America	discussion	NR_newRAT-Core
R2-1705601	General aspects to support URLLC in NR	Samsung Electronics	discussion	Rel-15 NR_newRAT-Core
R2-1704604	Waveform Modification in NR	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core

=> moved from 10.2.2

10.3.2 RLC

10.3.2.1 TS

Latest TS 38.323, rapporteur inputs, etc

Including output from email discussion [97bis#25][NR/UP] – Running 38.322 (MediaTek)

R2-1705513	Draft TS for 3GPP TS 38.322 specification	MediaTek Inc. (Rapporteur)	draft TS	38.322	0.0.2 Rel-15 NR_newRAT-Core

=> The TS is endorsed

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R2-1705514 Text proposal for RLC procedures MediaTek Inc. discussion Rel-15 NR_newRAT-Core

- Nokia thinks that in principle changing to more descriptive variables is nice. Ericsson thinks that those names are quite known so we should only change the naming if we have more functional changes.
- LG used these variables for PDCP specs so we should keep them.
- Huawei supports making them more readable. Samsung likes PDCP.

=> Lets try to use short and more descriptive names

=> Noted

10.3.2.2 RLC segmentation

Including use cases in which disabling segmentation is beneficial

R2-1705076 Cases for disabling segmentation Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

Proposal 1: *Confirm that UE shall support segmentation for all services as well as be prepared to segment for every transmission based on the given limits (parameter X in LCP).*

Proposal 2: *X is configurable to allow networked controlled dismissing segmentation on per TB/TTI basis.*

Proposal 3: *Both temporary negative token and temporary leftover token should be allowed to avoid unnecessary segmentation.*

Proposal 4*: The rules in LTE for LCP to skip segmentation and maximise transmission of data should be adopted for NR as well.*

Proposal 5*: The UE could skip segmentation for one LCH when there is other data for transmission for another LCH that does not require segmentation.*

- Levono thought this is already there in LTE.
- HTC asks if it can be same or different priority. Nokia says it can be different.
- Nokia explains that the intention is to prevent segmentation. LG thinks it is supported in LTE.
- ZTE would like to confirm that the UE still follows the priority rule.

=> Noted

R2-1704055 Benefits of disabling RLC segmentation Guangdong OPPO Mobile Telecom. Discussion

=> Noted

Discussion

- Mediatek thinks segmentation shouldn't be configurable and there isn't much overhead related to segmentation, as there is at most two segments.
- LG is concerned that if we disable segmentation we will have excessive padding. Ericsson shares the views of Nokia, Mediatek, LG.
- Vivo thinks that we should always allow segmentation and X should be fixed. Huawei supports X to be configurable.

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- Huawei doesn't think the segmentation prevents pre-processing.
- Mediatek wonders how we use X.
- LG, Mediatek and CATT doesn't think it should be configurable. Nokia thinks that we should be careful with how we chose X.

Agreements:
1. UE shall support segmentation for all services as well as be prepared to segment for every transmission based on the given limits (parameter X in LCP) for both RLC AM and UM. The value X is not configurable and the exact value is FFS. 2. As in LTE, temporary negative token in LCP to skip segmentation and maximise transmission of data is adopted for NR as well. 3. FFS if in LTE the UE could skip segmentation for one LCH when there is other data for transmission for another LCH that does not require segmentation. This is handled by the UE implementation.

R2-1704364 RLC Segmentation Configurability Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704516 Configurability of RLC segmentation LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1705112 Discussion on Disabling Segmentation ITRI discussion NR_newRAT-Core

R2-1705120 RLC Segmentation Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705719 Discussion on Disabling Segmentation Samsung discussion

10.3.2.3 RLC header format

Details on RLC header formats, need of fields, length of fields, etc

R2-1704140 SO field for the last SDU segment LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

=> Noted

R2-1705217 Consideration on the SO field size for small packets Xiaomi, CMCC, CATT, Coolpad discussion Rel-15

=> moved from10.3.2.3

Proposal 1: RAN2 is asked to introduce smaller SO size (smaller than 15/16 bits, e.g. 8bits) for small packets.

Proposal 2: RAN2 to consider whether the following option is feasible:

- configure two SO sizes which can be dynamically used in data packets of a DRB.

- LG thinks that SO field is related to the L field. So if we have two L sizes then we should have the same SO.
- Huawei agrees but the SO size doesn't have to be the same as the L.

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- Vivo explains that for NR the SO size is related to segmentation. Qualcomm agrees and if we support variable L fields we should have the same for SO.
- Nokia thinks that we should avoid having multiple formats.
- Ericsson and Samsung doesn't see the use case to have to multiple SO fields.
- Oppo doesn't think we should have dynamic SO field changes.
- LG thinks that at least the SO should indicate the full size of the PDCP, so it should be as large as the largest L field.
- Samsung doesn't see a benefit as there is only one SO field per logical channel.

=> Noted

R2-1705122 RLC header format Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> Noted

Agreements:

1. The SO field should be included in the last SDU segment as well as the middle SDU segment.
2. One SO size is supported for NR. SO field should be able to indicate the largest PDCP PDU size we intend to support.

R2-1704595 The details of RLC status report format vivo discussion

=> moved from 10.3.2.4

R2-1705077 RLC status report format Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

=> moved from 10.3.2.4

- Nokia thinks that if the number of bits used for the range is small then we need a solution similar to what they propose
- Oppo asks if several NACK ranges.

=> Noted

Agreements

1. NACK range field indicating the number of consequitively lost RLC SNs starting from and including NACK_SN.
2. FFS the number of bits required
3. E3 indicates the presence of NACK range
4. Several NACK range fields can be included in the RLC Status PDU
5. The rest of the fields can follow LTE baseline

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Not treated

R2-1705726 RLC Status PDU Format for NR Samsung discussion

R2-1704056 Discussion of the RLC PDU header formats Guangdong OPPO Mobile Telecom. discussion

R2-1704260 NR RLC PDU format CATT discussion Rel-15 NR_newRAT-Core

R2-1704274 SN for RLC UM Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1704515 Sequence Number for UMD PDU LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1704517 NACK SN range for RLC STATUS PDU LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1704614 SO-field size in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705067 RLC Status PDU format Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1705082 Discussion on RLC STATUS report PDU format KT Corporation discussion

R2-1705208 Overhead reduction for RLC UM transmission Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704366 RLC STATUS report format Ericsson discussion Rel-15 NR_newRAT-Core

=> moved from 10.3.2.4

R2-1705209 RLC Status PDU Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> moved from 10.3.2.4

10.3.2.4 RLC AM operation

Including ARQ operation, etc

R2-1705219 Segmentation implications to RLC status reporting Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

Proposal 1: Too early reporting of not transmitted yet or still ongoing segment should be avoided.

- Samsung asks how the UE knows if the packet is lost. Nokia explains that the UE keeps both highest SN received.
- Huawei asks how often this problem would occur. Nokia thinks that it depends on the number of HARQ ongoing. Huawei thinks that the timers are set taking into account HARQ.
- Samsung thinks that it would be nice to avoid it but how easy is it. Nokia explains that they want to follow the LTE way but translated into NR SN/SO.

=> Noted

R2-1705621 Moving Receiving Reordering Window in NR Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

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Proposal 1: In NR, the transmitter is allowed to request the receiver to move the receiving and reordering windows at both RLC and PDCP layers.

Proposal 2: The receiver acknowledges the window move request is received to the transmitter.

- Mediatek, Lenovo, Nokia, Ericsson, LG thinks that once you can create a RLC PDU we shouldn't discard even if discard timer has expired.
- Qualcomm thinks that it should be possible due to preprocessing. Lenovo and Mediatek thinks that pre-processing should be limited.
- LG thinks that there is some need to study more the PDCP problem.
- CATT sees some benefits with proposal 1

=> Noted

R2-1705720 Lossless AM Operation for NR Samsung discussion

Proposal 1. RLC AM should support only lossless AM operation in Rel-15 NR

- LG and QC thinks that RLF based on max number of retransmission is not useful. NTT thinks that RLF based on max number is needed and we agreed in main session that it is one of the criteria.
- Samsung thinks that if we remove the RLF criteria then we would still need to design a recovery mechanism. Nokia thinks that once it is needed it is essential.

=> Noted

Agreements
=> As in LTE, RLC AM should support only lossless AM operation
=> As a baseline, RLF is triggered based on RLC max number of retransmission reached for single leg.

R2-1705683 Discussion on RLC polling Samsung discussion Rel-15 NR_newRAT-Core

=> Noted

R2-1704615 ARQ operation in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

- Qualcomm agrees that it is not necessary to include multiple poll bits in the TB
- Nokia thinks that from the transmitter side we don't need to worry about where the polling bit is set.
- Ericsson doesn't see the issue. Huawei thinks that the receiver has to check the P field of every SDU.
- Intel and Samsung sees no impact as there is no overhead.

=> Noted

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Agreements:
1. RLC polling mechanisms are the same as in the LTE. No additional enhancements are needed.

R2-1704514 Receiving operation for RLC AM LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

Proposal1. The receiving AM RLC entity should have the receiving window operation for ARQ and reassembly operation for the segmented SDU separately.

- Samsung asks what additional gains we would achieve given that we have a well defined RLC AM mechanism already.
- Intel thinks that window control can be achived by the transmitter side and is quite different from UM

=> No support for the proposal

=> Noted

R2-1704275 Duplication Impacts to RLC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

=> Noted

10.3.2.5 RLC UM operation

Including discussion on need for duplicate detection, packet re-assembly aspects for RLC UM and how a missing segment is detected (e.g. need for Treassembly), etc

R2-1704261 NR RLC UM SN removal CATT discussion Rel-15 NR_newRAT-Core

Proposal 1: A complete NR RLC UMD PDU will not include SN field.

- Oppo is concerned that duplicate detection cannot be done without SN field.
- Intel thinks that this impacts pre-processing.

=> Noted

R2-1704365 RLC UM details for NR Ericsson discussion Rel-15 NR_newRAT-Core

=> moved from 10.3.2.5

=> Noted

Discussion

- Nokia, LG, Xiaomi, doesn't see the need to have duplicate detection for RLC UM.
- Intel thinks that we still need it for segmented SDUs. Nokia doesn't think that the MAC will discard duplicate HARQ transmissions in the same HARQ buffer.
- NTT docomo support Ericsson.
- Qualcomm thinks that this is related to PDCP re-ordering and has some concerns with the handling or the receive window.

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Not treated

R2-1704307	RLC UMD PDU without SN	Beijing Xiaomi Mobile Software	discussion	Rel-15
R2-1704792	Discarding of segments in RLC UM	Intel Corporation	discussion	NR_newRAT-Core
	=> Noted			
R2-1705054	RLC UM with t-reassembly	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core
	=> Noted			

Discussion on discarding of segment

- LG ask how to detect that the last missing segment. Intil thinks you would remove the bearer. Samsung doesn't think this is a problem
- SEquans supports the timer based approach and this would allow the HARQ failure detection in RLC. Oppo agrees with QC, but single reordering timer is not enough. LG agrees.
- Samsung, Ericsson, Nokia and NTT thinks we should use the same mechanism as LTE as is, so window based is better.
- CATT and Huawei thinks that the timer works well and simple.
- Nokia thinks that there a lot of aspects related to the timer that still need to be discussed.
- Mediatek has a slight preference for the window based approach.
- SEquans asks how it works if we don't have SN for complete PDUs. Nokia explains it is only for the data that is seating in the buffer and SN would only be included for segments. LG thinks that this would change the LTE behaviour anyways.

Questions:

Whether SN in included in every PDU

Whether the receive window mechanism is enough

1. SN is included in every PDU
    a. Option 1-1 with LTE window only mechanism
    b. Option 1-2 with window and timer

2. SN is included only in SDU segments
    a. Option 2-1 with window mechanism
    b. Option 2-2 with one T-reassembly timer
    c. Option 2-3 with multiple T-reassembly timer

✉ **[NR/UP] – RLC UM – Qualcomm**
- Discuss/understand solutions and complexity of solutions
- Company's preferences on the solutions

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- Before next meeting

Agreements:

=> Duplicate detection in RLC UM is not necessary

Not treated

R2-1704262 NR RLC UM operation CATT discussion Rel-15 NR_newRAT-Core

R2-1704494 NR RLC UM Receive Procedure National Instruments Corp. discussion

=> Withdrawn

R2-1704512 Reordering of RLC SDU segment in RLC UM LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1704513 Reassembly timer for RLC UM LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1704571 Receiving window based or timer based discarding Beijing Xiaomi Mobile Software discussion Rel-15

R2-1704669 Consideration on UM RLCZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1705050 The SN of RLC UMD PDU Guangdong OPPO Mobile Telecom. discussion

R2-1705078 On discarding by RLC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1705515 RLC UM receiver window operation MediaTek Inc. discussion Rel-15 NR_newRAT-Core

R2-1705104 NR RLC UM Receive Procedure National Instruments Corp. discussion

R2-1705111 Duplicate Detection Functionality is not needed for RLC UM ITRI, ASUSTEK, MediaTek Inc. discussion NR_newRAT-Core

R2-1705684 NR RLC UM receive window Samsung discussion Rel-15 NR_newRAT-Core

R2-1705685 RLC UM receive window operation Samsung discussion Rel-15 NR_newRAT-Core

R2-1705778 RLC UM operation for NR Sequans Communications discussion

R2-1705121 Assembly Timer for RLC Segments Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> moved from 10.3.2.

10.3.2.6 Other

Not treated

R2-1704518 STATUS PDU for RLC SDU segments LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

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R2-1705783 RLC SDU delivery consideration CMCC discussion Rel-15 NR_newRAT-Core

10.3.3 PDCP

R2-1704491 PDCP Status Reporting in NR AT&T discussion

=> not treated

10.3.3.1 TS

Latest TS 38.323, rapporteur inputs, etc

Including output from email discussion [97bis#24][NR/UP] – Running 38.323 (LG)

R2-1704076 NR; Packet Data Convergence Protocol (PDCP) specification LG Electronics Inc. draft TS 38.323 0.0.5 Rel-15 NR_newRAT-Core

- LG indicates that the state variables have to be changed

=> The CR is endorsed and the next revision will update the state variables

R2-1704141 TP on PDCP DL data receive operation LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

- Nokia, Huawei, ZTE and Qualcomm prefer option 2 and not leave it up to the UE implementation. Samsung would like to leave it to UE implementation for simplicity.

=> Option 2 will be implemented

- Intel asks if the receiver operations are the same as in LTE. Everything is the same as in LTE
- Nokia thinks that the fourth proposal is not exactly the same as LTE
- Ericsson thinks that R2-1704373 should be included. Nokia indicates that we have different proposals on the window mechanism.
- LG would prefer to have a unified approach. CATT would like to be able to discuss and understand the issues)

=> Noted

✉ **[NR/UP] – PDCP receive operation – LG**

- Discuss different receive window operation aspects discussed in contributions (e.g. push/pull or different ones for AM/UM)
- Finalize whether it is possible to have unified approach
- TP capturing agreements
- One week before the meeting

R2-1704142 PDCP data volume calculation LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

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- Samsung thinks it looks too simplified. LG explains that some of the sections dealing with what needs to be retransmitted is covered in other sections.
- Nokia thinks that for the normal case this look good but for the split bearer and duplication case we may need more explanation. LG thinks we can add more once we make more agreements

=> Noted

R2-1704373 PDCP common reception algorithm Ericsson discussion Rel-15 NR_newRAT-Core

=> Move to be discussed as part of email discussion

=> Noted

R2-1704918 ROHC profiles for PDCP InterDigital discussion Rel-15 NR_newRAT-Core

- Nokia agrees that we should refer to the latest versions
- InterDigital asks if we should also update the reference for LTE. Intel thinks that there were some CRs in the main session.

=> Agree to TP additions

10.3.3.2 PDCP PDU formats

Including further need for larger PDCP SN size, , PDCP header formats

Including output from email discussion [97bis#23][NR/UP] – PDCP PDU format – Huawei

R2-1705216 Summary of [97bis#23][NR/UP] – PDCP PDU format Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> Noted

Discuss whether out-of-order/duplicated reception of PDCP status report is an issue to be resolved in RAN2.

- CATT thinks that there can be an issue if PDCP status reports are duplicated.

Discussion on the P field for DRB

- Qualcomm thinks that the P field for DRB can still be useful. Mediatek thinks that it is used for LWA only in LTE and there is no use case for LTE. LG wants the same format for SRB and DRB.
- CATT supports the P field in the DRB. Nokia aks what the use case is. Vivo thinks that it can be useful for the UM split bearer. Samsung thinks that this will no happen if we have the proper SN. NTT docomo doesn't see a problem with UM split bearer.
- CATT thinks it can be useful for PDCP duplication case. Qualcomm agrees and it can also be used for flow control. Samsung thinks that high data rate and duplication is not very realistic. Mediatek thinks that flow control can be achieved via communication between eNBs. QC indicates that it is optional and it will probably also be option for NR.

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Agreements

1. the D/C field is not present in the PDCP data PDU format for SRB.
2. the D/C field is present in the PDCP data PDU format for DRB.
3. the P field is not present in the PDCP data PDU format for SRB and as a baseline for DRB as well.
4. the D/C field is present in all PDCP control PDUs.
5. the PDU type field is present in all PDCP control PDUs.
6. the PDU type field is 3 bits.
7. RAN2 assumes that out-of-order/duplicated reception of ROHC feedback is not an issue to be resolved to RAN2.
8. Out-of-order/duplicated reception of PDCP status report is not an issue to be resolved in RAN2.
9. As a baseline, PDCP SN number will not be added to the PDCP Control PDUs
10. 12 and 18 bit PDCP SN is used for NR

R2-1705725 Larger PDCP SN Size for NR Samsung discussion

Proposal 1. 20-bit PDCP SN size is supported as a large SN size for NR.

Proposal 2. One large PDCP SN size is supported for NR.

Proposal 3. Large PDCP SN size is not applicable for RLC UM.

- Huawei asks what RTT value has been used. Samsung explains that we use the DC case. Intel and Qualcomm think we shouldn't use the DC case. Intel thinks that we shouldn't use very large backhaul delays. Ericsson agrees.
- LG would like to use 32bit SN. NTT docomo indicates that 32 bits was discussed in SI phase and it wasn't agreed. Intel understands that large re-ordering timer is linked to backhaul delay and we don't think those should be considered.
- Huawei thinks we should increase the SN size.

=> Noted

R2-1705443 SN length in NR PDCP Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

=> Noted

Not treated

R2-1704671 Consideration on PDCP status report ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704263 PDCP PDU format CATT discussion Rel-15 NR_newRAT-Core

R2-1704367 PDCP SN length Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704380 PDCP PDU formats Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704555 PDCP Sequence Number length in NR LG Electronics France discussion Rel-15 NR_newRAT-Core

R2-1704556 Support of super jumbo frame LG Electronics France discussion Rel-15 NR_newRAT-Core

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R2-1704616 PDCP SN size Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704617 Support for super jumbo frame in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704670 Consideration on the in sequence delivery of ROHC feedback control PDU ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704682 Introduction of Jumbo frames in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704793 Maximum PDCP SDU size Intel Corporation discussion NR_newRAT-Core

R2-1704794 PDCP SN length in NR Intel Corporation discussion NR_newRAT-Core

R2-1705123 PDCP Sync Protection in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705210 PDCP Control PDU Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705686 NR RLC/PDCP header formats Samsung discussion Rel-15 NR_newRAT-Core

R2-1705157 A Hybrid UL Split Operation Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> moved from 10.2.2

10.3.3.3 Other

Including output from email discussion [97bis#11][NR] UL split operation (Ericsson)

R2-1704381 Email discussion report on UL data split Ericsson (Rapporteur) report Rel-15 NR_newRAT-Core

Proposal: A threshold based mechanism for UL split operation similar to LTE is defined as base-line, including reusing the BSR framework. The detailed design of the threshold based UL split operation mechanism including BSR reporting needed to accommodate the NR protocol is FFS.

- Samsung, Intel and LG would like to understand how to handle the pre-processing for the case that data volume is above the threshold.
- Lenovo doesn't think that the LTE Rel-13 solution allows pre-processing.
- Nokia thinks that some smart implementation can still handle pre-processing. Lenovo thinks that you cannot pre-process and you'd have to recalculate
- Ericsson thinks that some enhancements would still be needed.
- LG thinks that with a hard split there would not be misalignments.
- Lenovo thinks that finding a hard ratio is difficult and we should not repeat those discussion.
- Qualcomm thinks that for high data rates we can consider switching.
- Mediatek indicates that not all buffered packets have to be pre-processed.
- Huawei thinks for the below the threshold case the UE uses only one link. For above the threshold some enhancemnts can be introduced.
- LG thinks that the data rate should be used instead of buffer status. Mediatek asks what data rate is referring to. LG explains is amount of data arriving over a period. Ericsson thinks that data rate is related to the grant as well. Nokia thinks that we should chose a link based on delays. MEdiatek thinks that buffer, data rate, delay are similar and we should just use the buffer size as a baseline.

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- LG thinks that the main question is when the threshold checking happens. Lenovo thinks that this up to implementation. What we need to achieve is that we are ready to transmit.

=> Noted

Agreements
=> A configurable threshold approach is used to determine if the UE should transmit on one more than one link. As a baseline, the buffer status is used as a threshold. FFS if other thresholds like data rates or delay can be considered.
=> If below a threshold the UE transmits on one link. When above the threshold enhancements can be considered to allow for pre-processing and link performance.

R2-1704342 Consideration on UL split operation NTT DOCOMO INC. discussion Rel-15 NR_newRAT-Core

=> Not treated

R2-1704371 Header compression in NR Ericsson discussion Rel-15 NR_newRAT-Core

=> Not treated

R2-1705214 RoHC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Proposal 1: RAN2 is request to select one option for ROHC operation:

- *Option 1: the SDAP header is placed at the end of the SDAP PDU and is compressed together with the IP packet.*
- *Option 2: the PDCP layer should take off the SDAP header before ROHC compression and add it back after ROHC compression, i.e., the SDAP header is not included in the compressed IP packet.*
- Mediatek thinks that we can leave option 2 up to UE implementation. Nokia thinks that there is option 3, when there is no SDAP header.
- Ericsson agrees with Mediatek and option 3 can be done anyways. Oppo agrees with Mediatek. CATT thinks option 3 is a good baseline.
- Futjisu thinks we should consider that cross layer interaction is needed for option 2 and 3. Nokia explains that the whole bearer is configured such that there is no header.
- Mediatek thinks that we agreed in main session that no impact to PDCP.

=> As a baseline no specification impacts are needed to handle ROHC operation.

=> Noted

R2-1705776 Disabling of PDCP reordering Sequans Communications discussion

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=> Noted

R2-1704795 PDCP reordering operation in NR Intel Corporation discussion NR_newRAT-Core

=> Noted

Discussion on reordering configuration

- Huawei thinks that it should be configured whether it is enabled or not and T-reordering = 0 should be used. SA2 should have an indicator whether reordering is required or not.
- LG thinks reordering timer should not applied to SRB
- Sequans thinks that the question is whether we still want duplicate discarding. Nokia agrees that duplicate discarding should be applied and RRC should configure re-ordering.
- Samsung asks whether there is a use case to disable in-order delivery.
- Nokia is concerned about the handover case. Huawei thinks that's why it shouldn't be left to layer.
- LG explain that we can agree at this meeting that we should disable it and then after agreeing the receive operation we can discuss how to do it.

=> The need to disable reordering and how is postponed until receive window operation is completed

Not treated

R2-1704264 NR PDCP window and timer mechanisms CATT discussion Rel-15 NR_newRAT-Core

R2-1705447 PDCP handling of UM bearer Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1705411 PDCP discard timer for NR Lenovo, Motorola Mobility discussion NR_newRAT-Core

R2-1705444 PDCP trigger for uplink-data reporting to both MCG and SCG Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1704372 PDCP feedback and flow control Ericsson discussion Rel-15 NR_newRAT-Core

=> moved from 10.3.3.2

R2-1705215 PDCP consideration for flow control Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705784 Introducing Transmission Mode for PDCP Operation CMCC discussion Rel-15 NR_newRAT-Core

=> moved from 10.2.2

R2-1704143 Packet duplication in PDCP LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

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R2-1704144 PDCP UL split operation LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1704276 Duplication Impacts to PDCP Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1704836 Interaction between PDCP/RLC/MAC for Packet duplication Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> moved from 10.2.2

R2-1704369 Lossless PDCP SN reconfiguration at HO Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704370 PDCP data volume reporting in duplication (BSR) Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704618 PDCP reordering disabling/enabling Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704619 PDCP status report for RLC UM Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704681 PDCP Uplink transmit operation Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704795 PDCP reordering operation in NR Intel Corporation discussion NR_newRAT-Core

R2-1705211 LS on disable PDCP Reordering Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705212 PDCP discard mechanism Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705213 RLC-PDCP coordination for PDCP-level Packet duplication Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705258 SDAP header placement Fujitsu discussion Rel-15 NR_newRAT-Core

R2-1705263 Pre-prosessing and PDCP discard Fujitsu discussion Rel-15 NR_newRAT-Core

R2-1705318 PDCP reception and reordering window Ericsson discussion Rel-15 NR_newRAT-Core

R2-1705342 Pre-processing for UL split bearer operation Lenovo Mobile Com. Technology discussion Rel-15 NR_newRAT-Core

R2-1705343 Pre-processing for UL split bearer operation Lenovo Mobile Com. Technology discussion Rel-15 NR_newRAT-Core

R2-1705445 Reconfiguration to Shorter SN Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1705446 De-activation of re-ordering in PDCP Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1705447 PDCP handling of UM bearer Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1705516 PDCP ARQ function MediaTek Inc. discussion Rel-15 NR_newRAT-Core

R2-1705687 Out-of-sequence delivery in PDCP Samsung discussion Rel-15 NR_newRAT-Core

R2-1705688 Out of order reception or duplicate reception of ROHC feedbacks Samsung discussion Rel-15 NR_newRAT-Core

- According to Ericsson's analysis we can tolerate some out-of-order reception.

=> Noted

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R2-1705699 PDCP header compression for QoS flows HTC discussion Rel-15 NR_newRAT-Core

R2-1705700 Disabling PDCP reordering LG eletronics discussion

R2-1705701 Need for SN in PDCP Control PDU LG eletronics discussion

R2-1705777 PDCP reordering operation Sequans Communications discussion

R2-1705053 Decouple window size and SN space Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

=> moved from 10.2.2

R2-1705817 Clarification on threshold based solution for UL split bearer SAMSUNG

=> moved from 10.2.2

10.3.4 QoS layer

10.3.4.1 TS

Latest TS 37.3xx, rapporteur inputs, etc

R2-1704473 TP on SDAP PDU format LG Electronics discussion NR_newRAT-Core

=> Not treated

10.3.4.2 Header Format

R2-1704265 SDAP PDU format CATT discussion Rel-15 NR_newRAT-Core

=> noted

R2-1704277 QoS Flow Marking Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

=> Noted

Discussion

NR SDAP layer may have different PDU formats for UL and DL

- Samsung would like to have a uniform structure. Mediatek thinks that the UL and DL are different.

RAN shall be informed when NAS layer reflective QoS is activated over the C-plane

- Mediatek thinks that NAS and AS layer reflective QoS should be treated separately.
- Samsung explains that this also depends on whether the SDAP heaher is static or whether it dynamic

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- Huawei thinks that if the NAS doesn't notify the RAN then it implies that the SDAP header will always be present.
- LG thinks we should tell SA2
- Convida thinks we should discuss how to deal with the full SDAP header.
- Huawei and Nokia think that we are only talking about the dynamic mapping

If NAS reflective QoS is used do we need to include the QoS Flow ID

- ZTE wonders how does the RAN know. Nokia thinks that we need to ask SA2 how we will be made aware.
- Qualcomm thinks we should ask SA2 what it means to be activated/de-activation by C-plane, U-plane, etc. Mediatek also wants to ask when AS should be informed.

R2-1705866 Draft LS on NAS reflective QoS Nokia LS out

✉ **[NR-UP] LS on NAS reflective QoS – Nokia**

1. Inform SA2 of our agreements and our stage QoS text
2. ask questions on activation/de-activation of NAS reflective (U-plane/C-plane), when the AS should/will be informed, expected QoS flow ID size.

- Agree on final draft LS
- One week after the meeting

R2-1704472 Further considerations on QoS flow ID LG Electronics discussion NR_newRAT-Core

=> Not treated

R2-1704302 QoS layer header format Samsung discussion Rel-15 NR_newRAT-Core

- Mediatek agrees that at least the Q field and QFI is needed.
- Ericsson thinks that it can be configured by RRC, once configured it is always there and a transparent mode should be supported
- Qualcomm is not sure what the reason for having a dynamic header as even if there is no QoS Flow ID we still need a full byte.

=> Noted

Agreements of SDAP headers
1. The QoS flow ID is presence once the AS reflective QoS is active. FFS whether it is always present. 2. gNB should be informed when NAS layer reflective QoS is activated (e.g. can be used). It is FFS how we handle NAS reflective QoS and dependent on how/when it will be provided. 3. RAN2 will support a mode in which SDAP header is not present and is configured per DRB. If configured, FFS how the different fields are handled.

Not treated

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R2-1704470 Further discussion on Reflective QoS LG Electronics discussion NR_newRAT-Core

R2-1704593 Clarification on the network configuration of ignoring UL flow ID vivo discussion

R2-1704594 Discussion on the SDAP header format vivo discussion

R2-1704597 Draft LS on the new QoS layer vivo discussion

R2-1704649 Discusion on the SDAP PDU format ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704981 QoS Flow ID in SDAP Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704982 SDAP PDU Format Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704983 Use of Shorter QoS Flow ID Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704984 Draft LS on QoS Flow ID Size Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705058 Further considerations of SDAP header Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1705116 QoS and SDAP layer aspects in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1705259 Header format of QoS layer considering ROHC Fujitsu discussion Rel-15 NR_newRAT-Core

R2-1705264 SDAP header placement Fujitsu discussion Rel-15 NR_newRAT-Core

R2-1705665 Discussion on SDAP Mode of Operation and SDAP PDU Header Convida Wireless discussion Rel-15

R2-1705666 Discussion on the Location of SDP header in SDAP PDU Convida Wireless discussion Rel-15

R2-1705782 SDAP header format optimization CMCC discussion Rel-15 NR_newRAT-Core

10.3.4.3 Other

Flow remapping behaviour, handover behaviour, precedence between reflective/configured QoS, etc

Not treated

R2-1704304 Further considerations on the reflective QoS Samsung discussion Rel-15 NR_newRAT-Core

R2-1704278 QoS Flow Relocation Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1704059 Discussion on reflective QoS Guangdong OPPO Mobile Telecom. discussion

R2-1704266 QoS re-mapping of QoS flow and DRB CATT discussion Rel-15 NR_newRAT-Core

R2-1704267 How the ROHC in PDCP skip the compression of SDAP header CATT discussion Rel-15 NR_newRAT-Core

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R2-1704279 Reflective QoS in AS Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1704281 Further Discussions on the Remaining Issues with QoS Flow ID TCL Communication Ltd. discussion Rel-15 NR_newRAT-Core

R2-1704303 Re-configuration scenarios for the NR QoS framework Samsung discussion Rel-15 NR_newRAT-Core

R2-1704379 Reflective QoS and Flow-ID Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704469 Configurability for UL QoS flow ID marking LG Electronics discussion NR_newRAT-Core

R2-1704471 Precedence of the RRC configured mapping and reflective QoS LG Electronics discussion NR_newRAT-Core

R2-1704474 SDAP configuration LG Electronics discussion NR_newRAT-Core

R2-1704548 Location of QoS Flow ID in UL and DL packet LG Electronics France discussion Rel-15 NR_newRAT-Core

R2-1704552 QoS flow to DRB remapping LG Electronics France discussion NR_newRAT-Core

R2-1704563 Network configuration of the omitted QoS flow ID Beijing Xiaomi Mobile Software discussion Rel-15

R2-1704566 QoS flow marking with configurable length Beijing Xiaomi Mobile Software discussion Rel-15

R2-1704801 Remapping of QFI between DRB and precedence handling Intel Corporation discussion NR_newRAT-Core

R2-1704985 Activation and Deactivation of Reflective QoS Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704986 Initiation of SDAP Entity Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704987 QoS Flow to DRB Re-Mapping Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704988 Reflective Mapping in AS Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705060 Precedence order of RRC configured mapping and reflective mapping Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1705113 Discussion on omitting QoS flow ID ITRI, MediaTek Inc. discussion NR_newRAT-Core

R2-1705520 Managing packet loss and out-of-order delivery for QoS flow relocation MediaTek Inc. discussion Rel-15 NR_newRAT-Core

R2-1705521 Precedence between RRC and reflective mapping MediaTek Inc. discussion Rel-15 NR_newRAT-Core

R2-1705522 Configuration of AS reflective mapping MediaTek Inc. discussion Rel-15 NR_newRAT-Core

R2-1705780 QoS flow ID in AS Reflective QoS CMCC discussion Rel-15 NR_newRAT-Core

R2-1704250 Discussion on QoS mapping CATT discussion Rel-15 NR_newRAT-Core

=> moved from 10.2.12

R2-1704647 Discussion on intra-cell QoS flow remapping ZTE Corporation discussion Rel-15 NR_newRAT-Core

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=> moved from 10.2.12

R2-1704648 Discussion on reflective QoS ZTE Corporation discussion Rel-15 NR_newRAT-Core

=> moved from 10.2.12

R2-1704978 Reflective Mapping Handling During Handover Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> moved from 10.2.12

R2-1704979 Lossless Handover of QoS Flow Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

10.4 Stage 3 control plane

10.4.1 RRC

10.4.1.1 TS

Latest TS 38.331, rapporteur inputs, etc

Any further principles for drafting 38.331

R2-1705815 NR; Radio Resource Control (RRC); Protocol specification Ericsson draft TS38.331 0.0.3

=> Endorsed as first baseline.

R2-1705432 TP to 38.331 on RRC states Ericsson discussion Rel-15 NR_newRAT-Core

=> Offline discussion to tidy up the TP

=> Revised in R2-1706050 (offline discussion 45)

R2-1706050 TP to 38.331 on RRC states Ericsson discussion Rel-15 NR_newRAT-Core

=> Agreed

R2-1705354 Specification methodology improvements for NR RRC Samsung Telecommunications discussion Rel-15

Agreements:
1 Add need codes for Specified, Maintain, Release.
FFS whether we also have None or the None behaviour is default

R2-1704211 Need codes for NR RRC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1705166 Need Codes for NR ASN.1 Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

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R2-1704212 UE capability handling in NR RRC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

Agreements
1: Define procedural text for NR UE capabilities in a dedicated section (i.e. “UE capability transfer”) separate from “Other” - section.
2: Define ASN.1 elements for UE capabilities in a dedicated section (i.e. “UE capability information elements”) separate from “Other Information elements” - section.
3. The UE capability descriptions will only be in 38.306 (i.e. not duplicated in field descriptions)
FFS: Whether the UE capability ASN.1 and procedural text could be moved to TS38.306

R2-1705165 Use of modules for NSA/SA in NR ASN.1 Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> Noted

10.4.1.2 Connection control procedures

RRC connection establishment, RRC connection reconfiguration, RRC connection re-establishment, RRC connection release, etc

Procedures required for state transitions (including those involving inactive)

RRC state transitions

R2-1704145 NR RRC state transitions and signalling procedures Samsung discussion Rel-15 NR_newRAT-Core

- Samsung clarify the intent is not to establish 2 ways to do each procedure.

Agreements:
1 The RRC state transition from CONNECTED to IDLE follows one step procedure (e.g. release).
2 The RRC state transition from CONNECTED to INACTIVE follows one step procedure
3 As a baseline, RRC state transition from INACTIVE to CONNECTED follows three-step procedure (e.g. request, response, complete). (3 steps from the Request message, i.e. not including any paging). Continue to discuss a 2 step procedure for the state transition if it can be used for all cases
4 As a baseline, network initiated RRC state transition from INACTIVE to IDLE follows INACTIVE to CONNECTED and then CONNECTED to IDLE.

R2-1705434 SRB usage at transition from RRC_INACTIVE Ericsson discussion Rel-15 NR_newRAT-Core

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- Intel think that the UE should be able to receive MSG 4 both ciphered and not ciphered because the currently configured cipher algorithm is not supported by new eNB. Ericsson think it is not precluded whether we have a case where MSG4 is not ciphered. Qualcomm ask if this would mean that the UE needs to double decode.
- Huawei ask why it is important for MSG4 should be ciphered. Qualcomm think it contain the configuration and hence should be hidden. Intel think SA3 guidance is that the configuration should be ciphered as well. Vodafone have the same view.
- BlackBerry think it is a hack for SRB to send MSG4 IP protected but not ciphered.
- Intel point out R2-167436 is an LS from SA3 that explains that the reject to idle should not be sent unprotected.

Agreements for the case that the UE wants to transition from INACTIVE to CONNECTED
1 Initial UE RRC message from RRC_INACTIVE (e.g. MSG3) should be sent on SRB0
2 In case the RAN is successful in retrieving and verifying the UE context, MSG4 should be integrity protected and sent on SRB1
3 RAN2 aim that in case the RAN is successful in retrieving and verifying the UE context, MSG4 should be ciphered and sent on SRB1
FFS Whether there may be cases where message where the MSG4 cannot be ciphered.
4 If the UE received a resume message on MSG4 on SRB1 then the UE enters RRC Connected.
4a If the UE received a message suspending the UE on MSG4 on SRB1 then the UE remains in RRC Inactive.
FFS In case the RAN is not successful in retrieving or verifying the UE context, MSG4 (can be at least be a message that requests the UE to trigger a new connection) will be sent on SRB0
FFS Whether MSG 4 can be a reject to idle.
FFS When the UE receives in MSG4 on SRB0 then the UE releases at least the AS security context and UE NAS layer should be informed.

R2-1706124 Email discussion scope for RRC connection control topic Intel

✉ **[98#xx][NR] RRC Connection Control (Intel)**

Scope as defined in R2-1706124 with bullet 2 also application to CONNECTED to INACTIVE

Intended outcome: Email discussion report to next meeting

Deadline: Thursday 2017-05-25

R2-1705247 RRC connection establishment, re-establishment and resume Nokia discussion Rel-15 NR_newRAT-Core

R2-1704884 State transition between RRC CONNECTED and INACTIVE Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

moved from 10.4.1.6 to 10.4.1.2

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R2-1704774 NR RRC state transitions to get CONNECTED Intel Corporation discussion NR_newRAT-Core

R2-1704543 Procedure details related to RRC_INACTIVE LG Electronics France discussion NR_newRAT-Core

R2-1704119 CONNECTED to INACTIVE state transitions Ericsson discussion Rel-15 NR_newRAT-Core

R2-1705252 RRC connection release and inactivation procedures Nokia discussion Rel-15 NR_newRAT-Core

R2-1704885 RRC state transition from INACTIVE to IDLE Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

moved from 10.4.1.6 to 10.4.1.2

R2-1704094 State transition for INACTIVE state Guangdong OPPO Mobile Telecom. discussion Rel-15

R2-1704116 INACTIVE to CONNECTED state transitions Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704117 Use of INACTIVE to IDLE state transition Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704145 NR RRC state transitions and signalling procedures Samsung discussion Rel-15 NR_newRAT-Core

R2-1704146 Inactivity-based transition to a power efficient state Samsung discussion Rel-15 NR_newRAT-Core

R2-1704229 RRC connection establishment procedure in NR CATT discussion Rel-15 NR_newRAT-Core

R2-1704230 RRC connection re-establishment and resume procedures in NR CATT discussion Rel-15 NR_newRAT-Core

R2-1704231 RRC connection release procedure in NR CATT discussion Rel-15 NR_newRAT-Core

R2-1704240 UE states on state transitions CATT discussion Rel-15 NR_newRAT-Core

R2-1704308 Consideration on the transition between inactive state and idle state Beijing Xiaomi Mobile Software discussion Rel-15

R2-1704703 Multiplexing NAS messages with MSG3 Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704774 NR RRC state transitions to get CONNECTED Intel Corporation discussion NR_newRAT-Core

R2-1704775 NR RRC state transitions to get in IDLE and INACTIVE Intel Corporation discussion NR_newRAT-Core

R2-1704869 Consideration on the procedure design for RRC resume and RRC reestablishment Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704882 UE behaviour upon leaving RRC_CONNECTED state Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704926 Procedures for state transition in RRC INACTIVE InterDigital discussion Rel-15 NR_newRAT-Core

R2-1705167 Consideration on RRC connection establishment procedure Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

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R2-1705315 Discussion on UE release from RRC_INACTIVE to RRC_IDLE Guangdong OPPO Mobile Telecom. discussion Rel-15

Other

R2-1704540 Simplification of RRC procedures for NR LG Electronics France discussion NR_newRAT-Core

R2-1704704 Harmonizing of the RRCConnection, Reestablishment and Resume procedures Ericsson discussion Rel-15 NR_newRAT-Core

R2-1705355 Further discussion on merging NR RRC messages Samsung Telecommunications discussion Rel-15

R2-1704118 Need for Release Confirm or Suspend Confirm Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704125 UE context ID discussion Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704506 Numerology configuration in NR Samsung discussion Rel-15

R2-1704772 RACH RRC Msg.3 and UE ID Intel Corporation discussion NR_newRAT-Core

R2-1704773 Security optimizations when resuming or re-establishing an RRC connection Intel Corporation discussion NR_newRAT-Core

R2-1704831 UE capability in NR RRC connection request Sony discussion Rel-15 NR_newRAT-Core

R2-1705066 Impact on Control and User Plane procedure due to Intra and Inter CU HO Samsung Electronics Co., Ltd discussion

R2-1705099 RRC processing delays in NR and EN-DC Ericsson discussion Rel-15 NR_newRAT-Core

R2-1705168 Discussion on the support of SCG SRB for Intra-NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705169 Common UE Power Preference Indicator Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705170 Integrity protection and Counter Check Procedure for NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705171 RRC Establishment Cause Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705507 Mechanism design to avoid unnecessary inter-gNB mobility upon state transitions in NR ASTRI, TCL Communication Ltd. discussion

R2-1705620 Enhance RRC configuration procedure Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1705644 Handling of SRBs in re-establishment LG Electronics discussion Rel-15 NR_newRAT-Core

R2-1705645 RRC Connection Reconfiguration with Connection Inactivation LG Electronics discussion Rel-15 NR_newRAT-Core

R2-1705646 Configurable cause for NR LG Electronics discussion Rel-15 NR_newRAT-Core

R2-1705696 Common procedure for RRC connection setup, reestablishment and resume HTC discussion Rel-15 NR_newRAT-Core

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R2-1705697 RRC connection reestablishment HTC discussion Rel-15 NR_newRAT-Core

R2-1705811 RRC service request Mediatek Inc. discussion

10.4.1.3 Connection reconfiguration for NSA

RRC connection reconfiguration procedure via direct SRB or via MCG.

R2-1704815 RRC Connection Reconfiguration for EN-DC operation Intel Corporation discussion NR_newRAT-Core

R2-1704192 MCG/SCG configuration for LTE-NR Dual Connectivity NTT DOCOMO, INC. discussion Rel-15 NR_newRAT-Core

R2-1704232 RRC connection reconfiguration procedure in NSA CATT discussion Rel-15 NR_newRAT-Core

R2-1704315 Improvement on capturing bearer (re)configuration procedures for LTE-NR Dual Connectivity NTT DOCOMO, INC. discussion Rel-15 NR_newRAT-Core

R2-1705100 RRC details for E-UTRA-NR Dual Connectivity Ericsson discussion Rel-15 NR_newRAT-Core

R2-1705698 RRC message and transport for EN-DC HTC discussion Rel-15 NR_newRAT-Core

R2-1705706 Configuration failure handling in LTE NR DC Huawei, HiSilicon discussion NR_newRAT-Core

10.4.1.4 RRM measurements

Continue to progress cell quality derivation, measurement events, measurement configuration, measurement reporting, etc

Time index indication

R2-1704870 Time index indication receiving from PBCH Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705096 Considerations on NR beam identifier Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1704770 Issue on reading PBCH for SS block identifier reporting Intel Corporation discussion NR_newRAT-Core

R2-1704287 PBCH reading for measurement purposes Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

moved from 10.2.7 to 10..4.1.4

- Joint discussion of the 4 contributions above
- LG think we only need to consider question whether the UE needs to decode the MIB and would prefer to keep the principle that the UE does not decode the MIB.
- Samsung think in LTE the UE only decode the MIB after completing the RACH on the target cell. We can inform them this is how it is in LTE and if they intend to change there should be good reason to do so.

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- DOCOMO think RAN1 still discusses another option to use BMRS. We could provide feedback that a requirement to decode MIB then there would be impact to mobility.
- Vivo have concern about reading neighbour cell info and would prefer the LTE baseline.
- MediaTek think that decoding the MIB is different from LTE and some beam ID needs to be identified somehow. Also think it doesn't need to be decoded from every SS Block.
- Ericsson think if we have concerns on the mobility requirement. We need to have some efficient way to identify the beam information.
- Nokia think the important thing is that the UE should not have to combine multiple repetitions of the SS Block to read the PBCH.
- Ericsson think that even in LTE the PSS/SSS detection is not a one shot process. Eventually the whole beam detection process will need to be considered from RAN4 and consider the delay to detect a beam.
- CATT think that decoding PBCH is not desirable.
- OPPO think that it is allowed for UE to read PBCH.
- Samsung think there is a UE performance issue when the UE needs to start decoding PBCH of neighbour cells due to the need for gaps for inter-freq and possible for intra-freq.

=> Draft LS to respond to RAN1 that the important considerations from RAN2 point of view is that the beam and cell should be detected and identified and measured quickly and reliably and with minimal need for measurement gaps, and with consideration to UE power consumption. Can also ask if the RAN1 design would require that time index needs to be acquire every time a measurement is taken. Ask RAN1 to also consider the idle/inactive mode case. Final wording and whether any additional details can added to be discussed offline. (Intel, offline discussion 48) R2-1706054

R2-1706054 [DRAFT] [Response LS on CSI-RS for beam management and RRM measurements] Intel
LS out Rel-15 NR_newRAT-Core SARAN1

=> Revised in R2-1706145

R2-1706145 [DRAFT] [Response LS on CSI-RS for beam management and RRM measurements] Intel
LS out Rel-15 NR_newRAT-Core SARAN1

=> Remove " and complexity "

=> Approved in R2-1706160

R2-1704871 LS on Time index indication receiving from PBCH Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705381 UE requirements before and during handover Samsung discussion Rel-15

R2-1705383 [DRAFT] Reply LS on NR Initial access Samsung LS out Rel-15 NR_newRAT-Core
To: RAN1; Cc: RAN4

R2-1704092 Reading beam index for measurement Ericsson discussion Rel-15 NR_newRAT-Core

moved from 10.2.7 to 10..4.1.4

R2-1704288 Draft LS on PBCH reading for measurement purposes Nokia, Alcatel-Lucent Shanghai Bell
LS out Rel-15 NR_newRAT-Core To:RAN1; Cc: RAN4

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moved from 10.2.7 to 10..4.1.4

Cell quality derivation/measurement model

R2-1705736 Way Forward for Cell Quality Derivation Samsung, NEC discussion

R2-1704526 Cell Quality Derivation for RRM Measurements in NR MediaTek Inc. discussion

R2-1704832 RRM Measurements open issues Sony discussion Rel-15 NR_newRAT-Core

- Joint discussion of the above 3 documents
- Samsung suggest that we can consider to just use good beams.
- MediaTek think these is not a big difference between absolute and relative threshold.
- Qualcomm think the relative threshold is easier for the network to configure as absolute threshold would be difficult to determine. LG also think it is difficult to configure the absolute threshold.
- Intel the a detectable beam could still be a very low not usable beam.

Options

- Best N of the detected beams above absolute threshold [11]
- Best N-1 of the detected beams within a range of the best detected beam [5]

Agreements for combining of beam measurements if N > 1:
1 Averaging will be based on power values (i.e. not dBm values)
Working assumption: Average of up to best N of the detected beams above absolute threshold

R2-1705596 RRM Measurement: Is Additional Filtering Needed for L3 Moiblity? Samsung Electronics discussion Rel-15 NR_newRAT-Core

R2-1704100 Measurement model in NR Ericsson discussion Rel-15 NR_newRAT-Core

- Above 2 documents discussed together
- MediaTek support to have additional beam level filtering for beam level reporting. But wonder if there is preference that the beam filtered results are also used in the cell quality. Ericsson have no strong preference and think it would be enough for cell quality to rely ion cell L3 filter only.
- Intel support Ericsson view that additional filter is needed.
- Huawei support to have a configurable filter. And think that the configurable filter results should also be available for beam management.

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Agreements
1 There is an additional configurable filter per beam of the beam level measurements output from the L1 filter for the purpose of reporting beam measurement results in RRC measurement reports.
2 There is no additional specified filter between the L1 filters and cell quality derivation function for the purposes of cell quality derivation
3 Same NR measurement model is applicable for measurements performed on CSI-RS or NR-SS.

R2-1705793 On the Number of Beams to Derive Cell Quality CMCC discussion Rel-15 NR_newRAT-Core

- MediaTek think the value of N used for all cells on a frequency should be the same cell.
- LG think that the number of beams is determined by the threshold and so a single value should be enough.
- Samsung think that per cell configuration need more discussion.
- Vivo agree it can be configured differently for inter-frequency but prefer one value for all cells. OPPO have same view. Intel also agree it can be configured per frequency.

Agreements
- N (used in cell quality derivation) is configured per carrier.
FFS Whether a different value can be configured for NR-SS and CSI-RS and whether it can be configured per cell.

✉ **[98#xx][NR] Measurement model TP (Samsung)**

Draft TP to capture the measurement model to be captured in 38.300.

Intended outcome: Agreeable TP to be submitted to next meeting

Deadline: Thursday 2017-06-08

R2-1704101 Details on cell quality derivation Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704105 Trade-off between HO failure and HO ping-pong rates Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704235 Open issues on cell quality derivation CATT discussion Rel-15 NR_newRAT-Core

R2-1704524 Measurement Model for NR MediaTek Inc. discussion

R2-1704641 Discussion on cell quality derivation from N beams ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704765 Remaining issues on consolidation beams to cell quality Intel Corporation discussion NR_newRAT-Core

R2-1704877 Cell quality derivation Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

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R2-1705092 DL mobility above 6 GHz Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1705107 Remaining Issues of RRM Measurements ITRI discussion NR_newRAT-Core

R2-1705241 Cell quality derivation in CONNECTED LG Electronics Inc. discussion

R2-1705396 Mobility Measurements in Connected Mode Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1705526 Mobility Measurement Models Considering Beamforming Huawei, HiSilicon discussion Rel-15

R2-1705785 Considerations on threshold for deriving cell quality CMCC discussion Rel-15 NR_newRAT-Core

Measurement events and reporting

R2-1704766 SS block identifier reporting Intel Corporation discussion NR_newRAT-Core

P1

- Panasonic support the proposal. Qualcomm also support the proposal. MediaTek, LG, Samsung also support.
- Nokia wonder if the location of the CSI-RS has an impact as it could be got for free.
- Intel think it is not so useful for the network to have the information.

P2

- LG support proposal 2 as this is already known to the network. China Telecom think the flexibility could be useful. Ericsson don't see an issue with report the serving cells identifier.
- Qualcomm support as the only reason to include is to enable configuration of RACH for HO.
- CATT think it might be needed for event A1 and A2 and for CA. Vivo share this view.
- Nokia share Ericsson concern and think in LTE the serving cell is included. Ericsson think in LTE we report serving cell measurement as well as CQI in L1.

P3

Agreement
1: SS block identifier is not included in measurement reporting triggered by CSI-RS events
2: SS block identifier can be included in measurement reporting triggered by event A1-A6 for measurement reporting triggered by NR-SS events
FFS: How to select the x best beams to be included in the report.
FFS Whether x is the same value for the triggered cell and the non triggered cells.

R2-1704876 Measurement reporting for Idle mode RS and CSI-RS Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

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Agreements

1: For SS based events, the UE report the beams in the order of quality.

2: CSI-RS identifier can be included in measurement reporting triggered by event A1-A6 for measurement reporting triggered by CSI-RS events

3: for CSI-RS based events, the UE report the beams in the order of quality.

FFS: For A1-A6 events triggered by CSI-RS, the cell quality derived from NR-SS from the same cell can be included in the measurement report if available based on other measurements that have been configured.

✉ **[98#xx][NR] Measurement report content (Intel)**

Progress details on the content of measurement reports

Outcome of the email can include proposals for agreement, identification of the main options, and questions to be asked to other groups.

Intended outcome: Report to the next meeting

Deadline: Thursday 2017-06-08

R2-1704106 Measurement report content Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704233 Open issues on A1-A6 CATT discussion Rel-15 NR_newRAT-Core

R2-1704289 Beam results in RRM reporting Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1704527 Beam-based Measurement Reporting for NR MediaTek Inc. discussion

R2-1704643 Discussion on the measurement report ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1705753 To distinguish the NR-SS and CSI-RS in the measurement report Panasonic discussion

R2-1705792 On the Content of Measurement Report CMCC discussion Rel-15 NR_newRAT-Core

Measurement object configuration

R2-1704874 Measurement configuration for Idle RS Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

- Ericsson ask if RAN1 have discussed different SS bandwidths.
- Intel think we should discuss whether SS burst set is configured per carrier.
- Ericsson think it should be possible that the network configures a window then it should not be needed to configure other information.

=> Noted

R2-1704534 Configuration of CSI-RS for RRM measurement in CONNECTED MediaTek Inc. discussion NR_newRAT-Core

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✉ **[98#xx][NR/Measurement configuration] (MediaTek)**

Progress the details of measurement configuration.

Outcome of the email can include proposals for agreement, identification of the main options, and questions to be asked to other groups.

Intended outcome: Report to next meeting

Deadline: Thursday 2017-06-08

R2-1704103	Measurement configuration for CSI-RS	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704642	Discussion on the measurement configuration	ZTE Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1704104	Measurement configuration for SS Block	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704535	Consideration on NR-SS for CONNECTED RRM measusrement	MediaTek Inc.	discussion		NR_newRAT-Core
R2-1704640	Mandatory configuration of the NR-SS for CONNECTED UE	ZTE Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1704645	RRM measurements on Idle mode RS	ZTE Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1704767	Measurement framework in NR	Intel Corporation	discussion	NR_newRAT-Core	
R2-1704769	Signaling configuration for xSS	Intel Corporation	discussion	NR_newRAT-Core	
R2-1704875	Measurement configuration for CSI-RS	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705353	Improvements RRM measurement configuration	Samsung Telecommunications	discussion	Rel-15	
R2-1705527	Measurement configuration and reporting for mobility considering beamforming	Huawei, HiSilicon	discussion	Rel-15	

Inter-RAT events

R2-1704554	Discussion on Inter-RAT measurement event reports	Guangdong OPPO Mobile Telecom.	discussion	Rel-15	NR_newRAT-Core
R2-1704879	Inter-RAT mobility events and measurements	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core

Measurement gaps

R2-1704290	Measurement gaps in NR	Nokia, Alcatel-Lucent Shanghai Bell	discussion	Rel-15	NR_newRAT-Core
R2-1704484	Measurement gap for NR	Samsung	discussion	Rel-15	NR_newRAT-Core
R2-1704584	Discussion on measurement gap	vivo	discussion		

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R2-1704644 Consideration on the measurement gap ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704873 Measurement GAP Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704878 Measurement GAP coordination Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Other

R2-1704234 Introduction of C1 and C2 events CATT discussion Rel-15 NR_newRAT-Core

R2-1704507 RRM measurement bandwidth in NR Samsung discussion Rel-15

moved from 10.4.1.3 to 10.4.1.4

R2-1704508 RRM considerations for adaptive bandwidth in NR Samsung discussion Rel-15

moved from 10.4.1.3 to 10.4.1.4

R2-1704509 RRM measurement for multiple numerologies in NR Samsung discussion Rel-15

moved from 10.4.1.3 to 10.4.1.4

R2-1704528 Neighbouring Cell Measurement Threshold for NR Mobility MediaTek Inc. discussion

R2-1704590 Support beam operation for RRM measurement vivo discussion

R2-1704848 Speed dependent mobility for connected mode Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705397 Fast Radio Measurement Filtering for Multi-Connectivity Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1705595 The Impact of Beam Sweeping on RRM Measurement Samsung Electronics discussion Rel-15 NR_newRAT-Core

R2-1705598 Discussion on s-Measure Considering NR-SS and CSI-RS Samsung Electronics discussion Rel-15 NR_newRAT-Core

Late

R2-1704109 Necessity of measurement gaps in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704872 Means to Read PBCH (for acquiring Time index) Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705826 Speed Dependent Scaling of Measurement Related Parameters for CONNECTED UE in NR Samsung discussion

Withdrawn

R2-1705357 Mobility Measurements in Connected Mode Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

=> Withdrawn

R2-1705358 Fast Radio Measurement Filtering for Multi-Connectivity Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

=> Withdrawn

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R2-1705362 Mobility Measurements in Connected Mode Nokia, Alcatel-Lucent Shanghai Bell
discussion Rel-15 NR_newRAT-Core

=> Withdrawn

R2-1705363 Fast Radio Measurement Filtering for Multi-Connectivity Nokia, Alcatel-Lucent Shanghai Bell
discussion Rel-15 NR_newRAT-Core

=> Withdrawn

10.4.1.5 System information

On demand system information including addressing FFS points from last meeting.

Further details of stored SI including index/identifier format, system info modification procedure, system information structure, etc

On demand

R2-1704236 Procedures of on demand SI delivery and error handling CATT discussion Rel-15
NR_newRAT-Core

Agreements
1: For MSG1 based SI request, the minimum granularity of requested SI is one SI message (a set of SIBs as in LTE).
2: For MSG1 based SI request, one RACH preamble can be used to request for multiple SI messages.

R2-1704921 Procedures for requesting on-demand SI InterDigital discussion Rel-15 NR_newRAT-Core

R2-1704385 Remaining issues of On-demand SI Ericsson discussion Rel-15 NR_newRAT-Core

R2-1705382 Feedback for On-demand SI requests Lenovo, Motorola Mobility, Interdigital, NEC, Panasonic, Samsung discussion NR_newRAT-Core

- Discussed jointly with previous contributions
- OPPO think the option from Lenovo to use the current MSG2 is ok.
- LG also prefer the Lenovo proposal. UE should resend the SI request only when it was not received correctly.
- ZTE also support this proposal. Concerned that the other proposals may result in all UEs triggering re requests at the same time.
- MediaTek would like to reuse the RACH procedure. Xiaomi also support this proposal as the power ramping may take a long time. Vivo also support.
- Sony think that message 2 is not required as an acknowledgement. Qualcomm also have some concerns with the broadcast based ack.

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- LG think the UE will use a common preamble to request the broadcast SI , then a single MSG.2 can be used to ack many UEs MSG1 transmissions.
- Ericsson wonder if it would always be required for the network to transmit and also have concerns that the MSG2 may need to be beam swept.
- Lenovo gate update from offline: There is limited support for toggling of the broadcast bit. The benefit of the Ericsson approach is not sending MSG2.
- Ericsson think the MSG2 solution has the drawback of an additional reception and also wonder how it works if the network is not able to provide the SI message. Ericsson think it is not a normal case that the SI message is not sent but some UE behaviour will need to be defined.
- LG is concerned if SI request and RACH procedure could be ongoing at the same time.
- Sony consider the Ericsson approach to be simpler.
- Xiaomi is concerned that UE may send again at a higher power if the network chooses not to send in the SI window.
- Intel prefer to just re-use the random access procedure.
- CATT think there is no clear benefit in terms of delay in the random access approach.

Agreements for On demand request for broadcast delivery
1 On demand SI request will maximise commonality with the RACH procedure
2 Network sends an acknowledgement in MSG2 to the UE's SI request sent in Msg1
FFS Network sends an acknowledgement in MSG4 to the UE's SI request sent in Msg3

✉ **[98#xx][NR] On demand SI (Lenovo)**

Progress the next level of detail for on demand SI request (MSG1 and MSG3 based) for broadcast delivery. Email discussion can make proposals for agreement in the next meeting and also identify key options and pros and cons of those options so that a decision can be made at the next meeting.

Intended outcome:

Deadline: Thursday 2017-06-08

R2-1704190 Msg.1 based request for on-demand SI provisioning NTT DOCOMO, INC. discussion Rel-15 NR_newRAT-Core

- LG wonder if the same preamble format will be used for SI request and normal RACH. Think we need to ask if it would be possible to have enough preambles to use the normal preamble format. Need to understand how many preambles are needed.
- DOCOMO does not want to reduce the number of preambles available for other purposes.
- Huawei think RAN1 have already deprioritised preamble plus data.
- Vivo think if RAN1 had such a design we could use it but we should not ask them to design it.
- CATT think it could be considered by RAN1 when they design their PRACH.

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- Ericsson have not seen much benefit in a per SI request. We also have other ways to request more than one SI.
- Nokia think we could send an LS.
- Qualcomm support the proposal.

=> Noted

R2-1705510 Indication for On-Demand SI Broadcast Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1705174 Additional indication for On-Demand System Information Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704051 On Demand SI: Unicast Support in IDLE/INACTIVE State Samsung Electronics Co., Ltd discussion Rel-15

- China Telecom think if only one or 2 UEs request the SI then it is inefficient to broadcast.
- Samsung think there is not much difference in overhead of broadcast and unicast. Huawei think the difference is the flexibility when to send the message to the UE and so see some benefit.
- Vivo see benefit for the UE to be able to send this by unicast.
- Intel think that for idle/inactive there is no power control or link adaptation possible so resources cannot be saved.

Agreements
1 Only progress on the two agreed approaches for delivering on-demand system information (via dedicated signalling to RRC_CONNECTED UEs; via SI-Message broadcast to RRC_IDLE and RRC_INACTIVE UEs) and refrain from introducing additional solution variants.

R2-1705228 Other-SI request and acquisition in CONNECTED LG Electronics Inc. discussion

R2-1705585 On-demand SI delivery for RRC connected UE MediaTek Inc. discussion Rel-15 NR_newRAT-Core

R2-1705618 Consideration on on-demand SI TX request in NR Qualcomm Incorporated, Sony, NTT DOCOMO, INC. discussion Rel-15 NR_newRAT-Core

R2-1704049 On Demand SI: Further Details of MSG1 Approach Samsung Electronics Co., Ltd discussion Rel-15

R2-1704050 On Demand SI: Further Details of MSG3 Approach Samsung Electronics Co., Ltd discussion Rel-15

R2-1704064 On Demand SI: Additional TX Indication Samsung Electronics Co., Ltd discussion Rel-15

R2-1704065 On Demand SI: SI Period Monitoring Samsung Electronics Co., Ltd discussion Rel-15

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R2-1704071 Discussion on Detailed Procedure for On-Demand System Information Guangdong OPPO Mobile Telecom. discussion Rel-15

R2-1704072 Discussion on Indication Message for Other SI Guangdong OPPO Mobile Telecom. discussion Rel-15

R2-1704191 [DRAFT] LS on RA preamble for on-demand SI request NTT DOCOMO, INC. LS out Rel-15 NR_newRAT-Core to:RAN1

R2-1704237 Additional indicator in support of on-demand SI Request CATT discussion Rel-15 NR_newRAT-Core

R2-1704305 Discussion on SI request based on MSG1 Beijing Xiaomi Mobile Software discussion Rel-15

R2-1704306 Discussion on SI request timing Beijing Xiaomi Mobile Software discussion Rel-15

R2-1704314 Discussion on Left Issues for On-Demand System Information Guangdong OPPO Mobile Telecom. discussion Rel-15

R2-1704585 Other SI request and delivery vivo discussion

R2-1704586 Minimum SI configuration for other SI request via MSG1 vivo discussion

R2-1704833 On demand SI scheduling information Sony discussion Rel-15 NR_newRAT-Core

R2-1704922 Procedures for acquisition of on-demand SIs InterDigital discussion Rel-15 NR_newRAT-Core

R2-1705172 UE operations after On-demand SI request Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705173 MSG 3 details for on-demand SI request Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705175 Design on MSG1 based request and failure handling Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705229 Other-SI request and acquisition in IDLE/INACTIVE LG Electronics Inc. discussion

R2-1705298 Random access procedure for SI request ASUSTEK COMPUTER (SHANGHAI), ITRI discussion NR_newRAT-Core

R2-1705384 Details on Feedback to the SI requests Lenovo, Motorola Mobility, Interdigital, NEC, Panasonic discussion NR_newRAT-Core

R2-1705388 Preamble reservation for SI-request Lenovo, Motorola Mobility discussion NR_newRAT-Core

R2-1705438 Error Handling for On Demand SI Delivery MediaTek Inc. discussion Rel-15 NR_newRAT-Core

R2-1705502 Discussion on Msg1 Solution for On-demand SI SHARP Corporation discussion Rel-15

R2-1705511 SI Request and Delivery using Msg 3 Approach Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1705649 UE dedicated on-demand SI delivery in NR LG Electronics discussion Rel-15 NR_newRAT-Core

Stored SI

R2-1705584 On SI Index MediaTek Inc. discussion Rel-15 NR_newRAT-Core

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- Qualcomm ask if this is just a partition of a longer index or is it a structure. MediaTek think the UE will be aware of which part if area and which is value tag.
- Vivo support the proposal. OPPO have a similar understanding.
- IDC support 2 indices but not sure if the first is associated with an area.
- Samsung ask the benefit for the UE to know the area. MediaTek think the UE can avoid re-reading in a new cell.
- Samsung think there is a limitation in the partition of the value tag into two fixed size parts.
- Intel support the proposal.
- Nokia wonder what stays the same in different cells. Think we don't know about the detailed content and so it is difficult to know what can be common across cells.
- CATT agree there is benefit for the small cell scenario.
- Huawei support the proposal.
- China Telecom is concerns that the area ID may need to be globally unique. CMCC thinks it is sufficient for the area ID to be unique in a TA.
- Ericsson agree with area but may need more information as well.
- DOCOMO is not sure that the area ID is not very useful as only a few SIBs are valid across multiple cells. We can just use the value tag.

=> Offline discussion using the text below as starting point for possible agreements (Samsung, offline discussion 49):

- value tag is associated to each SIB
- value tag can be valid in only one cell or when combined with an area ID be valid in more than one cell

FFS whether the area ID is associated to each SIB or associated to a group of SIBs or all SIBs.

- Update from offline:

R2-1706133 Offline discussion summary for Area ID and valuetag

Agreements There will be at least a value tag and area ID - value tag is associated to each SIB - value tag can be valid in only one cell or when combined with an area ID to be valid in more than one cell. FFS whether the area ID and valuetag is separately signalled or as a single identifier

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FFS whether the area ID is associated to each SIB/ SI message or associated to a group of SIBs/ SI messages or all SIBs/ SI messages.

R2-1705332	On Demand SI: Index based approach	Samsung	discussion	Rel-15	
R2-1704388	Stored system information: Indexing and validity	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704239	Indexed SI in NR	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1704674	Consideration on the stored other SI	ZTE Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1704923	Validity of System Information for NR	InterDigital	discussion	Rel-15	NR_newRAT-Core
R2-1704925	Stored System Information for NR	InterDigital	discussion	Rel-15	NR_newRAT-Core
R2-1705179	Structure of SIB Index/Identifier	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705227	Index based system information	LG Electronics Inc.	discussion		
R2-1705279	Transmission for Indexed SI information	Innovative Technology Lab Co.	discussion	Rel-15	
R2-1705333	Storing System Information	Samsung	discussion	Rel-15	
R2-1705335	SI-Index for NR SIB1	Samsung	discussion	Rel-15	
R2-1705387	Further on Index based SI distributions	Lenovo, Motorola Mobility, Panasonic	discussion	NR_newRAT-Core	
R2-1705648	SI validity for broadcast SI and on-demand SI	LG Electronics	discussion	Rel-15	NR_newRAT-Core

System info modification

R2-1704062	System Information Update in NR	Samsung Electronics Co., Ltd	discussion	Rel-15	
R2-1704238	SI change notification in NR	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1704311	system information change in NR	Spreadtrum Communications	discussion	Rel-15	
R2-1704391	Change of System information in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704453	SI update behaviour in NR	Samsung Research America	discussion	NR_newRAT-Core	
R2-1704454	On supporting multiple modification periods in NR	Samsung Research America	discussion	NR_newRAT-Core	
R2-1704582	SI chang notification	vivo	discussion		
R2-1705176	SI Update procedure	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core

System info content/structure

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R2-1704386	System information structure and contents	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704389	Encoding of broadcasted system information	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704390	System information content at network sharing	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704673	Consideration on the content of minimal SI	ZTE Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1704905	Organization of system information	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT-Core
R2-1705177	Detailed design on the contents of System Information	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705334	Remaining contents of Minimum System Information	Samsung	discussion	Rel-15	
R2-1705616	NR PBCH contents	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT-Core

Other

R2-1704063	SI Message TX/RX in NR	Samsung Electronics Co., Ltd	discussion	Rel-15	
R2-1704384	System information Stage 3 text proposal	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704387	System information scheduling	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704392	Dedicated System Information	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704536	Other SI scheduling information	ETRI	discussion		
R2-1704675	On-demand SI Error handing	ZTE Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1704676	Consideration on the SI delivery schemes	ZTE Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1704811	Inactive mode cell reselection	Intel Corporation	discussion		NR_newRAT-Core
R2-1705178	Assisted Delivery of Minimum SI	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705180	Public Warning system for NR	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705181	SI transmission of beamforming	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705226	Dedicated delivery of on-demand SI	LG Electronics Inc.	discussion		
R2-1705647	SFN length for NR cells	LG Electronics	discussion	Rel-15	NR_newRAT-Core
R2-1705742	RRC_INACTIVE Principles	Qualcomm	discussion		
R2-1705796	Delivery of neighbouring cells' SS periodicities in other SI	CMCC	discussion	Rel-15	NR_newRAT-Core

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Late

R2-1705262 Random access procedure for SI request ASUSTEK COMPUTER (SHANGHAI), ITRI discussion NR_newRAT-Core

10.4.1.6 Inactive state

Other aspects of Inactive such as paging, periodic update, RAN area definitions, modelling, etc, noting that procedures for state transitions involving inactive will be discussed in 10.4.1.2

Modelling/General

R2-1704776 Functionality for a UE in INACTIVE Intel Corporation discussion NR_newRAT-Core

Agreements:
1 Define RRC_INACTIVE as a new RRC state in NR.
2 A UE in RRC_INACTIVE notifies the NR RAN of RAN-based location area update (RLAU) via a resume procedure when re-selecting to a cell not belonging to the configured RAN-based notification area (RNA) and periodically.

R2-1704881 State modeling and functionality for RRC_INACTIVE Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Agreement
1 AS support for PLMN selection (i.e. providing available PLMNs to NAS) for a UE in RRC_INACTIVE if SA2/CT1 confirm that PLMN selection is supported.

R2-1704147 Overview of the NR RRC state machine and modelling of the INACTIVE state Samsung discussion Rel-15 NR_newRAT-Core

R2-1704241 RNA Update and Configuration CATT discussion Rel-15 NR_newRAT-Core

R2-1704292 Security in inactive state Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1704886 Support of redistribution priority in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705652 Relation between RRC_INACTIVE and RRC_CONNECTED LG Electronics discussion Rel-15 NR_newRAT-Core

RAN area configuration

R2-1704293 RAN based notification area Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

=> Offline discussion to try to converge to a single solution (Nokia, offline discussion 46)

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- Update from offline: No consensus. Companies considered the area could be identified by either a cell list or a RAN area id list. Additionally a TA list was discussed but companies wanted more time

=> Can be discussed again at the next meeting

R2-1704124	RAN area aspects	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704148	RAN notification area for NR	Samsung	discussion	Rel-15	NR_newRAT-Core
R2-1704778	RAN notification area	Intel Corporation	discussion		NR_newRAT-Core
R2-1704889	RAN-based notification area configuration	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core

RAN area update

R2-1704149	RRC procedures for the RAN notification area for NR	Samsung	discussion	Rel-15	NR_newRAT-Core

Agreement
1 Connection resume message will include information that can at least indicate RAN area update. Inclusion of information to enable access control is not precluded.

R2-1704883	Scenarios and solution for state mismatch	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1704120	RAN area updating due to mobility in RRC_INACTIVE	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704121	Periodic RAN area updates in RRC_INACTIVE	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704122	CN area updating in RRC_INACTIVE	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704242	Relocation of anchor gNB	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1704312	Comparison and Discussion on RAN-based Notification Area Update	MTI	discussion		
R2-1704550	RAN Update Procedure in RRC_INACTIVE	PANASONIC R&D Center Germany	discussion		
R2-1704890	Periodic RAN-based notification area update	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1704891	Discussion on LAU and RNA update for inactive state	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1705260	RAN-based area update procedure	Fujitsu	discussion	Rel-15	NR_newRAT-Core
R2-1705269	Location update at RAN-based notification area boundary	NEC	discussion	Rel-15	NR_newRAT-Core

Paging

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R2-1704887 Paging mechanism in inactive state and idle state Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Agreements for paging in inactive using DRX (excludes eDRX, if supported)
1: Use the same paging occasion calculation mechanism for UEs in inactive as for UEs in idle.
2: The same input derived from CN UE ID and the same calculation equation is used to calculate the paging occasion for RAN-initiated paging and CN-initiated paging.
3: The gNB needs to know the input derived from CN UE ID to be used in the calculation and CN UE specific DRX cycle from the NG core.
4: A UE in inactive can be configured with a UE specific RAN DRX cycle over dedicated signalling.
5: The UE uses the shortest of the CN UE specific DRX cycle and the cell broadcasted DRX cycle and the RAN DRX cycle. All the DRX cycle values must be multiples of each other.
6: UE specific RAN DRX cycle is released when the UE enters idle states.
7 UE specific RAN DRX cycle is kept when the UE moves to one new cell in the RNA area in inactive state.

=> LS to RAN3/SA2 to inform them of our decision and the need to provide info from the CN to the RAN (LG, offline discussion 47) R2-1706053

R2-1706053 [DRAFT] [LS on Paging mechanism in inactive state and idle state] LG LS out Rel-15 NR_newRAT-Core To: RAN3, SA2

=> Correct sentence in final paragraph to " If configured, the UE keeps the value of the UE specific RAN DRX cycle within the same RAN notification area while in RRC_INACTIVE "

=> Approved in R2-1706157

R2-1704123 Further considerations on RAN and CN paging in INACTIVE Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704546 Paging response to CN paging in RRC_INACTIVE LG Electronics France discussion NR_newRAT-Core

R2-1704777 Functionality for RAN-initiated paging Intel Corporation discussion NR_newRAT-Core

R2-1704816 Interaction between RAN-initiated paging and CN-initiated paging Intel Corporation discussion NR_newRAT-Core

R2-1704888 RAN initiated paging Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705651 RAN paging DRX in RRC_INACTIVE LG Electronics discussion Rel-15 NR_newRAT-Core

Other

R2-1704150 Inter-RAT mobility in the RRC INACTIVE state Samsung discussion Rel-15 NR_newRAT-Core

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R2-1704485	Security procedure to suport data transmission in RRC_INACTIVE state for NR	Samsung	discussion	Rel-15	NR_newRAT-Core
R2-1704541	Modeling and signaling of INACTIVE	LG Electronics France	discussion	NR_newRAT-Core	
R2-1704542	Offloading UEs in RRC_INACTIVE	LG Electronics France	discussion	NR_newRAT-Core	
R2-1704545	Failure cases for UEs in RRC_INACTIVE	LG Electronics France	discussion	NR_newRAT-Core	
R2-1704547	Inter-RAT mobility from RRC_INACTIVE	LG Electronics France	discussion	NR_newRAT-Core	
R2-1704587	RAN based notification area update	vivo	discussion		
R2-1704880	Inactive UE inter-RAT mobility	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1704892	Security of direct UL transmission for inactive state	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1704893	Common aspects of UL transmission for inactive state	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1704894	DL data transmission in RRC_INACTIVE	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1704928	RRC Modelling and State Transitions in NR	InterDigital	discussion	Rel-15	NR_newRAT-Core
R2-1705433	TP to 38.300 on states	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1705607	RRC state transition between INACTIVE and CONNECTED	Samsung Electronics	discussion	Rel-15	NR_newRAT-Core
R2-1705608	Way forward for UL data transmission in INACTIVE	Samsung Electronics	discussion	Rel-15	NR_newRAT-Core
R2-1705650	Handling of radio bearers and security for data transmission in RRC_INACTIVE	LG Electronics	discussion	Rel-15	NR_newRAT-Core
R2-1705739	Unified Access Control in different RRC Modes	Qualcomm	discussion		

Late

R2-1704291	Paging initiation in inactive state	Nokia, Alcatel-Lucent Shanghai Bell	discussion	Rel-15	NR_newRAT-Core

10.4.1.7 Access control (SA)

Continue to progress unified access control

R2-1704779	5G access control mechanism	Intel Corporation	discussion	NR_newRAT-Core

Agreements

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1 RAN2 aims that the 5G AC mechanism for a UE in RRC_IDLE is applicable to a UE in RRC_INACTIVE.

FFS if any aspects may not be applicable or may need to be changed for RRC_INACTIVE relative to RRC_IDLE (to be addressed by both CT1 and RAN2).

2 RAN2 aims to define the 5G AC mechanism for a UE in RRC_CONNECTED. Details FFS

3 UE NAS provides the access category information to UE RRC at least for RRC_IDLE

FFS for RRC_INACTIVE

4 Connection Request will include some information to enable the gNB to decide whether to reject the connection request

FFS whether the information that is included is e.g. provided by NAS, derived from the AC, etc

FFS for RRC_INACTIVE

=> LS to CT1 (already allocated) to provide this information to CT1

R2-1705324 Access Control in NG-RAN Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

moved from 10.4.1.6 to 10.4.1.7

R2-1704356 Access Control for NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1705810 Generic Access Barring Mediatek Inc. discussion

moved from 10.4.1.6 to 10.4.1.7

R2-1705506 Further consideration of Access Control for NR Vodafone GmbH discussion Rel-15

R2-1704243 Consideration on Access Control CATT discussion Rel-15 NR_newRAT-Core

R2-1704280 Congestion Control in NG-RAN Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1704309 Considerations on access barring for UL grant free allocation in NRSpreadtrum Communications discussion Rel-15

R2-1704355 Unified Access Control Assessment Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704357 Establishment causes for NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704358 Access control for RRC_CONNECTED Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704455 NR access control Samsung Research America discussion NR_newRAT-Core

R2-1704680 Consideration on the access control in NR ZTE Corporation discussion Rel-15 NR_newRAT-Core

R2-1704780 [DRAFT] NR Access Control drafted response LS Intel Corporation LS out NR_newRAT-Core To: CT1, SA1, SA2

R2-1705182 Access Control in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

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R2-1705183 draft Reply LS on unified Access Control for 5G NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705184 Access Control in RRC_INACTIVE Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705653 Random Access Backoff for Access Control LG Electronics discussion Rel-15 NR_newRAT-Core

R2-1705654 Interaction between Random Access Backoff and Access Barring mechanism LG Electronics discussion Rel-15 NR_newRAT-Core

R2-1705655 Access category based access barring mechanism LG Electronics discussion Rel-15 NR_newRAT-Core

Withdrawn

R2-1704194 Further consideration of Access Control for NR Vodafone GmbH discussion Rel-15

=> Withdrawn

10.4.1.8 Other

R2-1704359 Wait Timer in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1705185 RRC Support of Multiple Numerologies Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705255 Control of UE beamforming in RRC_CONNECTED ASUSTEK COMPUTER (SHANGHAI) discussion NR_newRAT-Core

R2-1705331 RRC signalling to support LTE+NR Co-existence Samsung discussion Rel-15

R2-1705609 UE Assistance Information for energy efficiency Samsung Electronics discussion Rel-15 NR_newRAT-Core

10.4.2 Idle mode procedures

Idle mode procedures agenda item applicable to SA only.

10.4.2.1 Creation of TS

Rapporteur of 38.304 to propose TS skeleton

Specification principles for idle mode spec.

Identify which aspects of the LTE idle mode functionality could be reused for NR, which aspects are not needed based on the agreed scope of the NR WI, which aspects cannot be reused based on agreements already taken during the SI, and which aspects require further discussion to conclude.

R2-1705737 New Generation Radio Access Network; User Equipment (UE) procedures in Idle mode Qualcomm draft TS38.304 0.0.2 Rel-15 NR_newRAT-Core

- Ericsson think the LS on CSG was going to RAN for final decision. Wonder if the title should reflect that it also relates to inactive.
- Intel think we don’t need to consider GSM due to the WID.

=> Remove GSM and UTRA.

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=> Further comments can be provided directly to the rapporteur and an update provided to next meeting.

R2-1705738 Applicability of LTE Idle mode procedures for NR Qualcomm discussion

Agreements
1 LTE procedures for MBMS, ProSe, NB-IoT, eMTC, V2X, and GSM, URTRA, CDMA2000 are not captured in NR 38.304.
2: Parts of Inactive state procedures that are common with idle mode will be specified in NR 38.304.
3a: LTE procedures for AS support for PLMN selection is taken as a baseline in NR.
3b: The threshold for determining “high quality PLMN” should be decided by RAN4.
4a: Cell quality and frequency priority based cell selection and reselection will use LTE baseline.
FFS Service based cell selection and reselection
FFS Derivation of cell quality measurement from beam measurements
5a: AS procedures for Tracking Areas in LTE can be reused in NR.
6: Idle mode support of CSG cells are agreed after confirming with SA/RAN, LTE procedures should be taken as a baseline for NR.

=> Send LS to CT1/SA2 to provide our agreements that we intent to reuse LTE baseline for the AS support for PLMN selection and Tracking Areas (Qualcomm, offline discussion 50) R2-1706078

R2-1706078 [DRAFT] [LS to provide RAN2 agreements to reuse LTE baseline for the AS support for PLMN selection and TAs] Qualcomm LS out Rel-15 NR_newRAT-Core To: CT1, SA2

=> Add the RAN2 agreement that we can support PLMN selection inactive if they decide to support.

=> Revised in R2-1706148

R2-1706148 [DRAFT] [LS to provide RAN2 agreements to reuse LTE baseline for the AS support for PLMN selection and TAs] Qualcomm LS out Rel-15 NR_newRAT-Core To: CT1, SA2

=> Approved in R2-1706158

10.4.2.2 Idle mode mobility

Derivation of cell quantity from beam measurements (including filtering and FFS points from previous meetings)

Service based reselection

cell selection/ reselection

R2-1704295 Cell selection and reselection for NR IDLE Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

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R2-1705735 IDLE mode mobility in NR Samsung discussion

R2-1704896 Derivation of cell quality in IDLE/INACTIVE Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704244 Cell selection and cell reselection CATT discussion Rel-15 NR_newRAT-Core

R2-1704530 Cell Selection and Reselection in NR MediaTek Inc. discussion

R2-1704583 idle mode mobility vivo discussion

R2-1704809 Initial discussion for the idle mode UE behaviors Intel Corporation discussion NR_newRAT-Core

R2-1704849 Speed dependent mobility for idle mode Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1704895 UE Measurement in IDLE and INACTIVE state Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705130 Idle Measurement Enhancement using UE speed LG Electronics Inc. discussion Rel-15

R2-1705435 Derivation of cell quality in IDLE/INACTIVE Ericsson discussion Rel-15 NR_newRAT-Core

R2-1705436 Cell re-selection measurement window Ericsson discussion Rel-15 NR_newRAT-Core

R2-1705828 Mobility states and speed dependant scaling of measurement related parameters in NR IDLE/ INACTIVE mode Samsung discussion

Service based reselection

R2-1704360 Service-based RAT/frequency selection in INACTIVE or in IDLE Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704245 Service related cell selection/reselction CATT discussion Rel-15 NR_newRAT-Core

R2-1704068 Cell Re-selection: Frequency Prioritisation in NR Samsung Electronics Co., Ltd discussion Rel-15

Other

R2-1704294 NAS/AS modeling for NR IDLE Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

Agreements

1 UE does not need to consider RATs under “RAT restrictions” as candidates for selection/reselection for suitable cells.

2 If the best cell according to reselection rules is an intra-frequency or inter-frequency cell which is not suitable due to being part of the "forbidden area", the UE shall not consider this cell and other cells on the same frequency, as candidates for reselection for a duration.

3 “allowed area” and “non-allowed area” is transparent to AS. NAS will handle that no access is made in the “non allowed area”. Check with SA2/CT1 that this is OK assumption for them.

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4 RAN2 assumption that the UE in RRC_INACTIVE can perform RAN paging area updates and answer to RAN paging in a "non allowed area."

=> Send an LS to SA2/CT1 to confirm our assumption. To be included in draft LS in R2-1706078

=> Ask SA2/CT1 whether MICO mode is seen in AS so that no AS operations are ongoing until NAS requests a connection and it is OK to start cell selection procedure once upper layers request connection. To be included in draft LS in R2-1706078

10.4.2.3 Paging

R2-1704924 Paging Aspects for Multi-beam Operation in NR InterDigital discussion Rel-15 NR_newRAT-Core

R2-1704531 Overhead Reduction for Paging in Multi-beam Operation MediaTek Inc. discussion

R2-1704820 Consideration on NR paging Qualcomm Incorporated discussion Rel-15

R2-1704763 Response-driven paging to reduce beam sweeping overhead in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704066 Paging in NR – Beamforming Aspects Samsung Electronics Co., Ltd discussion Rel-15

R2-1704067 PO Determination for Paging Reception Samsung Electronics Co., Ltd discussion Rel-15

R2-1704095 Paging mechanism in NR Guangdong OPPO Mobile Telecom. discussion Rel-15

R2-1704351 Configurable Paging Procedure for NR Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1704352 Evaluation of Uplink Access using Paging Indicators Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1704361 DRX in idle state Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704762 Paging delivery in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1704897 Paging mechanism for high frequency Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1705656 CN paging DRX in RRC_IDLE LG Electronics discussion Rel-15 NR_newRAT-Core

R2-1705667 UE Assisted Paging Convida Wireless discussion Rel-15

R2-1705752 Use multiple P-RNTIs for NR paging Qualcomm discussion

Withdrawn

R2-1704812 Paging reception Intel Corporation discussion NR_newRAT-Core

=> Withdrawn

10.4.2.4 Other

R2-1704161 SFN based Broadcast TX at Higher Frequencies Samsung Electronics Co., Ltd discussion Rel-15

R2-1704162 Draft LS on SFN based Broadcast Transmission Samsung Electronics Co., Ltd discussion Rel-15

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R2-1704362	Camping in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1704457	On the very long DRX cycle	Samsung Research America	discussion		NR_newRAT-Core
R2-1704460	New NAS-based power saving mechanism for NR	Samsung Research America	discussion		NR_newRAT-Core
R2-1704461	[Draft] LS on NAS layer based power saving solution for NR	Samsung Research America	discussion		NR_newRAT-Core
R2-1705231	Mobility state estimation in NR	LG Electronics Inc.	discussion		
R2-1705657	AS context in RRC_IDLE	LG Electronics	discussion	Rel-15	NR_newRAT-Core

10.4.3 UE capability specification

This agenda items is for the creation of the UE capability specification only - discussion of UE capabilities for NSA and SA will take place in agenda item 10.2.6

10.4.3.1 Creation of TS

Rapporteur of 38.306 to propose TS skeleton

Specification principles for UE capability spec.

R2-1704806	Initial discussion on TS38.306 skeleton	Intel Corporation	discussion	NR_newRAT-Core

Agreements

1 TS36.306 is the baseline of TS38.306 skeleton (category related aspects can be revisited if categories are decided not to be used)

2 Independent downlink and uplink UE category is the baseline of TS38.306 skeleton.

3 RAN2 would assume that transport channel parameters and Total L2 buffer size would be parameters set by UE category:

4: Capabilities independent from the field UE category are:

- General capabilities
- SDAP capabilities
- PDCP capabilities
- RLC capabilities
- MAC capabilities
- PHY capabilities
- RF capabilities
- Measurement capabilities
- Inter-RAT capabilities
- Feature specific capabilities

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5: Optional capabilities w/o UE radio access capability parameters and conditional mandatory features are captured into TS38.306 skeleton.

6: UE capability signalling is used to inform if mandatory features implemented and tested successfully.

7: Separate section to list the mandatory features to be signalled is introduced.

FFS where NSA related capabilities are captured 38.306 or 36.306

R2-1704810 Skeleton of NR UE radio access capabilities (TS 38.306 v0.0.1) Intel Corporation
discussion NR_newRAT-Core

=> Revised skeleton to take into account above agreements to be submitted to the next meeting.

11 UTRA Release 11 and earlier releases

12 UTRA Release 12

(EDCH_enh-Core, leading WG: RAN2, REL-12, started: Dec. 13, closed: Dec. 14, WID: RP-140127)

(UTRA_SIBenh-Core, leading WG: RAN2, started: Dec. 13, closed: Sep 14, WID: RP-140131)

(UTRA_hetnet_enh-Core, leading WG: RAN1, started: Dec.13, closed: Sep. 14, RP-140463)

(UTRA_DCHenh-Core, leading WG: RAN1, started: Sept.13, closed: Sep. 14, RP-131357)

(UTRA_LTE_WLAN_interw-Core, leading WG: RAN2, REL-12, started: Dec.13, closed: Sep. 14, WID: RP-132101)

(LTE_UTRA_IncMon-Core, leading: RAN4, REL-12, started: Dec.13, closed: Dec. 14, WID: RP-132061)

Input to any other Rel-12 WI/SI not explicitly listed above.

(UTRA_hetnet_mob-Core, leading WG: RAN2, Started: Dec.13, closed: June 14, WID: RP-140463)

(LCS_BDS-UTRA-Core, leading WG: RAN2, started: March 13, closed: Dec.13, WID: RP-130416)

(EHNB_enh3-Core, leading WG: RAN3, REL-12, started: Sep.12, closed: Dec 13, WID: RP-130741)

(LCR_TDD_HSPA_sign_enh-Core, leading WG: RAN1, started: Dec 12, closed: Dec 13, WID: RP-121984)

(LTE_UTRA_SDL_BandL-Core, leading WG: RAN4, started: June 13, closed: June 14, WID: RP-140092)

Including corrections for UTRA functionality introduced as TEI12.

13 UTRA Release 13

13.1 WI: L2/L3 Downlink enhancements for UMTS

(UTRA_EDL_L23-Core, leading WG: RAN2, started: June 15, closed: Dec. 15, WID: RP-152184)

13.2 WI: Power saving enhancements for UMTS

(UTRA_SDATA_POWSAV-Core, leading WG: RAN2, started: June 15, closed: Dec 15, WID: RP-151998)

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13.3 WI: Support of EVS over UTRAN CS

(EVSoCS_UTRAN-Core; leading WG: RAN2, started: Dec. 14, closed: Dec 15, WID: RP-142282)

13.4 WI: Network-Assisted Interference Cancellation and Suppression for UMTS

(UTRA_NAICS-Core, leading WG: RAN1, started: Sep. 15, closed: Dec. 2015, WID: RP-151879)

13.5 WI: Multiflow Enhancements for UTRA

(HSDPA_MFTX_enh-Core, leading WG: RAN2, started March 15, closed:Sep. 15 , WID: RP-150288)

13.6 WI: HSPA Dual-Band UL carrier aggregation

(HSUPA_DB_MC-Core; leading WG: RAN4; REL-13; started: Dec. 14; closed: Dec. 15; WID: RP-151852)

13.7 WI: Application specific Congestion control

(ACDC-RAN-Core; leading WG: RAN2; REL-13; started: Mar. 15; closed: Dec. 15; WID: RP-150512)

13.8 WI: Indoor Positioning enhancements for UTRA and LTE

(UTRA_LTE_iPos_enh-Core; leading WG: RAN2; REL-13; started: Sept. 15; closed: Dec. 15; WID: RP-152251)

R2-1704955 CR to 25.305 on the correction to indoor positioning enhancements Huawei, HiSilicon

- E///: PCAP should also be updated. One possibility is to use CELL-ID along with the configuration of indoor positioning.

R2-1704956 CR to 25.305 on the correction to indoor positioning enhancements Huawei, HiSilicon

R2-1704957 CR to 25.331 on the correction to indoor positioning enhancements Huawei, HiSilicon

R2-1704958 CR to 25.331 on the correction to indoor positioning enhancements Huawei, HiSilicon

After offline discussion:

☒ **[UMTS/ Indoor positionling corrections] – Huawei**

- To see if we could reach consensus on the concept of having one additional positioning method be used in isolation, e.g.for WLAN to be used in isolation; and to check if this could be done without changing ASN.1 code.
- To also investigate the feasibility of cell-id + additional positioning method;
- If there is consensus achieved, targeting agreeable CRs for the coming plenary; if no consensus could be reached, we could continue to discussion till next RAN6 and RAN3 meeting.
- **Deadline: May 25. 2017. (if no consensus reached, could be extended to next RAN6/RAN3 meeting)**

13.9 WI: Downlink TPC enhancements for UMTS

(UTRA_EDL_TPC-Core; leading WG: RAN1; REL-13; started: Sept. 15; closed: Dec. 15; WID: RP-151880)

13.10 WI: Dual Carrier HSUPA Enhancements for UTRAN CS

(DC_HSUPA_CS-Core; leading WG: RAN2; REL-13; started: Sept. 15; closed: Dec. 15; WID: RP-151780)

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13.11 UTRA TEI13 enhancements

Small Technical Enhancements affecting UMTS Rel-13 that do not belong to any Rel-13 WI.

Note: A TEI enhancement proposal should be treated for only one meeting cycle and involve only one WG. Otherwise, a WI should be proposed at RAN plenary!

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14 UTRA Rel-14

14.1 WI: RRC optimization for UMTS

(UTRA_RRCopt-Core; leading WG: RAN2; REL-14; started: Dec. 15; closed: Sept. 16; WID: RP-160287)

This agenda item is for correction CRs to the closed WI.

14.2 WI: DTX/DRX enhancements in CELL_FACH

(FACH_DTXDRX-Core, leading WG: RAN2; REL-14; started: Dec. 15; closed: Dec. 16; WID:RP-162513)

This agenda item is for correction CRs to the closed WI.

14.3 WI: Multi-Carrier Enhancements for UMTS

(UTRA_MCe-Core, leading WG: RAN2; REL-14; started: Jun. 16; closed: Dec 16; WID:RP-162453)

This agenda item is for correction CRs to the closed WI.

14.3.0 In principle agreed CRs

14.3.1 Other

14.4 WI: QoE Measurement Collection for Streaming in UTRAN

(UMTS_QMC_Streaming, leading WG: RAN2; REL-14; started: Sep. 16; closed: Mar. 17; WID: RP-161917)

This agenda item is for correction CRs to the closed WI.

Including output from email discussion [97bis#38][UMTS] QoE Measurement Collection for streaming#1 – Ericsson

14.4.0 In principle agreed CRs

R2-1704738 Corrections of QoE measurements Ericsson

=> The CR is agreed.

14.4.1 Other

R2-1704112 Reply LS on the progress of QoE Measurement Collection for Streaming (S4-170452; contact: Ericsson)

⇨ Noted.

R2-1704113 LS on QMC session measurements (S4-170462; contact: Ericsson)

⇨ Noted.

R2-1704114 Reply LS on QoE Measurement Collection for streaming (S4-170491; contact: Huawei)

⇨ Noted.

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R2-1705840 LS reply to RAN2 on ”the progress of QoE Measurement Collection for Streaming to RAN3, SA4, SA5 and CT1” (S5-173334; contact: Ericsson)

- HW: we think we could just wait SA5 progress.

⇨ Noted.

R2-1704740 Clarification of UE capability for QoE Measurement Collection for streaming services Ericsson

- N: we checked, we found other scenarios, for example, when the number of neighbour cell list is big, the RLC size could also be large, so we don’t think there is a need to add such capability.
- N: another question is about the optionality.
- E: for a UE supporting QoE reporting, we think it is manadatory.
- HW: neutral. The CR itself makes sense, since it is written in RRC spec with similar requirement. We even took MDT as example, in 25.306, it requires minimum buffer size of 64kB.
- QC: the smaller the better.

⇨ The CR is not pursued.

R2-1704742 Discussion on LS on QMC session measurements Ericsson

- N: if we could understand the typical use case of QoE measurements and reporting.
- E///: the main issue is, the RNC doesn’t know if the report from UE is the final one; but there might be implementation that RNC could release a measurement control which was requested by OAM.
- HW: we share the view with E///, we think the use case of benefits is out of RAN scope, SA4 had clear spec about reporting criteria, for example, could refer to SA4 spec 26.247.
- N: fine with proposal that leaving to implementation, but would like to understand what the expected configuration from OAM or CN is.
- HW: we don’t think there is a need to mention of incomplete report, this will cause confusion in SA4. And we would like to discuss first in RAN2 that what’s the beneficial use case that RNC knows that the reporting task is finished.

⇨ The common understanding is: **It is up to implementation when the RNC starts and stops QoE measurements.**

⇨ We will not have reply LS from this meeting, we can have more discussions on the beneficial use case of RNC’s awareness of the incompletion/completion of a QoE report.

⇨ Noted.

R2-1704741 Unclear behaviour for transmission of “Container for application layer measurement reporting” Ericsson

- N: we support the approach of having new cause value.
- QC/HW: no strong opinion.
- HW: for the second question, we would like to have clear approach.
- N: if the network doesn’t switch the UE to DCH in the CUC message, we agree that UE should drop the report.
- E: we think to drop is a simple approach.
- N: would like to understand the intention not to transmit QoE report in HS-FACH state.
- E: the common E-DCH resource will be occupied with long time which may further cause block for other UEs to use common E-DCH resource.
- HW: we think it would be chanllenging to do this.

⇨ We will introduce a new cause value “application layer measurement report available”

⇨ We agree that the UE should drop the report if network doesn’t switch this UE to DCH.

⇨ Noted.

R2-1705835 Clarified behaviour for transmission of “Container for application layer measurement reporting” Ericsson

- HW: editorial to the change in the tabular.
- E: some other editoirals needed.

⇨ The CR is updated to R2-1705945

R2-1705945 Clarified behaviour for transmission of “Container for application layer measurement reporting” Ericsson

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- QC: since the changes now include corrections to the existing tabular error, we should consider to update the reason for change in the coversheet.
- ⇨ We agreed to have one CR, to also capture the corrections to existing tabular.
- ⇨ We will have short email discussion to check the additional changes, the texts are remain unchanged as agreed ones.
- ⇨ The final agreeable CR is updated to R2-1705950

☒ [UMTS/ QoE corrections] – E///

- **To check if the additional changes to exisiting tabular is correct or not, and agree the final CR in R2-170590.**
- **Deadline: May 25. 2017.**

14.5 TEI14

Small Technical Enhancements affecting UMTS Rel-14 that do not belong to any Rel-14 WI.

Note: A TEI enhancement proposal should be treated for only one meeting cycle and involve only one WG. Otherwise, a WI should be proposed at RAN plenary!

14.5.0 In principle agreed CRs

R2-1704735 Unclear naming of feature “Dual cell E-DCH operation” Ericsson

- ⇨ The CR is agreed.

R2-1704736 Unclear naming of feature “Dual cell E-DCH operation” Ericsson

- ⇨ The CR is agreed.

R2-1704737 Unclear naming of feature “Dual cell E-DCH operation” Ericsson

- ⇨ The CR is agreed.

14.5.1 Other

R2-1705380 Rapporteur corrections Ericsson

- ⇨ The CR is agreed.

14.6 Rel-14 UMTS ASN.1 review

This agenda item is for documents from the ASN.1 review coordinator, and for documents from others that address a specific issue(s) within the ASN.1 issue list (please include the issue number(s) that is addressed within the title of the document).

R2-1705278 25331 RRC Specification update after ASN1 review Ericsson

- ⇨ The CR is withdrawn.

R2-1705389 RRC Specification Update After ASN1 Review Ericsson

- ⇨ We will have a short email discussion, to double check all the changes.
- ⇨ The final agreeable CR is updated to R2-1705951.

☒ [UMTS/ ASN.1 review] – E///

- **To check ASN.1 changes, to see if anything is missing, and if any updates are needed, and target to agree the final CR in R2-1705951 for the coming plenary..**
- **Deadline: May 25. 2017.**

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15 UTRA Rel-15

15.1 WI: DL interference mitigation for UMTS

(UTRA_DL_IM-Core; leading WG: RAN2; REL-15; started: Mar. 17; target: Jun. 17: WID: RP-170703)

Time budget: 1 TU

R2-1705831 Introduction of DL interference mitigation Qualcomm Incorporated

- N: also for TDD? The current analysis is for FDD, that's why we have this question.
- QC: it is an optional feature, technically TDD should not be excluded. The main use case is for FDD, but we don't have to restrict to TDD.
- N: we are fine with this as it is now.
- QC: if we could idtenfiy something which is not apllicable to TDD, we could have correction CR later.
- N: we could also check if it is possible to suppored this CR in R13.
- E: maybe we need changes to the last change, optional should be added: Adjacentchannelinterferencelevel ENUMERATED { moderate, high } OPTIONAL

⇨ The CR is updated to R2-1705948

R2-1705948 Introduction of DL interference mitigation Qualcomm Incorporated

- QC: after checking, it seems impossible to just backport to R13 with a magic sentence. Pleanry delegate will update the WID.
- N: is it possible to backport to R13 with ASN.1 changed CR?
- E/QC: we need to check, the initial answer now is no.

⇨ The CR is agreed.

R2-1704163 Introduction of DL interference mitigation Qualcomm Incorporated

⇨ The CR is revised to R2-1705831

R2-1704164 Introduction of DL interference mitigation for UMTS Qualcomm Incorporated, Huawei, HiSilicon

⇨ The CR is revised to R2-1705836

R2-1705836 Introduction of DL interference mitigation Qualcomm Incorporated

=> The CR is updated to R2-1705949.

R2-1705949 Introduction of DL interference mitigation Qualcomm Incorporated

=> The CR is agreed.

15.2 SI: Study on Scheduling enhancements with carrier aggregation for UMTS

(FS_UTRA_CA_sched_enh; leading WG: RAN1; REL-15; started: Jun. 17; target: Jun. 17: SWID: RP-170719)

Time budget: 2 TU

R2-1704968 Discussion on RAN2 impacts due to eScheduling Huawei, HiSilicon

- N: for the listed options, do you have any preference, or just for open discussion?
- HW: in RAN1, we have papers for different options, we prefer option 1-1, but it should be RAN1's responsibility.
- QC: so the intention of this paper is just to list the possible impacts of different options? HW: yes.
- N: for option 1-1, do QC see any benefits?
- QC: it is up to network, UE doesn't care.

⇨ Noted.

R2-1704969 TP on RAN2 impacts due to eScheduling Huawei, HiSilicon

- QC: there is obvious stage 2 impact, no precondition, and the stage 3 impacts are also straight forward, e.g. capability, RRC signalling. Maybe we could just say, there will be stage 2 impacts and stage 3 capability and RRC signalling impacts.
- E: if spec number, e.g 331/306 should be explicitly mentioned.

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⇨ We will have a short TP in R2-1705946.
R2-1705946 TP on RAN2 impacts due to eScheduling Huawei, HiSilicon

⇨ The TP is agreed.
⇨ From RAN2 point of view, the SI is concluded.

15.3 SI: Study on a simplified HS-SCCH for UMTS

(FS_simplified_hsscch_UMTS; leading WG: RAN1; REL-15; started: Jun. 17; target: Jun. 17: SID: RP-170725)

Time budget: 0.5 TU

R2-1704010 LS on the progress for the SI on a simplified HS-SCCH for UMTS (R1-1706211; contact: Ericsson) RAN1

⇨ Noted.
R2-1704739 RAN2 impacts of simplified HS-SCCH Ericsson

- QC: LS should be to RAN1.
⇨ We will have a short TP in R2-1705947
R2-1705947 RAN2 impacts of simplified HS-SCCH Ericsson

⇨ The TP is agreed.
⇨ From RAN2 point of view, the SI is concluded.

16 Outgoing LSs and email discussions from UTRA session

16.1 Agreed outgoing LSs from UTRA session

16.2 Email discussions from UTRA

17 Comebacks

This agenda item will be used during the meeting. No documents are supposed to be submitted by delegates.

17.1 LTE breakout sessions

17.1.1 Report from LTE Break-Out session

R2-1704030 Report from LTE Break-Out session Vice-Chair (InterDigital) report

=> Approved

=> From RAN2 point of view the FeD2D study is complete.

Comebacks

R2-1705857 Miscellaneous corrections to V2X in TS 36.321 Huawei, HiSilicon CR Rel-14
36.321 14.2.1 LTE_V2X-Core 1 F

=> Agreed

R2-1705855 Introduction of UE capability for V2X in 36.331 (Option 2-1) LG Electronics Inc. CR Rel-14 36.331 14.2.2 LTE_V2X-Core 1 B

=> Add "as defined in 36.300"

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=> Agreed in R2-1706126

R2-1705856 Introduction of UE capability for V2X in 36.306 LG Electronics Inc. CR Rel-14 36.306 14.2.0 LTE_V2X-Core 1 B

=> Add "as defined in 36.300"

=> Agreed in R2-1706127

R2-1704562 Delete the value “ue” in the type SL-TypeTxSync-r14 CATT CR 36.331 14.2.2 2819 F Rel-14 LTE_V2X-Core

=> Withdrawn

R2-1705868 On message size of SIB21 Qualcomm Incorporated, Oppo

Agreements
1: Correct the wrong TX power ranges to [-41dBm, 31dBm] so that 7-bit can represent the allowed range for TX power adaptation.

=> Offline to conclude how to progress with this issue

- Update from offline.

R2-1706131 On message size of SIB21 Qualcomm Incorporated, Oppo

Agreements
FFS: Using number of sub-channel to instead number of RB in tx-Parameters-r14. Can be included in the CR after companies have had time to check.
2: Similar to CBR range, PPPP range can also be used to reduce the CBR configuration parameter size per each TX pool.
3: RAN2 to consider the above Option B as a baseline for a CR to reduce the SIB 21 size to support congestion control for V2X.

R2-1705854 CR on reduction of SIB21 size Qualcomm IncorporatedCR Rel-14 36.331 14.2.1 LTE_V2X-Core F

✉ **[98#xx][LTE/V2X] SIB21 (OPPO)**

Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

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R2-1705814 Correction of SRS switching in 36.331 Huawei, HiSilicon CR 36.331 14.2.2 2869 1 F Rel-14 LTE_SRS_switch-Core

=> Agreed

R2-1705847 Merging of retuningTimeBandPairList with regular supported BC capabilites (ASN.1 review issue S.059) Samsung Telecommunications CR Rel-14 36.331 14.2.1 LTE_SRS_switch, TEI14 1 F

=> Agreed

R2-1705850 Introduction of High Speed Features in 36.306 Huawei, HiSilicon CR Rel-14 36.306 14.2.0 LTE_high_speed-Core 2 B

- Nokia think a capability is useful as there is dedicated signalling to be used even if it is a common configuration as in this case it is only used in dedicated signalling.
- Session chair indicated there was agreement to have the capability.
- Qualcomm think we should add the capability and have a general discussion on the principle in future.

=> Capability to be added for this case but this should not be considered as the general principle which can be discussed in future.

=> Not pursued

R2-1705851 Correction of high speed in 36.331 Huawei, HiSilicon CR Rel-14 36.331 14.2.2 LTE_high_speed-Core 1 F

=> Not pursued

R2-1705853 Remaining issues in Activation/Deactivation of CSI-RS resources MAC CE for eFD-MIMO LG Electronics Inc., Samsung CR Rel-14 36.321 14.2.1 LTE_eFDMIMO-Core 1

F

=> Agreed

R2-1705852 Corrections on eFD-MIMO including ASN.1 review related issues Samsung Telecommunications CR Rel-14 36.331 14.2.1 LTE_eFDMIMO 1 F

✉ **[98#xx][LTE/eFD-MIMO] 36.331 CR for ASN.1 corrections(Samsung)**

Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

R2-1705862 TP for group mobility Huawei, HiSilicon discussion Rel-15 FS_feD2D_IoT_relay_wearable

=> Agreed

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R2-1705865 Draft LS on UL HARQ RTT for TDD LTE_sTTIandPT Ericsson discussion Rel-15

=> Revised in R2-1706128

R2-1706128 Draft LS on UL HARQ RTT for TDD LTE_sTTIandPT Ericsson discussion Rel-15

=> Approved in R2-1706159

High speed - new tdocs

R2-1706005 Introduction of UE capabilities for high speed in 36.306 Huawei, HiSilicon CR Rel-14 36.306 LTE_high_speed_core 1480 14.2.0

=> Agreed

R2-1706008 Correction of high speed in 36.331 Huawei, HiSilicon CR Rel-14 36.331 LTE_high_speed_core 2949 14.2.2

=> Agreed

R2-1705998 Introduction UE capabilities on high speed in 36.331 Huawei, HiSilicon CR Rel-14 36.331 LTE_high_speed_core 2948 14.2.2

=> Agreed

R2-1706056 LS on Relay UE discovery for bandwidth limited Remote UEs RAN1

- Ericsson think the case RAN1 is considering was excluded in RAN2
- Intel think the SID was fixed to make it clear that this case is included.
- Nokia think eMTC is in scope but NB-IoT is not.

=> We will respond from the next meeting (aim to send reply on Monday)

=> Noted

R2-1706058 LS to RAN2 on text proposal capturing RAN1 agreements in 3GPP TR 36.746

=> TP will be captured in the TR

=> Noted

17.1.2 Report from LTE Break-Out session

R2-1704031 Report from LTE Break-Out session Vice-chair (CMCC) report

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=> China Unicom will lead email on QOE

=> CATT will lead email on QOE

=> UDC study is complete from RAN2 point of view.

=> Report approved

Comeback on Friday

UDC:

=> CBF try to down selection [1000]

- CATT summary of situation. There are 2 solutions that are equal from technical point of view. Aim is to down select before moving to a WI.

R2-1706025 Way forward on UDC SI CATT, CMCC, China Telecom, China Unicom, Media Tek, vivo, Intel, ITRI, Xiaomi, OPPO, HTC, Asustek

=> Noted

ViLTE:

✉ **[96#xx][LTE/ViLTE] Identify the benefits of UE assistance information and corresponding solutions (CMCC)**

Intended outcome: Email discussion report to next meeting

Deadline: Thursday 2017-08-03

eMob:

R2-1706016 Miscellaneous RRC corrections on mobility enhancement ZTE Corporation CR 36.331 14.2.2 2851 F Rel-14 LTE_eMob-Core

=> Agreed

R2-1706017 Correction of RACH-less handover Kyocera CR 36.300 14.2.0 1032 F Rel-14 LTE_eMob-Core

=> Withdrawn

feMBMS:

R2-1706018 UE capabilities for feMBMS Ericsson CR 36.331 14.2.1 2874 B Rel-14 MBMS_LTE_enh2-Core

=> Agreed

R2-1705423 Introduction of FeMBMS to 36.306 Ericsson CR 36.306 14.2.0 1470 B Rel-14 MBMS_LTE_enh2-Core

=> Agreed

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R2-1706020 Correction to Downlink Reception Type Combinations for FeMBMS Qualcomm CR 36.302 14.2.0 1112 F Rel-14 MBMS_LTE_enh2-Core

=> Agreed

R2-1706021 Correction to Reselection priorities handling for FeMBMS Qualcomm CR 36.304 14.2.0 0380 F Rel-14 MBMS_LTE_enh2-Core

=> Agreed

R2-1706022 Changes to delay budget reporting related to ASN.1 review Samsung Telecommunications CR 36.331 14.2.1 2889 F Rel-14 LTE_VoLTE_ViLTE_enh, TEI14

=> Agreed

17.1.3 Report from NB-IOT session

R2-1704032 Report from NB-IOT session Session Chair (MediaTek) report

CBF: Report from LTE Break-Out Session, Session Chair (MediaTek)

=> eNB-IOT WI can be closed from RAN2 point of view

=> Approved

17.1.4 Report from Positioning session

R2-1705821 Report from Positioning session Session Chair (Huawei) report

=> Approved

Comebacks

R2-1705989 Draft LS to SA3 on the provision of an encryption solution for broadcast solution Ericsson LS out Rel-15 LCS_LTE_acc_enh-Core SA3

=> Approved in R2-1706150

17.2 Main session

This section contains a temporary list of comebacks

- New document

- => Revised in R2-1706090

- => Revised in R-1705882 to capture the behaviour in the spec. (Qualcomm, offline discussion 04)

- => Discuss offline to conclude on P5 and if anything should be captured in stage 2 regarding network behaviour. (Apple, offline discussion 5)

- => Revised in R2-1706091

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- => Revised in R2-1706092
- => Revised in R2-1706093
- => Revised in R2-1706094
- => Revised in R2-1706095
- => Revised in R2-1706096
- - Nokia agree with the intent but would like more time to check details
- - agree email discussion
- => Offline discussion to progress (Nokia, Offline discussion 08)
- => Revised in R2-1706097
- => Rel-12 to be provided in R2-1706098 CR 2957
- => Revised in R2-1706099
- => Revised in R2-1705971 (Offline discussion 12)
- => CR to add the Nfreqeffective in R2-1705972 CR 2946 (offline discussion 13)
- => Offline discussion to conclude (Nokia, offline discussion 14)
- => Revised in R2-1706102
- => Revised to R2-1705974
- => Offline discussion to progress on the solution (Huawei, offline discussion 17)
- => Revised in R2-1705982 (offline discussion number 24)
- => Offline discussion to identify all the stage 3 issues to be addressed and to conclude whether we want to go ahead of this. Can be discussed separately for LWA and DC. (Qualcomm, offline discussion 25)
- => Revised in R2-1706132
- => Revised in R2-1706135
- => Revised in R2-1706134
- => Revised in R2-175995 (DOCOMO, offline discussion 31)
- => Discuss offline and comeback Friday to see it is possible to agree or take a working assumption that NR-PDCP layer is used for both MCG split bearer and SCG split bearer. (Ericsson, offline discussion 32)
- => Offline discussion to try to conclude (Huawei, offline discussion 36)
- => Draft LS in R2-1706035 (DOCOMO, offline discussion 41)
- => Offline discussion to try to conclude whether we need to support the case that MN and SN are able to both configure measurements on the same NR frequency (relates to 2 FFS points from last meeting). Note agreement last time was that MN should be able to at least do inter-RAT HO to NR and consequence of this is that some measurements of the NR serving cell/frequency need to be available in MN. (Nokia, offline discussion 40)
- => Intention is that these 2 TPs will be discussed by email until the next meeting. Whether to have a common RAN2/3 discussion on one reflector to be discussed by chairs
- => Send LS to SA3 to whether UP integrity protection is supported and whether counter check is needed for NR. Should explain that the question relates to all options including option 3. Also ask what network behaviour is expected when counter check detects a problem. Background should also be explained. (Nokia, offline discussion 42) R2-1706036

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- => Send LS to RAN to ask whether we will have UE categories defined for NR and for MR-DC. Background for question needs to be explained. (DOCOMO, offline discussion 43). R2-1706043
- => Revised in R2-1706049 (offline discussion 44)
- => Revised in R2-1706009 (offline discussion 38)
- => Revised in R2-1706011 (offline discussion 39)
- => Revised in R2-1706050 (offline discussion 45)
- => Draft LS to respond to RAN1 that the important considerations from RAN2 point of view is that the beam and cell should be detected and identified and measured quickly and reliably and with minimal need for measurement gaps, and with consideration to UE power consumption. Can also ask if the RAN1 design would require that time index needs to be acquire every time a measurement is taken. Ask RAN1 to also consider the idle/inactive mode case. Final wording and whether any additional details can added to be discussed offline. (Intel, offline discussion 48) R2-1706054
- => Offline discussion using the text below as starting point for possible agreements (Samsung, offline discussion 49):
- => Offline discussion to try to converge to a single solution (Nokia, offline discussion 46)
- => LS to RAN3/SA2 to inform them of our decision and the need to provide info from the CN to the RAN (LG, offline discussion 47) R2-1706053
- => Send LS to CT1/SA2 to provide our agreements that we intent to reuse LTE baseline for the AS support for PLMN selection and Tracking Areas (Qualcomm, offline discussion 50) R2-1706078
- => Offline to conclude how to progress with this issue
- CBF: Report from LTE Break-Out Session, Session Chair (MediaTek)

17.3 Email Discussions from main session

Deadline Thursday, 2017-05-25, 23:59 Pacific Time

Please request TDoc numbers for the following email discussions from MCC if not already indicated below

[98#01][LTE/Rel-13] LAA/WiFi sharing 36.300 CR (Apple)

Discussion to focus on "the UE may expect eNB to deactivate the LAA SCell(s)" and the measurement part of the CR.

Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

[98#02][LTE/TEI14] ASN.1 review corrections CR (Ericsson)

Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

[98#03][LTE/TEI14] E-UTRAN sharing (Ericsson)

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Finalise CRs to 36.300 and 36.331

Intended outcome: Technically endorsed CRs

Deadline: Thursday 2017-05-25

[98#04][LTE/V2X] SIB21 (OPPO)

Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

[98#05][LTE/eFD-MIMO] 36.331 CR for ASN.1 corrections (Samsung)

Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

[98#06][LTE/V2X] – CR to 36.331 – LG

- Agree to final CR capturing all agreed CRs and changes in R2-1705844

Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

[98#07][LTE/FeD2D] – TR update – LG

- Capture agreements reached up to RAN2#98
- [Capture agreed TPs from other WGs – RAN1 and RAN3]
- Capture conclusions

Intended outcome: Agreed TR v1.0.0 to be provided to RAN for information

Deadline: Thursday 2017-05-25

[98#08][LTE/UDC] TR 36.754 (CATT)

- Capture the agreements from this meeting

Intended outcome: Agreed TR for one step approve in RANP

Deadline: Thursday 2017-05-25

[98#09][LTE/eMTC] Extended RSRP range (Huawei)

To decide if Rel-13 or Rel-14 and agree CR and Reply LS

Intended outcome: Agreed CR and approved LS

Deadline: Thursday 2017-05-25

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[98#10][LTE/eNB-IoT] RRC reestablishment DoNAS (Qualcomm)

Finalise CRs, 36.300 and 36.306 (small changes), 36.331 check inter-group alignment and include corrections to minor issues

Intended outcome: Agreed CRs

Deadline: Thursday 2017-05-25

[98#11][LTE/eNB-IoT] NB-IoT ASN.1 review (Huawei)

Primarily to fix clashes, can also address if there are further detailed comments

Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

[98#12][LTE/eNB-IoT] RACH handling at PDCCH order (ZTE)

Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

[98#13][LTE/feMTC/eNB-IoT] SC-PTM offset (Huawei)

To refine the wording(s), to arrive at an agreed CR

Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

[98#14][LTE/feMTC/eNB-IoT] SC-MCCH information change (Huawei)

Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

[98#15][LTE/feMTC] Enhanced RLM (Ericsson)

Ensure consistency with RAN4 and review of details

Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

[98#16][LTE/feMTC] ASN.1 review CR (Ericsson)

Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

[98#17][LTE/feMTC] Measurement gap sharing (Huawei)

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Intended outcome: Agreed CR

Deadline: Thursday 2017-05-25

[98#18][[UMTS/ QoE] – QoE corrections - Ericsson

- To check if the additional changes to existing tabular are correct or not, and agree the final CR in R2-170590.

  Intended outcome: Agreed CR

  Deadline: Thursday 2017-05-25

[98#19][UMT/ASN.1 review] – Ericsson

- To check ASN.1 changes, to see if anything is missing, and if any updates are needed, and target to agree the final CR in R2-1705951 for the coming plenary..

  Intended outcome: Agreed CR

  Deadline: Thursday 2017-05-25

[98#20][UMTS/ Indoor positioning corrections] – Huawei

- To see if we could reach consensus on the concept of having one additional positioning method be used in isolation, e.g.for WLAN to be used in isolation; and to check if this could be done without changing ASN.1 code.
- To also investigate the feasibility of cell-id + additional positioning method;
- If there is consensus achieved, targeting agreeable CRs for the coming plenary; if no consensus could be reached, we could continue to discussion till next RAN6 and RAN3 meeting.

  Intended outcome: Agreed CR

  Deadline: Thursday 2017-05-25 (if no consensus reached, could be extended to next RAN6/RAN3 meeting)

Deadline Thursday, 2017-06-01, 23:59 Pacific Time

Please request TDoc numbers for the following email discussions from MCC if not already indicated below

[98#21][NR] LS to SA3 (Nokia)

Intended outcome: Approved LS

Deadline: Thursday 2017-06-01

[98#22][NR/UP] LS on NAS reflective QoS – Nokia

1. Inform SA2 of RAN2 agreements and provide stage QoS text

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2. ask questions on activation/de-activation of NAS reflective (U-plane/C-plane), when the AS should/will be informed, expected QoS flow ID size.

   Intended outcome: Approved LS

   Deadline: Thursday 2017-06-01

[98#23][LTE/Rel-13] LS on BCS and fallback combinations (Nokia)

Intended outcome: Approved LS

Deadline: Thursday 2017-06-01

[98#24][LTE/UAV] Running TR of Study on enhancement support for Aerial Vehicles (DCM)

- Capture the agreements from this meeting and RAN1 agreements

  Intended outcome: Running TR

  Deadline: Thursday 2017-06-01

[98#49][LTE/UAV] Common RAN2 parameters for RLF and HOF simulation (Qualcomm)

- Based on the simulation assumption in R2-1704155 and RAN1 agreements
- Figure out the additional parameters needed by RAN2

  Intended outcome: Agreeable Report

Deadline: Thursday 2017-06-01

[98#56][LTE/NB-IoT] LS from RAN1 on partial NPDCCH search spaces (Huawei)

- Related to incoming LS from RAN1 in R2-1706138, discuss question from RAN1 based on the current RAN2 requirements. Attempt to send response to RAN1 and RAN before the RAN plenary so that potential company CRs may be considered in RAN if needed. If not possible to conclude in time to respond to RAN then the topic can be re-discussed at next RAN2.
- Intended outcome: Approved LS to RAN1/RAN
- Deadline: Thursday 2017-05-31 (note date one day earlier than others in this section)

Deadline Thursday, 2017-06-08, 23:59 Pacific Time

Please request TDoc numbers for the following email discussions from MCC if not already indicated below

[98#25][NR] TS 38.300 (Nokia)

Update draft TS 38.300 to include agreements from this meeting

Intended outcome: Endorsed version of draft TS

Deadline: Thursday 2017-06-08

Petitioners' Exhibit 1008, p. 538
AT&T et al v. Asustek Technology
IPR2024-00997

[98#54][NR] TS 38.300 RAN3 TP (Nokia)

Update draft TS 38.300 to include agreed TP from RAN3

Intended outcome: Endorsed version of draft TS

Deadline: Thursday 2017-06-08

[98#26][NR] SN/MN information exchange (Samsung)

Progress the details of the radio related information exchanged in case of MR DC (related to proposal 4 in R2-1705345)

Intended outcome: Report to next meeting

Deadline: Thursday 2017-06-08

[98#27][NR] TP to 37.340 - option 3 (ZTE)

Review to 37.340 on option 3 (provided in R2-1704659). RAN3 will review RAN3 relevant aspects and when their review is complete the outcome will be merged into this TP. RAN3 delegates are invited to participate in the continuing review on RAN2 reflector after this merge.

Intended outcome: Agreeable TP to next meeting

Deadline: Thursday 2017-06-12

[98#28][NR] TP to 37.340 - option 4/7 (ZTE)

Review to 37.340 on option 4/7 (provided in R2-1705415).

RAN3 delegates are invited to participate in the review on RAN2 reflector.

Agreements from this meeting are also to be included.

Intended outcome: Agreeable TP to next meeting

Deadline: Thursday 2017-06-12

[98#29][NR] Capability coordination (DOCOMO)

Capture the alternative approaches for capability coordination for EN-DC and NG-EN-DC. Focus should be on the coordination of the LTE and NR band combinations and baseband capabilities that may be dependent on the band combination (e.g. MIMO and CSI process capability). Aim is to provide clarity on the options to enable a decision to be made in the meeting. Aspects to consider: the UE capability information available to each node, and the information to be exchanged between the node in order to enable capability coordination.

Intended outcome: Report to next meeting

Deadline: Thursday 2017-06-08

[98#30][NR] RRC Connection Control (Intel)

Scope as defined in R2-1706124 with bullet 2 also application to CONNECTED to INACTIVE

Petitioners' Exhibit 1008, p. 539
AT&T et al v. Asustek Technology
IPR2024-00997

Intended outcome: Email discussion report to next meeting

Deadline: Thursday 2017-06-08

[98#31][NR] Measurement model TP (Samsung)

Draft TP to capture the measurement model to be captured in 38.300.

Intended outcome: Agreeable TP to be submitted to next meeting

Deadline: Thursday 2017-06-08

[98#32][NR] Measurement report content (Intel)

Progress details on the content of measurement reports

Outcome of the email can include proposals for agreement, identification of the main options, and questions to be asked to other groups.

Intended outcome: Report to the next meeting

Deadline: Thursday 2017-06-08

[98#33][NR/Measurement configuration] (MediaTek)

Progress the details of measurement configuration.

Outcome of the email can include proposals for agreement, identification of the main options, and questions to be asked to other groups.

Intended outcome: Report to next meeting

Deadline: Thursday 2017-06-08

[98#34][NR] On demand SI (Lenovo)

Progress the next level of detail for on demand SI request (MSG1 and MSG3 based) for broadcast delivery. Email discussion can make proposals for agreement in the next meeting and also identify key options and pros and cons of those options so that a decision can be made at the next meeting.

Intended outcome: Report to next meeting

Deadline: Thursday 2017-06-08

[98#35][NR/UP] – Running TS 38.321 - Samsung

- Agreeable running TS capturing agreements up to RAN2#98

Intended outcome: Agreeable TS

Deadline: Thursday 2017-06-08

[98#36][NR/UP] – Running TS 38.322 – Mediatek

Petitioners' Exhibit 1008, p. 540
AT&T et al v. Asustek Technology
IPR2024-00997

- Agreeable running TS capturing agreements up to RAN2#98

  Intended outcome: Agreeable TS

  Deadline: Thursday 2017-06-08

[98#37][NR/UP] – Running TS 38.323 – LG

- Agreeable running TS capturing agreements up to RAN2#98

  Intended outcome: Agreeable TS

  Deadline: Thursday 2017-06-08

[98#38][NR/UP] – BSR triggers – Huawei

- Discuss motivation of new BSR triggers on top of LTE (consider differences between NR and LTE)
- Discuss specific triggers for regular BSR based on company contribution proposals

  Intended outcome: Report to next meeting

  Deadline: Thursday 2017-06-08

[98#39][NR/UP] – RLC UM – Qualcomm

- Discuss/understand solutions and complexity of solutions
- Company's preferences on the solutions

  Intended outcome: Report to next meeting

  Deadline: Thursday 2017-06-08

[98#40][NR/UP] – PDCP receive operation – LG

- Discuss different receive window operation aspects discussed in contributions (e.g. push/pull or different ones for AM/UM)
- Finalize whether it is possible to have unified approach

  Intended outcome: TP capturing agreements

  Deadline: Thursday 2017-06-08

Deadline Thursday, 2017-08-03, 23:59 Pacific Time

TDoc numbers for the following email discussions may be requested via 3GU tool

[98#41][LTE/] NS extension (Nokia)

Progress CR to extend the value range for the NS values.

Petitioners' Exhibit 1008, p. 541
AT&T et al v. Asustek Technology
IPR2024-00997

Intended outcome: Agreeable CR for next meeting

Deadline: Thursday 2017-08-03

[98#42][LTE/Rel13] PUCCH-ConfigDedicated (Nokia)

Intended outcome: Agreeable CRs

Deadline: Thursday 2017-08-03

[98#43][LTE/TEI14] Overheating problem (Huawei)

Progress the solution to address the UE overheating problem, building on the agreements from this meeting. If progress is made on the solution then draft CRs can be discussed.

Intended outcome: Email discussion report and potentially agreeable CRs to the next meeting.

Deadline: Thursday 2017-08-03

[98#44][LTE/TEI14] RLC-UM for LWA (Qualcomm)

Progress all CRs for RLC-UM for LWA

Intended outcome: Agreeable CRs to next meeting

Deadline: Thursday 2017-08-03

[98#45][LTE/ViLTE] Identify the benefits of UE assistance information and corresponding solutions (CMCC)

Intended outcome: Email discussion report to next meeting

Deadline: Thursday 2017-08-03

[96#55][LTE/ViLTE] Solutions for critical data identification (Intel)

- Detailed solutions to make UE access stratum be aware of upper layer critical data within DRB of one user
- Solution through UE implementation is not excluded for email discussion.
- Clarify the FFS : Provide mechanisms for the eNB to be made aware whether the UE has upper layer critical data.

Intended outcome: Report

Deadline: Thursday 2017-08-03

[98#46][LTE/sTTI] – Running 36.300 CR - Ericsson

- Agreeable running CR capturing agreements up to RAN2#98

Intended outcome: Agreeable running CR

Deadline: Thursday 2017-08-03

Petitioners' Exhibit 1008, p. 542
AT&T et al v. Asustek Technology
IPR2024-00997

[98#47][LTE/sTTI] – Running 36.321 CR - Ericsson

- Agreeable running CR capturing agreements up to RAN2#98

  Intended outcome: Agreeable running CR

  Deadline: Thursday 2017-08-03

[98#48][LTE/sTTI] – Running 36.331 CR - Ericsson

- Agreeable to running CR capturing agreements up to RAN2#98

  Intended outcome: Agreeable running CR

  Deadline: Thursday 2017-08-03

[98#51][LTE/QMC] Solutions for QoE Measurements

- Figure out the details of CP and UP solutions and include the open issues, e.g., charging, user privacy, et al.

  Intended outcome: report

  Deadline: Thursday 2017-08-03

[98#52][NB-IoT] Power Consumption for RRM (Ericsson)

To continue discussion, with the goal to find solutions (simple) to reduce power consumption for detection and measurements of neighbour cells

Intended outcome: Report to next meeting

Deadline: Thursday 2017-08-03

[98#53][feMTC] PRS Occasion Group (ZTE)

clarify whether there is a problem or not, and if so, arrive at a solution

Intended outcome: Report to next meeting

Deadline: Thursday 2017-08-03

18 Outgoing LSs

Draft LSs should be submitted to their corresponding agenda item if there is one. If there is no appropriate agenda item, draft LSs may be submitted to this agenda item.

19 Any other business

R2-1704213 Work plan for the WID "Enhanced utilization of CA" Rel-15 LTE_euCA-Core — Nokia (rapporteur) — discussion

Petitioners' Exhibit 1008, p. 543
AT&T et al v. Asustek Technology
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R2-1704286 Work Plan for Enhancements to LTE operation in Unlicensed Spectrum Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 LTE_unlic-Core

Managing large number of documents

For next agenda:

- I will split agenda items that received a very large number of contributions into this meeting
- I will provide more guidance one what topics to contribute and where
- For some agenda items with well-defined scope I will indicate 'Maximum 1 tdoc per company'.

Your responsibilities:

- Read carefully and follow the guidance in the agenda (do not assume the agenda will be same as previous meetings).
- Submit documents to the correct agenda item
- Consider carefully whether your document is stage 2 or stage 3 (consider whether for LTE the related aspects are captured in 36.300)
- Respect the "Maximum 1 tdoc per company" if indicated
- If documents are resubmitted ensure they are updated to take into account the latest progress. Mark these documents as 'Resubmitted or revised R2-17xxxxx'.
- Do not submit multiple documents with overlapping proposals.
- Do not submit documents on topics that we have agreed not to discuss until we have made progress in other areas

RAN2 NR ad hoc in June

1/ Reminder of meeting closing time (as previously announced and stated on 3GPP meeting calendar): Thursday 2017-06-29 at 20:00

2/ Submission deadline: Friday 2017-06-16 at 23:59 Pacific

3/ Ad hoc can treat incoming LSs and approve outgoing LSs

20 Closing of the meeting (17:00)

The meeting was closed at 18:25 by the chairman.

Annex A: List of participants

RAN2#98 participants list is at: http://webapp.etsi.org/3GPPRegistration/fViewPart.asp?mid=17066

Petitioners' Exhibit 1008, p. 544
AT&T et al v. Asustek Technology
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Total number of participants: 320 (registered 417)

Annex B:
List of Tdocs

The list of tdocs of this RAN2#98 is attached to this report.

Total number of tdocs was 2213 of which 2146 tdocs were available.

Annex C:
Incoming liaison statements for TSG RAN2#98

TDoc	Title	Source	Status	Rel	Related WIs	To	Cc	Original LS

Petitioners' Exhibit 1008, p. 545
AT&T et al v. Asustek Technology
IPR2024-00997

R2-1704002	LS on access control mechanism for REAR (contact: LGE)	CT1	noted	Rel-15	REAR	RAN2, SA2, SA1		C1-171929
R2-1704003	LS on network slicing and 5GS network selection (contact: Qualcomm)	CT1	noted	Rel-15	5GS_Ph1-CT	SA1	SA2, RAN2, CT6	C1-171940
R2-1704004	Reply LS on security in E-UTRA-NR Dual Connectivity (contact: Ericsson)	CT1	noted	Rel-15	FS_NSA	SA3	RAN2, RAN3	C1-171941
R2-1704005	Reply LS on optimisation of network selection (contact: Intel)	CT1	noted	Rel-15	HORNS	SA1, CT6	RAN2	C1-171943
R2-1704006	Reply LS on LTE call redirection to GERAN (contact: Nokia)	CT1	noted	Rel-12	TEI12	RAN2	SA3, RAN3	C1-171945
R2-1704007	LS on unified Access Control for 5G NR (contact: Intel)	CT1	noted	Rel-15	FS_NR_newRAT	RAN2, SA2, SA1		C1-171965
R2-1704008	Response LS to clarification on PUSCH-Config in case of multiple uplink serving cells (contact: Qualcomm)	RAN1	noted	Rel-13	LTE_CA_enh_b5C-Core	RAN2		R1-1706342
R2-1704009	LS on RAN1 agreements for FeD2D study item (R1-1706843; contact: Intel)	RAN1	noted	Rel-15	FS_feD2D_IoT_relay_wearable	RAN2, RAN4		R1-1706843
R2-1704010	LS on the progress for the SI on a simplified HS-SCCH for UMTS (contact: Ericsson)	RAN1	noted	Rel-15	FS_UTRA_simple_HSSCCH	RAN1	RAN2	R1-1706211
R2-1704011	LS reply on TM10 / FD-MIMO UE capability signalling (contact: Intel)	RAN1	noted	Rel-14	LTE_EBF_FD MIMO-Core	RAN2, RAN4		R1-1706856
R2-1704012	LS reply to SA2 on maximum data rate (contact: MediaTek)	RAN1	noted	Rel-15	5GS_Ph1, EDCE5	SA2, RAN2	RAN3, SA1, CT4, CT1	R1-1706857
R2-1704013	LS on Status of Higher-Layer Functional split between Central and Distributed unit (contact: AT&T)	RAN3	withdrawn	Rel-15	NR_newRAT	RAN2, SA3	SA5, SA2	R3-171306
R2-1704014	Response LS Applying Extended NAS timers based on UE's operation in CE Mode B (contact: Intel)	RAN3	noted	Rel-14	CIoT	SA2	CT1, CT4, RAN2	R3-171379
R2-1704015	LS on Collection Period correction for MDT M3 measurement in eUTRAN (contact: Ericsson)	RAN3	noted	Rel-13	eMDT_UMTS LTE-Core	SA5	RAN2	R3-171382
R2-1704016	LS regarding RAN support for NW slicing (contact: Huawei)	RAN3	noted	Rel-15	NR_newRAT	SA2, RAN2	CT1	R3-171394
R2-1704017	Reply LS on N2 and N3 reference points for 5G system (contact: Qualcomm)	RAN3	noted	Rel-15	NR_newRAT	SA2	SA, RAN, CT, RAN3, CT4, CT1, SA3, RAN2	R3-171401
R2-1704018	Reply LS on Reply LS to RAN3 on support of redirection for VoLTE (contact: Ericsson)	RAN3	noted	Rel-14	LTE_VoLTE_ViLTE_enh-Core	SA2	RAN2	R3-171408
R2-1704019	LS on new UE power class for Rel-15 LTE_eMTC4 (contact: Ericsson)	RAN4	noted	Rel-15	LTE_eMTC4	RAN2	RAN1	R4-1703377
R2-1704020	LS on measurement capability for R14 Cat-M1/M2 UE (contact: Intel)	RAN4	noted	Rel-14	LTE_feMTC-Core	RAN2	RAN1	R4-1704163
R2-1704021	LS on required NR parameters from RAN4 perspective (contact: NTT DOCOMO)	RAN4	noted	Rel-15	FS_NR_newRAT	RAN1	RAN2	R4-1704216
R2-1704022	LS on measurement gap enhancement (contact: Intel)	RAN4	noted	Rel-14	LTE_meas_gap_enh-Core	RAN2		R4-1704277
R2-1704023	LS response on positioning for NB-IoT (contact: Ericsson)	RAN4	noted	Rel-14	NB_IOTenh-Core	RAN2	SA2, RAN1	R4-1704297

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R2-1704024	LS On Access Control for Light Connected state in LTE (contact: Nokia)	SA2	noted	Rel-15	FS_LTE_LIGHT_CON	SA1, RAN2		S2-172802
R2-1704025	LS on the need for EPS Bearer ID knowledge in NG-RAN for (inter-RAT) inter-system handover (contact: Intel)	SA2	noted	Rel-15	5GS_Ph1	RAN2, RAN3		S2-172864
R2-1704026	LS on Dual Connectivity with 5GC (contact: NTT DOCOMO)	SA2	noted	Rel-15	5GS_Ph1	RAN3	RAN2	S2-172866
R2-1704027	LS to RAN2 on adding PRB usage distribution and IP throughput distribution measurements (contact: Huawei)	SA5	noted	Rel-15		RAN2		S5-171993
R2-1704028	LS to RAN2 on adding measurements on average number of total active UEs (contact: Huawei)	SA5	noted	Rel-15		RAN2		S5-171996
R2-1704029	LS on MBMS bearer event notification (contact: Ericsson)	SA6	noted	Rel-15	MBMS_Mcservices	SA2, RAN2, RAN3		S6-170441
R2-1704110	LS reply Positioning for NB-IoT (contact: Ericsson, Intel)	RAN1	noted	Rel-14	NB_IOTenh-Core	RAN2	RAN4	R1-1706859
R2-1704111	Reply LS on RAN-Assisted Codec Adaptation (contact: Intel)	SA4	noted	Rel-14	LTE_VoLTE_ViLTE_enh-Core	RAN2, CT3	RAN3, SA2, RAN	S4-170430
R2-1704112	Reply LS on the progress of QoE Measurement Collection for Streaming (contact: Ericsson)	SA4	noted	Rel-14	IQoE, UMTS_QMC_Streaming	RAN2	RAN3, SA5, CT1	S4-170452
R2-1704113	LS on QMC session measurements (contact: Ericsson)	SA4	noted	Rel-14	IQoE, UMTS_QMC_Streaming	RAN2	RAN3, SA5, CT1	S4-170462
R2-1704114	Reply LS on QoE Measurement Collection for streaming (contact: Huawei)	SA4	noted	Rel-14	IQoE, UMTS_QMC_Streaming	RAN2	RAN3	S4-170491
R2-1704115	LS on eVoLP parameters (contact: Qualcomm)	SA4	noted	Rel-14	LTE_VoLTE_ViLTE_enh, FS_eVoLP	SA2, RAN2	RAN3	S4-170502
R2-1704215	Response LS to on V2x Sidelink Cross-Carrier Configuration (contact: Ericsson)	SA2	noted	Rel-14	V2XARC, LTE_V2X-Core	RAN2, CT1		S2-172305
R2-1704216	LS on indication of PRACH resources for non-contention based Random Access (contact: Intel)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1706716
R2-1705813	LS to RAN2 and RAN3 on security for RLFs for DoNAS UEs (contact: Vodafone)	SA3	noted	Rel-14	CIoT	RAN2, RAN3		S3A0009
R2-1705837	Reply LS on Data rates and Latency with NR, E-UTRA, EPS and 5GS (contact: Vodafone)	SA1	noted	Rel-15	SMARTER	SA2	RAN1, RAN2, RAN3, CT1, CT4	S1-172409
R2-1705838	Reply LS on network slicing and 5GS network selection (contact: Nokia)	SA1	noted	Rel-15	SMARTER, 5GS_Ph1-CT	CT1	SA2, RAN2, CT6	S1-172412
R2-1705839	LS on Access Control for Light Connected state in LTE (contact: Nokia)	SA1	noted	Rel-15	LTE_LIGHT_CON	RAN2, SA2	CT1	S1-172433
R2-1705840	LS reply to RAN2 on "the progress of QoE Measurement Collection for Streaming to RAN3, SA4, SA5 and CT1" (contact: Ericsson)	SA5	noted	Rel-14	UMTS_QMC_Streaming	RAN2	RAN3, SA4, CT1	S5-173334
R2-1705997	Reply LS to Reply LS from 3GPP RAN2 on Estimated Throughput (contact: InterDigital, Intel)	IEEE P802.11	noted			RAN2		11-17-0378-02-AANI-reply-ls-to-reply-ls-from-3gpp-ran2-on-estimated-throughput-

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								11-17-315r0
R2-1706041	Response LS on CSI-RS for beam management and RRM measurements (contact: ZTE)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1709581
R2-1706052	Reply LS on optimisation of network selection (contact: Safran)	CT6	noted	Rel-15	HORNS	SA1, CT1	RAN2	C6-170262
R2-1706055	LS on RAR window definition in CE mode B (contact: Ericsson)	RAN1	noted	Rel-13	LTE_MTCe2_L1-Core	RAN2		R1-1709337
R2-1706056	LS on Relay UE discovery for bandwidth limited Remote UEs (contact: Intel)	RAN1	noted	Rel-15	FS_feD2D_IoT_relay_wearable	RAN2		R1-1709621
R2-1706057	Reply LS on in-sync/out-of-sync indication for RLF (contact: NTT DOCOMO)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1709705
R2-1706058	LS to RAN2 on text proposal capturing RAN1 agreements in 3GPP TR 36.746 (contact Intel):	RAN1	noted	Rel-15	FS_feD2D_IoT_relay_wearable	RAN2	- RAN4	R1-1709755
R2-1706059	LS on extension of NS and CA_NS signalling space (contact: Nokia)	RAN4	noted	Rel-14	TEI14	RAN2		R4-1706076
R2-1706089	LS on support of eDECOR for NB-IoT (contact: Ericsson)	SA2	noted	Rel-14	eDECOR-UTRA_LTE-Core	RAN2		S2-173647
R2-1706103	LS on UL data transmission without UL grant for NR (contact: Huawei)	RAN1	available	Rel-15	NR_newRAT-Core	RAN2		R1-1709805
R2-1706136	LS on RLM enhancement for FeMTC UE (contact: Intel)	RAN4	noted	Rel-14	LTE_feMTC-Core	RAN2		R4-1705984
R2-1706138	Monitoring of partial NPDCCH search spaces (contact: Qualcomm)	RAN1	postponed	Rel-13	NB_IOT	RAN2		R1-1709716
R2-1706151	LS on RSRP range (contact: Huawei)	RAN4	available	Rel-13	LTE_MTCe2_L1-Core	RAN2		R4-1706175

54 incoming LS, of which 50 were noted.

Annex D:
Outgoing liaison statements of TSG RAN2#98

TDoc	Title	Release	Related WIs	To	Cc

Petitioners' Exhibit 1008, p. 548
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R2-1705861	Reply LS on supporting Rel-14 feature of performance enhancement for high speed scenarios from Rel-13	Rel-14	LTE_high_speed	RAN4	
R2-1705863	Response on access control mechanism for REAR	Rel-15	FS_feD2D_IoT_relay_wearable	SA1, SA2, CT1	
R2-1705867	LS on SR design principles in NR	Rel-15	NR_newRAT-Core	RAN1	
R2-1705920	Reply LS on SFN indication in handover message	Rel-14	LTE_feMTC-Core	RAN1, RAN4	
R2-1705939	Reply LS on security for RLFs for DoNAS UEs	Rel-14	NB_IOTenh-Core	SA3, SA2, RAN3, CT1	
R2-1706003	LS on EUTRAN Sharing enhancement	Rel-14	TEI14	SA2, RAN, RAN3, SA	
R2-1706013	RAN2 agreement on UAV requirements	Rel-15	FS_LTE_Aerial	RAN1	
R2-1706047	Reply LS on the need for EPS Bearer ID knowledge in NG-RAN for (inter-RAT) inter-system handover	Rel-15	5GS_Ph1	SA2	RAN3
R2-1706111	LS on UE-AMBR support for NB-IoT UE	Rel-13	NB_IOT-Core	RAN3, SA2	
R2-1706129	LS on LTE connectivity to 5G-CN	Rel-15	NR_newRAT	SA2	RAN3
R2-1706140	LS on UE measurement capabilities across LTE and NR	Rel-15	NR_newRAT-Core	RAN4	RAN1
R2-1706141	LS on UE categories for NR and LTE-NR Dual Connectivity	Rel-15	NR_newRAT-Core	RAN, RAN1	RAN4
R2-1706142	Reply LS on LS regarding RAN support for NW slicing	Rel-15	NR_newRAT-Core	RAN3	SA2, CT1
R2-1706143	Reply LS to SA2 on QoS Parameters	Rel-15	NR_newRAT-Core	SA2	RAN3
R2-1706149	LS reply to CT1 on GERAN redirection	Rel-14	TEI14	CT1	SA3, RAN3
R2-1706150	LS on encrypting broadcasted positioning data	Rel-15	LCS_LTE_acc_enh-Core	SA3	SA2
R2-1706153	LS on supported features by 5GC for E-UTRA connected to 5G CN	Rel-15	LTE_5GCN_connect-Core	SA2, SA5, CT1	RAN3, SA1
R2-1706154	NR Access Control drafted response LS	Rel-15	NR_newRAT-Core	CT1, SA1	SA2
R2-1706155	LS reply to SA2 on maximum data rate	Rel-15	5GS_Ph1, EDCE5	SA2, RAN1	RAN3, SA1, CT1, CT4
R2-1706156	Reply LS on Dual Connectivity with 5GC	Rel-15	5GS_Ph1	SA2, RAN3	
R2-1706157	LS to SA2 and RAN3 on RAN2 agreements on NR paging	Rel-15	NR_newRAT-Core	RAN3, SA2	
R2-1706158	LS on NR Idle Mode procedures	Rel-15	NR_newRAT-Core	SA2, CT1	RAN3
R2-1706159	LS on short processing time and short TTI	Rel-15	LTE_sTTIandPT	RAN1	
R2-1706160	Response LS on reading time index indication for RRM measurements	Rel-15	NR_newRAT-Core	RAN1	
R2-1706161	LS to SA3 on Counter Check Procedure and SCG SRB integrity check failure	Rel-15	NR_newRAT-Core	SA3	
R2-1706162	LS to RAN4 on support of BCS for fallback band combinations	Rel-13	LTE_CA_enh_b5C-Core	RAN4	
R2-1706187	LS reply on RSRP range	Rel-13	LTE_MTCe2_L1-Core	RAN4	
R2-1706195	Reply LS on monitoring of partial NPDCCH search spaces	Rel-13	NB_IOT-Core	RAN1	RAN
R2-1706203	LS on Measurement requirements for LAA/WiFi hardware sharing problem	Rel-14	LTE_LAA-Core	RAN4	

29 outgoing LS.

Annex E:
List of agreed CRs

Agreed CRs:

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TDoc	Title	Source	Rel	Spec	Related WIs	CR	Rev	Ca
R2-1704033	Optional feature without UE capability bit for VoLTE	Huawei, HiSilicon	Rel-12	36.306	TEI12, LTE-L23	1456		F
R2-1704034	Optional feature without UE capability bit for VoLTE	Huawei, HiSilicon	Rel-13	36.306	TEI12, LTE-L23	1457		A
R2-1704035	Optional feature without UE capability bit for VoLTE	Huawei, HiSilicon	Rel-14	36.306	TEI12, LTE-L23	1458		A
R2-1704181	Correction to paging carrier selection formula in Rel-14 NB-IoT	Ericsson	Rel-14	36.304	NB_IOTenh-Core	0363	2	F
R2-1704205	UE capabilities for eLWA	Nokia, Alcatel-Lucent Shanghai Bell	Rel-14	36.331	LTE_WLAN_aggr-Core	2714	2	F
R2-1704206	Clarification of the end marker solution for eLWA	Nokia, Alcatel-Lucent Shanghai Bell	Rel-14	36.300	LTE_WLAN_aggr-Core	1014	2	F
R2-1704436	LPP clean-up	Qualcomm Incorporated	Rel-14	36.355	TEI14	0176	2	F
R2-1704437	Correction to NPRS	Qualcomm Incorporated	Rel-14	36.355	NB_IOTenh-Core	0175	1	F
R2-1704438	Corrections to number of NPRS carriers and ECID measurements for NB-IoT	Qualcomm Incorporated	Rel-14	36.355	NB_IOTenh-Core	0177		F
R2-1704441	Correction to PRS Subframe Offset	Qualcomm Incorporated	Rel-14	36.355	LTE_feMTC-Core	0171	1	F
R2-1704443	Correction to SFN time stamp in OTDOA Signal Measurement Information	Qualcomm Incorporated	Rel-14	36.355	LTE_feMTC-Core	0173	1	F
R2-1704444	Correction to OTDOA capabilities	Qualcomm Incorporated	Rel-14	36.355	LTE_feMTC-Core	0174	1	F
R2-1704446	Leap second change for DFN timing	Qualcomm Incorporated	Rel-14	36.331	LTE_SL_V2V-Core	2771	1	F
R2-1704490	Stop condition for the drx-RetransmissionTimer for NB-IoT	LG Electronics	Rel-14	36.321	NB_IOTenh-Core	1096		F
R2-1704492	Correction to maximum number of HARQ processes for NB-IoT	LG Electronics, Ericsson	Rel-14	36.321	NB_IOTenh-Core	1097		F
R2-1704598	Correction on radio protocol architecture for DC	Huawei, HiSilicon	Rel-13	36.300	LTE_dualC_enh-Core	0994	2	F
R2-1704599	Correction on radio protocol architecture for DC	Huawei, HiSilicon	Rel-14	36.300	LTE_dualC_enh-Core	0995	2	A
R2-1704601	Correction on HARQ principles for eMTC	Huawei, HiSilicon	Rel-14	36.300	LTE_MTCe2_L1-Core	0996	1	F
R2-1704623	Correction on UE capabilities for eLAA	Huawei, HiSilicon	Rel-14	36.306	LTE_eLAA-Core	1437	1	F
R2-1704624	Correction on UE capabilities for eLAA	Huawei, HiSilicon	Rel-14	36.331	LTE_eLAA-Core	2709	1	F
R2-1704625	Correction on eLWA	Huawei, HiSilicon	Rel-14	36.300	LTE_WLAN_aggr-Core	0997	2	F
R2-1704626	CR on V2X miscellaneous RRC corrections	ZTE, Qualcomm Incorporated, Nokia, Alcatel-Lucent Shanghai Bell	Rel-14	36.331	LTE_V2X-Core	2820		F
R2-1704633	Correction on eLWA	Huawei, HiSilicon	Rel-14	36.331	LTE_WLAN_aggr-Core	2712	3	F
R2-1704700	Correction to RACH CE level info list	Ericsson	Rel-13	36.331	LTE_MTCe2_L1-Core	2772	1	F
R2-1704701	Correction to RACH CE level info list	Ericsson	Rel-14	36.331	LTE_MTCe2_L1-Core	2773	1	A
R2-1704705	CE mode configuration/deconfiguration without handover	Ericsson	Rel-14	36.300	LTE_feMTC-Core	1010	1	C
R2-1704706	CE mode configuration/deconfiguration without handover	Ericsson	Rel-14	36.306	LTE_feMTC-Core	1452	1	C
R2-1704735	Unclear naming of feature “Dual cell E-DCH operation”	Ericsson	Rel-14	25.306	EDCH_enh-Core, TEI12, DC_HSUPA_CS-Core	0517	6	A
R2-1704736	Unclear naming of feature “Dual cell E-DCH operation”	Ericsson	Rel-13	25.306	EDCH_enh-Core, TEI12, DC_HSUPA_CS-Core	0519	6	A
R2-1704737	Unclear naming of feature “Dual cell E-DCH operation”	Ericsson	Rel-12	25.306	EDCH_enh-Core, TEI12	0518	6	F
R2-1704738	Corrections of QoE measurements	Ericsson	Rel-14	25.331	UMTS_QMC_Streaming	5932	1	F
R2-1704752	Miscellaneous corrections to CA enhancements	Intel Corporation	Rel-14	36.331	LTE_CA_enh_b5C-Core	2826		A
R2-1704764	Correction for eDRX Hashed ID	Nokia, Alcatel-Lucent Shanghai Bell	Rel-13	36.304	LTE_extDRX-Core	0369	2	F
R2-1704819	Correction for eDRX Hashed ID	Nokia, Alcatel-Lucent Shanghai	Rel-14	36.304	LTE_extDRX-Core	0370	2	A

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		Bell						
R2-1704938	UE Capabilitites to enable Uplink-Only RoHC operations	Apple, MediaTek Inc.	Rel-14	36.306	TEI14	1463		B
R2-1704939	Enable Uplink-Only RoHC operations	Apple, MediaTek Inc.	Rel-14	36.323	TEI14	0198		B
R2-1704940	Enable Uplink-Only RoHC operations	Apple, MediaTek Inc.	Rel-14	36.331	TEI14	2831		B
R2-1704948	Correction on WLAN connection status report monitoring for LWIP	Huawei, HiSilicon, HTC Corporation	Rel-13	36.331	LTE_WLAN_radio_legacy-Core	2710	3	F
R2-1704949	Correction on WLAN connection status report monitoring for LWIP	Huawei, HiSilicon, HTC Corporation	Rel-14	36.331	LTE_WLAN_radio_legacy-Core	2711	3	A
R2-1704950	Correction on the data modulation of Uplink Shared Channel	NTT DOCOMO INC.	Rel-14	36.302	LTE_UL_CAP_enh-Core	0107	1	F
R2-1704952	Editorial correction on ab-Barring parameter	NTT DOCOMO INC.	Rel-13	36.331	NB_IOT-Core	2835		F
R2-1704953	Editorial correction on ab-Barring parameter	NTT DOCOMO INC.	Rel-14	36.331	NB_IOT-Core	2836		A
R2-1704971	CR for introduction of non-uniform gap in measurement gap enhancement	Intel Corporation	Rel-14	36.306	LTE_meas_gap_enh	1445	1	F
R2-1704991	Miscellaneous corrections to CA enhancements	Intel Corporation	Rel-13	36.331	LTE_CA_enh_b5C-Core	2717	1	F
R2-1704993	Clarification on the UE behaviour when the validity of PUSCH trigger A expires	Intel Corporation	Rel-14	36.321	LTE_eLAA-Core	1076	2	F
R2-1705018	Corrections to capabilities for NB-IoT	Ericsson	Rel-14	36.306	NB_IOTenh-Core	1464		F
R2-1705020	Correction to SIB-Type-NB	Ericsson, Huawei, HiSilicon	Rel-14	36.331	NB_IOTenh-Core	2737	1	F
R2-1705024	Correction to FGI 25	Ericsson, NTT DOCOMO INC.	Rel-14	36.331	LTE_feMTC-Core	2842		F
R2-1705102	Clarifications to eLWA	HTC Corporation	Rel-14	36.331	LTE_WLAN_aggr-Core	2720	2	F
R2-1705276	Correction to downlink reception types for BL UEs and UEs in CE	Sequans Communications	Rel-13	36.302	LTE_MTCe2_L1-Core	0108	2	F
R2-1705286	Alignment of the parameter names for SC-PTM DRX for SC-MCCH and SC-MTCH	Huawei, HiSilicon	Rel-14	36.331	LTE_feMTC-Core, NB_IOTenh-Core, TEI14	2749	1	F
R2-1705287	Alignment of the parameter names for SC-PTM DRX for SC-MCCH and SC-MTCH	Huawei, HiSilicon	Rel-14	36.321	LTE_feMTC-Core, NB_IOTenh-Core	1063	1	F
R2-1705290	Corrections to NB-IoT Enhancements	Huawei, HiSilicon	Rel-14	36.300	NB_IOTenh-Core	1006	1	F
R2-1705294	Miscellaneous corrections for NB-IoT	Huawei, HiSilicon	Rel-13	36.300	NB_IOT-Core	1026		F
R2-1705295	Miscellaneous corrections for NB-IoT	Huawei, HiSilicon	Rel-14	36.300	NB_IOT-Core	1027		A
R2-1705321	UL 256QAM capability clarification	Nokia, Alcatel-Lucent Shanghai Bell	Rel-14	36.306	LTE_UL_CAP_enh-Core	1465		F
R2-1705380	Rapporteur corrections	Ericsson	Rel-14	25.331	TEI14	5939		D
R2-1705385	Correction to downlink reception types for BL UEs and UEs in CE	Sequans Communications	Rel-14	36.302	LTE_MTCe2_L1-Core	0109	1	A
R2-1705404	Correction of L2 latency reduction	Huawei, HiSilicon	Rel-14	36.321	LTE_LATRED_L2-Core	1108		F
R2-1705405	FDD TDD difference for VoLTE capability	Huawei, HiSilicon	Rel-14	36.331	LTE_VoLTE_ViLTE_enh-Core	2797	1	F
R2-1705408	Miscellaneous eDECOR corrections and clarifications resulting from ASN.1 review	Ericsson	Rel-14	36.331	eDECOR-UTRA_LTE-Core	2871		F
R2-1705422	SI-RNTI number correction for feMBMS	Ericsson	Rel-14	36.321	MBMS_LTE_enh2-Core	1109		F
R2-1705423	Introduction of FeMBMS to 36.306	Ericsson	Rel-14	36.306	MBMS_LTE_enh2-Core	1470		B
R2-1705437	Clarification on polling	HTC Corporation, LG Electronics	Rel-13	36.323	LTE_WLAN_radio-Core	0195	2	F
R2-1705461	Clarification on polling	HTC Corporation, LG Electronics	Rel-14	36.323	LTE_WLAN_radio-Core	0199		A
R2-1705464	Clarification on additionalSpectrumEmission for eMTC	HTC Corporation	Rel-13	36.331	LTE_MTCe2_L1-Core	2753	1	F
R2-1705465	Correction on terminology of SI for eMTC	Huawei, HiSilicon	Rel-13	36.321	LTE_MTCe2_L1-Core	1046	2	F
R2-1705466	Correction on terminology of SI for eMTC	Huawei, HiSilicon	Rel-13	36.331	LTE_MTCe2_L1-Core	2800	1	F
R2-1705467	Correction on terminology of SI for eMTC	Huawei, HiSilicon	Rel-14	36.321	LTE_MTCe2_L1-Core	1114		A
R2-1705468	Correction on terminology of SI for eMTC	Huawei, HiSilicon	Rel-14	36.331	LTE_MTCe2_L1-Core	2879		A
R2-1705476	Correction on the description of ce-	Huawei, HiSilicon	Rel-14	36.306	LTE_feMTC-Core	1475		F

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	srsEnhancement for FeMTC							
R2-1705478	Minor correction on TS 36.306 for FeMTC	Huawei, HiSilicon	Rel-14	36.306	LTE_feMTC-Core	1476		F
R2-1705485	Corrections to make before break mobility	Ericsson	Rel-14	36.331	LTE_eMob-Core	2760	1	F
R2-1705491	Clarification regarding requesting fallback combinations with different capabilities	Samsung Telecommunications	Rel-14	36.331	LTE_CA_enh_b5C-Core, TEI14	2768	2	F
R2-1705500	Consistent gap pattern configuration for serving cells	Ericsson	Rel-14	36.331	LTE_meas_gap_enh	2891		F
R2-1705547	Corrections to Sidelink Discovery Gap for Transmission	Ericsson	Rel-14	36.321	LTE_eD2D_Prox-Core	1123		A
R2-1705563	Introducing a new SL master information block for V2X sidelink communication	Huawei, HiSilicon	Rel-14	36.331	LTE_V2X-Core	2715	2	B
R2-1705564	Introducing a new resource reselection trigger for V2X sidelink communication	Huawei, HiSilicon	Rel-14	36.321	LTE_SL_V2V-Core	1038	3	F
R2-1705565	Correction to exceptional pool usage in TS 36.331	Huawei, HiSilicon	Rel-14	36.331	LTE_SL_V2V-Core	2705	2	F
R2-1705610	Generic clarification of "first bit" as leftmost bit	Qualcomm	Rel-13	36.331	TEI13, LTE_EBF_FDMIMO-Core	2913		F
R2-1705689	Clarification on additionalSpectrumEmission for eMTC	HTC	Rel-14	36.331	LTE_MTCe2_L1-Core	2919		A
R2-1705690	Clarification on additionalSpectrumEmission for NB-IoT	HTC	Rel-13	36.331	NB_IOT-Core	2754	1	F
R2-1705691	Clarification on additionalSpectrumEmission for NB-IoT	HTC	Rel-14	36.331	NB_IOT-Core	2920		A
R2-1705695	Clarification on LWIP aggregation	HTC	Rel-14	36.361	TEI14	0006		F
R2-1705702	Introduction of new Transport Block Size for DL 256QAM	Qualcomm Incorporated	Rel-14	36.306	TEI14	1438	2	B
R2-1705703	Introduction of new Transport Block Size for DL 256QAM	Qualcomm Incorporated	Rel-14	36.331	TEI14	2713	2	B
R2-1705717	Corrections to stage 2 description for voice and video enhancements for LTE	Intel Corporation	Rel-14	36.300	LTE_VoLTE_ViLTE_enh-Core	1000	1	F
R2-1705756	Correction to CarrierConfigDedicated-NB	ZTE Corporation	Rel-14	36.331	NB_IOTenh-Core	2927		F
R2-1705772	Maximum PDSCH/PUSCH BW preference indication handling for handover	Apple	Rel-14	36.331	LTE_feMTC-Core	2932		F
R2-1705814	Correction of SRS switching	Huawei, HiSilicon	Rel-14	36.331	LTE_SRS_switch-Core	2869	1	F
R2-1705842	Indication of in proximity of CEN DSRC	Qualcomm Incorporated	Rel-14	36.300	LTE_SL_V2V-Core	1009	2	F
R2-1705843	Correction of RRCConnectionReconfiguration reception for V2X	Qualcomm Incorporated	Rel-14	36.331	LTE_SL_V2V-Core	2813	1	F
R2-1705844	Correction on V2X behavior in 36.331	LG Electronics Inc.	Rel-14	36.331	LTE_V2X-Core	2905	1	F
R2-1705847	Merging of retuningTimeBandPairList with regular supported BC capabilites (ASN.1 review issue S.059)	Samsung Telecommunications	Rel-14	36.331	LTE_SRS_switch, TEI14	2890	1	F
R2-1705853	Remaining issues in Activation/Deactivation of CSI-RS resources MAC CE for eFD-MIMO	LG Electronics Inc., Samsung	Rel-14	36.321	LTE_eFDMIMO-Core	1094	1	F
R2-1705854	CR on reduction of SIB21 size	Qualcomm Incorporated	Rel-14	36.331	LTE_V2X-Core	2950		F
R2-1705857	Miscellaneous corrections to V2X in TS 36.321	Huawei, HiSilicon	Rel-14	36.321	LTE_V2X-Core	1088	1	F
R2-1705858	CR to cell reselection for V2X in TS 36.300	Huawei, Samsung, HiSilicon	Rel-14	36.300	LTE_SL_V2V-Core	1017	2	F
R2-1705883	Stop condition for the drx-RetransmissionTimer for NB-IoT	LG Electronics	Rel-13	36.321	NB_IOT-Core	1095	1	F
R2-1705884	Correction on the UE AS context handling	HTC Corporation, LG Electronics Inc.	Rel-13	36.331	TEI13, NB_IOT-Core	2718	3	F
R2-1705885	Correction on the UE AS context handling	HTC Corporation, LG Electronics Inc.	Rel-14	36.331	TEI13, NB_IOT-Core	2848	1	A
R2-1705886	Correction on attach without PDN connectivity	HTC Corporation	Rel-13	36.331	NB_IOT-Core	2719	2	F
R2-1705887	Correction on attach without PDN connectivity	HTC Corporation	Rel-14	36.331	NB_IOT-Core	2849	1	A

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R2-1705890	Clarification on contention based random access for NB-IoT	NTT DOCOMO INC.	Rel-13	36.331	NB_IOT-Core	2832	1	F
R2-1705891	Clarification on contention based random access for NB-IoT	NTT DOCOMO INC.	Rel-14	36.331	NB_IOT-Core	2833	1	A
R2-1705892	Clarification of UE-AMBR support for NB-IoT	NTT DOCOMO INC.	Rel-13	36.300	NB_IOT-Core	1033	1	F
R2-1705893	Clarification of UE-AMBR support for NB-IoT	NTT DOCOMO INC.	Rel-14	36.300	NB_IOT-Core	1024	1	A
R2-1705895	Clarification on logicalChannelSR-ProhibitTimer for NB-IOT	MediaTek Inc.	Rel-14	36.331	NB_IOT-Core	2853	1	A
R2-1705896	Long DRX values with regular wake-up cycle – Option 1	Qualcomm Incorporated	Rel-14	36.331	NB_IOTenh-Core	2876	1	F
R2-1705897	Introduction of Overload Control for Control plane data only	Huawei, HiSilicon	Rel-14	36.331	NB_IOTenh-Core, TEI14	2746	2	C
R2-1705899	Correction to the value range of ce-AuthorisationOffset	Huawei, HiSilicon	Rel-14	36.331	NB_IOTenh-Core	2745	3	F
R2-1705903	Clarification to MIB repetitions	Sony	Rel-13	36.331	LTE_MTCe2_L1-Core	2827	1	F
R2-1705907	Correction to InterFreqRSTDMeasurementIndication message	Ericsson	Rel-14	36.331	LTE_feMTC-Core	2844	1	F
R2-1705908	Clarification on logicalChannelSR-ProhibitTimer for NB-IOT	MediaTek Inc.	Rel-13	36.331	NB_IOT-Core	2852	1	F
R2-1705910	Clarification to MIB repetitions	Sony	Rel-14	36.331	LTE_MTCe2_L1-Core	2828	2	A
R2-1705912	Signalling optimisation for NB-IoT Enhancements	Huawei, HiSilicon	Rel-14	36.355	NB_IOTenh-Core	0181	1	F
R2-1705913	Clarification to positioning measurement in idle state	Ericsson	Rel-14	36.305	NB_IOTenh-Core	0069	1	F
R2-1705914	Removal of FFS for retransmission timer in LPP	Qualcomm Incorporated	Rel-14	36.355	NB_IOTenh-Core	0178	1	F
R2-1705916	CE mode configuration/deconfiguration without handover	Ericsson	Rel-14	36.331	LTE_feMTC-Core	2775	2	C
R2-1705919	Introduction of SFN indication in handover message	Ericsson, Qualcomm Incorporated	Rel-14	36.331	LTE_feMTC-Core	2734	2	F
R2-1705922	Minor correction in TS 36.331 for feMTC	Huawei, HiSilicon	Rel-14	36.331	LTE_feMTC-Core	2884	1	F
R2-1705925	Small corrections to random access procedure and DRX for REl-14 NB-IoT Enhancements	Huawei, HiSilicon	Rel-14	36.321	NB_IOTenh-Core	1062	3	F
R2-1705926	Corrections to capabilities for feMTC	Ericsson	Rel-14	36.306	LTE_feMTC-Core	1448	2	F
R2-1705931	Editorial corrections for MAC	Ericsson	Rel-14	36.321	NB_IOTenh-Core, LTE_feMTC-Core	1068	2	D
R2-1705933	Action upon reception of SC-PTM stop indication	Huawei, HiSilicon	Rel-14	36.321	LTE_feMTC-Core, NB_IOTenh-Core	1105	1	F
R2-1705934	Correction to SC-MCCH and SC-MTCH reception type	Ericsson	Rel-14	36.302	LTE_feMTC-Core	0105	2	F
R2-1705940	Extension of SIntraSearchP value range	Huawei, HiSilicon	Rel-13	36.331	NB_IOT-Core	2930	2	F
R2-1705948	Introduction of DL interference mitigation for UMTS	Qualcomm Incorporated, Huawei, HiSilicon, Ericsson	Rel-14	25.331	UTRA_DL_IM-Core	5935	2	B
R2-1705949	Introduction of DL interference mitigation	Qualcomm Incorporated, Huawei, HiSilicon, Ericsson	Rel-14	25.300	UTRA_DL_IM-Core	0056	2	B
R2-1705965	Clarification on UE capability and early feature support	Samsung Telecommunications	Rel-13	36.331	LTE-L23, TEI13	2766	3	F
R2-1705966	Clarification on UE capability and early feature support	Samsung Telecommunications	Rel-14	36.331	LTE-L23, TEI13	2943		A
R2-1705967	Clarification regarding EBF-FDMIMO configuration (REL-13)	Samsung Telecommunications	Rel-13	36.331	LTE_EBF_FDMIMO-Core	2767	3	F
R2-1705968	Clarification regarding EBF-FDMIMO configuration (REL-13)	Samsung Telecommunications	Rel-14	36.331	LTE_EBF_FDMIMO-Core	2944		A
R2-1705975	Clarification for the UE Contention Resolution Identity MAC Control Element	Samsung	Rel-14	36.321	LTE_eMob-Core	1052	2	F
R2-1705976	Editorial Corrections to Support of Multiple SPS Configurations	Ericsson	Rel-14	36.300	LTE_V2X-Core	1029	1	F

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R2-1705983	Correction on V2X Rx pool for inter-frequency configuration in 36.331	CATT	Rel-14	36.331	LTE_V2X-Core	2791	3	F
R2-1705998	Introduction UE capabilities on high speed	Huawei, HiSilicon	Rel-14	36.331	LTE_high_speed-Core	2948		B
R2-1706005	Introduction of UE capabilities for high speed	Huawei, HiSilicon	Rel-14	36.306	LTE_high_speed-Core	1480		B
R2-1706008	Correction of high speed	Huawei, HiSilicon	Rel-14	36.331	LTE_high_speed-Core	2949		F
R2-1706014	Clarification of intra-frequency applicability of makeBeforeBreak HO	Nokia, Alcatel-Lucent Shanghai Bell	Rel-14	36.331	LTE_eMob-Core	2741	5	F
R2-1706015	Corrections to RACH-less handover and SCG change	HTC Corporation	Rel-14	36.331	LTE_eMob-Core	2752	3	F
R2-1706016	Miscellaneous RRC corrections on mobility enhancement	ZTE Corporation	Rel-14	36.331	LTE_eMob-Core	2851	1	F
R2-1706018	UE capabilities for feMBMS	Ericsson	Rel-14	36.331	MBMS_LTE_enh2-Core	2874	1	B
R2-1706020	Correction to Downlink Reception Type Combinations for FeMBMS	Qualcomm	Rel-14	36.302	MBMS_LTE_enh2-Core	1112	1	F
R2-1706021	Correction to Reselection priorities handling for FeMBMS	Qualcomm	Rel-14	36.304	MBMS_LTE_enh2-Core	0380	1	F
R2-1706022	Correction of issues related to ASN.1 review for eVoLTE	Samsung, CMCC	Rel-14	36.331	LTE_VoLTE_ViLTE_enh, TEI14	2889	1	F
R2-1706037	Correction on the description of ce-srsEnhancement for FeMTC	Huawei, HiSilicon	Rel-14	36.331	LTE_feMTC-Core	2882	1	F
R2-1706042	Miscellaneous feMBMS corrections and clarifications resulting from ASN.1 review	Ericsson, Nokia, Alcatel-Lucent Shanghai Bell	Rel-14	36.331	MBMS_LTE_enh2-Core	2873	1	F
R2-1706048	Support eDECOR for NB-IoT	HTC Corporation	Rel-14	36.331	eDECOR-UTRA_LTE-Core	2706	1	F
R2-1706066	Update of ROHC profile reference	Apple, Ericsson	Rel-14	36.306	TEI14	1462	1	F
R2-1706067	Update of ROHC profile reference	Apple, Ericsson	Rel-14	36.323	TEI14	0197	1	F
R2-1706093	LAA/WiFi sharing indication	Apple	Rel-13	36.306	LTE_LAA-Core	1460	2	B
R2-1706094	LAA/WiFi sharing indication	Apple	Rel-14	36.306	LTE_LAA-Core	1461	2	A
R2-1706097	Setting of FGI 107 and 108 in case of TDD-FDD CA	Qualcomm Incorporated	Rel-13	36.331	TEI12	2803	1	A
R2-1706098	Setting of FGI 107 and 108 in case of TDD-FDD CA	Qualcomm Incorporated	Rel-12	36.331	TEI12	2957		F
R2-1706099	Setting of FGI 107 and 108 in case of TDD-FDD CA	Qualcomm Incorporated	Rel-14	36.331	TEI12	2804	1	A
R2-1706101	ASN.1 corrections for eLWA	Intel Corporation, Qualcomm	Rel-14	36.331	LTE_WLAN_aggr-Core	2942	1	F
R2-1706104	Extension of SIntraSearchP value range	Huawei, HiSilicon	Rel-14	36.331	NB_IOT-Core	2931	2	A
R2-1706105	RAR reception for eMTC	Huawei, HiSilicon	Rel-13	36.321	LTE_MTCe2_L1-Core	1115	2	F
R2-1706106	RAR reception for eMTC	Huawei, HiSilicon	Rel-14	36.321	LTE_MTCe2_L1-Core	1116	1	A
R2-1706107	Configuration of preamble groups for CE levels and preamble groups A/B – Alt2	Ericsson	Rel-13	36.321	LTE_MTCe2_L1-Core	1071	3	F
R2-1706108	Configuration of preamble groups for CE levels and preamble groups A/B – Alt2	Ericsson	Rel-14	36.321	LTE_MTCe2_L1-Core	1072	3	A
R2-1706109	Configuration of preamble groups for CE levels and preamble groups A/B	NTT DOCOMO, Inc.	Rel-13	36.331	LTE_MTCe2_L1-Core	2951	1	F
R2-1706112	Miscellaneous corrections to TS 36.306	Intel Corporation	Rel-14	36.306	NB_IOTenh-Core	1443	2	F
R2-1706113	Corrections to stage 2 description of FeMTC and eNB-IoT	Intel Corporation	Rel-14	36.300	LTE_feMTC-Core, NB_IOTenh-Core	0999	3	F
R2-1706114	Resources selection for PRACH triggered by a PDCCH order in eNB-IoT(Option2)	ZTE, Ericsson, Huawei, HiSilicon	Rel-14	36.300	NB_IOTenh-Core	1028	2	F
R2-1706115	Correction to SC-MCCH and SC-MTCH configuration without delta configuration	Huawei, HiSilicon	Rel-14	36.331	LTE_feMTC-Core, NB_IOTenh-Core	2854	2	F
R2-1706117	Corrections on reconfiguration between CE mode and normal mode in eMTC	Huawei, HiSilicon	Rel-14	36.331	LTE_feMTC-Core	2885	2	F
R2-1706125	Correction to ceMeasurements-r14 measurement capability	Ericsson	Rel-14	36.306	LTE_feMTC-Core	1483		F
R2-1706126	Introduction of UE capability for V2X in 36.331	LG Electronics Inc.	Rel-14	36.331	LTE_V2X-Core	2903	2	B
R2-1706127	Introduction of UE capability for V2X in 36.306	LG Electronics Inc.	Rel-14	36.306	LTE_V2X-Core	1478	2	B
R2-1706146	LAA/WiFi sharing indication	Apple	Rel-13	36.331	LTE_LAA-Core	2829	3	B
R2-1706147	LAA/WiFi sharing indication	Apple	Rel-14	36.331	LTE_LAA-Core	2830	3	A

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R2-1706152	Revert PDCP state variable HFN and SN back to the values used in the source cell	Qualcomm	Rel-14	36.331	TEI14	2938	3	F
R2-1706163	Introduction of RRC connection re-establishment for NB-IoT control plane	Qualcomm Incorporated, Huawei, HiSilicon, Gemalto N.V.	Rel-14	36.300	NB_IOTenh-Core	1038		B
R2-1706164	Introduction of RRC connection re-establishment for NB-IoT control plane	Qualcomm Incorporated, Huawei, HiSilicon, Gemalto N.V.	Rel-14	36.306	NB_IOTenh-Core	1484		B
R2-1706165	Introduction of RRC connection re-establishment for NB-IoT control plane	Qualcomm Incorporated, Huawei, HiSilicon, Gemalto N.V.	Rel-14	36.331	NB_IOTenh-Core	2823	2	B
R2-1706166	Compact Signal Measurement Information for OTDOA	Ericsson	Rel-14	36.355	NB_IOTenh-Core	0169	3	F
R2-1706171	Support of RLF for CP CIoT Optimisation	Qualcomm Incorporated	Rel-14	36.300	NB_IOTenh	1041		B
R2-1706172	Resources selection for PRACH triggered by a PDCCH order in eNB-IoT(Option2)	ZTE, Ericsson, Huawei/HiSilicon	Rel-14	36.321	NB_IOTenh-Core	1113	2	F
R2-1706176	Extension of RSRP range for eMTC	Huawei, HiSilicon	Rel-13	36.331	LTE_MTCe2_L1-Core	2953	1	F
R2-1706177	Extension of RSRP range for eMTC	Huawei, HiSilicon	Rel-14	36.331	LTE_MTCe2_L1-Core	2954	1	A
R2-1706179	Miscellaneous NB-IoT corrections and clarifications resulting from ASN.1 review	Huawei	Rel-14	36.331	NB_IOTenh-Core	2929	2	F
R2-1706180	Correction to usage of SC-PTM offset in NB-IoT and FeMTC	Huawei, HiSilicon, Ericsson	Rel-14	36.304	LTE_feMTC-Core, NB_IOTenh-Core	0376	2	F
R2-1706181	SC-MCCH information change notification for FeMTC and NB-IoT enhancements	Huawei, HiSilicon	Rel-14	36.331	LTE_feMTC-Core, NB_IOTenh-Core	2748	2	F
R2-1706182	Measurement gap sharing for FeMTC intra- and inter-frequency measurement	Huawei, HiSilicon	Rel-14	36.331	LTE_feMTC-Core	2883	3	B
R2-1706183	Introduction of enhanced RLM reporting	Ericsson	Rel-14	36.331	LTE_feMTC-Core	2845	2	B
R2-1706184	Introduction of enhanced RLM measurement capabilities	Ericsson	Rel-14	36.306	LTE_feMTC-Core	1479	2	B
R2-1706185	Miscellaneous general corrections and clarifications resulting from ASN.1 review	Ericsson	Rel-14	36.331	TEI14	2872	2	F
R2-1706186	Miscellaneous feMTC corrections and clarifications resulting from ASN.1 review	Ericsson	Rel-14	36.331	LTE_feMTC-Core	2870	2	F
R2-1706188	Correction on UE-AMBR for NB-IoT UE using CP solution	Huawei, NTT DOCOMO, INC.	Rel-14	36.300	TEI14, NB_IOTenh-Core	1040	1	F
R2-1706193	UE capabilities for eLWA	Nokia, Alcatel-Lucent Shanghai Bell	Rel-14	36.306	LTE_WLAN_aggr-Core	1439	4	F
R2-1706194	RRC Specification Update After ASN1 Review	Ericsson	Rel-14	25.331	TEI14	5940	2	F
R2-1706196	Configuration of preamble groups for CE levels and preamble groups A/B	NTT DOCOMO, Inc.	Rel-14	36.331	LTE_MTCe2_L1-Core	2952	1	A
R2-1706197	Corrections to Sidelink Discovery Gap for Transmission	Ericsson	Rel-13	36.321	LTE_eD2D_Prox-Core	1079	3	F
R2-1706198	Corrections to per-CC measurement gap configuration	Intel Corporation, Ericsson	Rel-14	36.331	LTE_meas_gap_enh	2759	7	F
R2-1706199	LAA/WiFi sharing indication	Apple	Rel-13	36.300	LTE_LAA-Core	1022	4	B
R2-1706200	LAA/WiFi sharing indication	Apple	Rel-14	36.300	LTE_LAA-Core	1023	4	A
R2-1706201	Clarified behaviour for transmission of “Container for application layer measurement reporting”	Ericsson	Rel-14	25.331	UMTS_QMC_Streaming-Core	5933	5	F
R2-1706202	Generic clarification of "first bit" as leftmost bit	Qualcomm	Rel-14	36.331	TEI13, LTE_EBF_FDMIMO-Core	2945	1	A

Endorsed CRs:

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TDoc	Title	Source	Rel	Spec	Related WIs	CR	Rev	Ca
R2-1704970	Introduction of a new UL UE category for 300Mbps with 64QAM	Intel Corporation	Rel-14	36.306	TEI14	1446	1	B
R2-1705974	Introduction of a new UL UE category for 300Mbps with 64QAM	Intel Corporation	Rel-14	36.331	TEI14	2728	2	B
R2-1705995	Introduction of New Radio Access Technology in TS 36.300	NTT DOCOMO, INC.	Rel-15	36.300	NR_newRAT-Core	0998	2	B
R2-1706038	Entry-Level UE Support UL 64QAM	MediaTek Inc., Sequans	Rel-12	36.331	TEI12	2793	1	B
R2-1706039	Entry-Level UE Support UL 64QAM	MediaTek Inc., Sequans	Rel-13	36.331	TEI12	2794	1	A
R2-1706040	Entry-Level UE Support UL 64QAM	MediaTek Inc., Sequans	Rel-14	36.331	TEI12	2795	1	A
R2-1706044	Entry-Level UE Support UL 64QAM	MediaTek Inc., CMCC, Verizon, Sequans	Rel-12	36.306	TEI12	1440	2	B
R2-1706045	Entry-Level UE Support UL 64QAM	MediaTek Inc., CMCC, Verizon, Sequans	Rel-13	36.306	TEI12	1441	2	A
R2-1706046	Entry-Level UE Support UL 64QAM	MediaTek Inc., CMCC, Verizon, Sequans	Rel-14	36.306	TEI12	1442	2	A
R2-1706167	EUTRAN Sharing enhancement	Ericsson, Spidercloud, Qualcomm, Comcast	Rel-14	36.331	TEI14	2912	2	B

Annex F: History

Document history		
Date	**TSG RAN WG2 Tdoc**	**Subject**
09.06.2017	-	Draft report v1
21.08.2017	R2-1707601	Final version submitted for approval in RAN2#99

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Appendix 22a

TDoc	Title	Source	Contact	Contact ID	Type	For	Abstract	Secretary Remarks	Agenda item sort order	Agenda item	Agenda item description	TDoc sort order within agenda item	TDoc Status	Reservation date	Uploaded	Is revision of	Revised to	Release	Spec	Version	Related WIs	CR	CR revision	CR category	TSG CR Pack	Reply to	To	Cc	Original LS	Reply in
R2-1705949	Introduction of DL interference mitigation	Qualcomm Incorporated, Huawei, HiSilicon, Ericsson	Juha Korhonen	21609	CR	Agreement			226	15.1	WI: DL interference mitigation for UMTS	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705836		Rel-14	25.300	14.2.0	UTRA_DL_IM-Core	0056	2	B	RP-171240					
R2-1704735	Unclear naming of feature "Dual cell E-DCH operation"	Ericsson	Cecilia Eklof	59618	CR				222	14.5.0	In principle agreed CRs	0	agreed	2017-05-04 14:53:04	2017-05-05 11:53:07	R2-1703883		Rel-14	25.306	14.2.0	EDCH_enh-Core, TEI12, DC_HSUPA_CS-Core	0517	6	A	RP-171242					
R2-1704736	Unclear naming of feature "Dual cell E-DCH operation"	Ericsson	Cecilia Eklof	59618	CR				222	14.5.0	In principle agreed CRs	0	agreed	2017-05-04 14:53:05	2017-05-05 11:53:07	R2-1703884		Rel-13	25.306	13.2.0	EDCH_enh-Core, TEI12, DC_HSUPA_CS-Core	0519	6	A	RP-171242					
R2-1704737	Unclear naming of feature "Dual cell E-DCH operation"	Ericsson	Cecilia Eklof	59618	CR				222	14.5.0	In principle agreed CRs	0	agreed	2017-05-04 14:53:05	2017-05-05 11:53:07	R2-1703885		Rel-12	25.306	12.8.0	EDCH_enh-Core, TEI12	0518	6	F	RP-171242					
R2-1704738	Corrections of QoE measurements	Ericsson	Cecilia Eklof	59618	CR				219	14.4.0	In principle agreed CRs	47380	agreed	2017-05-04 14:53:06	2017-05-05 13:02:39	R2-1703218		Rel-14	25.331	14.2.0	UMTS_QMC_Streaming	5932	1	F	RP-171239					
R2-1705380	Rapporteur corrections	Ericsson	Ritesh Shreevastav	69655	CR	Approval			223	14.5.1	Other	53800	agreed	2017-05-05 14:44:40	2017-05-07 06:57:53			Rel-14	25.331	14.2.0	TEI14	5939		D	RP-171238					
R2-1705948	Introduction of DL interference mitigation for UMTS	Qualcomm Incorporated, Huawei, HiSilicon, Ericsson	Juha Korhonen	21609	CR	Agreement			226	15.1	WI: DL interference mitigation for UMTS	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705831		Rel-14	25.331	14.2.0	UTRA_DL_IM-Core	5935	2	B	RP-171240					
R2-1706194	RRC Specification Update After ASN1 Review	Ericsson	Juha Korhonen	21609	CR	Agreement			224	14.6	Rel-14 UMTS ASN.1 review	53892	agreed	2017-06-01 22:41:35	2017-06-01 23:57:52	R2-1705951		Rel-14	25.331	14.2.0	TEI14	5940	2	F	RP-171238					
R2-1706201	Clarified behaviour for transmission of "Container for application layer measurement reporting"	Ericsson	Juha Korhonen	21609	CR	Agreement			220	14.4.1	Other	58404	agreed	2017-06-01 22:41:45	2017-06-01 23:57:52	R2-1706192		Rel-14	25.331	14.2.0	UMTS_QMC_Streaming-Core	5933	5	F	RP-171239					
R2-1704206	Clarification of the end marker solution for eLWA	Nokia, Alcatel-Lucent Shanghai Bell	Tero Henttonen	69943	CR	Discussion			49	8.5.0	In principle agreed CRs	42060	agreed	2017-05-02 11:37:14	2017-05-05 17:25:40	R2-1703808		Rel-14	36.300	14.2.0	LTE_WLAN_aggr-Core	1014	2	F	RP-171236					
R2-1704598	Correction on radio protocol architecture for DC	Huawei, HiSilicon	Li Zhao	62841	CR	Approval			35	7.5.0	In principle agreed CRs	45980	agreed	2017-05-04 11:45:20	2017-05-06 12:17:53	R2-1703772		Rel-13	36.300	13.7.0	LTE_dualC_enh-Core	0994	2	F	RP-171243					
R2-1704599	Correction on radio protocol architecture for DC	Huawei, HiSilicon	Li Zhao	62841	CR	Approval			35	7.5.0	In principle agreed CRs	45990	agreed	2017-05-04 11:46:55	2017-05-06 12:17:53	R2-1703773		Rel-14	36.300	14.2.0	LTE_dualC_enh-Core	0995	2	A	RP-171243					
R2-1704601	Correction on HARQ principles for eMTC	Huawei, HiSilicon	Li Zhao	62841	CR	Approval			29	7.3.0	In principle agreed CRs	46020	agreed	2017-05-04 11:49:45	2017-05-06 12:17:53	R2-1702581		Rel-14	36.300	14.2.0	LTE_MTCe2_L1-Core	0996	1	F	RP-171244					
R2-1704625	Correction on eLWA	Huawei, HiSilicon	Li Zhao	62841	CR	Approval			49	8.5.0	In principle agreed CRs	46250	agreed	2017-05-04 12:01:34	2017-05-06 12:17:53	R2-1703811		Rel-14	36.300	14.2.0	LTE_WLAN_aggr-Core	0997	2	F	RP-171236					
R2-1704705	CE mode configuration/deconfiguration without handover	Ericsson	Mattias Bergstrom	46046	CR				65	8.12.0	In principle agreed CRs	47050	agreed	2017-05-04 14:22:02	2017-05-04 14:47:31	R2-1703484		Rel-14	36.300	14.2.0	LTE_feMTC-Core	1010	1	C	RP-171223					
R2-1705290	Corrections to NB-IoT Enhancements	Huawei, HiSilicon	Baokun Shan	70626	CR	Approval			63	8.11.2	Other	57560	agreed	2017-05-05 10:16:21	2017-05-06 11:02:55	R2-1703188		Rel-14	36.300	14.2.0	NB_IOTenh-Core	1006	1	F	RP-171224					
R2-1705294	Miscellaneous corrections for NB-IoT	Huawei, HiSilicon	Baokun Shan	70626	CR	Approval			33	7.4.1	Other	53770	agreed	2017-05-05 10:16:25	2017-05-06 11:02:55			Rel-13	36.300	13.7.0	NB_IOT-Core	1026		F	RP-171245					
R2-1705295	Miscellaneous corrections for NB-IoT	Huawei, HiSilicon	Baokun Shan	70626	CR	Approval			33	7.4.1	Other	53780	agreed	2017-05-05 10:16:25	2017-05-06 11:02:55			Rel-14	36.300	14.2.0	NB_IOT-Core	1027		A	RP-171245					
R2-1705717	Corrections to stage 2 description for voice and video enhancements for LTE	Intel Corporation	Juha Korhonen	21609	CR				83	8.18.1	Other	57170	agreed	2017-05-07 23:04:02	2017-05-07 23:07:53			Rel-14	36.300	14.2.0	LTE_VoLTE_ViLTE_enh-Core	1000	1	F	RP-171235					
R2-1705842	Indication of in proximity of CEN DSRC	Qualcomm Incorporated	Juha Korhonen	21609	CR	Agreement			43	8.2.1	Stage 2	44471	agreed	2017-05-12 13:30:38	2017-05-12 13:30:38	R2-1704447		Rel-14	36.300	14.2.0	LTE_SL_V2V-Core	1009	2	F	RP-171226					
R2-1705858	CR to cell reselection for V2X in TS 36.300	Huawei, Samsung, HiSilicon	Juha Korhonen	21609	CR	Approval			43	8.2.1	Stage 2	40362	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705841		Rel-14	36.300	14.2.0	LTE_SL_V2V-Core	1017	2	F	RP-171226					
R2-1705892	Clarification of UE-AMBR support for NB-IoT	NTT DOCOMO INC.	Juha Korhonen	21609	CR				33	7.4.1	Other	53721	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705812		Rel-13	36.300	13.7.0	NB_IOT-Core	1033	1	F	RP-171245					
R2-1705893	Clarification of UE-AMBR support for NB-IoT	NTT DOCOMO INC.	Juha Korhonen	21609	CR				33	7.4.1	Other	53731	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704962		Rel-14	36.300	14.2.0	NB_IOT-Core	1024	1	A	RP-171245					
R2-1705976	Editorial Corrections to Support of Multiple SPS Configurations	Ericsson	Juha Korhonen	21609	CR				94	8.25.1	Other	54091	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705545		Rel-14	36.300	14.2.0	LTE_V2X-Core	1029	1	F	RP-171227					
R2-1706113	Corrections to stage 2 description of FeMTC and eNB-IoT	Intel Corporation	Juha Korhonen	21609	CR	Agreement			67	8.12.2	Other	58062	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705935		Rel-14	36.300	14.2.0	LTE_feMTC-Core, NB_IOTenh-Core	0999	3	F	RP-171223					
R2-1706114	Resources selection for PRACH triggered by a PDCCH order in eNB-IoT(Option2)	ZTE, Ericsson, Huawei, HiSilicon	Juha Korhonen	21609	CR				63	8.11.2	Other	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705930		Rel-14	36.300	14.2.0	NB_IOTenh-Core	1028	2	F	RP-171224					
R2-1706163	Introduction of RRC connection re-establishment for NB-IoT control plane	Qualcomm Incorporated, Huawei, HiSilicon, Gemalto N.V.	Umesh Phuyal	71775	CR	Agreement			62	8.11.1	Mobility enhancements	0	agreed	2017-05-26 10:08:44	2017-05-26 20:57:53			Rel-14	36.300	14.2.0	NB_IOTenh-Core	1038		B	RP-171224					
R2-1706171	Support of RLF for CP CIoT Optimisation	Qualcomm Incorporated	Juha Korhonen	21609	CR	Agreement			241	19	Any other business	0	agreed	2017-05-26 10:09:05	2017-05-26 20:57:53			Rel-14	36.300	14.2.0	NB_IOTenh	1041		B	RP-171224					
R2-1706188	Correction on UE-AMBR for NB-IoT UE using CP solution	Huawei, NTT DOCOMO, INC.	Juha Korhonen	21609	CR	Agreement			241	19	Any other business	0	agreed	2017-05-27 10:40:49	2017-05-27 10:47:52	R2-1706170		Rel-14	36.300	14.2.0	TEI14, NB_IOTenh-Core	1040	1	F	RP-171225					
R2-1706199	LAA/WiFi sharing indication	Apple	Juha Korhonen	21609	CR	Agreement			24	7.1	WI: Licensed-Assisted Access using LTE	49344	agreed	2017-06-01 22:41:42	2017-06-01 23:57:52	R2-1706173		Rel-13	36.300	13.7.0	LTE_LAA-Core	1022	4	B	RP-171243					
R2-1706200	LAA/WiFi sharing indication	Apple	Juha Korhonen	21609	CR	Agreement			24	7.1	WI: Licensed-Assisted Access using LTE	49354	agreed	2017-06-01 22:41:44	2017-06-01 23:57:52	R2-1706174		Rel-14	36.300	14.2.0	LTE_LAA-Core	1023	4	A	RP-171243					
R2-1704950	Correction on the data modulation of Uplink Shared Channel	NTT DOCOMO INC.	Ryusuke Matsukawa	64580	CR				86	8.20.0	In principle agreed CRs	49500	agreed	2017-05-05 01:41:54	2017-05-05 06:37:00	R2-1703166		Rel-14	36.302	14.2.0	LTE_UL_CAP_enh-Core	0107	1	F	RP-171234					
R2-1705276	Correction to downlink reception types for BL UEs and UEs in CE	Sequans Communications	Olivier Marco	63229	CR	Approval			29	7.3.0	In principle agreed CRs	53850	agreed	2017-05-05 09:32:36	2017-05-07 06:57:52	R2-1703890		Rel-13	36.302	13.5.0	LTE_MTCe2_L1-Core	0108	2	F	RP-171244					
R2-1705385	Correction to downlink reception types for BL UEs and UEs in CE	Sequans Communications	Olivier Marco	63229	CR	Agreement			29	7.3.0	In principle agreed CRs	54640	agreed	2017-05-05 14:51:42	2017-05-07 06:57:53	R2-1703891		Rel-14	36.302	14.2.0	LTE_MTCe2_L1-Core	0109	1	A	RP-171244					
R2-1705934	Correction to SC-MCCH and SC-MTCH reception type	Ericsson	Juha Korhonen	21609	CR	Approval			66	8.12.1	Multicast for feMTC and eNB-IoT	54741	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704182		Rel-14	36.302	14.2.0	LTE_feMTC-Core	0105	2	F	RP-171223					
R2-1706020	Correction to Downlink Reception Type Combinations for FeMBMS	Qualcomm	Juha Korhonen	21609	CR				59	8.10	WI: eMBMS enhancements for LTE	57411	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705740		Rel-14	36.302	14.2.0	MBMS_LTE_enh2-Core	1112	1	F	RP-171221					
R2-1704181	Correction to paging carrier selection formula in Rel-14 NB-IoT	Ericsson	Oscar Ohlsson	57517	CR	Approval			61	8.11.0	In principle agreed CRs	44370	agreed	2017-05-02 07:27:18	2017-05-02 14:16:59	R2-1703835		Rel-14	36.304	14.2.0	NB_IOTenh-Core	0363	2	F	RP-171224					
R2-1704764	Correction for eDRX Hashed ID	Nokia, Alcatel-Lucent Shanghai Bell	Jussi-pekka Koskinen	69951	CR	Agreement			35	7.5.0	In principle agreed CRs	46210	agreed	2017-05-04 17:11:40	2017-05-04 17:24:44	R2-1703774		Rel-13	36.304	13.5.0	LTE_extDRX-Core	0369	2	F	RP-171243					
R2-1704819	Correction for eDRX Hashed ID	Nokia, Alcatel-Lucent Shanghai Bell	Jussi-pekka Koskinen	69951	CR	Agreement			35	7.5.0	In principle agreed CRs	46220	agreed	2017-05-04 17:18:22	2017-05-04 17:24:44	R2-1703775		Rel-14	36.304	14.2.0	LTE_extDRX-Core	0370	2	A	RP-171243					
R2-1706021	Correction to Reselection priorities handling for FeMBMS	Qualcomm	Juha Korhonen	21609	CR				59	8.10	WI: eMBMS enhancements for LTE	57412	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705741		Rel-14	36.304	14.2.0	MBMS_LTE_enh2-Core	0380	1	F	RP-171221					
R2-1706180	Correction to usage of SC-PTM offset in NB-IoT and FeMTC	Huawei, HiSilicon, Ericsson	Juha Korhonen	21609	CR	Approval			66	8.12.1	Multicast for feMTC and eNB-IoT	0	agreed	2017-05-26 10:09:18	2017-05-26 14:57:53	R2-1705927		Rel-14	36.304	14.2.0	LTE_feMTC-Core, NB_IOTenh-Core	0376	2	F	RP-171223					
R2-1705913	Clarification to positioning measurement in idle state	Ericsson	Juha Korhonen	21609	CR				63	8.11.2	Other	50111	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705016		Rel-14	36.305	14.1.0	NB_IOTenh-Core	0069	1	F	RP-171224					
R2-1704033	Optional feature without UE capability bit for VoLTE	Huawei, HiSilicon	Yi GUO	56629	CR	Approval			21	6.0	In principle agreed CRs	40330	agreed	2017-04-28 02:04:27	2017-04-28 02:10:37	R2-1703768		Rel-12	36.306	12.11.0	TEI12, LTE-L23	1456		F	RP-171241					
R2-1704034	Optional feature without UE capability bit for VoLTE	Huawei, HiSilicon	Yi GUO	56629	CR	Approval			21	6.0	In principle agreed CRs	40340	agreed	2017-04-28 02:04:30	2017-04-28 02:10:37	R2-1703769		Rel-13	36.306	13.5.0	TEI12, LTE-L23	1457		A	RP-171241					
R2-1704035	Optional feature without UE capability bit for VoLTE	Huawei, HiSilicon	Yi GUO	56629	CR	Approval			21	6.0	In principle agreed CRs	40350	agreed	2017-04-28 02:04:31	2017-04-28 02:10:37	R2-1703770		Rel-14	36.306	14.2.0	TEI12, LTE-L23	1458		A	RP-171241					
R2-1704623	Correction on UE capabilities for eLAA	Huawei, HiSilicon	Li Zhao	62841	CR	Approval			39	8.1.0	In principle agreed CRs	46230	agreed	2017-05-04 11:58:33	2017-05-06 12:17:53	R2-1702577		Rel-14	36.306	14.2.0	LTE_eLAA-Core	1437	1	F	RP-171231					
R2-1704706	CE mode configuration/deconfiguration without handover	Ericsson	Mattias Bergstrom	46046	CR				65	8.12.0	In principle agreed CRs	47060	agreed	2017-05-04 14:22:43	2017-05-04 14:47:31	R2-1703485		Rel-14	36.306	14.2.0	LTE_feMTC-Core	1452	1	C	RP-171223					
R2-1704938	UE Capabilitites to enable Uplink-Only RoHC operations	Apple, MediaTek Inc.	Haijing Hu	61646	CR				93	8.25.0	In principle agreed CRs	49380	agreed	2017-05-05 00:05:40	2017-05-05 18:32:42			Rel-14	36.306	14.2.0	TEI14	1463		B	RP-171225					
R2-1704971	CR for introduction of non-uniform gap in measurement gap enhancement	Intel Corporation	Youn hyoung Heo	47007	CR				75	8.15.0	In principle agreed CRs	49710	agreed	2017-05-05 03:00:12	2017-05-06 10:57:54	R2-1702985		Rel-14	36.306	14.2.0	LTE_meas_gap_enh	1445	1	F	RP-171222					
R2-1705018	Corrections to capabilities for NB-IoT	Ericsson	Martin Van Der Zee	58600	CR				63	8.11.2	Other	50200	agreed	2017-05-05 03:39:10	2017-05-06 10:47:54			Rel-14	36.306	14.2.0	NB_IOTenh-Core	1464		F	RP-171224					
R2-1705321	UL 256QAM capability clarification	Nokia, Alcatel-Lucent Shanghai Bell	Malgorzata Tomala	68485	CR				87	8.20.1	Other	53210	agreed	2017-05-05 12:55:41	2017-05-06 07:23:46			Rel-14	36.306	14.2.0	LTE_UL_CAP_enh-Core	1465		F	RP-171234					
R2-1705423	Introduction of FeMBMS to 36.306	Ericsson	Helka-liina Maattanen	61821	CR				59	8.10	WI: eMBMS enhancements for LTE	57400	agreed	2017-05-05 16:35:33	2017-05-05 17:11:44			Rel-14	36.306	14.2.0	MBMS_LTE_enh2-Core	1470		B	RP-171221					
R2-1705476	Correction on the description of ce-srsEnhancement for FeMTC	Huawei, HiSilicon	Zhenzhen Cao	58032	CR	Approval			67	8.12.2	Other	54810	agreed	2017-05-05 17:14:23	2017-05-06 13:07:29			Rel-14	36.306	14.2.0	LTE_feMTC-Core	1475		F	RP-171223					
R2-1705478	Minor correction on TS 36.306 for FeMTC	Huawei, HiSilicon	Zhenzhen Cao	58032	CR	Approval			67	8.12.2	Other	57720	agreed	2017-05-05 17:14:25	2017-05-06 13:07:29			Rel-14	36.306	14.2.0	LTE_feMTC-Core	1476		F	RP-171223					
R2-1705702	Introduction of new Transport Block Size for DL 256QAM	Qualcomm Incorporated	Juha Korhonen	21609	CR				93	8.25.0	In principle agreed CRs	49920	agreed	2017-05-07 23:03:55	2017-05-07 23:07:53			Rel-14	36.306	14.2.0	TEI14	1438	2	B	RP-171225					
R2-1705926	Corrections to capabilities for feMTC	Ericsson	Juha Korhonen	21609	CR				67	8.12.2	Other	57161	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705017		Rel-14	36.306	14.2.0	LTE_feMTC-Core	1448	2	F	RP-171223					
R2-1706005	Introduction of UE capabilities for high speed	Huawei, HiSilicon	Juha Korhonen	21609	CR	Agreement			78	8.17	WI: Performance enhancements for high speed scenario in LTE	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35			Rel-14	36.306	14.2.0	LTE_high_speed-Core	1480		B	RP-171229					
R2-1706066	Update of ROHC profile reference	Apple, Ericsson	Juha Korhonen	21609	CR				94	8.25.1	Other	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704936		Rel-14	36.306	14.2.0	TEI14	1462	1	F	RP-171225					
R2-1706093	LAA/WiFi sharing indication	Apple	Juha Korhonen	21609	CR	Approval			24	7.1	WI: Licensed-Assisted Access using LTE	49302	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1706060		Rel-13	36.306	13.5.0	LTE_LAA-Core	1460	2	B	RP-171243					
R2-1706094	LAA/WiFi sharing indication	Apple	Juha Korhonen	21609	CR	Approval			24	7.1	WI: Licensed-Assisted Access using LTE	49312	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1706061		Rel-14	36.306	14.2.0	LTE_LAA-Core	1461	2	A	RP-171243					
R2-1706112	Miscellaneous corrections to TS 36.306	Intel Corporation	Juha Korhonen	21609	CR	Agreement			67	8.12.2	Other	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704990		Rel-14	36.306	14.2.0	NB_IOTenh-Core	1443	2	F	RP-171224					
R2-1706125	Correction to ceMeasurements-r14 measurement capability	Ericsson	Juha Korhonen	21609	CR	Agreement			67	8.12.2	Other	612500	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35			Rel-14	36.306	14.2.0	LTE_feMTC-Core	1483		F	RP-171223					
R2-1706127	Introduction of UE capability for V2X in 36.306	LG Electronics Inc.	Juha Korhonen	21609	CR				72	8.13.3	Control plane	45190	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705856		Rel-14	36.306	14.2.0	LTE_V2X-Core	1478	2	B						

R2-1706164	Introduction of RRC connection re-establishment for NB-IoT control plane	Qualcomm Incorporated, Huawei, HiSilicon, Gemalto N.V.	Umesh Phuyal	71775	CR	Agreement			62	8.11.1	Mobility enhancements	0	agreed	2017-05-26 10:08:50	2017-05-26 20:57:53			Rel-14	36.306	14.2.0	NB_IOTenh-Core	1484		B	RP-171224										
R2-1706184	Introduction of enhanced RLM measurement capabilities	Ericsson	Juha Korhonen	21609	CR	Agreement			67	8.12.2	Other	0	agreed	2017-05-26 22:03:19	2017-05-26 22:07:53	R2-1705918		Rel-14	36.306	14.2.0	LTE_feMTC-Core	1479	2	B	RP-171223										
R2-1706193	UE capabilities for eLWA	Nokia, Alcatel-Lucent Shanghai Bell	Juha Korhonen	21609	CR	Agreement			50	8.5.1	Other	0	agreed	2017-05-29 16:32:31	2017-05-29 20:27:52	R2-1705971		Rel-14	36.306	14.2.0	LTE_WLAN_aggr-Core	1439	4	F	RP-171236										
R2-1704490	Stop condition for the drx-RetransmissionTimer for NB-IoT	LG Electronics	Jeonggu Lee	70359	CR	Approval			61	8.11.0	In principle agreed CRs	44920	agreed	2017-05-04 04:36:23	2017-05-04 05:39:09			Rel-14	36.321	14.2.1	NB_IOTenh-Core	1096		F	RP-171224										
R2-1704492	Correction to maximum number of HARQ processes for NB-IoT	LG Electronics, Ericsson	Jeonggu Lee	70359	CR	Approval			61	8.11.0	In principle agreed CRs	52910	agreed	2017-05-04 04:42:29	2017-05-04 05:39:09			Rel-14	36.321	14.2.1	NB_IOTenh-Core	1097		F	RP-171224										
R2-1704993	Clarification on the UE behaviour when the validity of PUSCH trigger A expires	Intel Corporation	Youn hyoung Heo	47007	CR				39	8.1.0	In principle agreed CRs	49930	agreed	2017-05-05 03:04:27	2017-05-06 10:57:54	R2-1703782		Rel-14	36.321	14.2.1	LTE_eLAA-Core	1076	2	F	RP-171231										
R2-1705287	Alignment of the parameter names for SC-PTM DRX for SC-MCCH and SC-MTCH	Huawei, HiSilicon	Baokun Shan	70626	CR	Approval			66	8.12.1	Multicast for feMTC and eNB-IoT	52960	agreed	2017-05-05 10:16:19	2017-05-06 11:02:55	R2-1703191		Rel-14	36.321	14.2.0	LTE_feMTC-Core, NB_IOTenh-Core	1063	1	F	RP-171223										
R2-1705404	Correction of L2 latency reduction	Huawei, HiSilicon	Lei Liu	59582	CR	Agreement			57	8.8	WI: L2 latency reduction techniques for LTE	54040	agreed	2017-05-05 15:02:23	2017-05-05 15:17:18			Rel-14	36.321	14.2.1	LTE_LATRED_L2-Core	1108		F	RP-171228										
R2-1705422	SI-RNTI number correction for feMBMS	Ericsson	Helka-liina Maaltanen	61821	CR				59	8.10	WI: eMBMS enhancements for LTE	54240	agreed	2017-05-05 16:35:32	2017-05-05 17:11:44			Rel-14	36.321	14.2.0	MBMS_LTE_enh2-Core	1109		F	RP-171221										
R2-1705465	Correction on terminology of SI for eMTC	Huawei, HiSilicon	Zhenzhen Cao	58032	CR	Approval			29	7.3.0	In principle agreed CRs	54670	agreed	2017-05-05 17:14:14	2017-05-06 13:07:29	R2-1703832		Rel-13	36.321	13.5.0	LTE_MTCe2_L1-Core	1046	2	F	RP-171244										
R2-1705467	Correction on terminology of SI for eMTC	Huawei, HiSilicon	Zhenzhen Cao	58032	CR	Approval			29	7.3.0	In principle agreed CRs	56890	agreed	2017-05-05 17:14:16	2017-05-06 13:07:29			Rel-14	36.321	14.2.0	LTE_MTCe2_L1-Core	1114		A	RP-171244										
R2-1705547	Corrections to Sidelink Discovery Gap for Transmission	Ericsson	Juha Korhonen	21609	CR				35	7.5.0	In principle agreed CRs	49490	agreed	2017-05-07 23:02:18	2017-05-07 23:07:52			Rel-14	36.321	14.2.1	LTE_eD2D_Prox-Core	1123		A	RP-171243										
R2-1705564	Introducing a new resource reselection trigger for V2X sidelink communication	Huawei, HiSilicon	Juha Korhonen	21609	CR				42	8.2.0	In principle agreed CRs	55640	agreed	2017-05-07 23:02:41	2017-05-07 23:07:52			Rel-14	36.321	14.2.1	LTE_SL_V2V-Core	1038	3	F	RP-171226										
R2-1705853	Remaining issues in Activation/Deactivation of CSI-RS resources MAC CE for eFD-MIMO	LG Electronics Inc., Samsung	Juha Korhonen	21609	CR	Approval			88	8.21	WI: Enhancements on Full-Dimension (FD) MIMO for LTE	43361	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704336		Rel-14	36.321	14.2.1	LTE_eFDMIMO-Core	1094	1	F	RP-171232										
R2-1705857	Miscellaneous corrections to V2X in TS 36.321	Huawei, HiSilicon	Juha Korhonen	21609	CR	Approval			71	8.13.2	User plane	40411	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704040		Rel-14	36.321	14.2.1	LTE_V2X-Core	1088	1	F	RP-171227										
R2-1705883	Stop condition for the drx-RetransmissionTimer for NB-IoT	LG Electronics	Juha Korhonen	21609	CR	Approval			32	7.4.0	In principle agreed CRs	44891	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704489		Rel-13	36.321	13.5.0	NB_IOT-Core	1095	1	F	RP-171245										
R2-1705925	Small corrections to random access procedure and DRX for REI-14 NB-IoT Enhancements	Huawei, HiSilicon	Juha Korhonen	21609	CR	Approval			61	8.11.0	In principle agreed CRs	53682	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705391		Rel-14	36.321	14.2.0	NB_IOTenh-Core	1062	3	F	RP-171224										
R2-1705931	Editorial corrections for MAC	Ericsson	Juha Korhonen	21609	CR	Approval			63	8.11.2	Other	56731	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704183		Rel-14	36.321	14.2.0	NB_IOTenh-Core, LTE_feMTC-Core	1068	2	D	RP-171224										
R2-1705933	Action upon reception of SC-PTM stop indication	Huawei, HiSilicon	Juha Korhonen	21609	CR	Approval			66	8.12.1	Multicast for feMTC and eNB-IoT	52871	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705296		Rel-14	36.321	14.2.0	LTE_feMTC-Core, NB_IOTenh-Core	1105	1	F	RP-171223										
R2-1705975	Clarification for the UE Contention Resolution Identity MAC Control Element	Samsung	Juha Korhonen	21609	CR	Agreement			52	8.6.0	In principle agreed CRs	54850	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35			Rel-14	36.321	14.2.1	LTE_eMob-Core	1052	2	F	RP-171233										
R2-1706105	RAR reception for eMTC	Huawei, HiSilicon	Juha Korhonen	21609	CR	Approval			30	7.3.1	Other	41852	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705928		Rel-13	36.321	13.5.0	LTE_MTCe2_L1-Core	1115	2	F	RP-171244										
R2-1706106	RAR reception for eMTC	Huawei, HiSilicon	Juha Korhonen	21609	CR	Approval			30	7.3.1	Other	41861	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705473		Rel-14	36.321	14.2.0	LTE_MTCe2_L1-Core	1116	1	A	RP-171244										
R2-1706107	Configuration of preamble groups for CE levels and preamble groups A/B – Alt2	Ericsson	Juha Korhonen	21609	CR	Approval			30	7.3.1	Other	54711	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705901		Rel-13	36.321	13.5.0	LTE_MTCe2_L1-Core	1071	3	F	RP-171244										
R2-1706108	Configuration of preamble groups for CE levels and preamble groups A/B – Alt2	Ericsson	Juha Korhonen	21609	CR	Approval			30	7.3.1	Other	54731	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705902		Rel-14	36.321	14.2.0	LTE_MTCe2_L1-Core	1072	3	A	RP-171244										
R2-1706172	Resources selection for PRACH triggered by a PDCCH order in eNB-IoT(Option2)	ZTE, Ericsson, Huawei/HiSilicon	Juha Korhonen	21609	CR				63	8.11.2	Other	0	agreed	2017-05-26 10:09:09	2017-05-30 15:57:47	R2-1705929		Rel-14	36.321	14.2.1	NB_IOTenh-Core	1113	2	F	RP-171224										
R2-1706197	Corrections to Sidelink Discovery Gap for Transmission	Ericsson	Juha Korhonen	21609	CR	Agreement			35	7.5.0	In principle agreed CRs	49481	agreed	2017-06-01 22:41:40	2017-06-01 23:57:52	R2-1705546		Rel-13	36.321	13.5.0	LTE_eD2D_Prox-Core	1079	3	F	RP-171243										
R2-1704939	Enable Uplink-Only RoHC operations	Apple, MediaTek Inc.	Haijing Hu	61646	CR				93	8.25.0	In principle agreed CRs	49390	agreed	2017-05-05 00:10:18	2017-05-05 18:32:42			Rel-14	36.323	14.2.0	TEI14	0198		B	RP-171225										
R2-1705437	Clarification on polling	HTC Corporation, LG Electronics	Frank Wu	65148	CR				26	7.2.0	In principle agreed CRs	54370	agreed	2017-05-05 16:52:46	2017-05-06 12:27:26	R2-1703771		Rel-13	36.323	13.5.0	LTE_WLAN_radio-Core	0195	2	F	RP-171244										
R2-1705461	Clarification on polling	HTC Corporation, LG Electronics	Frank Wu	65148	CR				26	7.2.0	In principle agreed CRs	54610	agreed	2017-05-05 17:04:54	2017-05-06 12:27:26			Rel-14	36.323	14.2.0	LTE_WLAN_radio-Core	0199		A	RP-171244										
R2-1706067	Update of ROHC profile reference	Apple, Ericsson	Juha Korhonen	21609	CR				94	8.25.1	Other	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704937		Rel-14	36.323	14.2.0	TEI14	0197	1	F	RP-171225										
R2-1704205	UE capabilities for eLWA	Nokia, Alcatel-Lucent Shanghai Bell	Tero Henttonen	69943	CR	Decision			49	8.5.0	In principle agreed CRs	42050	agreed	2017-05-02 11:37:13	2017-05-05 17:25:40	R2-1703810		Rel-14	36.331	14.2.2	LTE_WLAN_aggr-Core	2714	2	F	RP-171236										
R2-1704446	Leap second change for DFN timing	Qualcomm Incorporated	Zhibin Wu	49530	CR	Agreement			42	8.2.0	In principle agreed CRs	44460	agreed	2017-05-03 20:46:02	2017-05-06 08:17:54	R2-1703478		Rel-14	36.331	14.2.2	LTE_SL_V2V-Core	2771	1	F	RP-171226										
R2-1704624	Correction on UE capabilities for eLAA	Huawei, HiSilicon	Li Zhao	62841	CR	Approval			39	8.1.0	In principle agreed CRs	46240	agreed	2017-05-04 12:00:04	2017-05-06 12:17:53	R2-1702580		Rel-14	36.331	14.2.2	LTE_eLAA-Core	2709	1	F	RP-171231										
R2-1704626	CR on V2X miscellaneous RRC corrections	ZTE, Qualcomm Incorporated, Nokia, Alcatel-Lucent Shanghai Bell	Yuqin Chen	45569	CR	Decision			69	8.13.0	In principle agreed CRs	46260	agreed	2017-05-04 12:03:39	2017-05-05 16:36:57			Rel-14	36.331	14.2.2	LTE_V2X-Core	2820		F	RP-171227										
R2-1704633	Correction on eLWA	Huawei, HiSilicon	Li Zhao	62841	CR	Approval			49	8.5.0	In principle agreed CRs	46330	agreed	2017-05-04 12:18:12	2017-05-06 12:17:53	R2-1703947		Rel-14	36.331	14.2.2	LTE_WLAN_aggr-Core	2712	3	F	RP-171236										
R2-1704700	Correction to RACH CE level info list	Ericsson	Mattias Bergstrom	46046	CR				29	7.3.0	In principle agreed CRs	47010	agreed	2017-05-04 14:19:47	2017-05-04 14:47:31	R2-1703479		Rel-13	36.331	13.5.0	LTE_MTCe2_L1-Core	2772	1	F	RP-171244										
R2-1704701	Correction to RACH CE level info list	Ericsson	Mattias Bergstrom	46046	CR				29	7.3.0	In principle agreed CRs	52760	agreed	2017-05-04 14:20:34	2017-05-04 14:47:31	R2-1703480		Rel-14	36.331	14.2.2	LTE_MTCe2_L1-Core	2773	1	A	RP-171244										
R2-1704752	Miscellaneous corrections to CA enhancements	Intel Corporation	Youn hyoung Heo	47007	CR				35	7.5.0	In principle agreed CRs	49470	agreed	2017-05-04 15:55:31	2017-05-06 10:57:54			Rel-14	36.331	14.2.2	LTE_CA_enh_b5C-Core	2826		A	RP-171243										
R2-1704940	Enable Uplink-Only RoHC operations	Apple, MediaTek Inc.	Haijing Hu	61646	CR				93	8.25.0	In principle agreed CRs	49400	agreed	2017-05-05 00:13:02	2017-05-05 18:32:42			Rel-14	36.331	14.2.2	TEI14	2831		B	RP-171225										
R2-1704948	Correction on WLAN connection status report monitoring for LWIP	Huawei, HiSilicon, HTC Corporation	Li Zhao	62841	CR	Approval			35	7.5.0	In principle agreed CRs	47520	agreed	2017-05-05 01:36:01	2017-05-06 12:17:54	R2-1703912		Rel-13	36.331	13.5.0	LTE_WLAN_radio_legacy-Core	2710	3	F	RP-171243										
R2-1704949	Correction on WLAN connection status report monitoring for LWIP	Huawei, HiSilicon, HTC Corporation	Li Zhao	62841	CR	Approval			35	7.5.0	In principle agreed CRs	47640	agreed	2017-05-05 01:37:23	2017-05-06 12:17:54	R2-1703913		Rel-14	36.331	14.2.2	LTE_WLAN_radio_legacy-Core	2711	3	A	RP-171243										
R2-1704952	Editorial correction on ab-Barring parameter	NTT DOCOMO INC.	Ryusuke Matsukawa	64580	CR				33	7.4.1	Other	53700	agreed	2017-05-05 01:52:56	2017-05-05 06:37:00			Rel-13	36.331	13.5.0	NB_IOT-Core	2835		F	RP-171245										
R2-1704953	Editorial correction on ab-Barring parameter	NTT DOCOMO INC.	Ryusuke Matsukawa	64580	CR				33	7.4.1	Other	53710	agreed	2017-05-05 01:55:11	2017-05-05 06:37:00			Rel-14	36.331	14.2.2	NB_IOT-Core	2836		A	RP-171245										
R2-1704991	Miscellaneous corrections to CA enhancements	Intel Corporation	Youn hyoung Heo	47007	CR	Agreement			35	7.5.0	In principle agreed CRs	48190	agreed	2017-05-05 03:03:11	2017-05-06 10:57:54	R2-1702848		Rel-13	36.331	13.5.0	LTE_CA_enh_b5C-Core	2717	1	F	RP-171243										
R2-1705020	Correction to SIB-Type-NB	Ericsson, Huawei, HiSilicon	Martin Van Der Zee	58600	CR				63	8.11.2	Other	50320	agreed	2017-05-05 03:39:12	2017-05-06 10:47:54	R2-1703057		Rel-14	36.331	14.2.1	NB_IOTenh-Core	2737	1	F	RP-171224										
R2-1705024	Correction to FGI 25	Ericsson, NTT DOCOMO INC.	Martin Van Der Zee	58600	CR				67	8.12.2	Other	54800	agreed	2017-05-05 03:39:15	2017-05-06 10:47:54			Rel-14	36.331	14.2.1	LTE_feMTC-Core	2842		F	RP-171223										
R2-1705102	Clarifications to eLWA	HTC Corporation	Jing-Rong Hsieh	63040	CR	Approval			49	8.5.0	In principle agreed CRs	51020	agreed	2017-05-05 06:25:58	2017-05-05 15:25:56	R2-1703813		Rel-14	36.331	14.2.2	LTE_WLAN_aggr-Core	2720	2	F	RP-171236										
R2-1705286	Alignment of the parameter names for SC-PTM DRX for SC-MCCH and SC-MTCH	Huawei, HiSilicon	Baokun Shan	70626	CR	Approval			66	8.12.1	Multicast for feMTC and eNB-IoT	52890	agreed	2017-05-05 10:16:18	2017-05-06 11:02:55	R2-1703192		Rel-14	36.331	14.2.1	LTE_feMTC-Core, NB_IOTenh-Core, TEI14	2749	1	F	RP-171223										
R2-1705405	FDD TDD difference for VoLTE capability	Huawei, HiSilicon	Lei Liu	59582	CR	Agreement			82	8.18.0	In principle agreed CRs	57990	agreed	2017-05-05 15:02:24	2017-05-05 15:17:18	R2-1703896		Rel-14	36.331	14.2.2	LTE_VoLTE_ViLTE_enh-Core	2797	1	F	RP-171235										
R2-1705408	Miscellaneous eDECOR corrections and clarifications resulting from ASN.1 review	Ericsson	Kai-Erik Sunell	37638	CR	Agreement			17	5.1	Enhancements of Dedicated Core Networks for UMTS and LTE	54080	agreed	2017-05-05 15:19:24	2017-05-05 21:31:39			Rel-14	36.331	14.2.1	eDECOR-UTRA_LTE-Core	2871		F	RP-171237										
R2-1705464	Clarification on additionalSpectrumEmission for eMTC	HTC Corporation	Frank Wu	65148	CR				29	7.3.0	In principle agreed CRs	54650	agreed	2017-05-05 17:13:44	2017-05-06 12:28:53	R2-1703249		Rel-13	36.331	13.5.0	LTE_MTCe2_L1-Core	2753	1	F	RP-171244										
R2-1705466	Correction on terminology of SI for eMTC	Huawei, HiSilicon	Zhenzhen Cao	58032	CR	Approval			29	7.3.0	In principle agreed CRs	54680	agreed	2017-05-05 17:14:15	2017-05-06 13:07:29	R2-1703833		Rel-13	36.331	13.5.0	LTE_MTCe2_L1-Core	2800	1	F	RP-171244										
R2-1705468	Correction on terminology of SI for eMTC	Huawei, HiSilicon	Zhenzhen Cao	58032	CR	Approval			29	7.3.0	In principle agreed CRs	605500	agreed	2017-05-05 17:14:17	2017-05-06 13:07:29			Rel-14	36.331	14.2.0	LTE_MTCe2_L1-Core	2879		A	RP-171244										
R2-1705485	Corrections to make before break mobility	Ericsson	Hakan Palm	18830	CR				52	8.6.0	In principle agreed CRs	54200	agreed	2017-05-05 17:24:48	2017-05-06 22:57:53	R2-1703321		Rel-14	36.331	14.2.2	LTE_eMob-Core	2760	1	F	RP-171233										
R2-1705491	Clarification regarding requesting fallback combinations with different capabilities	Samsung Telecommunications	Himke Van der Velde	3491	CR	Decision			93	8.25.0	In principle agreed CRs	49700	agreed	2017-05-05 18:02:51	2017-05-06 09:35:32	R2-1703927		Rel-14	36.331	14.2.1	LTE_CA_enh_b5C-Core, TEI14	2768	2	F	RP-171243										
R2-1705500	Consistent gap pattern configuration for serving cells	Ericsson	Hakan Palm	18830	CR				76	8.15.1	Other	55000	agreed	2017-05-05 18:31:45	2017-05-06 22:57:53			Rel-14	36.331	14.2.2	LTE_meas_gap_enh	2891		F	RP-171222										
R2-1705563	Introducing a new SL master information block for V2X sidelink communication	Huawei, HiSilicon	Juha Korhonen	21609	CR				69	8.13.0	In principle agreed CRs	55630	agreed	2017-05-07 23:02:40	2017-05-07 23:07:52			Rel-14	36.331	14.2.2	LTE_V2X-Core	2715	2	B	RP-171227										
R2-1705565	Correction to exceptional pool usage in TS 36.331	Huawei, HiSilicon	Juha Korhonen	21609	CR				42	8.2.0	In principle agreed CRs	55650	agreed	2017-05-07 23:02:42	2017-05-07 23:07:52			Rel-14	36.331	14.2.2	LTE_SL_V2V-Core	2705	2	F	RP-171226										
R2-1705610	Generic clarification of "first bit" as leftmost bit	Qualcomm	Juha Korhonen	21609	CR				36	7.5.1	Other	57050	agreed	2017-05-07 23:03:09	2017-05-07 23:07:53			Rel-13	36.331	13.5.0	TEI13, LTE_EBF_FDMIMO-Core	2913		F	RP-171245										
R2-1705689	Clarification on additionalSpectrumEmission for eMTC	HTC	Juha Korhonen	21609	CR				29	7.3.0	In principle agreed CRs	54660	agreed	2017-05-07 23:03:39	2017-05-07 23:07:53			Rel-14	36.331	14.2.2	LTE_MTCe2_L1-Core	2919		A	RP-171244										
R2-1705690	Clarification on additionalSpectrumEmission for NB-IoT	HTC	Juha Korhonen	21609	CR				32	7.4.0	In principle agreed CRs	56900	agreed	2017-05-07 23:03:41	2017-05-07 23:07:53			Rel-13	36.331	13.5.0	NB_IOT-Core	2754	1	F	RP-171245										
R2-1705691	Clarification on additionalSpectrumEmission for NB-IoT	HTC	Juha Korhonen	21609	CR				32	7.4.0	In principle agreed CRs	56910	agreed	2017-05-07 23:03:42	2017-05-07 23:07:53			Rel-14	36.331	14.2.2	NB_IOT-Core	2920		A	RP-171245										
R2-1705703	Introduction of new Transport Block Size for DL 256QAM	Qualcomm Incorporated	Juha Korhonen	21609	CR				93	8.25.0	In principle agreed CRs	49921	agreed	2017-05-07 23:03:56	2017-05-07 23:07:53			Rel-14	36.331	14.2.2	TEI14	2713	2	B	RP-171225										
R2-1705756	Correction to CarrierConfigDedicated-NB	ZTE Corporation	Juha Korhonen	21609	CR				63	8.11.2	Other	51860	agreed	2017-05-07 23:04:21	2017-05-07 23:07:53			Rel-14	36.331	14.2.2	NB_IOTenh-Core	2927		F	RP-171224										
R2-1705772	Maximum PDSCH/PUSCH BW preference indication handling for handover	Apple	Juha Korhonen	21609	CR				67	8.12.2	Other	52250	agreed	2017-05-07 23:04:41	2017-05-07 23:07:53			Rel-14	36.331	14.2.2	LTE_feMTC-Core	2932		F	RP-171223										
R2-1705814	Correction of SRS switching	Huawei, HiSilicon	Lei Liu	59582	CR	Agreement			73	8.14	WI: SRS switching between LTE component carriers	54970	agreed	2017-05-09 13:02:37	2017-05-10 13:29:30	R2-1705403		Rel-14	36.331	14.2.2	LTE_SRS_switch-Core	2869	1	F	RP-171230										
R2-1705843	Correction of RRCConnectionReconfiguration reception for V2X	Qualcomm Incorporated	Juha Korhonen	21609	CR	Agreement			45	8.2.3	Control plane	44481	agreed	2017-05-13 10:54:11	2017-05-13 10:54:11	R2-1704448		Rel-14	36.331	14.2.2	LTE_SL_V2V-Core	2813	1	F	RP-171226										

R2-1705844	Correction on V2X behavior in 36.331	LG Electronics Inc.	Juha Korhonen	21609	CR				72	8.13.3	Control plane	0	agreed	2017-05-26 10:03:47	2017-05-31 22:17:52	R2-1705553		Rel-14	36.331	14.2.2	LTE_V2X-Core	2905	1	F	RP-171227										
R2-1705847	Merging of retuningTimeBandPairList with regular supported BC capabilites (ASN.1 review issue S.059)	Samsung Telecommunications	Juha Korhonen	21609	CR	Decision			73	8.14	WI: SRS switching between LTE component carriers	58140	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705497		Rel-14	36.331	14.2.1	LTE_SRS_switch, TEI14	2890	1	F	RP-171230										
R2-1705854	CR on reduction of SIB21 size	Qualcomm Incorporated	Juha Korhonen	21609	CR	Agreement			72	8.13.3	Control plane	0	agreed	2017-05-26 10:03:56	2017-05-31 22:17:52			Rel-14	36.331	14.2.2	LTE_V2X-Core	2950		F	RP-171227										
R2-1705884	Correction on the UE AS context handling	HTC Corporation, LG Electronics Inc.	Juha Korhonen	21609	CR	Approval			32	7.4.0	In principle agreed CRs	50791	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705079		Rel-13	36.331	13.5.0	TEI13, NB_IOT-Core	2718	3	F	RP-171245										
R2-1705885	Correction on the UE AS context handling	HTC Corporation, LG Electronics Inc.	Juha Korhonen	21609	CR	Approval			32	7.4.0	In principle agreed CRs	50801	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705080		Rel-14	36.331	14.2.2	TEI13, NB_IOT-Core	2848	1	A	RP-171245										
R2-1705886	Correction on attach without PDN connectivity	HTC Corporation	Juha Korhonen	21609	CR				32	7.4.0	In principle agreed CRs	50811	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705081		Rel-13	36.331	13.5.0	NB_IOT-Core	2719	2	F	RP-171245										
R2-1705887	Correction on attach without PDN connectivity	HTC Corporation	Juha Korhonen	21609	CR				32	7.4.0	In principle agreed CRs	50851	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705085		Rel-14	36.331	14.2.2	NB_IOT-Core	2849	1	A	RP-171245										
R2-1705890	Clarification on contention based random access for NB-IoT	NTT DOCOMO INC.	Juha Korhonen	21609	CR				33	7.4.1	Other	52991	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704942		Rel-13	36.331	13.5.0	NB_IOT-Core	2832	1	F	RP-171245										
R2-1705891	Clarification on contention based random access for NB-IoT	NTT DOCOMO INC.	Juha Korhonen	21609	CR				33	7.4.1	Other	53061	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704943		Rel-14	36.331	14.2.2	NB_IOT-Core	2833	1	A	RP-171245										
R2-1705895	Clarification on logicalChannelSR-ProhibitTimer for NB-IOT	MediaTek Inc.	Juha Korhonen	21609	CR				33	7.4.1	Other	53761	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705224		Rel-14	36.331	14.2.2	NB_IOT-Core	2853	1	A	RP-171245										
R2-1705896	Long DRX values with regular wake-up cycle – Option 1	Qualcomm Incorporated	Juha Korhonen	21609	CR	Agreement			33	7.4.1	Other	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705451		Rel-14	36.331	14.2.2	NB_IOTenh-Core	2876	1	F	RP-171224										
R2-1705897	Introduction of Overload Control for Control plane data only	Huawei, HiSilicon	Juha Korhonen	21609	CR	Approval			61	8.11.0	In principle agreed CRs	53671	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705291		Rel-14	36.331	14.2.0	NB_IOTenh-Core, TEI14	2746	2	C	RP-171224										
R2-1705899	Correction to the value range of ce-AuthorisationOffset	Huawei, HiSilicon	Juha Korhonen	21609	CR	Approval			61	8.11.0	In principle agreed CRs	57591	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705392		Rel-14	36.331	14.2.1	NB_IOTenh-Core	2745	3	F	RP-171224										
R2-1705903	Clarification to MIB repetitions	Sony	Juha Korhonen	21609	CR				30	7.3.1	Other	55721	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704821		Rel-13	36.331	13.5.0	LTE_MTCe2_L1-Core	2827	1	F	RP-171244										
R2-1705907	Correction to InterFreqRSTDMeasurementIndication message	Ericsson	Juha Korhonen	21609	CR				67	8.12.2	Other	50191	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705026		Rel-14	36.331	14.2.1	LTE_feMTC-Core	2844	1	F	RP-171223										
R2-1705908	Clarification on logicalChannelSR-ProhibitTimer for NB-IOT	MediaTek Inc.	Juha Korhonen	21609	CR				33	7.4.1	Other	53751	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705221		Rel-13	36.331	13.5.0	NB_IOT-Core	2852	1	F	RP-171245										
R2-1705910	Clarification to MIB repetitions	Sony	Juha Korhonen	21609	CR				30	7.3.1	Other	55740	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705904		Rel-14	36.331	14.2.2	LTE_MTCe2_L1-Core	2828	2	A	RP-171244										
R2-1705916	CE mode configuration/deconfiguration without handover	Ericsson	Juha Korhonen	21609	CR				65	8.12.0	In principle agreed CRs	47081	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704708		Rel-14	36.331	14.2.2	LTE_feMTC-Core	2775	2	C	RP-171223										
R2-1705919	Introduction of SFN indication in handover message	Ericsson, Qualcomm Incorporated	Juha Korhonen	21609	CR				67	8.12.2	Other	54131	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705019		Rel-14	36.331	14.2.1	LTE_feMTC-Core	2734	2	F	RP-171223										
R2-1705922	Minor correction in TS 36.331 for feMTC	Huawei, HiSilicon	Juha Korhonen	21609	CR	Approval			67	8.12.2	Other	55781	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705480		Rel-14	36.331	14.2.0	LTE_feMTC-Core	2884	1	F	RP-171223										
R2-1705940	Extension of SIntraSearchP value range	Huawei, HiSilicon	Juha Korhonen	21609	CR				33	7.4.1	Other	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705888		Rel-13	36.331	13.5.0	NB_IOT-Core	2930	2	F	RP-171245										
R2-1705965	Clarification on UE capability and early feature support	Samsung Telecommunications	Juha Korhonen	21609	CR	Decision			36	7.5.1	Other	55601	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705489		Rel-13	36.331	13.5.0	LTE-L23, TEI13	2766	3	F	RP-171241										
R2-1705966	Clarification on UE capability and early feature support	Samsung Telecommunications	Juha Korhonen	21609	CR	Agreement			36	7.5.1	Other	55610	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35			Rel-14	36.331	14.2.2	LTE-L23, TEI13	2943		A	RP-171241										
R2-1705967	Clarification regarding EBF-FDMIMO configuration (REL-13)	Samsung Telecommunications	Juha Korhonen	21609	CR	Agreement			36	7.5.1	Other	56101	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705490		Rel-13	36.331	13.5.0	LTE_EBF_FDMIMO-Core	2767	3	F	RP-171243										
R2-1705968	Clarification regarding EBF-FDMIMO configuration (REL-13)	Samsung Telecommunications	Juha Korhonen	21609	CR	Agreement			36	7.5.1	Other	57040	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35			Rel-14	36.331	14.2.2	LTE_EBF_FDMIMO-Core	2944		A	RP-171243										
R2-1705983	Correction on V2X Rx pool for inter-frequency configuration in 36.331	CATT	Juha Korhonen	21609	CR	Agreement			69	8.13.0	In principle agreed CRs	598300	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35			Rel-14	36.331	14.2.1	LTE_V2X-Core	2791	3	F	RP-171227										
R2-1705998	Introduction UE capabilities on high speed	Huawei, HiSilicon	Juha Korhonen	21609	CR	Agreement			80	8.17.1	Other	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35			Rel-14	36.331	14.2.2	LTE_high_speed-Core	2948		B	RP-171229										
R2-1706008	Correction of high speed	Huawei, HiSilicon	Juha Korhonen	21609	CR	Agreement			78	8.17	WI: Performance enhancements for high speed scenario in LTE	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35			Rel-14	36.331	14.2.2	LTE_high_speed-Core	2949		F	RP-171229										
R2-1706014	Clarification of intra-frequency applicability of makeBeforeBreak HO	Nokia, Alcatel-Lucent Shanghai Bell	Juha Korhonen	21609	CR	Agreement			52	8.6.0	In principle agreed CRs	53651	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705399		Rel-14	36.331	14.2.2	LTE_eMob-Core	2741	5	F	RP-171233										
R2-1706015	Corrections to RACH-less handover and SCG change	HTC Corporation	Juha Korhonen	21609	CR				52	8.6.0	In principle agreed CRs	53991	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705420		Rel-14	36.331	14.2.2	LTE_eMob-Core	2752	3	F	RP-171233										
R2-1706016	Miscellaneous RRC corrections on mobility enhancement	ZTE Corporation	Juha Korhonen	21609	CR	Agreement			53	8.6.1	RACH-less handover	42081	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705129		Rel-14	36.331	14.2.2	LTE_eMob-Core	2851	1	F	RP-171233										
R2-1706018	UE capabilities for feMBMS	Ericsson	Juha Korhonen	21609	CR				59	8.10	WI: eMBMS enhancements for LTE	54231	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705424		Rel-14	36.331	14.2.1	MBMS_LTE_enh2-Core	2874	1	B	RP-171221										
R2-1706022	Correction of issues related to ASN.1 review for eVoLTE	Samsung, CMCC	Juha Korhonen	21609	CR	Decision			81	8.18	WI: Voice and Video enhancement for LTE	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705496		Rel-14	36.331	14.2.1	LTE_VoLTE_ViLTE_enh TEI14	2889	1	F	RP-171235										
R2-1706037	Correction on the description of ce-srsEnhancement for FeMTC	Huawei, HiSilicon	Juha Korhonen	21609	CR	Approval			67	8.12.2	Other	54821	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705477		Rel-14	36.331	14.2.0	LTE_feMTC-Core	2882	1	F	RP-171223										
R2-1706042	Miscellaneous feMBMS corrections and clarifications resulting from ASN.1 review	Ericsson, Nokia, Alcatel-Lucent Shanghai Bell	Juha Korhonen	21609	CR				59	8.10	WI: eMBMS enhancements for LTE	54210	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705421		Rel-14	36.331	14.2.1	MBMS_LTE_enh2-Core	2873	1	F	RP-171221										
R2-1706048	Support eDECOR for NB-IoT	HTC Corporation	Juha Korhonen	21609	CR	Agreement			17	5.1	Enhancements of Dedicated Core Networks for UMTS and LTE	604800	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35			Rel-14	36.331	14.2.2	eDECOR-UTRA_LTE-Core	2706	1	F	RP-171237										
R2-1706097	Setting of FGI 107 and 108 in case of TDD-FDD CA	Qualcomm Incorporated	Juha Korhonen	21609	CR	Approval			36	7.5.1	Other	42140	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704132		Rel-13	36.331	13.5.0	TEI12	2803	1	A	RP-171242										
R2-1706098	Setting of FGI 107 and 108 in case of TDD-FDD CA	Qualcomm Incorporated	Juha Korhonen	21609	CR	Agreement			36	7.5.1	Other	609800	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35			Rel-12	36.331	12.13.0	TEI12	2957		F	RP-171242										
R2-1706099	Setting of FGI 107 and 108 in case of TDD-FDD CA	Qualcomm Incorporated	Juha Korhonen	21609	CR	Approval			36	7.5.1	Other	49332	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704133		Rel-14	36.331	14.2.2	TEI12	2804	1	A	RP-171242										
R2-1706101	ASN.1 corrections for eLWA	Intel Corporation, Qualcomm	Juha Korhonen	21609	CR	Agreement			95	8.26	Rel-14 LTE ASN.1 review	58201	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705820		Rel-14	36.331	14.2.2	LTE_WLAN_aggr-Core	2942	1	F	RP-171236										
R2-1706104	Extension of SIntraSearchP value range	Huawei, HiSilicon	Juha Korhonen	21609	CR				33	7.4.1	Other	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705889		Rel-14	36.331	14.2.2	NB_IOT-Core	2931	2	A	RP-171245										
R2-1706109	Configuration of preamble groups for CE levels and preamble groups A/B	NTT DOCOMO, Inc.	Juha Korhonen	21609	CR	Agreement			30	7.3.1	Other	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1706068	R2-1706110	Rel-13	36.331	13.5.0	LTE_MTCe2_L1-Core	2951	1	F	RP-171244										
R2-1706115	Correction to SC-MCCH and SC-MTCH configuration without delta configuration	Huawei, HiSilicon	Juha Korhonen	21609	CR	Approval			66	8.12.1	Multicast for feMTC and eNB-IoT	50142	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705924		Rel-14	36.331	14.2.1	LTE_feMTC-Core, NB_IOTenh-Core	2854	2	F	RP-171223										
R2-1706117	Corrections on reconfiguration between CE mode and normal mode in eMTC	Huawei, HiSilicon	Juha Korhonen	21609	CR	Approval			67	8.12.2	Other	55802	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705923		Rel-14	36.331	14.2.0	LTE_feMTC-Core	2885	2	F	RP-171223										
R2-1706126	Introduction of UE capability for V2X in 36.331	LG Electronics Inc.	Juha Korhonen	21609	CR				72	8.13.3	Control plane	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705855		Rel-14	36.331	14.2.2	LTE_V2X-Core	2903	2	B											
R2-1706146	LAA/WiFi sharing indication	Apple	Juha Korhonen	21609	CR				24	7.1	WI: Licensed-Assisted Access using LTE	49323	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1706095		Rel-13	36.331	13.5.0	LTE_LAA-Core	2829	3	B	RP-171243										
R2-1706147	LAA/WiFi sharing indication	Apple	Juha Korhonen	21609	CR				24	7.1	WI: Licensed-Assisted Access using LTE	49333	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1706096		Rel-14	36.331	14.2.2	LTE_LAA-Core	2830	3	A	RP-171243										
R2-1706152	Revert PDCP state variable HFN and SN back to the values used in the source cell	Qualcomm	Juha Korhonen	21609	CR				22	6.1	Other	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1706144		Rel-14	36.331	14.2.2	TEI14	2938	3	F	RP-171225										
R2-1706165	Introduction of RRC connection re-establishment for NB-IoT control plane	Qualcomm Incorporated, Huawei, HiSilicon, Gemalto N.V.	Umesh Phuyal	71775	CR	Agreement			62	8.11.1	Mobility enhancements	0	agreed	2017-05-26 10:08:53	2017-05-26 20:57:53	R2-1705906		Rel-14	36.331	14.2.2	NB_IOTenh-Core	2823	2	B	RP-171224										
R2-1706176	Extension of RSRP range for eMTC	Huawei, HiSilicon	Juha Korhonen	21609	CR	Agreement			33	7.4.1	Other	0	agreed	2017-05-26 10:09:13	2017-05-30 16:21:52	R2-1706071		Rel-13	36.331	13.5.0	LTE_MTCe2_L1-Core	2953	1	F	RP-171244										
R2-1706177	Extension of RSRP range for eMTC	Huawei, HiSilicon	Juha Korhonen	21609	CR	Agreement			33	7.4.1	Other	0	agreed	2017-05-26 10:09:15	2017-05-30 16:21:52	R2-1706072		Rel-14	36.331	14.2.2	LTE_MTCe2_L1-Core	2954	1	A	RP-171244										
R2-1706179	Miscellaneous NB-IoT corrections and clarifications resulting from ASN.1 review	Huawei	Juha Korhonen	21609	CR				63	8.11.2	Other	0	agreed	2017-05-26 10:09:16	2017-05-26 22:27:52	R2-1705900		Rel-14	36.331	14.2.2	NB_IOTenh-Core	2929	2	F	RP-171224										
R2-1706181	SC-MCCH information change notification for FeMTC and NB-IoT enhancements	Huawei, HiSilicon	Juha Korhonen	21609	CR	Approval			66	8.12.1	Multicast for feMTC and eNB-IoT	0	agreed	2017-05-26 10:09:19	2017-05-26 14:57:53	R2-1705285		Rel-14	36.331	14.2.1	LTE_feMTC-Core, NB_IOTenh-Core	2748	2	F	RP-171223										
R2-1706182	Measurement gap sharing for FeMTC intra- and inter-frequency measurement	Huawei, HiSilicon	Juha Korhonen	21609	CR	Approval			67	8.12.2	Other	0	agreed	2017-05-26 10:09:20	2017-05-26 14:57:53	R2-1705921		Rel-14	36.331	14.2.0	LTE_feMTC-Core	2883	3	B	RP-171223										
R2-1706183	Introduction of enhanced RLM reporting	Ericsson	Juha Korhonen	21609	CR	Agreement			67	8.12.2	Other	0	agreed	2017-05-26 22:01:26	2017-05-26 22:07:53	R2-1705917		Rel-14	36.331	14.2.1	LTE_feMTC-Core	2845	2	B	RP-171223										
R2-1706185	Miscellaneous general corrections and clarifications resulting from ASN.1 review	Ericsson	Juha Korhonen	21609	CR	Agreement			94	8.25.1	Other	0	agreed	2017-05-26 22:03:20	2017-05-26 22:07:53	R2-1705978		Rel-14	36.331	14.2.2	TEI14	2872	2	F	RP-171225										
R2-1706186	Miscellaneous feMTC corrections and clarifications resulting from ASN.1 review	Ericsson	Juha Korhonen	21609	CR	Agreement			67	8.12.2	Other	0	agreed	2017-05-26 22:03:22	2017-05-26 22:07:53	R2-1705915		Rel-14	36.331	14.2.1	LTE_feMTC-Core	2870	2	F	RP-171223										
R2-1706196	Configuration of preamble groups for CE levels and preamble groups A/B	NTT DOCOMO, Inc.	Juha Korhonen	21609	CR	Agreement			30	7.3.1	Other	55701	agreed	2017-06-01 22:41:39	2017-06-01 23:57:52	R2-1706069		Rel-14	36.331	14.2.2	LTE_MTCe2_L1-Core	2952	1	A	RP-171244										
R2-1706198	Corrections to per-CC measurement gap configuration	Intel Corporation, Ericsson	Juha Korhonen	21609	CR	Agreement			76	8.15.1	Other	55014	agreed	2017-06-01 22:41:41	2017-06-01 23:57:52	R2-1706137		Rel-14	36.331	14.2.2	LTE_meas_gap_enh	2759	7	F	RP-171222										
R2-1706202	Generic clarification of "first bit" as leftmost bit	Qualcomm	Juha Korhonen	21609	CR	Agreement			36	7.5.1	Other	596601	agreed	2017-06-01 22:41:46	2017-06-01 23:57:52	R2-1705969		Rel-14	36.331	14.2.2	TEI13, LTE_EBF_FDMIMO-Core	2945	1	A	RP-171245										
R2-1704436	LPP clean-up	Qualcomm Incorporated	Sven Fischer	20628	CR	Approval			93	8.25.0	In principle agreed CRs	44360	agreed	2017-05-03 17:04:38	2017-05-05 18:00:45	R2-1703823		Rel-14	36.355	14.1.0	TEI14	0176	2	F	RP-171225										
R2-1704437	Correction to NPRS	Qualcomm Incorporated	Sven Fischer	20628	CR	Approval			61	8.11.0	In principle agreed CRs	44900	agreed	2017-05-03 17:07:14	2017-05-05 18:00:45	R2-1703268		Rel-14	36.355	14.1.0	NB_IOTenh-Core	0175	1	F	RP-171224										
R2-1704438	Corrections to number of NPRS carriers and ECID measurements for NB-IoT	Qualcomm Incorporated	Sven Fischer	20628	CR	Approval			63	8.11.2	Other	50150	agreed	2017-05-03 17:09:46	2017-05-05 18:00:45			Rel-14	36.355	14.1.0	NB_IOTenh-Core	0177		F	RP-171224										
R2-1704441	Correction to PRS Subframe Offset	Qualcomm Incorporated	Sven Fischer	20628	CR	Approval			67	8.12.2	Other	44410	agreed	2017-05-03 17:19:42	2017-05-05 18:00:45	R2-1703263		Rel-14	36.355	14.1.0	LTE_feMTC-Core	0171	1	F	RP-171223										
R2-1704443	Correction to SFN time stamp in OTDOA Signal Measurement Information	Qualcomm Incorporated	Sven Fischer	20628	CR	Approval			67	8.12.2	Other	44420	agreed	2017-05-03 17:22:46	2017-05-05 18:00:45	R2-1703266		Rel-14	36.355	14.1.0	LTE_feMTC-Core	0173	1	F	RP-171223										
R2-1704444	Correction to OTDOA capabilities	Qualcomm Incorporated	Sven Fischer	20628	CR	Approval			67	8.12.2	Other	49940	agreed	2017-05-03 17:24:21	2017-05-05 18:00:45	R2-1703267		Rel-14	36.355	14.1.0	LTE_feMTC-Core	0174	1	F	RP-171223										

R2-1705912	Signalling optimisation for NB-IoT Enhancements	Huawei, HiSilicon	Juha Korhonen	21609	CR	Approval			63	8.11.2	Other	45101	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705293		Rel-14	36.355	14.1.0	NB_IOTenh-Core	0181	1	F	RP-171224							
R2-1705914	Removal of FFS for retransmission timer in LPP	Qualcomm Incorporated	Juha Korhonen	21609	CR	Approval			63	8.11.2	Other	50161	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1704439		Rel-14	36.355	14.1.0	NB_IOTenh-Core	0178	1	F	RP-171224							
R2-1706166	Compact Signal Measurement Information for OTDOA	Ericsson	Juha Korhonen	21609	CR				63	8.11.2	Other	0	agreed	2017-05-13 11:40:35	2017-05-13 11:40:35	R2-1705911		Rel-14	36.355	14.1.0	NB_IOTenh-Core	0169	3	F	RP-171224							
R2-1705695	Clarification on LWIP aggregation	HTC	Juha Korhonen	21609	CR				94	8.25.1	Other	56410	agreed	2017-05-07 23:03:53	2017-05-07 23:07:53			Rel-14	36.361	14.0.0	TEI14	0006		F	RP-171225							

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Appendix 23

www.3gpp.org / ftp / tsg_ran / WG2_RL2 / TSGR2_98 / Docs

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R2-1704141.zip	2017/05/06 9:36	27,7 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1704142.zip	2017/05/06 9:36	25,3 KB
R2-1704143.zip	2017/05/06 9:36	24,8 KB
R2-1704144.zip	2017/05/06 9:36	60,7 KB
R2-1704145.zip	2017/05/05 20:53	76,2 KB
R2-1704146.zip	2017/05/05 20:53	44 KB
R2-1704147.zip	2017/05/05 20:53	102 KB
R2-1704148.zip	2017/05/05 20:43	87,1 KB
R2-1704149.zip	2017/05/05 20:43	52,3 KB
R2-1704150.zip	2017/05/05 20:44	78 KB
R2-1704151.zip	2017/05/05 20:54	43,1 KB
R2-1704152.zip	2017/05/06 6:46	300 KB
R2-1704153.zip	2017/05/06 5:47	46,1 KB
R2-1704154.zip	2017/05/06 5:47	44,6 KB
R2-1704155.zip	2017/05/06 5:47	64,2 KB
R2-1704156.zip	2017/05/06 5:47	342,4 KB
R2-1704157.zip	2017/05/04 5:37	100,4 KB
R2-1704158.zip	2017/05/04 5:37	168,1 KB
R2-1704159.zip	2017/05/04 5:37	106,8 KB
R2-1704160.zip	2017/05/04 5:37	228,8 KB
R2-1704161.zip	2017/05/04 5:37	394 KB
R2-1704162.zip	2017/05/04 5:37	14,5 KB
R2-1704163.zip	2017/05/06 8:05	43,1 KB
R2-1704164.zip	2017/05/06 8:05	22,6 KB
R2-1704165.zip	2017/05/05 14:55	43,4 KB
R2-1704166.zip	2017/05/05 19:33	28,1 KB
R2-1704167.zip	2017/05/05 20:23	41,3 KB
R2-1704168.zip	2017/05/05 19:33	36,3 KB
R2-1704170.zip	2017/05/05 19:33	14 KB
R2-1704171.zip	2017/05/05 19:33	43,8 KB
R2-1704172.zip	2017/05/05 20:23	116,3 KB
R2-1704173.zip	2017/05/05 20:23	46,6 KB
R2-1704174.zip	2017/05/05 20:23	154,5 KB
R2-1704175.zip	2017/05/05 20:23	42,3 KB
R2-1704176.zip	2017/05/05 20:23	117,2 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1704177.zip	2017/05/05 20:23	39,5 KB
R2-1704178.zip	2017/05/05 20:23	174,8 KB
R2-1704179.zip	2017/05/04 11:09	93,9 KB
R2-1704180.zip	2017/05/02 14:16	26 KB
R2-1704181.zip	2017/05/02 14:16	28 KB
R2-1704182.zip	2017/05/02 14:16	31,9 KB
R2-1704183.zip	2017/05/02 14:16	23,1 KB
R2-1704184.zip	2017/05/05 6:07	201,9 KB
R2-1704185.zip	2017/05/02 14:16	35,6 KB
R2-1704186.zip	2017/05/02 14:16	30,8 KB
R2-1704187.zip	2017/05/02 14:16	35,2 KB
R2-1704188.zip	2017/05/02 14:16	30,9 KB
R2-1704189.zip	2017/05/06 6:46	28,5 KB
R2-1704190.zip	2017/05/06 6:46	49,1 KB
R2-1704191.zip	2017/05/06 6:46	12,8 KB
R2-1704192.zip	2017/05/06 6:46	453,4 KB
R2-1704193.zip	2017/05/05 18:18	0 KB
R2-1704194.zip	2017/05/05 13:11	65,2 KB
R2-1704195.zip	2017/05/05 17:22	79 KB
R2-1704196.zip	2017/05/05 17:22	24,1 KB
R2-1704197.zip	2017/05/05 17:22	32,2 KB
R2-1704198.zip	2017/05/05 17:22	36,3 KB
R2-1704199.zip	2017/05/05 17:22	30,3 KB
R2-1704200.zip	2017/05/05 17:22	35,8 KB
R2-1704201.zip	2017/05/05 17:22	35,1 KB
R2-1704202.zip	2017/05/05 17:22	35,9 KB
R2-1704203.zip	2017/05/05 17:22	35,2 KB
R2-1704204.zip	2017/05/05 17:22	35,1 KB
R2-1704205.zip	2017/05/05 17:22	136,1 KB
R2-1704206.zip	2017/05/05 17:22	127 KB
R2-1704207.zip	2017/05/05 17:22	31,9 KB
R2-1704209.zip	2017/05/05 17:22	30,4 KB
R2-1704211.zip	2017/05/05 17:22	29,6 KB
R2-1704212.zip	2017/05/05 17:22	28,3 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1704213.zip	2017/05/15 8:16	31,8 KB
R2-1704214.zip	2017/05/04 10:01	12,1 KB
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R2-1704216.zip	2017/05/02 14:21	13 KB
R2-1704217.zip	2017/05/06 10:04	360,3 KB
R2-1704218.zip	2017/05/06 10:04	42,8 KB
R2-1704219.zip	2017/05/06 10:04	36,9 KB
R2-1704220.zip	2017/05/06 10:04	33,8 KB
R2-1704221.zip	2017/05/06 10:04	39,9 KB
R2-1704222.zip	2017/05/06 10:04	95,9 KB
R2-1704223.zip	2017/05/06 10:04	180,2 KB
R2-1704224.zip	2017/05/06 10:04	38,3 KB
R2-1704225.zip	2017/05/06 10:04	68,8 KB
R2-1704226.zip	2017/05/06 10:04	75,4 KB
R2-1704227.zip	2017/05/06 10:04	35 KB
R2-1704228.zip	2017/05/06 10:04	194,1 KB
R2-1704229.zip	2017/05/06 10:04	49,5 KB
R2-1704230.zip	2017/05/06 10:04	85,5 KB
R2-1704231.zip	2017/05/06 10:04	50,9 KB
R2-1704232.zip	2017/05/06 10:04	39,4 KB
R2-1704233.zip	2017/05/06 10:04	35,7 KB
R2-1704234.zip	2017/05/06 10:04	168,5 KB
R2-1704235.zip	2017/05/06 10:04	38 KB
R2-1704236.zip	2017/05/06 10:04	104,2 KB
R2-1704237.zip	2017/05/06 10:04	171,1 KB
R2-1704238.zip	2017/05/06 10:04	49,9 KB
R2-1704239.zip	2017/05/06 10:04	83,4 KB
R2-1704240.zip	2017/05/06 10:04	67,6 KB
R2-1704241.zip	2017/05/06 10:04	31,7 KB
R2-1704242.zip	2017/05/06 10:04	40,5 KB
R2-1704243.zip	2017/05/06 10:04	33,9 KB
R2-1704244.zip	2017/05/06 10:04	41,3 KB
R2-1704245.zip	2017/05/06 10:04	43,2 KB
R2-1704246.zip	2017/05/06 10:04	192,5 KB

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R2-1704250.zip	2017/05/06 10:04	28,1 KB
R2-1704251.zip	2017/05/06 10:04	108 KB
R2-1704252.zip	2017/05/06 10:04	215,2 KB
R2-1704253.zip	2017/05/06 10:04	48,9 KB
R2-1704254.zip	2017/05/06 10:04	94 KB
R2-1704255.zip	2017/05/06 10:04	148,1 KB
R2-1704256.zip	2017/05/06 10:04	65,3 KB
R2-1704257.zip	2017/05/06 10:04	41,6 KB
R2-1704258.zip	2017/05/06 10:04	38 KB
R2-1704259.zip	2017/05/06 10:04	83,1 KB
R2-1704260.zip	2017/05/06 10:04	299,6 KB
R2-1704261.zip	2017/05/06 10:04	104,7 KB
R2-1704262.zip	2017/05/06 10:04	45,9 KB
R2-1704263.zip	2017/05/06 10:04	153,5 KB
R2-1704264.zip	2017/05/06 10:04	112,5 KB
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R2-1704266.zip	2017/05/06 10:05	75,1 KB
R2-1704267.zip	2017/05/06 10:05	60 KB
R2-1704268.zip	2017/05/06 10:05	10 KB
R2-1704269.zip	2017/05/04 9:44	24 KB
R2-1704270.zip	2017/05/04 9:44	35 KB
R2-1704271.zip	2017/05/04 9:44	23,7 KB
R2-1704272.zip	2017/05/04 9:44	20,4 KB
R2-1704273.zip	2017/05/04 9:44	17,2 KB
R2-1704274.zip	2017/05/04 9:44	17,2 KB
R2-1704275.zip	2017/05/04 9:44	18,4 KB
R2-1704276.zip	2017/05/04 9:44	24,1 KB
R2-1704277.zip	2017/05/04 9:44	18 KB
R2-1704278.zip	2017/05/04 9:44	46,8 KB
R2-1704279.zip	2017/05/04 9:44	26,4 KB
R2-1704280.zip	2017/05/04 9:44	16,8 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1704283.zip	2017/05/05 6:51	402,1 KB
R2-1704284.zip	2017/05/06 9:55	42,5 KB
R2-1704285.zip	2017/05/06 9:55	24,6 KB
R2-1704286.zip	2017/05/06 9:55	31,4 KB
R2-1704287.zip	2017/05/06 9:55	38,9 KB
R2-1704288.zip	2017/05/06 9:55	22,1 KB
R2-1704289.zip	2017/05/06 9:55	25,5 KB
R2-1704290.zip	2017/05/06 9:55	362 KB
R2-1704292.zip	2017/05/06 9:55	28 KB
R2-1704293.zip	2017/05/06 9:55	17,5 KB
R2-1704294.zip	2017/05/06 9:55	36,8 KB
R2-1704295.zip	2017/05/06 9:55	130,7 KB
R2-1704296.zip	2017/05/03 17:03	2900,8 KB
R2-1704297.zip	2017/05/05 20:42	35,5 KB
R2-1704298.zip	2017/05/03 17:00	3255 KB
R2-1704299.zip	2017/05/05 20:42	28,3 KB
R2-1704300.zip	2017/05/05 20:42	25,3 KB
R2-1704301.zip	2017/05/04 11:09	371,3 KB
R2-1704302.zip	2017/05/05 14:56	27,7 KB
R2-1704303.zip	2017/05/05 14:56	65,5 KB
R2-1704304.zip	2017/05/05 14:56	28,1 KB
R2-1704305.zip	2017/05/05 9:22	18,7 KB
R2-1704306.zip	2017/05/05 9:22	58,9 KB
R2-1704307.zip	2017/05/05 9:22	16,8 KB
R2-1704308.zip	2017/05/05 9:22	133,8 KB
R2-1704309.zip	2017/05/05 18:02	34,2 KB
R2-1704310.zip	2017/05/05 18:02	79,7 KB
R2-1704311.zip	2017/05/05 18:03	54,4 KB
R2-1704312.zip	2017/05/04 9:31	142 KB
R2-1704313.zip	2017/05/06 9:55	33,3 KB
R2-1704314.zip	2017/05/05 10:42	49,9 KB
R2-1704315.zip	2017/05/06 6:46	29,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1704316.zip	2017/05/06 9:28	60,8 KB
R2-1704317.zip	2017/05/06 9:28	57,7 KB
R2-1704318.zip	2017/05/06 9:28	27,5 KB
R2-1704319.zip	2017/05/06 9:28	487,7 KB
R2-1704320.zip	2017/05/05 17:43	51,4 KB
R2-1704321.zip	2017/05/05 17:43	80,8 KB
R2-1704322.zip	2017/05/05 17:43	33,4 KB
R2-1704323.zip	2017/05/09 13:09	27,2 KB
R2-1704324.zip	2017/05/05 17:43	34,8 KB
R2-1704325.zip	2017/05/05 17:44	196,5 KB
R2-1704326.zip	2017/05/05 17:44	27 KB
R2-1704327.zip	2017/05/05 17:44	28 KB
R2-1704328.zip	2017/05/05 17:44	29,1 KB
R2-1704329.zip	2017/05/05 17:44	77,1 KB
R2-1704330.zip	2017/05/05 17:44	53,1 KB
R2-1704331.zip	2017/05/05 17:44	45,6 KB
R2-1704332.zip	2017/05/06 9:28	33,9 KB
R2-1704333.zip	2017/05/06 9:28	500,4 KB
R2-1704334.zip	2017/05/06 9:28	97,1 KB
R2-1704335.zip	2017/05/06 9:28	28,9 KB
R2-1704336.zip	2017/05/03 12:57	132,4 KB
R2-1704337.zip	2017/05/03 12:56	93,3 KB
R2-1704338.zip	2017/05/03 12:56	46,5 KB
R2-1704339.zip	2017/05/03 12:56	219,3 KB
R2-1704340.zip	2017/05/03 12:56	46 KB
R2-1704341.zip	2017/05/03 12:56	47,3 KB
R2-1704342.zip	2017/05/03 12:56	44,5 KB
R2-1704343.zip	2017/05/03 12:56	211,5 KB
R2-1704344.zip	2017/05/05 19:29	73,3 KB
R2-1704345.zip	2017/05/05 19:29	413,2 KB
R2-1704346.zip	2017/05/05 19:29	54,6 KB
R2-1704347.zip	2017/05/05 19:29	24,6 KB
R2-1704348.zip	2017/05/05 19:29	22,6 KB
R2-1704349.zip	2017/05/05 19:29	45,2 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1704351.zip	2017/05/05 19:29	31,1 KB
R2-1704352.zip	2017/05/05 19:29	135,5 KB
R2-1704353.zip	2017/05/06 21:27	39,6 KB
R2-1704354.zip	2017/05/06 21:27	38 KB
R2-1704355.zip	2017/05/06 21:27	42,2 KB
R2-1704356.zip	2017/05/06 21:27	77,9 KB
R2-1704357.zip	2017/05/06 21:27	43,9 KB
R2-1704358.zip	2017/05/06 21:27	72,9 KB
R2-1704359.zip	2017/05/06 21:27	78,6 KB
R2-1704360.zip	2017/05/06 21:27	39,4 KB
R2-1704361.zip	2017/05/06 21:27	48 KB
R2-1704362.zip	2017/05/06 21:27	41,4 KB
R2-1704363.zip	2017/05/06 19:44	90 KB
R2-1704364.zip	2017/05/06 19:44	28,6 KB
R2-1704365.zip	2017/05/06 19:44	69,5 KB
R2-1704366.zip	2017/05/06 19:44	141,6 KB
R2-1704367.zip	2017/05/06 19:44	39,2 KB
R2-1704368.zip	2017/05/06 19:44	60,4 KB
R2-1704369.zip	2017/05/06 19:44	85 KB
R2-1704370.zip	2017/05/06 19:44	194,5 KB
R2-1704371.zip	2017/05/06 19:44	39,1 KB
R2-1704372.zip	2017/05/06 19:44	38,9 KB
R2-1704373.zip	2017/05/06 19:44	106,7 KB
R2-1704374.zip	2017/05/06 19:44	36,2 KB
R2-1704375.zip	2017/05/06 19:44	46,4 KB
R2-1704376.zip	2017/05/06 19:44	51 KB
R2-1704377.zip	2017/05/15 8:16	24,9 KB
R2-1704378.zip	2017/05/06 19:44	60,7 KB
R2-1704379.zip	2017/05/06 19:44	56,2 KB
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R2-1704382.zip	2017/05/06 19:44	36,8 KB
R2-1704383.zip	2017/05/06 19:44	41 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1704386.zip	2017/05/06 21:27	61,3 KB
R2-1704387.zip	2017/05/06 21:27	55 KB
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R2-1704389.zip	2017/05/06 21:27	104,4 KB
R2-1704390.zip	2017/05/06 21:27	36,3 KB
R2-1704391.zip	2017/05/06 21:27	40 KB
R2-1704392.zip	2017/05/06 21:27	39,7 KB
R2-1704393.zip	2017/05/06 19:19	39,3 KB
R2-1704394.zip	2017/05/06 19:19	74,3 KB
R2-1704395.zip	2017/05/06 19:19	109,2 KB
R2-1704396.zip	2017/05/06 19:19	36,7 KB
R2-1704397.zip	2017/05/06 19:19	36,1 KB
R2-1704398.zip	2017/05/06 19:19	36,2 KB
R2-1704399.zip	2017/05/06 19:19	42,9 KB
R2-1704400.zip	2017/05/06 19:19	60,7 KB
R2-1704401.zip	2017/05/06 19:19	65,8 KB
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R2-1704404.zip	2017/05/06 19:19	33,3 KB
R2-1704405.zip	2017/05/06 19:19	32,6 KB
R2-1704406.zip	2017/05/06 19:19	44,2 KB
R2-1704407.zip	2017/05/06 19:19	51,7 KB
R2-1704408.zip	2017/05/06 19:19	84,9 KB
R2-1704409.zip	2017/05/06 19:19	32 KB
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R2-1704411.zip	2017/05/06 19:16	32,9 KB
R2-1704412.zip	2017/05/06 19:16	110,7 KB
R2-1704413.zip	2017/05/06 19:16	121,4 KB
R2-1704414.zip	2017/05/06 8:57	38 KB
R2-1704415.zip	2017/05/06 8:57	84,9 KB
R2-1704416.zip	2017/05/06 8:57	33,6 KB
R2-1704417.zip	2017/05/06 8:57	62,2 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1704422.zip	2017/05/06 8:57	126,7 KB
R2-1704423.zip	2017/05/06 8:57	37,2 KB
R2-1704424.zip	2017/05/06 8:57	49,1 KB
R2-1704425.zip	2017/05/06 8:57	66 KB
R2-1704426.zip	2017/05/06 8:57	91,3 KB
R2-1704427.zip	2017/05/06 8:57	38,6 KB
R2-1704428.zip	2017/05/06 8:57	90,6 KB
R2-1704429.zip	2017/05/06 8:57	102,6 KB
R2-1704430.zip	2017/05/06 8:57	54,2 KB
R2-1704431.zip	2017/05/06 8:57	42,3 KB
R2-1704432.zip	2017/05/06 8:57	34,3 KB
R2-1704433.zip	2017/05/06 8:57	58,1 KB
R2-1704434.zip	2017/05/06 8:57	144,1 KB
R2-1704435.zip	2017/05/06 8:57	142,3 KB
R2-1704436.zip	2017/05/05 17:59	87,3 KB
R2-1704437.zip	2017/05/05 17:59	51,2 KB
R2-1704438.zip	2017/05/05 17:59	56,6 KB
R2-1704439.zip	2017/05/05 17:59	21,3 KB
R2-1704440.zip	2017/05/05 18:00	44,2 KB
R2-1704441.zip	2017/05/05 18:00	46,4 KB
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R2-1704445.zip	2017/05/06 8:14	403,7 KB
R2-1704446.zip	2017/05/06 8:14	22,1 KB
R2-1704447.zip	2017/05/06 8:14	27,1 KB
R2-1704448.zip	2017/05/06 8:14	35,3 KB
R2-1704449.zip	2017/05/06 8:14	36 KB
R2-1704450.zip	2017/05/06 8:14	33,6 KB
R2-1704451.zip	2017/05/06 8:14	38 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1704455.zip	2017/05/04 7:27	29,7 KB
R2-1704456.zip	2017/05/04 7:27	28 KB
R2-1704457.zip	2017/05/04 7:27	37,4 KB
R2-1704458.zip	2017/05/04 7:27	30,6 KB
R2-1704459.zip	2017/05/04 7:28	12,5 KB
R2-1704460.zip	2017/05/04 7:28	29,6 KB
R2-1704461.zip	2017/05/04 7:28	12,1 KB
R2-1704462.zip	2017/05/06 10:31	32,4 KB
R2-1704463.zip	2017/05/04 8:08	32 KB
R2-1704464.zip	2017/05/04 8:13	29,8 KB
R2-1704465.zip	2017/05/04 8:13	29,1 KB
R2-1704466.zip	2017/05/04 8:13	33,1 KB
R2-1704467.zip	2017/05/04 8:13	68,5 KB
R2-1704468.zip	2017/05/06 10:32	31,5 KB
R2-1704469.zip	2017/05/04 8:15	128,8 KB
R2-1704470.zip	2017/05/04 8:15	61,4 KB
R2-1704471.zip	2017/05/04 8:15	43,2 KB
R2-1704472.zip	2017/05/04 8:15	37 KB
R2-1704473.zip	2017/05/04 8:15	80,4 KB
R2-1704474.zip	2017/05/04 8:15	40,5 KB
R2-1704475.zip	2017/05/04 10:43	482,6 KB
R2-1704476.zip	2017/05/04 10:43	13,7 KB
R2-1704477.zip	2017/05/04 10:43	18,3 KB
R2-1704478.zip	2017/05/04 10:43	27,9 KB
R2-1704479.zip	2017/05/04 10:43	26,3 KB
R2-1704480.zip	2017/05/04 10:43	14,2 KB
R2-1704481.zip	2017/05/04 10:43	25,2 KB
R2-1704482.zip	2017/05/04 10:43	26 KB
R2-1704483.zip	2017/05/04 10:43	9,7 KB
R2-1704484.zip	2017/05/04 10:43	46,5 KB
R2-1704485.zip	2017/05/04 10:43	51 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1704486.zip	2017/05/06 20:44	21,5 KB
R2-1704487.zip	2017/05/06 20:44	192,9 KB
R2-1704488.zip	2017/05/06 20:44	128,7 KB
R2-1704489.zip	2017/05/04 5:38	20 KB
R2-1704490.zip	2017/05/04 5:38	20,5 KB
R2-1704491.zip	2017/05/06 20:45	40,6 KB
R2-1704492.zip	2017/05/04 5:38	34,7 KB
R2-1704493.zip	2017/05/04 5:39	36,9 KB
R2-1704494.zip	2017/05/05 5:00	118,5 KB
R2-1704495.zip	2017/05/07 6:55	102,7 KB
R2-1704496.zip	2017/05/04 5:39	30,3 KB
R2-1704497.zip	2017/05/07 6:55	18,6 KB
R2-1704498.zip	2017/05/04 5:39	18 KB
R2-1704499.zip	2017/05/04 5:39	22 KB
R2-1704500.zip	2017/05/04 12:32	54,6 KB
R2-1704501.zip	2017/05/04 12:32	169,2 KB
R2-1704502.zip	2017/05/04 12:32	55,5 KB
R2-1704503.zip	2017/05/04 12:32	152,6 KB
R2-1704504.zip	2017/05/04 12:32	79,7 KB
R2-1704505.zip	2017/05/04 12:32	181,5 KB
R2-1704506.zip	2017/05/04 12:32	183,2 KB
R2-1704507.zip	2017/05/04 12:32	59,5 KB
R2-1704508.zip	2017/05/04 12:32	76,9 KB
R2-1704509.zip	2017/05/04 12:32	106,8 KB
R2-1704510.zip	2017/05/06 8:52	36,1 KB
R2-1704511.zip	2017/05/06 8:52	30,7 KB
R2-1704512.zip	2017/05/06 8:52	225,3 KB
R2-1704513.zip	2017/05/06 8:52	91,2 KB
R2-1704514.zip	2017/05/06 8:52	33,3 KB
R2-1704515.zip	2017/05/06 8:52	34,1 KB
R2-1704516.zip	2017/05/06 8:52	167 KB
R2-1704517.zip	2017/05/06 8:52	33,3 KB
R2-1704518.zip	2017/05/06 8:52	32,5 KB
R2-1704519.zip	2017/05/04 8:18	75,8 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1704520.zip	2017/05/04 8:18	26,9 KB
R2-1704521.zip	2017/05/04 8:18	28,8 KB
R2-1704522.zip	2017/05/04 8:18	24,4 KB
R2-1704523.zip	2017/05/05 10:32	91,4 KB
R2-1704524.zip	2017/05/05 11:22	413,4 KB
R2-1704525.zip	2017/05/05 10:32	99,3 KB
R2-1704526.zip	2017/05/05 11:22	412 KB
R2-1704527.zip	2017/05/05 11:22	186 KB
R2-1704528.zip	2017/05/05 11:22	43,5 KB
R2-1704529.zip	2017/05/05 10:32	462,5 KB
R2-1704530.zip	2017/05/05 11:22	50,3 KB
R2-1704531.zip	2017/05/05 11:22	829,3 KB
R2-1704532.zip	2017/05/05 10:32	230,6 KB
R2-1704533.zip	2017/05/05 10:32	228,1 KB
R2-1704534.zip	2017/05/05 10:32	22,7 KB
R2-1704535.zip	2017/05/05 10:32	22,3 KB
R2-1704536.zip	2017/05/04 7:00	42,8 KB
R2-1704537.zip	2017/05/04 7:17	101,1 KB
R2-1704538.zip	2017/05/04 7:27	30,1 KB
R2-1704539.zip	2017/05/04 8:40	38,2 KB
R2-1704540.zip	2017/05/05 16:25	38,4 KB
R2-1704541.zip	2017/05/04 8:40	39,6 KB
R2-1704542.zip	2017/05/04 8:40	34,9 KB
R2-1704543.zip	2017/05/04 8:40	163,7 KB
R2-1704544.zip	2017/05/06 22:28	115,6 KB
R2-1704545.zip	2017/05/04 8:40	39,6 KB
R2-1704546.zip	2017/05/04 8:40	35,5 KB
R2-1704547.zip	2017/05/04 8:40	175,1 KB
R2-1704548.zip	2017/05/04 8:48	72,5 KB
R2-1704549.zip	2017/05/05 19:48	146,9 KB
R2-1704550.zip	2017/05/05 19:48	72,7 KB
R2-1704551.zip	2017/05/06 6:42	31,2 KB
R2-1704552.zip	2017/05/04 9:08	200,5 KB
R2-1704553.zip	2017/05/06 6:42	178,7 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1704554.zip	2017/05/05 17:59	205,9 KB
R2-1704555.zip	2017/05/04 9:16	43,4 KB
R2-1704556.zip	2017/05/04 9:25	31,9 KB
R2-1704557.zip	2017/05/06 6:41	20,8 KB
R2-1704558.zip	2017/05/06 6:41	28,9 KB
R2-1704559.zip	2017/05/06 6:41	21,4 KB
R2-1704560.zip	2017/05/06 6:41	39 KB
R2-1704561.zip	2017/05/04 14:10	27,6 KB
R2-1704562.zip	2017/05/06 6:41	23,1 KB
R2-1704563.zip	2017/05/05 9:22	16,7 KB
R2-1704564.zip	2017/05/06 6:41	25,3 KB
R2-1704565.zip	2017/05/06 6:41	25,6 KB
R2-1704566.zip	2017/05/05 9:22	18 KB
R2-1704567.zip	2017/05/06 10:05	44 KB
R2-1704568.zip	2017/05/06 10:05	39,8 KB
R2-1704569.zip	2017/05/06 10:05	74,1 KB
R2-1704570.zip	2017/05/06 5:42	51,6 KB
R2-1704571.zip	2017/05/05 9:22	16,7 KB
R2-1704572.zip	2017/05/04 13:33	51,4 KB
R2-1704573.zip	2017/05/04 13:33	48,2 KB
R2-1704574.zip	2017/05/06 7:20	94,4 KB
R2-1704575.zip	2017/05/06 7:20	72,1 KB
R2-1704576.zip	2017/05/06 7:20	45,3 KB
R2-1704577.zip	2017/05/06 7:20	104 KB
R2-1704578.zip	2017/05/06 7:20	60,1 KB
R2-1704579.zip	2017/05/06 7:20	137,6 KB
R2-1704580.zip	2017/05/06 7:20	48,3 KB
R2-1704581.zip	2017/05/06 7:20	51,4 KB
R2-1704582.zip	2017/05/06 7:20	91,9 KB
R2-1704583.zip	2017/05/06 7:20	48,1 KB
R2-1704584.zip	2017/05/06 7:20	72,2 KB
R2-1704585.zip	2017/05/06 7:20	105,4 KB
R2-1704586.zip	2017/05/06 7:20	42,4 KB
R2-1704587.zip	2017/05/06 7:20	40,5 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1704588.zip	2017/05/06 7:20	92,4 KB
R2-1704589.zip	2017/05/06 7:20	61,6 KB
R2-1704590.zip	2017/05/06 7:21	172,1 KB
R2-1704591.zip	2017/05/06 7:21	469,5 KB
R2-1704592.zip	2017/05/06 7:21	72,5 KB
R2-1704593.zip	2017/05/06 7:21	51,4 KB
R2-1704594.zip	2017/05/06 7:21	94,2 KB
R2-1704595.zip	2017/05/06 7:21	184,6 KB
R2-1704596.zip	2017/05/06 7:21	126 KB
R2-1704597.zip	2017/05/06 7:21	17,1 KB
R2-1704598.zip	2017/05/06 12:14	32,8 KB
R2-1704599.zip	2017/05/06 12:14	32,7 KB
R2-1704600.zip	2017/05/05 16:36	67,7 KB
R2-1704601.zip	2017/05/06 12:14	24,3 KB
R2-1704603.zip	2017/05/05 16:36	47,7 KB
R2-1704604.zip	2017/05/06 7:25	45,6 KB
R2-1704605.zip	2017/05/06 7:31	22,8 KB
R2-1704606.zip	2017/05/06 7:31	165,9 KB
R2-1704607.zip	2017/05/06 7:31	87,4 KB
R2-1704608.zip	2017/05/06 7:31	148,7 KB
R2-1704609.zip	2017/05/06 7:31	15,9 KB
R2-1704610.zip	2017/05/06 7:31	149,7 KB
R2-1704611.zip	2017/05/06 7:31	170,7 KB
R2-1704612.zip	2017/05/06 7:31	406,6 KB
R2-1704613.zip	2017/05/06 7:31	68,2 KB
R2-1704614.zip	2017/05/06 7:31	46,4 KB
R2-1704615.zip	2017/05/06 7:31	49,3 KB
R2-1704616.zip	2017/05/06 7:31	39,2 KB
R2-1704617.zip	2017/05/06 7:31	40,4 KB
R2-1704618.zip	2017/05/06 7:32	40,8 KB
R2-1704619.zip	2017/05/06 7:32	39,3 KB
R2-1704620.zip	2017/05/05 16:36	41,3 KB
R2-1704623.zip	2017/05/06 12:14	23,6 KB
R2-1704624.zip	2017/05/06 12:14	82,5 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1704625.zip	2017/05/06 12:14	97,2 KB
R2-1704626.zip	2017/05/05 16:36	41,9 KB
R2-1704627.zip	2017/05/05 16:36	88,7 KB
R2-1704628.zip	2017/05/05 16:36	29,6 KB
R2-1704629.zip	2017/05/05 16:36	38,8 KB
R2-1704630.zip	2017/05/05 16:36	101,5 KB
R2-1704631.zip	2017/05/05 16:36	197,5 KB
R2-1704632.zip	2017/05/05 16:36	206,1 KB
R2-1704633.zip	2017/05/06 12:14	81,3 KB
R2-1704634.zip	2017/05/05 16:36	110,8 KB
R2-1704635.zip	2017/05/05 16:36	294,3 KB
R2-1704636.zip	2017/05/05 16:36	178,4 KB
R2-1704637.zip	2017/05/05 16:36	67,4 KB
R2-1704638.zip	2017/05/05 16:36	90,5 KB
R2-1704639.zip	2017/05/05 17:11	259,7 KB
R2-1704640.zip	2017/05/05 17:11	35,4 KB
R2-1704641.zip	2017/05/05 17:11	38,2 KB
R2-1704642.zip	2017/05/05 17:11	32,7 KB
R2-1704643.zip	2017/05/05 17:11	68,6 KB
R2-1704644.zip	2017/05/05 17:11	60,9 KB
R2-1704645.zip	2017/05/05 17:11	39,6 KB
R2-1704646.zip	2017/05/05 17:11	84,9 KB
R2-1704647.zip	2017/05/05 17:11	35,4 KB
R2-1704648.zip	2017/05/05 17:11	46,2 KB
R2-1704649.zip	2017/05/05 17:11	167,5 KB
R2-1704650.zip	2017/05/05 17:12	55,3 KB
R2-1704651.zip	2017/05/05 17:12	99,6 KB
R2-1704652.zip	2017/05/06 10:11	85,3 KB
R2-1704653.zip	2017/05/06 10:11	129,2 KB
R2-1704654.zip	2017/05/05 17:12	188,7 KB
R2-1704655.zip	2017/05/05 17:12	74,6 KB
R2-1704656.zip	2017/05/05 17:12	52,1 KB
R2-1704657.zip	2017/05/05 17:12	89,2 KB
R2-1704658.zip	2017/05/07 3:07	57,1 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1704659.zip	2017/05/07 3:07	456 KB
R2-1704660.zip	2017/05/05 17:12	51,6 KB
R2-1704661.zip	2017/05/06 10:11	52,2 KB
R2-1704662.zip	2017/05/05 17:12	45,9 KB
R2-1704663.zip	2017/05/05 17:12	104 KB
R2-1704664.zip	2017/05/05 17:12	51,6 KB
R2-1704665.zip	2017/05/05 17:12	50,1 KB
R2-1704666.zip	2017/05/05 17:12	160,5 KB
R2-1704667.zip	2017/05/05 17:12	168,2 KB
R2-1704668.zip	2017/05/05 17:12	92,5 KB
R2-1704669.zip	2017/05/05 17:12	88,8 KB
R2-1704670.zip	2017/05/05 17:12	55,3 KB
R2-1704671.zip	2017/05/05 17:13	106,8 KB
R2-1704672.zip	2017/05/05 17:13	90 KB
R2-1704673.zip	2017/05/05 17:13	34 KB
R2-1704674.zip	2017/05/05 17:13	32,6 KB
R2-1704675.zip	2017/05/05 17:13	179,6 KB
R2-1704676.zip	2017/05/05 17:13	78,7 KB
R2-1704677.zip	2017/05/05 17:13	59,6 KB
R2-1704678.zip	2017/05/05 17:13	29,8 KB
R2-1704679.zip	2017/05/05 17:13	29,6 KB
R2-1704680.zip	2017/05/05 17:13	30,4 KB
R2-1704681.zip	2017/05/06 19:44	42,6 KB
R2-1704683.zip	2017/05/06 19:18	46,8 KB
R2-1704684.zip	2017/05/06 19:17	42,9 KB
R2-1704685.zip	2017/05/06 8:09	90,6 KB
R2-1704686.zip	2017/05/06 8:09	47 KB
R2-1704687.zip	2017/05/06 8:09	39,6 KB
R2-1704688.zip	2017/05/06 8:09	130,5 KB
R2-1704689.zip	2017/05/06 8:09	37,6 KB
R2-1704690.zip	2017/05/06 8:09	41,5 KB
R2-1704691.zip	2017/05/04 13:41	94,4 KB
R2-1704692.zip	2017/05/04 13:41	36,8 KB
R2-1704693.zip	2017/05/04 13:41	82,7 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1704694.zip	2017/05/04 13:41	135,8 KB
R2-1704695.zip	2017/05/04 13:41	36,4 KB
R2-1704696.zip	2017/05/04 13:41	27 KB
R2-1704697.zip	2017/05/05 18:40	1062,4 KB
R2-1704698.zip	2017/05/05 17:13	94,3 KB
R2-1704699.zip	2017/05/05 17:13	98,3 KB
R2-1704700.zip	2017/05/04 14:47	19,6 KB
R2-1704701.zip	2017/05/04 14:47	19,2 KB
R2-1704702.zip	2017/05/06 8:31	375,8 KB
R2-1704703.zip	2017/05/06 8:31	38,4 KB
R2-1704704.zip	2017/05/06 8:31	44,2 KB
R2-1704705.zip	2017/05/04 14:47	16,7 KB
R2-1704706.zip	2017/05/04 14:47	17,3 KB
R2-1704707.zip	2017/05/05 21:01	24 KB
R2-1704708.zip	2017/05/04 14:47	77,9 KB
R2-1704709.zip	2017/05/05 21:01	310,8 KB
R2-1704710.zip	2017/05/05 15:18	27,1 KB
R2-1704711.zip	2017/05/05 15:18	63,9 KB
R2-1704712.zip	2017/05/05 15:18	31,6 KB
R2-1704713.zip	2017/05/05 20:23	37,3 KB
R2-1704714.zip	2017/05/06 7:00	117,5 KB
R2-1704715.zip	2017/05/05 15:19	268,2 KB
R2-1704716.zip	2017/05/05 15:19	56,4 KB
R2-1704717.zip	2017/05/05 15:19	66,6 KB
R2-1704718.zip	2017/05/05 15:19	91,7 KB
R2-1704719.zip	2017/05/05 15:03	36,5 KB
R2-1704720.zip	2017/05/05 21:01	14,6 KB
R2-1704721.zip	2017/05/06 9:47	33,3 KB
R2-1704722.zip	2017/05/06 9:47	149,8 KB
R2-1704723.zip	2017/05/06 9:47	45,1 KB
R2-1704724.zip	2017/05/06 9:47	30,2 KB
R2-1704725.zip	2017/05/06 9:47	38,9 KB
R2-1704726.zip	2017/05/06 9:47	21,8 KB
R2-1704727.zip	2017/05/06 9:47	31,5 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1704728.zip	2017/05/05 14:01	22,2 KB
R2-1704729.zip	2017/05/05 14:01	726 KB
R2-1704730.zip	2017/05/12 14:06	51,7 KB
R2-1704731.zip	2017/05/05 14:01	93,6 KB
R2-1704732.zip	2017/05/05 14:00	29,7 KB
R2-1704733.zip	2017/05/05 13:12	24 KB
R2-1704734.zip	2017/05/05 13:11	20,7 KB
R2-1704735.zip	2017/05/05 11:52	18,7 KB
R2-1704736.zip	2017/05/05 11:52	18,5 KB
R2-1704737.zip	2017/05/05 11:52	18,2 KB
R2-1704738.zip	2017/05/05 13:02	33,6 KB
R2-1704739.zip	2017/05/05 13:03	19,2 KB
R2-1704740.zip	2017/05/05 13:02	26 KB
R2-1704741.zip	2017/05/05 13:02	20 KB
R2-1704742.zip	2017/05/05 14:50	19,7 KB
R2-1704743.zip	2017/05/06 16:25	38 KB
R2-1704744.zip	2017/05/05 17:22	31 KB
R2-1704745.zip	2017/05/06 16:25	37,4 KB
R2-1704746.zip	2017/05/06 16:25	63,4 KB
R2-1704747.zip	2017/05/06 7:00	15 KB
R2-1704748.zip	2017/05/06 16:25	10,4 KB
R2-1704749.zip	2017/05/06 16:25	81,4 KB
R2-1704750.zip	2017/05/06 10:56	72,7 KB
R2-1704751.zip	2017/05/06 10:56	61,5 KB
R2-1704752.zip	2017/05/06 10:56	102,7 KB
R2-1704753.zip	2017/05/06 10:56	23,7 KB
R2-1704755.zip	2017/05/07 2:21	18 KB
R2-1704756.zip	2017/05/06 10:56	31,7 KB
R2-1704757.zip	2017/05/06 10:56	519,8 KB
R2-1704759.zip	2017/05/07 5:34	245,7 KB
R2-1704760.zip	2017/05/07 5:34	42,5 KB
R2-1704761.zip	2017/05/07 5:34	21,1 KB
R2-1704762.zip	2017/05/06 21:27	40,1 KB
R2-1704763.zip	2017/05/06 21:27	36,8 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1704764.zip	2017/05/04 17:24	26,3 KB
R2-1704765.zip	2017/05/06 10:56	476,7 KB
R2-1704766.zip	2017/05/06 10:56	50,8 KB
R2-1704767.zip	2017/05/06 10:56	51,1 KB
R2-1704768.zip	2017/05/06 10:56	314,5 KB
R2-1704769.zip	2017/05/06 10:56	539 KB
R2-1704770.zip	2017/05/06 10:56	133 KB
R2-1704771.zip	2017/05/06 10:57	293,2 KB
R2-1704772.zip	2017/05/06 10:57	25,7 KB
R2-1704773.zip	2017/05/06 10:57	228,3 KB
R2-1704774.zip	2017/05/06 10:57	58,5 KB
R2-1704775.zip	2017/05/06 10:57	57 KB
R2-1704776.zip	2017/05/06 10:57	24,1 KB
R2-1704777.zip	2017/05/06 10:57	24,8 KB
R2-1704778.zip	2017/05/06 10:57	23 KB
R2-1704779.zip	2017/05/06 10:57	29,7 KB
R2-1704780.zip	2017/05/06 10:57	15,3 KB
R2-1704781.zip	2017/05/06 10:57	15,8 KB
R2-1704782.zip	2017/05/06 10:57	18,7 KB
R2-1704783.zip	2017/05/06 10:57	18,6 KB
R2-1704784.zip	2017/05/07 2:21	56,6 KB
R2-1704785.zip	2017/05/07 2:21	137,4 KB
R2-1704786.zip	2017/05/06 10:57	63 KB
R2-1704787.zip	2017/05/06 10:57	116,3 KB
R2-1704788.zip	2017/05/06 10:57	538,5 KB
R2-1704789.zip	2017/05/06 10:57	69 KB
R2-1704790.zip	2017/05/06 10:57	97,1 KB
R2-1704791.zip	2017/05/06 10:57	199,6 KB
R2-1704792.zip	2017/05/06 10:57	158,8 KB
R2-1704793.zip	2017/05/06 10:57	122,9 KB
R2-1704794.zip	2017/05/06 10:57	69,4 KB
R2-1704795.zip	2017/05/06 10:57	133,9 KB
R2-1704796.zip	2017/05/06 10:57	60,5 KB
R2-1704797.zip	2017/05/06 10:57	77 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1704798.zip	2017/05/06 10:57	106,4 KB
R2-1704799.zip	2017/05/06 10:57	69,6 KB
R2-1704800.zip	2017/05/06 10:57	222,5 KB
R2-1704801.zip	2017/05/06 10:57	52,1 KB
R2-1704802.zip	2017/05/06 10:57	47,1 KB
R2-1704803.zip	2017/05/19 11:00	55,2 KB
R2-1704804.zip	2017/05/06 10:57	109,4 KB
R2-1704805.zip	2017/05/07 3:30	258,8 KB
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R2-1704808.zip	2017/05/07 2:21	97 KB
R2-1704809.zip	2017/05/07 2:21	24,7 KB
R2-1704810.zip	2017/05/07 2:21	60,4 KB
R2-1704811.zip	2017/05/07 2:21	20,8 KB
R2-1704813.zip	2017/05/06 10:57	67 KB
R2-1704814.zip	2017/05/06 10:57	35,9 KB
R2-1704815.zip	2017/05/06 10:57	89,1 KB
R2-1704816.zip	2017/05/06 10:57	21,6 KB
R2-1704817.zip	2017/05/06 10:57	61,5 KB
R2-1704818.zip	2017/05/06 10:57	41,7 KB
R2-1704819.zip	2017/05/04 17:24	26,5 KB
R2-1704820.zip	2017/05/06 22:28	173,1 KB
R2-1704821.zip	2017/05/05 21:01	22,5 KB
R2-1704822.zip	2017/05/05 21:01	22,5 KB
R2-1704823.zip	2017/05/05 21:01	49,8 KB
R2-1704824.zip	2017/05/05 21:01	58,4 KB
R2-1704825.zip	2017/05/05 21:01	26,2 KB
R2-1704826.zip	2017/05/05 21:01	74,5 KB
R2-1704827.zip	2017/05/05 21:01	276,7 KB
R2-1704828.zip	2017/05/05 21:01	155,2 KB
R2-1704829.zip	2017/05/05 21:01	119,5 KB
R2-1704830.zip	2017/05/05 21:01	43,7 KB
R2-1704831.zip	2017/05/05 21:01	25,6 KB
R2-1704832.zip	2017/05/05 21:01	264,8 KB
R2-1704833.zip	2017/05/05 21:01	61,7 KB

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R2-1704838.zip	2017/05/06 5:46	39,6 KB
R2-1704839.zip	2017/05/06 5:46	37,7 KB
R2-1704840.zip	2017/05/06 5:46	104,2 KB
R2-1704841.zip	2017/05/06 5:46	120,9 KB
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R2-1704843.zip	2017/05/06 5:46	95,7 KB
R2-1704844.zip	2017/05/06 5:46	35,8 KB
R2-1704845.zip	2017/05/06 5:46	20,7 KB
R2-1704846.zip	2017/05/06 5:46	20,2 KB
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R2-1704848.zip	2017/05/06 5:46	41,2 KB
R2-1704849.zip	2017/05/06 5:46	40,3 KB
R2-1704850.zip	2017/05/06 5:46	172,9 KB
R2-1704851.zip	2017/05/06 5:46	43,7 KB
R2-1704852.zip	2017/05/06 5:46	425,3 KB
R2-1704853.zip	2017/05/06 5:46	377,4 KB
R2-1704854.zip	2017/05/06 5:46	393,8 KB
R2-1704855.zip	2017/05/06 5:46	288,5 KB
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R2-1704859.zip	2017/05/06 5:46	36,9 KB
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R2-1704861.zip	2017/05/06 5:46	61,1 KB
R2-1704862.zip	2017/05/06 5:46	80,5 KB
R2-1704863.zip	2017/05/06 5:46	95 KB
R2-1704864.zip	2017/05/06 5:46	35,8 KB
R2-1704865.zip	2017/05/06 5:46	35,7 KB
R2-1704866.zip	2017/05/06 5:46	54,1 KB
R2-1704867.zip	2017/05/06 5:46	54,8 KB
R2-1704868.zip	2017/05/06 5:46	107,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1704871.zip	2017/05/06 5:46	11,8 KB
R2-1704873.zip	2017/05/06 5:46	105,2 KB
R2-1704874.zip	2017/05/06 5:47	198,2 KB
R2-1704875.zip	2017/05/06 5:47	35,8 KB
R2-1704876.zip	2017/05/06 5:47	34,8 KB
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R2-1704878.zip	2017/05/06 5:47	71 KB
R2-1704879.zip	2017/05/06 5:47	35,1 KB
R2-1704880.zip	2017/05/06 5:47	116,2 KB
R2-1704881.zip	2017/05/06 5:47	51,5 KB
R2-1704882.zip	2017/05/06 5:47	68,6 KB
R2-1704883.zip	2017/05/06 5:47	38,4 KB
R2-1704884.zip	2017/05/06 5:47	82,8 KB
R2-1704885.zip	2017/05/06 5:47	146,7 KB
R2-1704886.zip	2017/05/06 5:47	72 KB
R2-1704887.zip	2017/05/06 5:47	77,1 KB
R2-1704888.zip	2017/05/06 5:47	55,5 KB
R2-1704889.zip	2017/05/06 5:47	149,7 KB
R2-1704890.zip	2017/05/06 5:47	119 KB
R2-1704891.zip	2017/05/06 5:47	61,7 KB
R2-1704892.zip	2017/05/06 5:47	102,1 KB
R2-1704893.zip	2017/05/06 5:47	44,5 KB
R2-1704894.zip	2017/05/06 5:47	102,3 KB
R2-1704895.zip	2017/05/06 5:47	168,3 KB
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R2-1704897.zip	2017/05/06 5:47	87,2 KB
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R2-1704900.zip	2017/05/04 22:55	23,7 KB
R2-1704901.zip	2017/05/04 22:55	19 KB
R2-1704902.zip	2017/05/04 22:55	21,8 KB
R2-1704903.zip	2017/05/04 22:55	18,1 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1704908.zip	2017/05/06 9:15	29,2 KB
R2-1704909.zip	2017/05/06 9:15	31,7 KB
R2-1704910.zip	2017/05/06 9:15	31,8 KB
R2-1704911.zip	2017/05/06 9:15	89,3 KB
R2-1704912.zip	2017/05/06 9:15	180,9 KB
R2-1704913.zip	2017/05/06 9:15	30,5 KB
R2-1704914.zip	2017/05/06 9:15	24,6 KB
R2-1704915.zip	2017/05/06 9:15	27,5 KB
R2-1704916.zip	2017/05/06 11:39	29,4 KB
R2-1704917.zip	2017/05/06 11:39	22,4 KB
R2-1704918.zip	2017/05/06 11:39	30,1 KB
R2-1704919.zip	2017/05/06 23:34	31,8 KB
R2-1704920.zip	2017/05/07 0:11	32,3 KB
R2-1704921.zip	2017/05/06 23:07	30,6 KB
R2-1704922.zip	2017/05/06 23:31	30,2 KB
R2-1704923.zip	2017/05/06 23:32	31,8 KB
R2-1704924.zip	2017/05/06 23:35	67,7 KB
R2-1704925.zip	2017/05/06 23:37	31,3 KB
R2-1704926.zip	2017/05/06 23:44	30,6 KB
R2-1704927.zip	2017/05/07 0:51	30,7 KB
R2-1704928.zip	2017/05/06 23:43	30,2 KB
R2-1704929.zip	2017/05/05 18:29	75,1 KB
R2-1704930.zip	2017/05/05 18:30	134,5 KB
R2-1704931.zip	2017/05/05 18:30	17,6 KB
R2-1704932.zip	2017/05/05 18:30	303,4 KB
R2-1704933.zip	2017/05/05 18:30	307,1 KB
R2-1704934.zip	2017/05/05 18:30	160,2 KB
R2-1704935.zip	2017/05/05 18:30	176 KB
R2-1704936.zip	2017/05/05 18:31	19,4 KB
R2-1704937.zip	2017/05/05 18:31	19,2 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1704939.zip	2017/05/05 18:32	17,8 KB
R2-1704940.zip	2017/05/05 18:32	83 KB
R2-1704941.zip	2017/05/05 13:01	28,9 KB
R2-1704942.zip	2017/05/05 6:36	20,5 KB
R2-1704943.zip	2017/05/05 6:36	24 KB
R2-1704944.zip	2017/05/06 7:00	27,9 KB
R2-1704945.zip	2017/05/05 6:36	62,3 KB
R2-1704946.zip	2017/05/06 7:00	52,9 KB
R2-1704948.zip	2017/05/06 12:14	25 KB
R2-1704949.zip	2017/05/06 12:14	25 KB
R2-1704950.zip	2017/05/05 6:36	528,1 KB
R2-1704951.zip	2017/05/05 1:58	19,1 KB
R2-1704952.zip	2017/05/05 6:36	18,1 KB
R2-1704953.zip	2017/05/05 6:36	18,2 KB
R2-1704954.zip	2017/05/06 13:08	65,8 KB
R2-1704955.zip	2017/05/05 14:44	128,7 KB
R2-1704956.zip	2017/05/05 14:44	128,7 KB
R2-1704957.zip	2017/05/05 14:44	18,2 KB
R2-1704958.zip	2017/05/05 14:44	18,3 KB
R2-1704959.zip	2017/05/05 6:36	16,2 KB
R2-1704960.zip	2017/05/05 14:44	93,8 KB
R2-1704961.zip	2017/05/05 14:44	76,9 KB
R2-1704962.zip	2017/05/05 6:36	15,6 KB
R2-1704963.zip	2017/05/05 6:36	9,4 KB
R2-1704964.zip	2017/05/05 14:44	265,3 KB
R2-1704965.zip	2017/05/05 14:44	57,8 KB
R2-1704966.zip	2017/05/05 14:44	41,1 KB
R2-1704967.zip	2017/05/05 14:44	54,4 KB
R2-1704968.zip	2017/05/05 14:44	39 KB
R2-1704969.zip	2017/05/05 14:44	38,4 KB
R2-1704970.zip	2017/05/06 10:57	32,6 KB
R2-1704971.zip	2017/05/06 10:57	28,5 KB
R2-1704972.zip	2017/05/06 10:56	114,1 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1704975.zip	2017/05/06 11:00	159,9 KB
R2-1704976.zip	2017/05/06 11:00	36,9 KB
R2-1704977.zip	2017/05/06 11:00	122,7 KB
R2-1704978.zip	2017/05/06 11:00	30 KB
R2-1704979.zip	2017/05/06 11:00	158,6 KB
R2-1704980.zip	2017/05/06 11:00	76,4 KB
R2-1704981.zip	2017/05/06 11:00	41,8 KB
R2-1704983.zip	2017/05/06 11:00	52,8 KB
R2-1704984.zip	2017/05/06 11:00	17,4 KB
R2-1704985.zip	2017/05/06 11:00	84,2 KB
R2-1704986.zip	2017/05/06 11:00	30,1 KB
R2-1704987.zip	2017/05/06 11:00	170 KB
R2-1704988.zip	2017/05/06 11:00	86,1 KB
R2-1704989.zip	2017/05/06 10:57	82,8 KB
R2-1704990.zip	2017/05/06 10:57	24,4 KB
R2-1704991.zip	2017/05/06 10:57	89,8 KB
R2-1704992.zip	2017/05/06 10:57	68,3 KB
R2-1704993.zip	2017/05/06 10:57	25,3 KB
R2-1704994.zip	2017/05/06 10:57	51,1 KB
R2-1704995.zip	2017/05/05 14:55	37,2 KB
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R2-1704999.zip	2017/05/06 8:22	466,5 KB
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R2-1705002.zip	2017/05/06 9:40	117,7 KB
R2-1705003.zip	2017/05/06 9:40	130,1 KB
R2-1705004.zip	2017/05/06 9:40	359 KB
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R2-1705006.zip	2017/05/06 9:40	26,7 KB
R2-1705007.zip	2017/05/06 9:40	38 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1705013.zip	2017/05/06 10:44	16,5 KB
R2-1705014.zip	2017/05/06 10:44	21,9 KB
R2-1705015.zip	2017/05/06 10:44	19,8 KB
R2-1705016.zip	2017/05/06 10:44	43,1 KB
R2-1705017.zip	2017/05/06 10:44	17,2 KB
R2-1705018.zip	2017/05/06 10:44	19,4 KB
R2-1705019.zip	2017/05/06 10:44	24,5 KB
R2-1705020.zip	2017/05/06 10:44	23 KB
R2-1705021.zip	2017/05/06 10:44	17,7 KB
R2-1705022.zip	2017/05/06 10:44	19,1 KB
R2-1705023.zip	2017/05/06 10:44	19,6 KB
R2-1705024.zip	2017/05/06 10:44	21,8 KB
R2-1705025.zip	2017/05/06 10:44	17,2 KB
R2-1705026.zip	2017/05/06 10:44	261,6 KB
R2-1705027.zip	2017/05/06 10:44	52 KB
R2-1705028.zip	2017/05/06 10:44	25,4 KB
R2-1705029.zip	2017/05/06 10:44	12,4 KB
R2-1705030.zip	2017/05/06 10:44	17,9 KB
R2-1705031.zip	2017/05/06 10:44	375 KB
R2-1705032.zip	2017/05/06 10:44	36,6 KB
R2-1705033.zip	2017/05/06 10:44	186,5 KB
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R2-1705036.zip	2017/05/06 10:44	221,2 KB
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R2-1705038.zip	2017/05/06 10:44	22,6 KB
R2-1705039.zip	2017/05/06 10:44	18 KB
R2-1705040.zip	2017/05/06 10:44	18,7 KB
R2-1705041.zip	2017/05/06 10:44	18,5 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1705045.zip	2017/05/05 11:22	27 KB
R2-1705046.zip	2017/05/05 11:22	27 KB
R2-1705047.zip	2017/05/05 4:40	28,9 KB
R2-1705048.zip	2017/05/05 10:12	9,7 KB
R2-1705049.zip	2017/05/05 10:12	9,7 KB
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R2-1705054.zip	2017/05/06 18:14	16,4 KB
R2-1705055.zip	2017/05/06 18:14	14,6 KB
R2-1705056.zip	2017/05/06 18:14	14,8 KB
R2-1705057.zip	2017/05/05 9:15	28,3 KB
R2-1705058.zip	2017/05/06 18:14	16,7 KB
R2-1705059.zip	2017/05/05 9:15	27,1 KB
R2-1705060.zip	2017/05/06 18:14	13,2 KB
R2-1705061.zip	2017/05/06 18:14	18,2 KB
R2-1705062.zip	2017/05/05 9:15	27,2 KB
R2-1705063.zip	2017/05/06 18:14	18,5 KB
R2-1705064.zip	2017/05/05 9:15	76,8 KB
R2-1705065.zip	2017/05/06 18:14	18,2 KB
R2-1705066.zip	2017/05/05 9:15	128,3 KB
R2-1705067.zip	2017/05/06 18:14	18,5 KB
R2-1705068.zip	2017/05/05 9:15	45,5 KB
R2-1705069.zip	2017/05/05 9:15	43,4 KB
R2-1705070.zip	2017/05/05 13:21	18,5 KB
R2-1705071.zip	2017/05/05 13:21	18,3 KB
R2-1705072.zip	2017/05/05 13:21	25,8 KB
R2-1705073.zip	2017/05/05 13:21	25,7 KB
R2-1705074.zip	2017/05/05 13:21	19 KB
R2-1705075.zip	2017/05/05 13:21	19 KB

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R2-1705079.zip	2017/05/05 7:09	25,8 KB
R2-1705080.zip	2017/05/05 7:10	25,6 KB
R2-1705081.zip	2017/05/05 7:10	26,9 KB
R2-1705082.zip	2017/05/05 5:49	22,3 KB
R2-1705083.zip	2017/05/05 5:58	21,2 KB
R2-1705084.zip	2017/05/07 1:12	177,7 KB
R2-1705085.zip	2017/05/05 7:13	26,6 KB
R2-1705086.zip	2017/05/07 10:12	54,5 KB
R2-1705087.zip	2017/05/05 6:07	22,3 KB
R2-1705088.zip	2017/05/07 1:12	18,1 KB
R2-1705089.zip	2017/05/07 2:24	39,4 KB
R2-1705090.zip	2017/05/07 2:24	32,1 KB
R2-1705092.zip	2017/05/07 1:12	326 KB
R2-1705093.zip	2017/05/07 1:12	223 KB
R2-1705094.zip	2017/05/06 9:40	38,5 KB
R2-1705095.zip	2017/05/07 1:13	205,9 KB
R2-1705096.zip	2017/05/07 1:13	18,7 KB
R2-1705097.zip	2017/05/06 10:02	57,3 KB
R2-1705098.zip	2017/05/06 11:51	224,4 KB
R2-1705099.zip	2017/05/05 21:33	70,6 KB
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R2-1705108.zip	2017/05/06 9:41	26,1 KB
R2-1705109.zip	2017/05/05 14:52	23 KB
R2-1705110.zip	2017/05/05 14:52	23,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1705114.zip	2017/05/06 9:56	139,9 KB
R2-1705115.zip	2017/05/05 14:52	20,7 KB
R2-1705116.zip	2017/05/06 19:44	85,9 KB
R2-1705117.zip	2017/05/06 8:05	132,3 KB
R2-1705118.zip	2017/05/06 8:05	40,3 KB
R2-1705119.zip	2017/05/06 8:05	170,4 KB
R2-1705120.zip	2017/05/06 8:05	54 KB
R2-1705121.zip	2017/05/06 8:05	84,4 KB
R2-1705122.zip	2017/05/06 8:05	265,8 KB
R2-1705123.zip	2017/05/06 8:05	117,9 KB
R2-1705124.zip	2017/05/05 19:45	90,2 KB
R2-1705125.zip	2017/05/05 14:45	40,8 KB
R2-1705126.zip	2017/05/05 18:56	46,4 KB
R2-1705127.zip	2017/05/06 7:00	26,3 KB
R2-1705128.zip	2017/05/06 8:55	82,9 KB
R2-1705129.zip	2017/05/05 17:13	52,2 KB
R2-1705130.zip	2017/05/05 8:02	88,1 KB
R2-1705131.zip	2017/05/05 8:02	383,2 KB
R2-1705132.zip	2017/05/06 7:36	31,3 KB
R2-1705133.zip	2017/05/06 7:36	141,1 KB
R2-1705134.zip	2017/05/06 7:36	77,9 KB
R2-1705135.zip	2017/05/06 7:36	40,8 KB
R2-1705136.zip	2017/05/06 7:36	45 KB
R2-1705137.zip	2017/05/06 7:36	43,6 KB
R2-1705138.zip	2017/05/06 7:36	36,6 KB
R2-1705139.zip	2017/05/06 7:36	95,3 KB
R2-1705140.zip	2017/05/06 7:36	142,7 KB
R2-1705141.zip	2017/05/06 7:36	108,9 KB
R2-1705142.zip	2017/05/06 7:36	73,1 KB
R2-1705143.zip	2017/05/06 7:36	150,2 KB
R2-1705144.zip	2017/05/06 7:35	53,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705145.zip	2017/05/06 7:35	58,8 KB
R2-1705146.zip	2017/05/06 7:35	107,9 KB
R2-1705147.zip	2017/05/06 7:35	51 KB
R2-1705148.zip	2017/05/06 7:35	78 KB
R2-1705149.zip	2017/05/06 7:35	78,3 KB
R2-1705150.zip	2017/05/06 7:35	45,8 KB
R2-1705151.zip	2017/05/06 7:35	74,7 KB
R2-1705152.zip	2017/05/06 7:35	43,9 KB
R2-1705153.zip	2017/05/06 7:35	116,4 KB
R2-1705154.zip	2017/05/06 7:35	43,7 KB
R2-1705155.zip	2017/05/07 6:50	100,1 KB
R2-1705156.zip	2017/05/06 7:35	44,4 KB
R2-1705157.zip	2017/05/06 7:35	45,1 KB
R2-1705158.zip	2017/05/06 7:35	128,6 KB
R2-1705159.zip	2017/05/06 7:35	122,9 KB
R2-1705160.zip	2017/05/06 7:35	91,7 KB
R2-1705161.zip	2017/05/06 7:35	129,7 KB
R2-1705162.zip	2017/05/06 7:35	93,9 KB
R2-1705163.zip	2017/05/06 7:35	85,3 KB
R2-1705164.zip	2017/05/06 7:35	19,3 KB
R2-1705165.zip	2017/05/06 7:35	78,5 KB
R2-1705166.zip	2017/05/06 7:35	36,8 KB
R2-1705167.zip	2017/05/06 7:35	245,7 KB
R2-1705168.zip	2017/05/06 7:35	55,8 KB
R2-1705169.zip	2017/05/06 7:35	20 KB
R2-1705170.zip	2017/05/06 7:35	34,3 KB
R2-1705171.zip	2017/05/06 7:35	40 KB
R2-1705172.zip	2017/05/06 7:35	114,4 KB
R2-1705173.zip	2017/05/06 7:35	43,1 KB
R2-1705174.zip	2017/05/06 7:35	41,1 KB
R2-1705175.zip	2017/05/06 7:35	81 KB
R2-1705176.zip	2017/05/06 7:35	87,3 KB
R2-1705177.zip	2017/05/06 7:35	49,1 KB
R2-1705178.zip	2017/05/06 7:36	203,8 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705179.zip	2017/05/06 7:36	78,8 KB
R2-1705180.zip	2017/05/06 7:36	34,1 KB
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R2-1705182.zip	2017/05/06 7:36	69,8 KB
R2-1705183.zip	2017/05/06 7:36	11 KB
R2-1705184.zip	2017/05/06 7:36	34,5 KB
R2-1705185.zip	2017/05/06 7:36	29 KB
R2-1705186.zip	2017/05/05 8:02	75,9 KB
R2-1705187.zip	2017/05/06 9:51	39 KB
R2-1705188.zip	2017/05/06 9:51	21,9 KB
R2-1705189.zip	2017/05/06 9:51	37 KB
R2-1705190.zip	2017/05/06 9:51	26,8 KB
R2-1705191.zip	2017/05/06 9:51	26,9 KB
R2-1705192.zip	2017/05/06 9:51	39,5 KB
R2-1705193.zip	2017/05/06 9:51	29,5 KB
R2-1705194.zip	2017/05/06 9:51	46,4 KB
R2-1705195.zip	2017/05/06 9:51	58,4 KB
R2-1705196.zip	2017/05/06 9:51	42,2 KB
R2-1705197.zip	2017/05/06 9:51	24,7 KB
R2-1705198.zip	2017/05/06 9:51	24,6 KB
R2-1705199.zip	2017/05/06 9:51	38,9 KB
R2-1705200.zip	2017/05/06 9:51	39,3 KB
R2-1705201.zip	2017/05/06 9:51	121 KB
R2-1705202.zip	2017/05/06 9:51	24,7 KB
R2-1705203.zip	2017/05/06 9:51	39,1 KB
R2-1705204.zip	2017/05/06 9:51	37,4 KB
R2-1705206.zip	2017/05/06 9:51	39,2 KB
R2-1705207.zip	2017/05/06 9:51	57,7 KB
R2-1705208.zip	2017/05/06 9:51	88,5 KB
R2-1705209.zip	2017/05/06 9:51	148,7 KB
R2-1705210.zip	2017/05/06 9:51	146 KB
R2-1705211.zip	2017/05/06 9:51	37,2 KB
R2-1705212.zip	2017/05/06 9:51	38,6 KB
R2-1705213.zip	2017/05/06 9:51	108 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705214.zip	2017/05/06 9:51	79,2 KB
R2-1705215.zip	2017/05/06 9:51	46,4 KB
R2-1705216.zip	2017/05/06 9:51	322 KB
R2-1705217.zip	2017/05/05 9:22	22,5 KB
R2-1705218.zip	2017/05/05 8:04	25,5 KB
R2-1705219.zip	2017/05/05 13:21	85,3 KB
R2-1705220.zip	2017/05/05 8:09	25,4 KB
R2-1705221.zip	2017/05/05 11:22	25,7 KB
R2-1705222.zip	2017/05/06 6:46	9,5 KB
R2-1705223.zip	2017/05/05 8:28	39,1 KB
R2-1705224.zip	2017/05/05 11:22	25,8 KB
R2-1705225.zip	2017/05/05 18:19	33,7 KB
R2-1705226.zip	2017/05/05 8:28	40 KB
R2-1705227.zip	2017/05/05 8:28	75,7 KB
R2-1705228.zip	2017/05/05 8:28	97,8 KB
R2-1705229.zip	2017/05/05 8:20	136,5 KB
R2-1705230.zip	2017/05/05 18:15	28 KB
R2-1705231.zip	2017/05/05 8:28	692,1 KB
R2-1705232.zip	2017/05/05 11:41	34,9 KB
R2-1705233.zip	2017/05/05 11:41	33,4 KB
R2-1705234.zip	2017/05/05 11:41	31 KB
R2-1705235.zip	2017/05/05 11:41	31,6 KB
R2-1705236.zip	2017/05/05 11:41	51,7 KB
R2-1705237.zip	2017/05/05 11:41	31,5 KB
R2-1705238.zip	2017/05/05 11:41	40,3 KB
R2-1705239.zip	2017/05/05 11:41	33,9 KB
R2-1705240.zip	2017/05/05 11:41	39 KB
R2-1705241.zip	2017/05/05 8:28	628,9 KB
R2-1705242.zip	2017/05/05 11:41	40 KB
R2-1705243.zip	2017/05/05 8:47	36,9 KB
R2-1705244.zip	2017/05/05 10:22	317,3 KB
R2-1705245.zip	2017/05/05 9:03	36,3 KB
R2-1705246.zip	2017/05/05 9:03	158,8 KB
R2-1705247.zip	2017/05/05 17:13	44,1 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1705250.zip	2017/05/05 9:03	36 KB
R2-1705251.zip	2017/05/05 9:03	12,9 KB
R2-1705252.zip	2017/05/05 17:13	33,1 KB
R2-1705253.zip	2017/05/05 9:03	35,5 KB
R2-1705254.zip	2017/05/05 9:03	35 KB
R2-1705255.zip	2017/05/05 16:14	27 KB
R2-1705256.zip	2017/05/05 13:21	51,2 KB
R2-1705257.zip	2017/05/05 13:21	156 KB
R2-1705260.zip	2017/05/05 13:21	51 KB
R2-1705263.zip	2017/05/05 13:21	378,4 KB
R2-1705264.zip	2017/05/05 13:21	53,4 KB
R2-1705265.zip	2017/05/06 9:26	211,3 KB
R2-1705266.zip	2017/05/06 9:34	74 KB
R2-1705267.zip	2017/05/06 9:34	116,2 KB
R2-1705268.zip	2017/05/06 9:34	54,9 KB
R2-1705269.zip	2017/05/06 9:34	53,8 KB
R2-1705271.zip	2017/05/06 9:26	191,2 KB
R2-1705274.zip	2017/05/06 9:26	75,1 KB
R2-1705275.zip	2017/05/06 9:26	76,1 KB
R2-1705276.zip	2017/05/07 6:55	34,5 KB
R2-1705277.zip	2017/05/05 18:00	17,7 KB
R2-1705279.zip	2017/05/06 6:25	23,2 KB
R2-1705280.zip	2017/05/06 11:02	46,9 KB
R2-1705281.zip	2017/05/06 11:02	33,6 KB
R2-1705282.zip	2017/05/06 11:02	34,9 KB
R2-1705283.zip	2017/05/06 11:02	47,3 KB
R2-1705284.zip	2017/05/06 11:02	31,2 KB
R2-1705285.zip	2017/05/06 11:02	23 KB
R2-1705286.zip	2017/05/06 11:02	31,5 KB
R2-1705287.zip	2017/05/06 11:02	18,4 KB
R2-1705288.zip	2017/05/06 11:02	70,7 KB
R2-1705289.zip	2017/05/06 11:02	17,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1705292.zip	2017/05/06 11:02	32,6 KB
R2-1705293.zip	2017/05/06 11:02	31,6 KB
R2-1705294.zip	2017/05/06 11:02	161,6 KB
R2-1705295.zip	2017/05/06 11:02	162,3 KB
R2-1705296.zip	2017/05/06 11:02	17,1 KB
R2-1705297.zip	2017/05/06 11:02	28,6 KB
R2-1705298.zip	2017/05/05 16:14	75,1 KB
R2-1705299.zip	2017/05/05 17:49	24,8 KB
R2-1705300.zip	2017/05/05 11:41	242,7 KB
R2-1705301.zip	2017/05/05 11:41	155,8 KB
R2-1705302.zip	2017/05/05 11:41	265,9 KB
R2-1705303.zip	2017/05/05 11:41	378,9 KB
R2-1705304.zip	2017/05/05 11:42	181,5 KB
R2-1705305.zip	2017/05/06 11:02	47,2 KB
R2-1705306.zip	2017/05/05 17:49	24,8 KB
R2-1705307.zip	2017/05/05 16:14	59,4 KB
R2-1705308.zip	2017/05/05 18:37	218,6 KB
R2-1705309.zip	2017/05/05 20:20	29,1 KB
R2-1705310.zip	2017/05/05 13:38	37,5 KB
R2-1705311.zip	2017/05/05 12:01	35,2 KB
R2-1705312.zip	2017/05/05 20:20	11,1 KB
R2-1705313.zip	2017/05/05 12:01	69,1 KB
R2-1705314.zip	2017/05/05 20:20	37 KB
R2-1705315.zip	2017/05/05 18:00	25,5 KB
R2-1705316.zip	2017/05/05 20:20	193,8 KB
R2-1705317.zip	2017/05/05 15:25	18 KB
R2-1705318.zip	2017/05/06 19:44	41 KB
R2-1705320.zip	2017/05/05 15:25	41,2 KB
R2-1705321.zip	2017/05/06 7:23	24,1 KB
R2-1705322.zip	2017/05/06 7:23	14,7 KB
R2-1705323.zip	2017/05/06 7:23	25,4 KB
R2-1705324.zip	2017/05/06 7:23	60,6 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705325.zip	2017/05/06 7:23	112,8 KB
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R2-1705330.zip	2017/05/05 14:43	106,9 KB
R2-1705331.zip	2017/05/05 14:43	91,2 KB
R2-1705332.zip	2017/05/05 14:43	31,3 KB
R2-1705333.zip	2017/05/05 14:43	13,9 KB
R2-1705334.zip	2017/05/05 14:43	17,8 KB
R2-1705335.zip	2017/05/05 14:43	12,6 KB
R2-1705336.zip	2017/05/05 15:37	70,9 KB
R2-1705337.zip	2017/05/05 15:37	104,2 KB
R2-1705338.zip	2017/05/05 15:37	76,4 KB
R2-1705339.zip	2017/05/05 15:37	86,6 KB
R2-1705340.zip	2017/05/05 15:37	29,6 KB
R2-1705341.zip	2017/05/05 15:37	10,9 KB
R2-1705343.zip	2017/05/05 15:25	15,3 KB
R2-1705344.zip	2017/05/05 13:38	41,6 KB
R2-1705345.zip	2017/05/08 11:42	154,8 KB
R2-1705346.zip	2017/05/08 11:42	22,7 KB
R2-1705347.zip	2017/05/06 9:35	92,2 KB
R2-1705348.zip	2017/05/06 9:35	592,4 KB
R2-1705349.zip	2017/05/06 9:35	69,2 KB
R2-1705350.zip	2017/05/06 9:35	116 KB
R2-1705351.zip	2017/05/06 9:35	158,2 KB
R2-1705352.zip	2017/05/06 9:35	26,1 KB
R2-1705353.zip	2017/05/06 9:35	23,1 KB
R2-1705354.zip	2017/05/06 9:35	24,4 KB
R2-1705355.zip	2017/05/06 9:35	30,5 KB
R2-1705356.zip	2017/05/05 20:43	30,1 KB
R2-1705367.zip	2017/05/06 11:05	33,9 KB
R2-1705379.zip	2017/05/05 15:02	13,5 KB
R2-1705380.zip	2017/05/07 6:55	73,7 KB
R2-1705381.zip	2017/05/05 15:02	35,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1705384.zip	2017/05/05 15:02	84,9 KB
R2-1705385.zip	2017/05/07 6:55	35,7 KB
R2-1705386.zip	2017/05/05 14:56	73,2 KB
R2-1705387.zip	2017/05/05 15:02	15,1 KB
R2-1705388.zip	2017/05/05 15:02	41,4 KB
R2-1705389.zip	2017/05/14 14:16	3448,8 KB
R2-1705390.zip	2017/05/05 17:22	235 KB
R2-1705391.zip	2017/05/05 15:52	34 KB
R2-1705392.zip	2017/05/05 15:52	37,3 KB
R2-1705393.zip	2017/05/09 15:50	23,9 KB
R2-1705394.zip	2017/05/09 15:51	198,9 KB
R2-1705395.zip	2017/05/09 15:51	49,4 KB
R2-1705396.zip	2017/05/05 19:13	236,1 KB
R2-1705397.zip	2017/05/05 19:13	239,4 KB
R2-1705398.zip	2017/05/05 19:13	24,3 KB
R2-1705399.zip	2017/05/05 19:13	29,6 KB
R2-1705400.zip	2017/05/05 19:13	27,8 KB
R2-1705401.zip	2017/05/05 15:17	22 KB
R2-1705402.zip	2017/05/05 15:17	35,6 KB
R2-1705403.zip	2017/05/05 15:17	46,7 KB
R2-1705404.zip	2017/05/05 15:17	24,1 KB
R2-1705405.zip	2017/05/05 15:17	78,5 KB
R2-1705406.zip	2017/05/05 15:23	15,3 KB
R2-1705407.zip	2017/05/05 21:30	149,5 KB
R2-1705408.zip	2017/05/05 21:30	18,4 KB
R2-1705409.zip	2017/05/05 21:30	1664,4 KB
R2-1705410.zip	2017/05/05 21:30	508,6 KB
R2-1705411.zip	2017/05/05 15:23	15,1 KB
R2-1705412.zip	2017/05/06 7:09	39,9 KB
R2-1705413.zip	2017/05/05 15:54	18,6 KB
R2-1705414.zip	2017/05/05 16:14	108,8 KB
R2-1705415.zip	2017/05/07 6:41	539,6 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1705418.zip	2017/05/05 16:16	340,5 KB
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R2-1705420.zip	2017/05/06 12:27	37,9 KB
R2-1705421.zip	2017/05/05 21:14	69,8 KB
R2-1705422.zip	2017/05/05 17:11	30,3 KB
R2-1705423.zip	2017/05/05 17:11	29,1 KB
R2-1705424.zip	2017/05/05 17:11	88,9 KB
R2-1705425.zip	2017/05/05 17:11	43,1 KB
R2-1705426.zip	2017/05/05 19:29	77,6 KB
R2-1705427.zip	2017/05/05 19:29	1928,6 KB
R2-1705428.zip	2017/05/05 19:05	41,1 KB
R2-1705429.zip	2017/05/05 18:57	33,1 KB
R2-1705430.zip	2017/05/06 14:17	47,5 KB
R2-1705431.zip	2017/05/06 14:25	103,7 KB
R2-1705432.zip	2017/05/06 15:07	129,1 KB
R2-1705433.zip	2017/05/06 15:10	35,3 KB
R2-1705434.zip	2017/05/06 15:11	78,2 KB
R2-1705435.zip	2017/05/06 18:13	49,1 KB
R2-1705436.zip	2017/05/06 18:11	181,4 KB
R2-1705437.zip	2017/05/06 12:27	25 KB
R2-1705438.zip	2017/05/06 7:00	50,8 KB
R2-1705439.zip	2017/05/05 19:12	39,9 KB
R2-1705440.zip	2017/05/05 21:12	149,1 KB
R2-1705441.zip	2017/05/05 21:12	106,8 KB
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R2-1705443.zip	2017/05/05 21:12	24,5 KB
R2-1705444.zip	2017/05/05 21:12	30,6 KB
R2-1705445.zip	2017/05/05 21:12	103,8 KB
R2-1705446.zip	2017/05/05 21:12	87 KB
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R2-1705448.zip	2017/05/05 21:12	33,9 KB
R2-1705449.zip	2017/05/05 21:01	84,4 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705450.zip	2017/05/05 21:01	20,8 KB
R2-1705451.zip	2017/05/05 21:01	20,7 KB
R2-1705452.zip	2017/05/05 21:01	17,3 KB
R2-1705453.zip	2017/05/05 21:01	18 KB
R2-1705454.zip	2017/05/05 21:01	20,6 KB
R2-1705455.zip	2017/05/05 21:01	20,9 KB
R2-1705456.zip	2017/05/05 21:01	20,9 KB
R2-1705457.zip	2017/05/05 21:01	20,8 KB
R2-1705458.zip	2017/05/05 21:01	17,3 KB
R2-1705459.zip	2017/05/05 21:01	18,1 KB
R2-1705460.zip	2017/05/05 21:01	20,6 KB
R2-1705461.zip	2017/05/06 12:27	25 KB
R2-1705462.zip	2017/05/05 19:14	48 KB
R2-1705463.zip	2017/05/05 19:16	24,8 KB
R2-1705464.zip	2017/05/06 12:28	60,5 KB
R2-1705465.zip	2017/05/06 13:07	26,3 KB
R2-1705466.zip	2017/05/06 13:07	24,1 KB
R2-1705467.zip	2017/05/06 13:07	25,3 KB
R2-1705468.zip	2017/05/06 13:07	24,8 KB
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R2-1705470.zip	2017/05/06 13:07	25,4 KB
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R2-1705472.zip	2017/05/06 13:07	26,9 KB
R2-1705473.zip	2017/05/06 13:07	27,1 KB
R2-1705474.zip	2017/05/06 13:07	33,9 KB
R2-1705475.zip	2017/05/06 13:07	25,9 KB
R2-1705476.zip	2017/05/06 13:06	21,5 KB
R2-1705477.zip	2017/05/06 13:06	26,4 KB
R2-1705478.zip	2017/05/06 13:06	25,6 KB
R2-1705479.zip	2017/05/06 13:06	25,8 KB
R2-1705480.zip	2017/05/06 13:06	48,1 KB
R2-1705481.zip	2017/05/06 13:07	45,7 KB
R2-1705482.zip	2017/05/06 13:07	32 KB
R2-1705483.zip	2017/05/05 19:18	25,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705484.zip	2017/05/06 9:55	18,9 KB
R2-1705485.zip	2017/05/06 22:48	39,1 KB
R2-1705487.zip	2017/05/05 19:19	118,9 KB
R2-1705488.zip	2017/05/06 22:48	25,6 KB
R2-1705489.zip	2017/05/06 9:35	78,3 KB
R2-1705490.zip	2017/05/06 9:35	32,1 KB
R2-1705491.zip	2017/05/06 9:35	93,6 KB
R2-1705492.zip	2017/05/06 9:35	75,5 KB
R2-1705493.zip	2017/05/09 7:21	28,2 KB
R2-1705494.zip	2017/05/09 7:21	97,5 KB
R2-1705495.zip	2017/05/08 6:32	59,5 KB
R2-1705496.zip	2017/05/07 20:43	41,8 KB
R2-1705497.zip	2017/05/07 20:40	75,6 KB
R2-1705498.zip	2017/05/06 22:48	42,1 KB
R2-1705499.zip	2017/05/06 22:48	34,8 KB
R2-1705500.zip	2017/05/06 22:48	31,2 KB
R2-1705501.zip	2017/05/06 22:48	26,9 KB
R2-1705502.zip	2017/05/06 6:39	79,2 KB
R2-1705503.zip	2017/05/06 16:12	23,3 KB
R2-1705504.zip	2017/05/06 7:02	23,3 KB
R2-1705505.zip	2017/05/05 21:27	65,2 KB
R2-1705506.zip	2017/05/05 21:27	28,4 KB
R2-1705507.zip	2017/05/05 21:23	494,4 KB
R2-1705508.zip	2017/05/06 10:19	28,3 KB
R2-1705509.zip	2017/05/06 10:19	104,8 KB
R2-1705510.zip	2017/05/06 10:19	37,4 KB
R2-1705511.zip	2017/05/06 10:19	114,2 KB
R2-1705512.zip	2017/05/06 14:27	50,1 KB
R2-1705513.zip	2017/05/06 8:21	1013,8 KB
R2-1705514.zip	2017/05/06 8:20	51,6 KB
R2-1705515.zip	2017/05/06 8:20	38,7 KB
R2-1705516.zip	2017/05/06 8:20	49,5 KB
R2-1705517.zip	2017/05/06 8:20	42,7 KB
R2-1705518.zip	2017/05/06 8:21	135,1 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705519.zip	2017/05/06 8:21	265 KB
R2-1705520.zip	2017/05/06 8:21	20,8 KB
R2-1705521.zip	2017/05/06 8:21	17,7 KB
R2-1705522.zip	2017/05/06 8:21	68,4 KB
R2-1705523.zip	2017/05/06 10:06	329,3 KB
R2-1705524.zip	2017/05/06 10:06	64,9 KB
R2-1705525.zip	2017/05/06 10:06	57,3 KB
R2-1705526.zip	2017/05/06 10:06	175,2 KB
R2-1705527.zip	2017/05/06 10:06	63,8 KB
R2-1705528.zip	2017/05/06 14:12	22,9 KB
R2-1705529.zip	2017/05/06 14:12	24,6 KB
R2-1705530.zip	2017/05/06 14:12	71,1 KB
R2-1705531.zip	2017/05/06 14:12	34,6 KB
R2-1705532.zip	2017/05/06 14:12	30,5 KB
R2-1705533.zip	2017/05/06 14:12	22,5 KB
R2-1705534.zip	2017/05/06 14:12	39,6 KB
R2-1705535.zip	2017/05/06 14:12	25,5 KB
R2-1705536.zip	2017/05/06 14:12	34 KB
R2-1705537.zip	2017/05/06 14:12	29,2 KB
R2-1705538.zip	2017/05/06 14:12	40,2 KB
R2-1705539.zip	2017/05/06 14:12	30,4 KB
R2-1705540.zip	2017/05/06 14:12	31 KB
R2-1705541.zip	2017/05/06 14:12	35,8 KB
R2-1705542.zip	2017/05/06 14:12	32,5 KB
R2-1705543.zip	2017/05/06 14:12	85,6 KB
R2-1705544.zip	2017/05/06 14:12	23,9 KB
R2-1705545.zip	2017/05/06 14:12	21,8 KB
R2-1705546.zip	2017/05/06 14:12	17,6 KB
R2-1705547.zip	2017/05/06 14:12	21,5 KB
R2-1705548.zip	2017/05/06 11:01	77 KB
R2-1705549.zip	2017/05/06 11:01	77,6 KB
R2-1705550.zip	2017/05/06 11:01	28,8 KB
R2-1705551.zip	2017/05/06 11:01	24,9 KB
R2-1705552.zip	2017/05/06 11:01	32,2 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705553.zip	2017/05/06 11:01	152,5 KB
R2-1705554.zip	2017/05/06 11:01	28,7 KB
R2-1705555.zip	2017/05/06 11:01	12,9 KB
R2-1705556.zip	2017/05/06 11:01	30,9 KB
R2-1705557.zip	2017/05/06 11:01	25,6 KB
R2-1705558.zip	2017/05/06 11:01	151,4 KB
R2-1705559.zip	2017/05/06 17:38	81,8 KB
R2-1705560.zip	2017/05/06 17:38	23,5 KB
R2-1705561.zip	2017/05/06 17:38	23,5 KB
R2-1705562.zip	2017/05/06 11:32	54,9 KB
R2-1705563.zip	2017/05/07 6:55	29,6 KB
R2-1705564.zip	2017/05/07 6:55	32,1 KB
R2-1705565.zip	2017/05/07 6:55	32,4 KB
R2-1705566.zip	2017/05/07 6:55	20,6 KB
R2-1705567.zip	2017/05/06 17:18	17,6 KB
R2-1705568.zip	2017/05/06 17:18	17,4 KB
R2-1705569.zip	2017/05/06 10:58	21,3 KB
R2-1705570.zip	2017/05/06 22:48	47,9 KB
R2-1705571.zip	2017/05/06 22:48	47,5 KB
R2-1705572.zip	2017/05/06 22:48	25,1 KB
R2-1705573.zip	2017/05/06 22:48	29,6 KB
R2-1705574.zip	2017/05/06 22:48	25,2 KB
R2-1705575.zip	2017/05/06 22:48	17,4 KB
R2-1705576.zip	2017/05/06 22:48	25 KB
R2-1705577.zip	2017/05/06 22:48	25,5 KB
R2-1705578.zip	2017/05/06 22:48	27,2 KB
R2-1705579.zip	2017/05/06 22:48	31,8 KB
R2-1705580.zip	2017/05/06 22:48	40,2 KB
R2-1705581.zip	2017/05/06 22:48	34,2 KB
R2-1705582.zip	2017/05/06 22:48	23,3 KB
R2-1705583.zip	2017/05/06 22:48	22 KB
R2-1705584.zip	2017/05/06 14:09	25,4 KB
R2-1705585.zip	2017/05/06 14:09	26,7 KB
R2-1705586.zip	2017/05/06 14:09	26,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705587.zip	2017/05/06 17:05	16,7 KB
R2-1705588.zip	2017/05/06 17:05	16,3 KB
R2-1705589.zip	2017/05/06 17:05	29,3 KB
R2-1705590.zip	2017/05/06 17:05	96,5 KB
R2-1705591.zip	2017/05/06 14:10	99,5 KB
R2-1705592.zip	2017/05/06 14:10	68,7 KB
R2-1705593.zip	2017/05/06 14:10	64,4 KB
R2-1705594.zip	2017/05/06 14:10	87 KB
R2-1705595.zip	2017/05/06 14:10	69,7 KB
R2-1705596.zip	2017/05/06 14:10	79,5 KB
R2-1705597.zip	2017/05/06 14:10	22,2 KB
R2-1705598.zip	2017/05/06 14:10	75,3 KB
R2-1705599.zip	2017/05/06 14:10	81 KB
R2-1705600.zip	2017/05/06 14:10	16,7 KB
R2-1705601.zip	2017/05/06 14:10	58,6 KB
R2-1705602.zip	2017/05/06 14:10	40,4 KB
R2-1705603.zip	2017/05/06 14:10	37,2 KB
R2-1705604.zip	2017/05/06 14:10	39,1 KB
R2-1705605.zip	2017/05/06 14:10	39,9 KB
R2-1705606.zip	2017/05/06 14:10	799,2 KB
R2-1705607.zip	2017/05/06 14:10	139,8 KB
R2-1705608.zip	2017/05/06 14:10	123,2 KB
R2-1705609.zip	2017/05/06 14:10	40,1 KB
R2-1705610.zip	2017/05/06 17:13	34,9 KB
R2-1705611.zip	2017/05/06 17:13	35,9 KB
R2-1705612.zip	2017/05/06 17:13	45 KB
R2-1705613.zip	2017/05/06 16:37	6650,9 KB
R2-1705614.zip	2017/05/06 16:36	42,6 KB
R2-1705615.zip	2017/05/10 13:29	62,8 KB
R2-1705616.zip	2017/05/06 22:28	17 KB
R2-1705617.zip	2017/05/06 22:28	143 KB
R2-1705618.zip	2017/05/06 22:28	17,9 KB
R2-1705619.zip	2017/05/06 22:28	16,3 KB
R2-1705620.zip	2017/05/06 22:28	18,5 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705621.zip	2017/05/06 22:28	18,3 KB
R2-1705622.zip	2017/05/06 22:28	18,4 KB
R2-1705623.zip	2017/05/06 12:14	142,4 KB
R2-1705624.zip	2017/05/06 12:14	92,9 KB
R2-1705625.zip	2017/05/06 12:14	81,4 KB
R2-1705626.zip	2017/05/06 12:14	87,2 KB
R2-1705627.zip	2017/05/06 12:14	52,5 KB
R2-1705628.zip	2017/05/06 12:14	50,5 KB
R2-1705629.zip	2017/05/06 8:18	22,5 KB
R2-1705630.zip	2017/05/07 6:55	36 KB
R2-1705631.zip	2017/05/07 6:55	30,9 KB
R2-1705632.zip	2017/05/06 14:33	34,7 KB
R2-1705633.zip	2017/05/06 14:33	75,2 KB
R2-1705634.zip	2017/05/06 14:33	33,8 KB
R2-1705635.zip	2017/05/06 14:33	30,6 KB
R2-1705636.zip	2017/05/06 14:33	28,7 KB
R2-1705637.zip	2017/05/06 14:33	32,6 KB
R2-1705638.zip	2017/05/06 14:33	29 KB
R2-1705639.zip	2017/05/06 14:33	76,3 KB
R2-1705640.zip	2017/05/06 14:33	39,2 KB
R2-1705641.zip	2017/05/06 14:33	34,5 KB
R2-1705642.zip	2017/05/06 14:33	71,9 KB
R2-1705643.zip	2017/05/06 14:33	122,9 KB
R2-1705644.zip	2017/05/06 14:33	103,4 KB
R2-1705645.zip	2017/05/06 14:33	150,9 KB
R2-1705646.zip	2017/05/06 14:33	72,4 KB
R2-1705647.zip	2017/05/06 14:33	71,8 KB
R2-1705648.zip	2017/05/06 14:33	72,3 KB
R2-1705649.zip	2017/05/06 14:33	123,1 KB
R2-1705650.zip	2017/05/06 14:33	102,6 KB
R2-1705651.zip	2017/05/06 14:33	72,2 KB
R2-1705652.zip	2017/05/06 14:33	105,4 KB
R2-1705653.zip	2017/05/06 14:33	72,1 KB
R2-1705654.zip	2017/05/06 14:33	71,8 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705655.zip	2017/05/06 14:33	138,1 KB
R2-1705656.zip	2017/05/06 14:33	96,6 KB
R2-1705657.zip	2017/05/06 14:33	71,3 KB
R2-1705658.zip	2017/05/06 11:36	312,2 KB
R2-1705659.zip	2017/05/06 11:36	75,5 KB
R2-1705660.zip	2017/05/06 11:36	75,8 KB
R2-1705661.zip	2017/05/06 11:36	206,2 KB
R2-1705662.zip	2017/05/06 18:30	337,6 KB
R2-1705663.zip	2017/05/06 18:30	31,7 KB
R2-1705664.zip	2017/05/06 18:30	30,4 KB
R2-1705665.zip	2017/05/06 18:30	32,3 KB
R2-1705666.zip	2017/05/06 18:30	29,1 KB
R2-1705667.zip	2017/05/06 18:30	74,1 KB
R2-1705668.zip	2017/05/06 12:54	143,7 KB
R2-1705669.zip	2017/05/06 12:53	823,3 KB
R2-1705670.zip	2017/05/06 12:49	73,5 KB
R2-1705671.zip	2017/05/06 12:49	13,5 KB
R2-1705672.zip	2017/05/06 12:49	26,6 KB
R2-1705673.zip	2017/05/06 12:49	72,6 KB
R2-1705674.zip	2017/05/06 12:49	32,8 KB
R2-1705675.zip	2017/05/06 12:49	30,1 KB
R2-1705676.zip	2017/05/06 12:49	29,3 KB
R2-1705677.zip	2017/05/06 12:49	63,1 KB
R2-1705678.zip	2017/05/06 12:11	32,1 KB
R2-1705679.zip	2017/05/06 12:11	27,1 KB
R2-1705680.zip	2017/05/06 12:11	230,7 KB
R2-1705681.zip	2017/05/06 12:11	32 KB
R2-1705682.zip	2017/05/06 12:11	32,7 KB
R2-1705683.zip	2017/05/06 12:11	33,1 KB
R2-1705684.zip	2017/05/06 12:11	81,5 KB
R2-1705685.zip	2017/05/06 12:11	34,5 KB
R2-1705686.zip	2017/05/06 12:11	185,8 KB
R2-1705687.zip	2017/05/06 12:11	32,5 KB
R2-1705688.zip	2017/05/06 12:11	25,1 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705689.zip	2017/05/06 12:55	60,5 KB
R2-1705690.zip	2017/05/06 12:55	38,4 KB
R2-1705691.zip	2017/05/06 12:55	37,4 KB
R2-1705692.zip	2017/05/06 12:55	36,7 KB
R2-1705693.zip	2017/05/06 12:55	32,7 KB
R2-1705694.zip	2017/05/06 12:55	25,1 KB
R2-1705695.zip	2017/05/06 12:55	116,3 KB
R2-1705696.zip	2017/05/06 12:55	29,2 KB
R2-1705697.zip	2017/05/06 12:55	27,9 KB
R2-1705698.zip	2017/05/06 12:55	33,4 KB
R2-1705699.zip	2017/05/06 12:55	80,5 KB
R2-1705700.zip	2017/05/06 12:45	39 KB
R2-1705701.zip	2017/05/06 12:45	41,1 KB
R2-1705702.zip	2017/05/06 12:52	39 KB
R2-1705703.zip	2017/05/06 12:52	94,9 KB
R2-1705704.zip	2017/05/06 14:13	45,1 KB
R2-1705705.zip	2017/05/06 14:13	25,3 KB
R2-1705706.zip	2017/05/06 14:13	44,2 KB
R2-1705707.zip	2017/05/06 14:13	31,5 KB
R2-1705708.zip	2017/05/06 14:13	30,2 KB
R2-1705709.zip	2017/05/06 14:13	58,2 KB
R2-1705710.zip	2017/05/06 14:13	134 KB
R2-1705711.zip	2017/05/06 14:13	35,5 KB
R2-1705712.zip	2017/05/06 14:13	33,8 KB
R2-1705713.zip	2017/05/06 14:13	67,3 KB
R2-1705714.zip	2017/05/06 14:13	11,1 KB
R2-1705715.zip	2017/05/06 14:13	10,9 KB
R2-1705716.zip	2017/05/06 12:51	16 KB
R2-1705717.zip	2017/05/07 6:55	24 KB
R2-1705718.zip	2017/05/10 13:29	38,7 KB
R2-1705719.zip	2017/05/07 6:55	32,2 KB
R2-1705720.zip	2017/05/07 6:55	31,4 KB
R2-1705721.zip	2017/05/07 6:55	31,9 KB
R2-1705722.zip	2017/05/07 6:55	34,4 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705723.zip	2017/05/07 6:55	53,5 KB
R2-1705724.zip	2017/05/07 6:55	36,5 KB
R2-1705725.zip	2017/05/07 6:55	36,7 KB
R2-1705726.zip	2017/05/07 6:55	104,3 KB
R2-1705727.zip	2017/05/07 6:55	36,3 KB
R2-1705728.zip	2017/05/07 6:55	88 KB
R2-1705729.zip	2017/05/07 6:55	403,8 KB
R2-1705730.zip	2017/05/07 6:55	58,2 KB
R2-1705731.zip	2017/05/07 6:55	63,1 KB
R2-1705732.zip	2017/05/07 6:55	175,4 KB
R2-1705733.zip	2017/05/07 6:55	31,4 KB
R2-1705734.zip	2017/05/07 6:55	85,2 KB
R2-1705735.zip	2017/05/07 6:55	81,5 KB
R2-1705736.zip	2017/05/07 6:55	216,6 KB
R2-1705737.zip	2017/05/07 6:55	42,4 KB
R2-1705738.zip	2017/05/07 6:55	31,6 KB
R2-1705739.zip	2017/05/07 6:55	29,7 KB
R2-1705740.zip	2017/05/07 6:55	44,2 KB
R2-1705741.zip	2017/05/07 6:55	34,5 KB
R2-1705742.zip	2017/05/07 6:55	33,6 KB
R2-1705743.zip	2017/05/07 6:55	31,2 KB
R2-1705744.zip	2017/05/07 6:55	103,8 KB
R2-1705745.zip	2017/05/07 6:55	34 KB
R2-1705746.zip	2017/05/07 6:55	28,4 KB
R2-1705747.zip	2017/05/07 6:55	26,5 KB
R2-1705748.zip	2017/05/07 6:55	25,9 KB
R2-1705749.zip	2017/05/07 6:55	30,6 KB
R2-1705750.zip	2017/05/07 6:55	28,9 KB
R2-1705751.zip	2017/05/07 6:55	300,1 KB
R2-1705752.zip	2017/05/07 6:55	71,1 KB
R2-1705753.zip	2017/05/06 12:50	49,2 KB
R2-1705754.zip	2017/05/06 16:34	44,5 KB
R2-1705755.zip	2017/05/06 16:34	47,9 KB
R2-1705756.zip	2017/05/06 16:34	30,4 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705757.zip	2017/05/06 12:20	24,5 KB
R2-1705758.zip	2017/05/06 16:51	164,9 KB
R2-1705759.zip	2017/05/06 17:17	27,3 KB
R2-1705760.zip	2017/05/06 17:17	102,3 KB
R2-1705761.zip	2017/05/06 17:17	18,2 KB
R2-1705762.zip	2017/05/06 17:17	17,6 KB
R2-1705763.zip	2017/05/06 17:17	22,2 KB
R2-1705764.zip	2017/05/06 17:17	22,5 KB
R2-1705765.zip	2017/05/06 17:17	31,7 KB
R2-1705766.zip	2017/05/06 16:51	36 KB
R2-1705767.zip	2017/05/06 22:28	47,7 KB
R2-1705768.zip	2017/05/06 22:28	58,5 KB
R2-1705769.zip	2017/05/06 22:28	33,9 KB
R2-1705770.zip	2017/05/06 22:28	29,3 KB
R2-1705771.zip	2017/05/06 22:28	30,5 KB
R2-1705772.zip	2017/05/06 15:38	160,9 KB
R2-1705773.zip	2017/05/07 6:55	233,5 KB
R2-1705774.zip	2017/05/07 6:55	24 KB
R2-1705775.zip	2017/05/07 6:55	24,1 KB
R2-1705776.zip	2017/05/07 6:55	79,2 KB
R2-1705777.zip	2017/05/07 6:55	201,3 KB
R2-1705778.zip	2017/05/07 6:55	92,7 KB
R2-1705779.zip	2017/05/07 6:55	24,6 KB
R2-1705780.zip	2017/05/07 6:55	22,8 KB
R2-1705781.zip	2017/05/07 6:55	150,9 KB
R2-1705782.zip	2017/05/07 6:55	107,4 KB
R2-1705783.zip	2017/05/07 6:56	160,7 KB
R2-1705784.zip	2017/05/07 6:56	45,2 KB
R2-1705785.zip	2017/05/07 6:56	109,1 KB
R2-1705786.zip	2017/05/07 6:56	63,3 KB
R2-1705787.zip	2017/05/07 6:56	38,1 KB
R2-1705788.zip	2017/05/07 6:56	37,8 KB
R2-1705789.zip	2017/05/07 6:56	43,8 KB
R2-1705790.zip	2017/05/07 6:56	20,3 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705791.zip	2017/05/07 6:56	21,5 KB
R2-1705792.zip	2017/05/07 6:56	50,3 KB
R2-1705793.zip	2017/05/07 6:56	127,7 KB
R2-1705794.zip	2017/05/07 6:56	79,5 KB
R2-1705795.zip	2017/05/07 6:56	46,4 KB
R2-1705796.zip	2017/05/07 6:56	45,1 KB
R2-1705797.zip	2017/05/07 6:56	55,8 KB
R2-1705798.zip	2017/05/07 6:56	28 KB
R2-1705799.zip	2017/05/07 6:56	76,1 KB
R2-1705800.zip	2017/05/06 20:37	174,7 KB
R2-1705801.zip	2017/05/06 18:17	24,4 KB
R2-1705802.zip	2017/05/06 18:17	24,5 KB
R2-1705803.zip	2017/05/06 18:17	24,5 KB
R2-1705804.zip	2017/05/07 6:56	532,1 KB
R2-1705805.zip	2017/05/07 6:56	21,4 KB
R2-1705806.zip	2017/05/12 8:26	48,6 KB
R2-1705807.zip	2017/05/12 8:26	25,7 KB
R2-1705808.zip	2017/05/07 6:56	76,3 KB
R2-1705809.zip	2017/05/07 7:22	22,2 KB
R2-1705810.zip	2017/05/07 7:22	24 KB
R2-1705811.zip	2017/05/07 7:22	22,4 KB
R2-1705812.zip	2017/05/08 20:02	15,5 KB
R2-1705813.zip	2017/05/08 20:02	375,1 KB
R2-1705814.zip	2017/05/10 13:29	47,8 KB
R2-1705815.zip	2017/05/10 8:55	1527,8 KB
R2-1705816.zip	2017/05/11 17:58	166,1 KB
R2-1705817.zip	2017/05/12 8:14	199 KB
R2-1705818.zip	2017/05/10 14:58	53,8 KB
R2-1705819.zip	2017/05/11 10:08	146,9 KB
R2-1705820.zip	2017/05/19 11:00	83,1 KB
R2-1705821.zip	2017/05/19 11:00	161,9 KB
R2-1705822.zip	2017/05/12 10:11	73 KB
R2-1705823.zip	2017/05/12 10:11	93,8 KB
R2-1705824.zip	2017/05/12 10:11	79,1 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1705825.zip	2017/05/12 10:11	52,4 KB
R2-1705826.zip	2017/05/12 10:11	236,8 KB
R2-1705827.zip	2017/05/12 10:11	41,6 KB
R2-1705828.zip	2017/05/12 10:11	79,5 KB
R2-1705829.zip	2017/05/12 7:42	732,6 KB
R2-1705830.zip	2017/05/12 7:42	33,4 KB
R2-1705831.zip	2017/05/12 22:17	43,3 KB
R2-1705832.zip	2017/05/14 21:33	51,6 KB
R2-1705833.zip	2017/05/12 8:13	25,9 KB
R2-1705834.zip	2017/05/25 9:00	130,7 KB
R2-1705835.zip	2017/05/12 13:30	28,4 KB
R2-1705836.zip	2017/05/13 10:54	22,9 KB
R2-1705837.zip	2017/05/13 11:40	10,8 KB
R2-1705838.zip	2017/05/13 11:40	10,9 KB
R2-1705839.zip	2017/05/13 11:40	10,9 KB
R2-1705840.zip	2017/05/13 11:40	10,4 KB
R2-1705841.zip	2017/05/19 11:00	32,6 KB
R2-1705842.zip	2017/05/19 11:00	27,8 KB
R2-1705843.zip	2017/05/19 11:00	35,6 KB
R2-1705844.zip	2017/05/31 22:10	248,9 KB
R2-1705845.zip	2017/05/19 11:00	45,1 KB
R2-1705846.zip	2017/05/19 11:00	58,6 KB
R2-1705847.zip	2017/05/19 11:00	76,3 KB
R2-1705848.zip	2017/05/19 11:00	10,9 KB
R2-1705849.zip	2017/05/19 11:00	11 KB
R2-1705850.zip	2017/05/19 11:00	22,6 KB
R2-1705851.zip	2017/05/19 11:00	35,9 KB
R2-1705852.zip	2017/05/28 10:28	127,4 KB
R2-1705853.zip	2017/05/19 11:00	133,2 KB
R2-1705854.zip	2017/05/31 22:10	61,8 KB
R2-1705855.zip	2017/05/19 11:00	82 KB
R2-1705856.zip	2017/05/19 11:00	29,6 KB
R2-1705857.zip	2017/05/19 11:00	38,6 KB
R2-1705858.zip	2017/05/19 11:00	33,4 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1705863.zip	2017/05/19 11:01	13,2 KB
R2-1705864.zip	2017/05/19 11:01	11,5 KB
R2-1705865.zip	2017/05/19 11:01	31,5 KB
R2-1705867.zip	2017/05/19 11:01	11,5 KB
R2-1705868.zip	2017/05/19 11:01	63,8 KB
R2-1705881.zip	2017/05/19 11:01	11,2 KB
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R2-1705886.zip	2017/05/19 11:01	26,9 KB
R2-1705887.zip	2017/05/19 11:01	26,6 KB
R2-1705888.zip	2017/05/19 11:01	30,4 KB
R2-1705889.zip	2017/05/19 11:01	30,5 KB
R2-1705890.zip	2017/05/19 11:01	21,1 KB
R2-1705891.zip	2017/05/19 11:01	24,5 KB
R2-1705892.zip	2017/05/19 11:01	15,8 KB
R2-1705893.zip	2017/05/19 11:01	15,7 KB
R2-1705894.zip	2017/05/19 11:01	41,3 KB
R2-1705895.zip	2017/05/19 11:01	25,7 KB
R2-1705896.zip	2017/05/19 11:01	20,1 KB
R2-1705897.zip	2017/05/19 11:01	27,9 KB
R2-1705899.zip	2017/05/19 11:01	37,4 KB
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R2-1705902.zip	2017/05/19 11:01	31,3 KB
R2-1705903.zip	2017/05/19 11:01	22,5 KB
R2-1705904.zip	2017/05/19 11:01	22,5 KB
R2-1705905.zip	2017/05/19 11:01	15 KB
R2-1705906.zip	2017/05/19 11:01	41,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1705908.zip	2017/05/19 11:01	25,8 KB
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R2-1705911.zip	2017/05/19 11:01	27,9 KB
R2-1705912.zip	2017/05/19 11:01	59,5 KB
R2-1705913.zip	2017/05/19 11:01	16,3 KB
R2-1705914.zip	2017/05/19 11:01	21,5 KB
R2-1705915.zip	2017/05/19 11:01	149,7 KB
R2-1705916.zip	2017/05/19 11:01	78 KB
R2-1705917.zip	2017/05/19 11:02	51,9 KB
R2-1705918.zip	2017/05/19 11:02	15,9 KB
R2-1705919.zip	2017/05/19 11:02	24,5 KB
R2-1705920.zip	2017/06/06 14:29	14,2 KB
R2-1705921.zip	2017/05/19 11:02	30,1 KB
R2-1705922.zip	2017/05/19 11:02	50,8 KB
R2-1705923.zip	2017/05/19 11:02	32,8 KB
R2-1705924.zip	2017/05/19 11:02	33,9 KB
R2-1705925.zip	2017/05/19 11:02	34,1 KB
R2-1705926.zip	2017/05/19 11:02	23,3 KB
R2-1705927.zip	2017/05/19 11:02	31,8 KB
R2-1705928.zip	2017/05/19 11:02	35,7 KB
R2-1705929.zip	2017/05/19 11:02	61,2 KB
R2-1705930.zip	2017/05/19 11:02	51,8 KB
R2-1705931.zip	2017/05/19 11:02	23,1 KB
R2-1705933.zip	2017/05/19 11:02	17,5 KB
R2-1705934.zip	2017/05/19 11:02	31,9 KB
R2-1705935.zip	2017/05/19 11:02	149,5 KB
R2-1705936.zip	2017/05/19 11:02	9,2 KB
R2-1705937.zip	2017/05/19 11:02	9 KB
R2-1705938.zip	2017/05/19 11:02	70,1 KB
R2-1705939.zip	2017/05/19 11:02	9 KB
R2-1705940.zip	2017/05/19 11:02	30,6 KB
R2-1705941.zip	2017/05/19 11:02	84,6 KB
R2-1705942.zip	2017/05/19 11:02	300,8 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1705946.zip	2017/05/19 11:02	38,1 KB
R2-1705947.zip	2017/05/19 11:02	18,9 KB
R2-1705948.zip	2017/05/19 11:02	43,2 KB
R2-1705949.zip	2017/05/19 11:02	23,2 KB
R2-1705950.zip	2017/05/22 14:18	32,2 KB
R2-1705951.zip	2017/05/29 16:08	3448,2 KB
R2-1705965.zip	2017/05/19 11:02	77,1 KB
R2-1705966.zip	2017/05/19 11:02	79,4 KB
R2-1705967.zip	2017/05/19 11:02	32 KB
R2-1705968.zip	2017/05/19 11:02	37,2 KB
R2-1705969.zip	2017/05/19 11:02	33,3 KB
R2-1705971.zip	2017/05/19 11:02	34,9 KB
R2-1705972.zip	2017/05/19 11:02	28,9 KB
R2-1705973.zip	2017/05/19 11:02	43,5 KB
R2-1705974.zip	2017/05/19 11:03	68,5 KB
R2-1705975.zip	2017/05/19 11:03	33 KB
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R2-1705979.zip	2017/05/19 11:03	9,3 KB
R2-1705980.zip	2017/05/19 11:03	88,2 KB
R2-1705981.zip	2017/05/19 11:03	15,9 KB
R2-1705983.zip	2017/05/19 11:03	26 KB
R2-1705984.zip	2017/05/19 11:03	15,2 KB
R2-1705985.zip	2017/05/19 11:03	14,7 KB
R2-1705988.zip	2017/05/19 11:03	10,1 KB
R2-1705989.zip	2017/05/19 11:03	10,2 KB
R2-1705994.zip	2017/05/19 11:04	2876 KB
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R2-1705996.zip	2017/05/19 11:03	28,5 KB
R2-1705997.zip	2017/05/19 11:03	15,3 KB
R2-1705998.zip	2017/05/19 11:03	73,7 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1706002.zip	2017/05/19 11:03	18,5 KB
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R2-1706005.zip	2017/05/19 11:04	22,1 KB
R2-1706006.zip	2017/05/19 11:04	65,1 KB
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R2-1706012.zip	2017/05/19 11:04	10,7 KB
R2-1706013.zip	2017/05/19 11:04	10,3 KB
R2-1706014.zip	2017/05/19 11:04	29,7 KB
R2-1706015.zip	2017/05/19 11:04	37,9 KB
R2-1706016.zip	2017/05/19 11:04	52,7 KB
R2-1706018.zip	2017/05/19 11:04	88 KB
R2-1706020.zip	2017/05/19 11:04	43,7 KB
R2-1706021.zip	2017/05/19 11:04	34,7 KB
R2-1706022.zip	2017/05/19 11:04	104,5 KB
R2-1706025.zip	2017/05/19 11:04	40,2 KB
R2-1706035.zip	2017/05/19 11:04	13,6 KB
R2-1706036.zip	2017/05/19 11:04	10,1 KB
R2-1706037.zip	2017/05/19 11:04	35,2 KB
R2-1706038.zip	2017/05/19 11:04	51 KB
R2-1706039.zip	2017/05/19 11:04	71,4 KB
R2-1706040.zip	2017/05/19 11:04	74,1 KB
R2-1706041.zip	2017/05/19 11:04	12,9 KB
R2-1706042.zip	2017/05/19 11:04	70,6 KB
R2-1706043.zip	2017/05/19 11:04	11,4 KB
R2-1706044.zip	2017/05/19 11:04	24,8 KB
R2-1706045.zip	2017/05/19 11:04	34,3 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1706048.zip	2017/05/19 11:04	25,9 KB
R2-1706049.zip	2017/05/19 11:04	10,8 KB
R2-1706050.zip	2017/05/19 11:05	129,4 KB
R2-1706051.zip	2017/05/19 11:05	40,6 KB
R2-1706052.zip	2017/05/19 11:05	28,9 KB
R2-1706053.zip	2017/05/19 11:05	19,6 KB
R2-1706054.zip	2017/05/19 11:05	11,5 KB
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R2-1706056.zip	2017/05/19 11:05	16,2 KB
R2-1706057.zip	2017/05/19 11:05	9,9 KB
R2-1706058.zip	2017/05/19 11:05	76,8 KB
R2-1706059.zip	2017/05/19 11:05	11,7 KB
R2-1706060.zip	2017/05/19 11:05	135,6 KB
R2-1706061.zip	2017/05/19 11:05	17,7 KB
R2-1706062.zip	2017/05/19 11:05	292,6 KB
R2-1706063.zip	2017/05/19 11:05	298,6 KB
R2-1706064.zip	2017/05/19 11:05	158,2 KB
R2-1706065.zip	2017/05/19 11:05	172,6 KB
R2-1706066.zip	2017/05/19 11:05	19,5 KB
R2-1706067.zip	2017/05/19 11:05	20,5 KB
R2-1706068.zip	2017/05/19 11:05	19,6 KB
R2-1706069.zip	2017/05/19 11:05	19,3 KB
R2-1706070.zip	2017/05/19 11:05	54,1 KB
R2-1706071.zip	2017/05/19 11:05	48,1 KB
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R2-1706074.zip	2017/05/19 11:05	34 KB
R2-1706075.zip	2017/05/19 11:05	102,7 KB
R2-1706076.zip	2017/05/19 11:05	23,8 KB
R2-1706077.zip	2017/05/19 11:05	39,5 KB
R2-1706078.zip	2017/05/19 11:05	15,7 KB
R2-1706079.zip	2017/05/19 11:05	39 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1706083.zip	2017/05/19 11:05	91,3 KB
R2-1706084.zip	2017/05/19 11:05	93,1 KB
R2-1706087.zip	2017/05/19 11:05	101,8 KB
R2-1706088.zip	2017/05/19 11:05	114,6 KB
R2-1706089.zip	2017/05/19 11:05	9,4 KB
R2-1706090.zip	2017/05/19 11:05	11,4 KB
R2-1706091.zip	2017/05/19 11:06	157,1 KB
R2-1706092.zip	2017/05/19 11:06	173,8 KB
R2-1706093.zip	2017/05/19 11:06	135,3 KB
R2-1706094.zip	2017/05/19 11:06	17,8 KB
R2-1706095.zip	2017/05/19 11:06	279,6 KB
R2-1706096.zip	2017/05/19 11:06	286,3 KB
R2-1706097.zip	2017/05/19 11:06	29 KB
R2-1706098.zip	2017/05/19 11:06	29 KB
R2-1706099.zip	2017/05/19 11:06	28,9 KB
R2-1706100.zip	2017/05/19 11:06	23,2 KB
R2-1706101.zip	2017/05/25 20:43	76,7 KB
R2-1706102.zip	2017/05/19 11:06	44,2 KB
R2-1706103.zip	2017/05/19 11:06	12,7 KB
R2-1706104.zip	2017/05/24 16:11	30,6 KB
R2-1706105.zip	2017/05/19 11:06	35,8 KB
R2-1706106.zip	2017/05/19 11:06	35,5 KB
R2-1706107.zip	2017/05/19 11:06	36,4 KB
R2-1706108.zip	2017/05/19 11:06	31,4 KB
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R2-1706111.zip	2017/05/19 11:06	41,1 KB
R2-1706112.zip	2017/05/19 11:06	18,9 KB
R2-1706113.zip	2017/05/19 11:06	149 KB
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R2-1706115.zip	2017/05/22 14:18	33,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1706117.zip	2017/05/19 11:06	41,2 KB
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R2-1706125.zip	2017/05/19 11:06	16,6 KB
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R2-1706127.zip	2017/05/19 11:06	29,9 KB
R2-1706128.zip	2017/05/19 11:06	31,9 KB
R2-1706129.zip	2017/05/19 11:06	18,4 KB
R2-1706130.zip	2017/06/20 9:49	18,7 KB
R2-1706131.zip	2017/05/19 11:06	65,2 KB
R2-1706132.zip	2017/05/19 11:06	12,1 KB
R2-1706133.zip	2017/05/19 11:06	11,1 KB
R2-1706134.zip	2017/05/19 11:06	10,4 KB
R2-1706135.zip	2017/05/19 11:06	15,6 KB
R2-1706136.zip	2017/05/19 11:06	14,6 KB
R2-1706137.zip	2017/05/19 11:06	44,4 KB
R2-1706138.zip	2017/05/19 11:06	39,8 KB
R2-1706139.zip	2017/05/19 11:06	11,9 KB
R2-1706140.zip	2017/05/19 11:07	13,4 KB
R2-1706141.zip	2017/05/19 11:07	11,2 KB
R2-1706142.zip	2017/05/19 17:00	10,8 KB
R2-1706143.zip	2017/05/19 11:07	22,8 KB
R2-1706144.zip	2017/05/19 11:07	25,9 KB
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R2-1706148.zip	2017/05/19 11:07	15,9 KB
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R2-1706151.zip	2017/05/19 11:07	9,9 KB
R2-1706152.zip	2017/05/19 11:07	27,3 KB
R2-1706153.zip	2017/05/19 11:07	11,6 KB
R2-1706154.zip	2017/05/19 11:07	15,4 KB
R2-1706155.zip	2017/05/19 11:07	14,7 KB
R2-1706156.zip	2017/05/19 11:07	10,1 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1706158.zip	2017/05/19 11:07	15,9 KB
R2-1706159.zip	2017/05/19 11:07	32,2 KB
R2-1706160.zip	2017/05/19 11:07	11,4 KB
R2-1706161.zip	2017/06/02 17:27	11,9 KB
R2-1706162.zip	2017/06/06 14:15	14,3 KB
R2-1706163.zip	2017/05/26 20:56	43,6 KB
R2-1706164.zip	2017/05/26 20:56	19,7 KB
R2-1706165.zip	2017/05/26 20:56	44 KB
R2-1706166.zip	2017/05/25 8:25	28,1 KB
R2-1706167.zip	2017/05/26 9:47	93,6 KB
R2-1706168.zip	2017/05/26 9:47	15,9 KB
R2-1706169.zip	2017/05/24 16:11	19,2 KB
R2-1706170.zip	2017/05/24 16:11	31,9 KB
R2-1706171.zip	2017/05/26 20:56	85,5 KB
R2-1706172.zip	2017/05/30 15:57	40,3 KB
R2-1706173.zip	2017/05/27 10:11	45,4 KB
R2-1706174.zip	2017/05/27 10:11	177 KB
R2-1706175.zip	2017/05/30 16:21	43,7 KB
R2-1706176.zip	2017/05/30 16:21	66,2 KB
R2-1706177.zip	2017/05/30 16:21	72,9 KB
R2-1706178.zip	2017/05/30 16:21	11,6 KB
R2-1706179.zip	2017/05/26 22:21	112,1 KB
R2-1706180.zip	2017/05/26 14:56	32,2 KB
R2-1706181.zip	2017/05/26 14:56	32,2 KB
R2-1706182.zip	2017/05/26 14:56	39,3 KB
R2-1706183.zip	2017/05/26 9:17	52,8 KB
R2-1706184.zip	2017/05/26 9:17	16 KB
R2-1706185.zip	2017/05/26 10:12	1658,7 KB
R2-1706186.zip	2017/05/26 10:10	149,1 KB
R2-1706187.zip	2017/05/26 20:56	157,1 KB
R2-1706188.zip	2017/05/26 14:56	31,9 KB
R2-1706189.zip	2017/05/27 10:11	1422,6 KB
R2-1706190.zip	2017/05/27 10:11	1417,1 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1706196.zip	2017/06/01 23:48	18,9 KB
R2-1706197.zip	2017/06/01 23:48	17,3 KB
R2-1706198.zip	2017/06/01 23:48	43,9 KB
R2-1706199.zip	2017/06/01 23:48	25,7 KB
R2-1706200.zip	2017/06/01 23:48	39,3 KB
R2-1706201.zip	2017/06/01 23:48	31,7 KB
R2-1706202.zip	2017/06/01 23:48	34 KB
R2-1706203.zip	2017/06/05 10:21	85,3 KB
R2-1706204.zip	2017/06/09 10:03	3584,4 KB
R2-1706205.zip	2017/06/09 10:03	3592,9 KB
R2-1706206.zip	2017/06/12 10:29	3590,5 KB
R2-1706207.zip	2017/06/17 5:13	67,7 KB
R2-1706208.zip	2017/07/13 9:06	635,2 KB
R2-1728050.zip	2017/05/19 11:08	4140,4 KB
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TDoc_List_Meeting_RAN2#98.xlsx	2017/10/14 9:55	608,6 KB
TDoc_List_Meeting_RAN2#98.zip	2018/01/10 16:48	1148,8 KB

2092 items.

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Appendix 24

www.3gpp.org / ftp / tsg_ran / WG2_RL2 / TSGR2_AHs / 2017_06_NR / Docs

sort by name/desc	sort by date/desc	sort by size/desc
R2-1706300.zip	2017/06/15 9:52	165,6 KB
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R2-1706307.zip	2017/06/13 22:11	13,3 KB
R2-1706308.zip	2017/06/13 22:11	14,9 KB
R2-1706309.zip	2017/06/13 22:11	9,6 KB
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R2-1706312.zip	2017/06/13 22:11	10,5 KB
R2-1706313.zip	2017/06/13 22:11	10,4 KB
R2-1706314.zip	2017/06/13 22:11	11 KB
R2-1706315.zip	2017/06/13 22:11	9,6 KB
R2-1706316.zip	2017/06/13 22:11	14,7 KB
R2-1706317.zip	2017/06/13 22:11	9,6 KB
R2-1706318.zip	2017/06/13 22:11	15,7 KB
R2-1706319.zip	2017/06/13 22:11	12,1 KB
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R2-1706326.zip	2017/06/16 19:04	36,8 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1706332.zip	2017/06/16 9:30	141,4 KB
R2-1706333.zip	2017/06/16 9:30	31 KB
R2-1706334.zip	2017/06/16 9:30	21 KB
R2-1706335.zip	2017/06/16 9:30	37,3 KB
R2-1706337.zip	2017/06/15 21:24	21,7 KB
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R2-1706339.zip	2017/06/16 9:26	21 KB
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R2-1706341.zip	2017/06/16 9:26	21,7 KB
R2-1706342.zip	2017/06/16 9:58	53 KB
R2-1706343.zip	2017/06/16 9:59	43,9 KB
R2-1706344.zip	2017/06/16 10:00	43,2 KB
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R2-1706346.zip	2017/06/16 10:02	23,1 KB
R2-1706347.zip	2017/06/16 11:02	202,4 KB
R2-1706348.zip	2017/06/16 11:02	28,3 KB
R2-1706349.zip	2017/06/16 11:02	25,7 KB
R2-1706350.zip	2017/06/16 11:02	34 KB
R2-1706351.zip	2017/06/16 11:02	80,5 KB
R2-1706352.zip	2017/06/16 16:01	16,9 KB
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R2-1706356.zip	2017/06/16 9:33	131,8 KB
R2-1706357.zip	2017/06/16 9:34	47 KB
R2-1706358.zip	2017/06/16 9:15	144,1 KB
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R2-1706360.zip	2017/06/17 1:17	60,8 KB
R2-1706361.zip	2017/06/17 1:17	50,6 KB

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R2-1706390.zip	2017/06/16 15:52	39,3 KB
R2-1706391.zip	2017/06/16 15:52	63,4 KB
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R2-1706412.zip	2017/06/16 15:53	39,3 KB
R2-1706413.zip	2017/06/16 15:54	44,2 KB
R2-1706414.zip	2017/06/16 15:54	42,4 KB
R2-1706415.zip	2017/06/16 15:54	50,3 KB
R2-1706417.zip	2017/06/17 1:18	115 KB
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R2-1706452.zip	2017/06/17 1:44	25,7 KB
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R2-1706462.zip	2017/06/17 5:24	27,5 KB
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R2-1706476.zip	2017/06/17 5:24	23,4 KB
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R2-1706481.zip	2017/06/17 5:23	90,7 KB
R2-1706482.zip	2017/06/17 5:23	41,5 KB
R2-1706483.zip	2017/06/17 5:23	78,2 KB
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R2-1706487.zip	2017/06/16 21:14	31,1 KB
R2-1706488.zip	2017/06/16 21:14	31 KB
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R2-1706510.zip	2017/06/16 20:53	38,4 KB
R2-1706511.zip	2017/06/16 20:53	45,9 KB
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R2-1706548.zip	2017/06/17 1:20	16,1 KB
R2-1706549.zip	2017/06/17 1:20	18,7 KB
R2-1706550.zip	2017/06/17 1:20	24,4 KB
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R2-1706552.zip	2017/06/17 1:20	47 KB
R2-1706553.zip	2017/06/17 1:20	26,5 KB
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R2-1706555.zip	2017/06/17 4:14	32,3 KB
R2-1706556.zip	2017/06/17 4:14	28,7 KB
R2-1706557.zip	2017/06/17 4:14	65,8 KB
R2-1706558.zip	2017/06/16 11:32	27,8 KB
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R2-1706567.zip	2017/06/16 14:12	51,5 KB
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R2-1706577.zip	2017/06/16 22:38	60,5 KB
R2-1706578.zip	2017/06/16 22:38	35,3 KB
R2-1706579.zip	2017/06/16 22:38	43 KB
R2-1706580.zip	2017/06/16 22:38	40,5 KB
R2-1706581.zip	2017/06/16 9:44	12,6 KB
R2-1706582.zip	2017/06/16 9:27	39,1 KB
R2-1706583.zip	2017/06/16 10:28	25,1 KB
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R2-1706585.zip	2017/06/16 10:28	94,1 KB
R2-1706586.zip	2017/06/16 10:28	75,6 KB
R2-1706587.zip	2017/06/16 10:28	21,5 KB
R2-1706588.zip	2017/06/16 10:28	19,9 KB
R2-1706589.zip	2017/06/16 10:28	21,2 KB
R2-1706590.zip	2017/06/16 10:28	20,8 KB
R2-1706591.zip	2017/06/16 10:28	18,4 KB
R2-1706592.zip	2017/06/16 10:28	119,8 KB
R2-1706593.zip	2017/06/16 10:28	83,4 KB
R2-1706594.zip	2017/06/16 10:28	171,1 KB
R2-1706595.zip	2017/06/16 18:05	15,6 KB
R2-1706596.zip	2017/06/16 18:05	92,1 KB
R2-1706597.zip	2017/06/16 18:05	15,6 KB
R2-1706598.zip	2017/06/22 10:30	36,6 KB
R2-1706599.zip	2017/06/16 18:05	47,4 KB
R2-1706600.zip	2017/06/16 18:05	38,5 KB
R2-1706601.zip	2017/06/16 18:05	26,7 KB
R2-1706602.zip	2017/06/16 18:05	235 KB
R2-1706603.zip	2017/06/16 19:09	282,7 KB
R2-1706604.zip	2017/06/17 1:18	28,4 KB
R2-1706605.zip	2017/06/17 11:47	72,4 KB
R2-1706606.zip	2017/06/17 11:47	22,9 KB
R2-1706607.zip	2017/06/17 11:47	51,4 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1706608.zip	2017/06/16 6:39	619,9 KB
R2-1706609.zip	2017/06/16 6:39	19,7 KB
R2-1706610.zip	2017/06/16 6:39	25,3 KB
R2-1706611.zip	2017/06/16 6:40	26 KB
R2-1706612.zip	2017/06/16 6:40	9,8 KB
R2-1706613.zip	2017/06/16 6:40	46,5 KB
R2-1706614.zip	2017/06/16 19:59	28,5 KB
R2-1706615.zip	2017/06/16 19:59	44,9 KB
R2-1706616.zip	2017/06/16 19:59	26,5 KB
R2-1706617.zip	2017/06/16 19:59	214,4 KB
R2-1706618.zip	2017/06/16 19:59	119,7 KB
R2-1706619.zip	2017/06/16 19:59	62,5 KB
R2-1706620.zip	2017/06/16 19:59	25,7 KB
R2-1706621.zip	2017/06/16 19:59	102,8 KB
R2-1706622.zip	2017/06/16 19:59	159,6 KB
R2-1706623.zip	2017/06/16 19:59	55,7 KB
R2-1706624.zip	2017/06/16 19:59	55,5 KB
R2-1706625.zip	2017/06/16 21:16	146,8 KB
R2-1706626.zip	2017/06/16 21:21	143,1 KB
R2-1706627.zip	2017/06/16 21:24	127,4 KB
R2-1706628.zip	2017/06/16 21:25	49,4 KB
R2-1706629.zip	2017/06/16 22:34	38,5 KB
R2-1706630.zip	2017/06/16 21:26	87,4 KB
R2-1706631.zip	2017/06/16 21:27	91,4 KB
R2-1706632.zip	2017/06/16 22:37	38,9 KB
R2-1706633.zip	2017/06/16 23:07	40,7 KB
R2-1706634.zip	2017/06/16 21:28	66,1 KB
R2-1706635.zip	2017/06/16 21:30	95,9 KB
R2-1706636.zip	2017/06/16 22:47	41,6 KB
R2-1706637.zip	2017/06/16 22:47	39,7 KB
R2-1706638.zip	2017/06/16 22:47	37,5 KB
R2-1706639.zip	2017/06/16 12:58	52,5 KB
R2-1706640.zip	2017/06/16 12:58	49,6 KB
R2-1706641.zip	2017/06/16 17:03	51,5 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1706643.zip	2017/06/16 17:04	73,5 KB
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R2-1706645.zip	2017/06/16 17:04	102 KB
R2-1706646.zip	2017/06/16 17:04	88,1 KB
R2-1706647.zip	2017/06/16 17:04	94 KB
R2-1706648.zip	2017/06/16 17:04	202,4 KB
R2-1706649.zip	2017/06/16 17:04	100,1 KB
R2-1706650.zip	2017/06/17 0:52	52,2 KB
R2-1706651.zip	2017/06/17 0:52	87,8 KB
R2-1706652.zip	2017/06/17 0:52	38 KB
R2-1706654.zip	2017/06/16 17:04	38 KB
R2-1706655.zip	2017/06/17 0:52	55,4 KB
R2-1706656.zip	2017/06/17 0:52	101,8 KB
R2-1706657.zip	2017/06/17 0:52	41,1 KB
R2-1706658.zip	2017/06/17 0:52	449,6 KB
R2-1706659.zip	2017/06/17 0:52	91,8 KB
R2-1706660.zip	2017/06/17 0:52	188,7 KB
R2-1706661.zip	2017/06/16 17:04	38,2 KB
R2-1706662.zip	2017/06/16 17:04	36,1 KB
R2-1706663.zip	2017/06/16 17:04	118,2 KB
R2-1706664.zip	2017/06/16 17:04	297,3 KB
R2-1706665.zip	2017/06/16 17:04	48,3 KB
R2-1706666.zip	2017/06/16 17:05	165,8 KB
R2-1706667.zip	2017/06/16 17:05	35,4 KB
R2-1706668.zip	2017/06/16 17:05	43,4 KB
R2-1706669.zip	2017/06/16 17:05	38 KB
R2-1706670.zip	2017/06/16 17:05	103,9 KB
R2-1706671.zip	2017/06/16 17:05	37,3 KB
R2-1706672.zip	2017/06/16 17:05	44,3 KB
R2-1706673.zip	2017/06/16 17:05	115,5 KB
R2-1706674.zip	2017/06/16 17:05	57,8 KB
R2-1706675.zip	2017/06/16 17:05	139,1 KB
R2-1706676.zip	2017/06/16 17:06	259,7 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1706677.zip	2017/06/16 17:06	61,1 KB
R2-1706678.zip	2017/06/17 4:42	86 KB
R2-1706679.zip	2017/06/17 4:42	27,4 KB
R2-1706680.zip	2017/06/17 4:42	349,5 KB
R2-1706681.zip	2017/06/16 20:24	33 KB
R2-1706682.zip	2017/06/16 20:24	30,9 KB
R2-1706683.zip	2017/06/16 20:24	94,1 KB
R2-1706684.zip	2017/06/16 20:24	24,6 KB
R2-1706685.zip	2017/06/16 15:02	33,9 KB
R2-1706686.zip	2017/06/16 15:02	36,3 KB
R2-1706687.zip	2017/06/16 15:02	33,1 KB
R2-1706688.zip	2017/06/16 15:02	26,9 KB
R2-1706689.zip	2017/06/16 3:22	32,6 KB
R2-1706690.zip	2017/06/16 14:08	29 KB
R2-1706691.zip	2017/06/16 3:23	32,6 KB
R2-1706692.zip	2017/06/16 3:24	31,2 KB
R2-1706693.zip	2017/06/16 14:09	30,6 KB
R2-1706694.zip	2017/06/16 3:24	28,9 KB
R2-1706695.zip	2017/06/16 3:24	29,1 KB
R2-1706696.zip	2017/06/16 3:24	29,2 KB
R2-1706697.zip	2017/06/16 3:25	30 KB
R2-1706698.zip	2017/06/16 3:25	31,8 KB
R2-1706699.zip	2017/06/16 3:25	67,7 KB
R2-1706700.zip	2017/06/16 21:44	221,7 KB
R2-1706701.zip	2017/06/16 21:44	71 KB
R2-1706702.zip	2017/06/16 21:44	50,8 KB
R2-1706703.zip	2017/06/16 21:44	46,2 KB
R2-1706704.zip	2017/06/16 21:45	14,7 KB
R2-1706705.zip	2017/06/17 2:43	190,6 KB
R2-1706706.zip	2017/06/17 2:43	343,3 KB
R2-1706707.zip	2017/06/17 2:43	391,7 KB
R2-1706708.zip	2017/06/17 2:43	189,9 KB
R2-1706709.zip	2017/06/17 2:43	377 KB
R2-1706710.zip	2017/06/17 2:43	278,2 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1706711.zip	2017/06/17 2:43	97,7 KB
R2-1706712.zip	2017/06/17 2:43	122 KB
R2-1706713.zip	2017/06/17 2:43	94,3 KB
R2-1706714.zip	2017/06/17 2:43	96,3 KB
R2-1706715.zip	2017/06/17 6:40	47,2 KB
R2-1706716.zip	2017/06/17 6:40	189,3 KB
R2-1706717.zip	2017/06/17 6:40	45,4 KB
R2-1706718.zip	2017/06/17 6:40	54,9 KB
R2-1706719.zip	2017/06/17 6:40	48,6 KB
R2-1706720.zip	2017/06/17 6:40	39,8 KB
R2-1706721.zip	2017/06/17 6:40	95,1 KB
R2-1706722.zip	2017/06/17 6:40	163,6 KB
R2-1706723.zip	2017/06/17 6:40	73,3 KB
R2-1706724.zip	2017/06/17 6:40	44,7 KB
R2-1706725.zip	2017/06/17 6:40	146,1 KB
R2-1706726.zip	2017/06/17 6:40	68,7 KB
R2-1706727.zip	2017/06/17 6:40	479,5 KB
R2-1706728.zip	2017/06/17 6:40	40,3 KB
R2-1706729.zip	2017/06/17 6:40	36,7 KB
R2-1706730.zip	2017/06/17 6:40	96,3 KB
R2-1706731.zip	2017/06/17 6:40	35,3 KB
R2-1706732.zip	2017/06/17 6:40	35,1 KB
R2-1706733.zip	2017/06/17 6:40	109,1 KB
R2-1706734.zip	2017/06/17 6:40	87,1 KB
R2-1706735.zip	2017/06/17 6:40	274,6 KB
R2-1706736.zip	2017/06/17 6:40	38 KB
R2-1706737.zip	2017/06/17 6:40	57,1 KB
R2-1706738.zip	2017/06/17 6:40	113 KB
R2-1706739.zip	2017/06/17 6:40	73,5 KB
R2-1706740.zip	2017/06/17 6:40	47 KB
R2-1706741.zip	2017/06/17 6:40	30,5 KB
R2-1706742.zip	2017/06/17 6:40	40,3 KB
R2-1706743.zip	2017/06/17 6:40	36,5 KB
R2-1706744.zip	2017/06/17 6:40	87,3 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1706745.zip	2017/06/17 6:40	74,5 KB
R2-1706746.zip	2017/06/17 6:40	55 KB
R2-1706747.zip	2017/06/17 6:40	38,4 KB
R2-1706748.zip	2017/06/16 11:39	454,5 KB
R2-1706749.zip	2017/06/16 11:39	29,9 KB
R2-1706750.zip	2017/06/16 6:37	72,4 KB
R2-1706751.zip	2017/06/16 12:46	27,7 KB
R2-1706752.zip	2017/06/17 1:44	26,8 KB
R2-1706753.zip	2017/06/16 7:32	61,9 KB
R2-1706754.zip	2017/06/16 7:32	134,8 KB
R2-1706755.zip	2017/06/16 6:13	32,1 KB
R2-1706756.zip	2017/06/16 10:34	253,6 KB
R2-1706757.zip	2017/06/16 10:34	121,5 KB
R2-1706758.zip	2017/06/16 10:34	47,6 KB
R2-1706759.zip	2017/06/16 10:34	46,6 KB
R2-1706760.zip	2017/06/16 10:34	50,2 KB
R2-1706761.zip	2017/06/16 10:34	832,8 KB
R2-1706762.zip	2017/06/17 4:37	51,3 KB
R2-1706763.zip	2017/06/17 4:37	45,7 KB
R2-1706764.zip	2017/06/17 4:37	22,9 KB
R2-1706765.zip	2017/06/17 4:37	63,7 KB
R2-1706766.zip	2017/06/17 4:37	82,8 KB
R2-1706767.zip	2017/06/17 4:37	45,3 KB
R2-1706768.zip	2017/06/17 4:37	160 KB
R2-1706769.zip	2017/06/17 4:37	73,7 KB
R2-1706770.zip	2017/06/17 4:37	193,7 KB
R2-1706771.zip	2017/06/17 4:37	98 KB
R2-1706772.zip	2017/06/17 4:37	41 KB
R2-1706773.zip	2017/06/17 4:37	38,3 KB
R2-1706774.zip	2017/06/17 3:42	39 KB
R2-1706775.zip	2017/06/17 3:42	150,2 KB
R2-1706776.zip	2017/06/17 3:42	40,5 KB
R2-1706777.zip	2017/06/17 3:42	43,5 KB
R2-1706778.zip	2017/06/17 3:42	33,2 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1706779.zip	2017/06/17 3:42	37,5 KB
R2-1706780.zip	2017/06/17 3:42	87 KB
R2-1706781.zip	2017/06/17 3:42	39 KB
R2-1706782.zip	2017/06/17 3:42	171,9 KB
R2-1706783.zip	2017/06/17 3:42	41,6 KB
R2-1706784.zip	2017/06/17 3:42	52,8 KB
R2-1706785.zip	2017/06/17 3:42	86,6 KB
R2-1706786.zip	2017/06/17 3:42	85,1 KB
R2-1706787.zip	2017/06/17 3:42	170,4 KB
R2-1706788.zip	2017/06/17 3:42	100,7 KB
R2-1706789.zip	2017/06/17 3:42	30,8 KB
R2-1706790.zip	2017/06/17 3:42	39,9 KB
R2-1706791.zip	2017/06/16 14:13	42,7 KB
R2-1706794.zip	2017/06/17 1:13	104,7 KB
R2-1706795.zip	2017/06/16 4:05	262,2 KB
R2-1706796.zip	2017/06/16 4:05	187,5 KB
R2-1706797.zip	2017/06/16 4:05	76,1 KB
R2-1706798.zip	2017/06/17 1:13	14,3 KB
R2-1706799.zip	2017/06/17 1:13	12,8 KB
R2-1706800.zip	2017/06/17 1:13	18,3 KB
R2-1706801.zip	2017/06/17 1:13	17,3 KB
R2-1706802.zip	2017/06/17 1:14	94,1 KB
R2-1706803.zip	2017/06/17 1:14	43,9 KB
R2-1706804.zip	2017/06/17 1:14	27,2 KB
R2-1706805.zip	2017/06/16 4:06	191,4 KB
R2-1706806.zip	2017/06/16 14:55	96,2 KB
R2-1706807.zip	2017/06/16 14:55	1071,6 KB
R2-1706808.zip	2017/06/16 4:15	52,2 KB
R2-1706809.zip	2017/06/16 4:18	30,5 KB
R2-1706810.zip	2017/06/17 3:03	43,7 KB
R2-1706811.zip	2017/06/16 5:23	33,3 KB
R2-1706812.zip	2017/06/16 5:23	44,7 KB
R2-1706813.zip	2017/06/17 5:13	87,5 KB
R2-1706814.zip	2017/06/17 4:35	79,6 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1706816.zip	2017/06/16 6:23	31,3 KB
R2-1706817.zip	2017/06/16 5:23	72,5 KB
R2-1706818.zip	2017/06/16 6:24	31,2 KB
R2-1706819.zip	2017/06/17 2:53	27,7 KB
R2-1706820.zip	2017/06/17 2:54	29,1 KB
R2-1706821.zip	2017/06/16 9:29	27,6 KB
R2-1706822.zip	2017/06/17 2:54	38,5 KB
R2-1706823.zip	2017/06/16 6:24	28,6 KB
R2-1706824.zip	2017/06/17 2:54	115 KB
R2-1706825.zip	2017/06/16 6:25	37,7 KB
R2-1706826.zip	2017/06/16 5:02	61,3 KB
R2-1706827.zip	2017/06/16 6:25	30,8 KB
R2-1706828.zip	2017/06/16 6:25	12,7 KB
R2-1706829.zip	2017/06/16 14:55	50,5 KB
R2-1706830.zip	2017/06/16 14:55	25 KB
R2-1706831.zip	2017/06/16 14:55	34,5 KB
R2-1706832.zip	2017/06/16 8:20	68 KB
R2-1706833.zip	2017/06/16 8:52	47,5 KB
R2-1706834.zip	2017/06/16 6:44	21,6 KB
R2-1706835.zip	2017/06/16 12:01	33,4 KB
R2-1706836.zip	2017/06/16 12:01	361,7 KB
R2-1706837.zip	2017/06/16 12:01	15,9 KB
R2-1706838.zip	2017/06/16 12:01	26,9 KB
R2-1706839.zip	2017/06/16 12:01	17,9 KB
R2-1706840.zip	2017/06/16 12:01	117,6 KB
R2-1706841.zip	2017/06/16 12:01	38,6 KB
R2-1706842.zip	2017/06/16 14:55	17,1 KB
R2-1706843.zip	2017/06/16 7:43	47,5 KB
R2-1706844.zip	2017/06/16 8:40	650,3 KB
R2-1706845.zip	2017/06/16 14:55	13,8 KB
R2-1706846.zip	2017/06/16 6:44	21,5 KB
R2-1706847.zip	2017/06/16 14:55	15,6 KB
R2-1706848.zip	2017/06/16 6:44	21 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1706850.zip	2017/06/16 5:13	117,5 KB
R2-1706851.zip	2017/06/16 6:44	37,8 KB
R2-1706852.zip	2017/06/16 5:20	30,4 KB
R2-1706853.zip	2017/06/16 5:20	43,9 KB
R2-1706854.zip	2017/06/16 8:33	58,9 KB
R2-1706855.zip	2017/06/17 6:18	25,2 KB
R2-1706856.zip	2017/06/17 6:18	45,2 KB
R2-1706857.zip	2017/06/17 6:18	54,7 KB
R2-1706858.zip	2017/06/17 6:18	49,9 KB
R2-1706859.zip	2017/06/17 6:18	413,6 KB
R2-1706860.zip	2017/06/17 6:18	65,7 KB
R2-1706861.zip	2017/06/17 6:18	31,3 KB
R2-1706862.zip	2017/06/17 6:18	134,9 KB
R2-1706863.zip	2017/06/16 5:32	41,7 KB
R2-1706864.zip	2017/06/17 2:02	44,8 KB
R2-1706865.zip	2017/06/17 5:37	33,3 KB
R2-1706866.zip	2017/06/17 5:37	25,5 KB
R2-1706867.zip	2017/06/17 5:37	27,3 KB
R2-1706868.zip	2017/06/17 5:37	844,5 KB
R2-1706869.zip	2017/06/17 5:37	301,9 KB
R2-1706870.zip	2017/06/17 5:37	25,1 KB
R2-1706871.zip	2017/06/16 6:11	61,9 KB
R2-1706872.zip	2017/06/16 6:11	122 KB
R2-1706873.zip	2017/06/16 6:11	20,1 KB
R2-1706874.zip	2017/06/16 14:55	14,3 KB
R2-1706875.zip	2017/06/16 6:11	17,6 KB
R2-1706876.zip	2017/06/17 5:14	30,8 KB
R2-1706877.zip	2017/06/17 5:14	309 KB
R2-1706878.zip	2017/06/16 6:11	185,1 KB
R2-1706879.zip	2017/06/17 5:14	28,5 KB
R2-1706880.zip	2017/06/16 9:06	69,1 KB
R2-1706881.zip	2017/06/17 5:14	35,4 KB
R2-1706882.zip	2017/06/17 5:14	177,8 KB
R2-1706883.zip	2017/06/16 9:06	18,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1706885.zip	2017/06/16 14:55	91,1 KB
R2-1706886.zip	2017/06/17 5:15	75,7 KB
R2-1706887.zip	2017/06/16 9:07	15,5 KB
R2-1706888.zip	2017/06/17 5:15	349,9 KB
R2-1706889.zip	2017/06/20 16:09	28,2 KB
R2-1706890.zip	2017/06/17 5:16	29,8 KB
R2-1706891.zip	2017/06/17 5:16	29,9 KB
R2-1706892.zip	2017/06/17 5:16	319,3 KB
R2-1706893.zip	2017/06/17 5:16	27,4 KB
R2-1706894.zip	2017/06/17 0:52	42,7 KB
R2-1706895.zip	2017/06/16 17:06	37,7 KB
R2-1706896.zip	2017/06/16 17:06	166 KB
R2-1706897.zip	2017/06/16 17:06	73,2 KB
R2-1706898.zip	2017/06/16 17:06	132,5 KB
R2-1706899.zip	2017/06/16 17:06	28,3 KB
R2-1706900.zip	2017/06/17 0:13	121,6 KB
R2-1706901.zip	2017/06/17 0:13	82,5 KB
R2-1706902.zip	2017/06/17 0:13	122,2 KB
R2-1706903.zip	2017/06/17 0:13	52,1 KB
R2-1706904.zip	2017/06/16 16:46	37,8 KB
R2-1706905.zip	2017/06/16 16:46	59,6 KB
R2-1706906.zip	2017/06/16 9:14	31,3 KB
R2-1706907.zip	2017/06/17 1:13	177,1 KB
R2-1706908.zip	2017/06/17 5:11	178,5 KB
R2-1706909.zip	2017/06/17 5:11	46,1 KB
R2-1706910.zip	2017/06/16 10:03	37,5 KB
R2-1706911.zip	2017/06/17 5:10	29,4 KB
R2-1706912.zip	2017/06/17 5:10	302,9 KB
R2-1706913.zip	2017/06/16 8:24	89,6 KB
R2-1706914.zip	2017/06/17 5:10	17,3 KB
R2-1706915.zip	2017/06/17 5:10	99,8 KB
R2-1706916.zip	2017/06/16 8:24	77,9 KB
R2-1706917.zip	2017/06/17 2:21	36,8 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1706918.zip	2017/06/17 2:21	271,4 KB
R2-1706919.zip	2017/06/17 2:21	127,1 KB
R2-1706920.zip	2017/06/17 2:21	316,6 KB
R2-1706921.zip	2017/06/17 2:21	39,5 KB
R2-1706922.zip	2017/06/17 2:21	39 KB
R2-1706923.zip	2017/06/17 2:21	97,5 KB
R2-1706924.zip	2017/06/17 2:21	37,8 KB
R2-1706925.zip	2017/06/17 2:21	682,8 KB
R2-1706926.zip	2017/06/17 5:11	18,1 KB
R2-1706927.zip	2017/06/16 8:04	23 KB
R2-1706928.zip	2017/06/16 8:34	25,9 KB
R2-1706929.zip	2017/06/16 8:34	26 KB
R2-1706930.zip	2017/06/16 8:34	100,5 KB
R2-1706931.zip	2017/06/16 8:48	39,2 KB
R2-1706932.zip	2017/06/16 9:14	58,3 KB
R2-1706933.zip	2017/06/16 8:24	88,1 KB
R2-1706934.zip	2017/06/16 9:14	34,1 KB
R2-1706935.zip	2017/06/16 10:05	82,9 KB
R2-1706936.zip	2017/06/16 10:05	33,4 KB
R2-1706937.zip	2017/06/16 10:05	87,8 KB
R2-1706938.zip	2017/06/16 10:05	216,8 KB
R2-1706939.zip	2017/06/16 10:06	113,8 KB
R2-1706940.zip	2017/06/16 10:06	94,5 KB
R2-1706941.zip	2017/06/16 10:06	27,1 KB
R2-1706942.zip	2017/06/16 10:06	87,7 KB
R2-1706943.zip	2017/06/16 10:06	94,7 KB
R2-1706944.zip	2017/06/16 10:06	39 KB
R2-1706945.zip	2017/06/16 8:30	38 KB
R2-1706946.zip	2017/06/16 8:24	23 KB
R2-1706947.zip	2017/06/16 20:19	76,1 KB
R2-1706948.zip	2017/06/16 20:19	231,6 KB
R2-1706949.zip	2017/06/16 20:19	48 KB
R2-1706950.zip	2017/06/16 20:19	46,2 KB
R2-1706951.zip	2017/06/16 8:24	42,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1706952.zip	2017/06/16 13:12	32,7 KB
R2-1706953.zip	2017/06/17 3:03	92,3 KB
R2-1706954.zip	2017/06/16 13:12	48,3 KB
R2-1706955.zip	2017/06/17 3:03	239,3 KB
R2-1706956.zip	2017/06/16 17:06	35,7 KB
R2-1706957.zip	2017/06/17 4:07	98,1 KB
R2-1706958.zip	2017/06/17 4:07	55,3 KB
R2-1706959.zip	2017/06/17 4:07	83,2 KB
R2-1706960.zip	2017/06/17 5:22	51,2 KB
R2-1706961.zip	2017/06/17 5:22	349,3 KB
R2-1706962.zip	2017/06/17 5:22	31,7 KB
R2-1706963.zip	2017/06/17 5:22	51,2 KB
R2-1706964.zip	2017/06/17 5:22	304,8 KB
R2-1706965.zip	2017/06/17 5:22	49,7 KB
R2-1706966.zip	2017/06/17 5:22	200,1 KB
R2-1706967.zip	2017/06/17 5:22	100,2 KB
R2-1706968.zip	2017/06/17 5:22	1036,7 KB
R2-1706969.zip	2017/06/17 5:22	72,2 KB
R2-1706970.zip	2017/06/17 5:22	18,6 KB
R2-1706971.zip	2017/06/17 5:22	60,7 KB
R2-1706972.zip	2017/06/17 5:22	91,6 KB
R2-1706973.zip	2017/06/17 5:22	135,7 KB
R2-1706974.zip	2017/06/17 5:22	111,4 KB
R2-1706975.zip	2017/06/17 5:22	127,4 KB
R2-1706976.zip	2017/06/17 5:22	47,9 KB
R2-1706977.zip	2017/06/17 5:22	191,1 KB
R2-1706978.zip	2017/06/17 5:22	40,5 KB
R2-1706979.zip	2017/06/17 5:22	83,3 KB
R2-1706980.zip	2017/06/17 0:53	145,1 KB
R2-1706981.zip	2017/06/17 2:42	41,4 KB
R2-1706982.zip	2017/06/17 2:42	189,2 KB
R2-1706983.zip	2017/06/17 2:42	42,6 KB
R2-1706984.zip	2017/06/17 7:38	51,6 KB
R2-1706985.zip	2017/06/17 2:42	31 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1706986.zip	2017/06/17 5:24	24,8 KB
R2-1706987.zip	2017/06/16 12:43	90,9 KB
R2-1706988.zip	2017/06/17 1:47	61,7 KB
R2-1706989.zip	2017/06/17 1:47	21,5 KB
R2-1706990.zip	2017/06/17 1:47	19,8 KB
R2-1706991.zip	2017/06/17 1:47	96,9 KB
R2-1706992.zip	2017/06/17 1:47	49,9 KB
R2-1706993.zip	2017/06/17 1:47	20 KB
R2-1706994.zip	2017/06/17 1:47	160,3 KB
R2-1706995.zip	2017/06/17 1:47	129,7 KB
R2-1706996.zip	2017/06/17 1:47	70,5 KB
R2-1706997.zip	2017/06/17 1:47	66,1 KB
R2-1706998.zip	2017/06/17 1:47	38,1 KB
R2-1706999.zip	2017/06/17 1:47	24,6 KB
R2-1707000.zip	2017/06/17 1:47	41,2 KB
R2-1707001.zip	2017/06/16 16:46	44,7 KB
R2-1707002.zip	2017/06/17 2:10	181,2 KB
R2-1707003.zip	2017/06/17 2:10	53,4 KB
R2-1707004.zip	2017/06/17 2:10	171,8 KB
R2-1707005.zip	2017/06/17 2:10	146 KB
R2-1707006.zip	2017/06/17 2:10	54 KB
R2-1707007.zip	2017/06/17 2:10	201,7 KB
R2-1707008.zip	2017/06/16 10:00	48,6 KB
R2-1707009.zip	2017/06/16 10:02	27 KB
R2-1707010.zip	2017/06/16 10:02	109,8 KB
R2-1707011.zip	2017/06/16 14:19	52,3 KB
R2-1707012.zip	2017/06/17 5:03	558,2 KB
R2-1707013.zip	2017/06/17 5:03	51,2 KB
R2-1707014.zip	2017/06/17 5:03	65,6 KB
R2-1707016.zip	2017/06/17 5:03	81 KB
R2-1707017.zip	2017/06/17 5:03	214,5 KB
R2-1707018.zip	2017/06/17 5:03	128,1 KB
R2-1707019.zip	2017/06/17 5:03	133,8 KB
R2-1707020.zip	2017/06/17 5:03	105 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1707021.zip	2017/06/17 5:03	63,8 KB
R2-1707022.zip	2017/06/17 5:03	61,2 KB
R2-1707023.zip	2017/06/17 5:03	65,1 KB
R2-1707024.zip	2017/06/17 5:03	79,8 KB
R2-1707025.zip	2017/06/17 5:03	59,5 KB
R2-1707026.zip	2017/06/17 5:03	32,7 KB
R2-1707027.zip	2017/06/17 5:03	19,1 KB
R2-1707028.zip	2017/06/17 5:03	18 KB
R2-1707029.zip	2017/06/17 5:03	18,7 KB
R2-1707030.zip	2017/06/17 5:03	62 KB
R2-1707031.zip	2017/06/17 5:03	45,3 KB
R2-1707032.zip	2017/06/17 5:03	52,5 KB
R2-1707033.zip	2017/06/17 5:03	44,2 KB
R2-1707034.zip	2017/06/17 5:03	47,4 KB
R2-1707035.zip	2017/06/17 5:03	52,9 KB
R2-1707036.zip	2017/06/17 5:03	137,8 KB
R2-1707037.zip	2017/06/17 5:03	105,9 KB
R2-1707038.zip	2017/06/17 5:03	106,3 KB
R2-1707039.zip	2017/06/17 5:03	25,5 KB
R2-1707040.zip	2017/06/17 5:03	230,4 KB
R2-1707041.zip	2017/06/17 5:03	18,4 KB
R2-1707042.zip	2017/06/17 5:03	23,2 KB
R2-1707043.zip	2017/06/17 5:03	22,2 KB
R2-1707044.zip	2017/06/17 5:03	28,1 KB
R2-1707045.zip	2017/06/17 5:03	23,3 KB
R2-1707046.zip	2017/06/17 5:03	38,6 KB
R2-1707047.zip	2017/06/17 5:03	126,9 KB
R2-1707048.zip	2017/06/17 5:03	38,4 KB
R2-1707049.zip	2017/06/17 5:03	39,2 KB
R2-1707050.zip	2017/06/17 5:03	54,8 KB
R2-1707051.zip	2017/06/17 5:03	40,6 KB
R2-1707052.zip	2017/06/17 5:03	97,8 KB
R2-1707053.zip	2017/06/17 5:03	22,2 KB
R2-1707054.zip	2017/06/17 5:03	20,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1707055.zip	2017/06/17 5:03	23,9 KB
R2-1707056.zip	2017/06/17 5:03	22,8 KB
R2-1707057.zip	2017/06/17 5:03	22,3 KB
R2-1707058.zip	2017/06/17 5:03	49,4 KB
R2-1707059.zip	2017/06/17 5:03	24,2 KB
R2-1707060.zip	2017/06/17 5:03	539 KB
R2-1707061.zip	2017/06/17 5:03	94,5 KB
R2-1707062.zip	2017/06/17 5:03	46,4 KB
R2-1707063.zip	2017/06/17 5:03	88,8 KB
R2-1707064.zip	2017/06/17 5:04	46 KB
R2-1707065.zip	2017/06/17 5:04	213,9 KB
R2-1707066.zip	2017/06/17 5:04	86,7 KB
R2-1707067.zip	2017/06/17 5:04	47,8 KB
R2-1707068.zip	2017/06/17 5:04	32,7 KB
R2-1707069.zip	2017/06/17 5:04	32,9 KB
R2-1707070.zip	2017/06/17 5:04	17,7 KB
R2-1707071.zip	2017/06/17 5:04	328,6 KB
R2-1707072.zip	2017/06/17 5:04	61,6 KB
R2-1707073.zip	2017/06/17 5:04	72,9 KB
R2-1707074.zip	2017/06/17 5:04	97,4 KB
R2-1707075.zip	2017/06/17 5:04	88,5 KB
R2-1707076.zip	2017/06/17 5:04	61,1 KB
R2-1707077.zip	2017/06/17 5:04	65,4 KB
R2-1707078.zip	2017/06/17 5:04	255,7 KB
R2-1707079.zip	2017/06/17 5:04	209 KB
R2-1707080.zip	2017/06/17 5:04	17,8 KB
R2-1707081.zip	2017/06/17 5:04	71,2 KB
R2-1707082.zip	2017/06/17 5:04	58,4 KB
R2-1707083.zip	2017/06/16 11:06	212,3 KB
R2-1707084.zip	2017/06/16 11:07	26,4 KB
R2-1707085.zip	2017/06/16 11:07	212,6 KB
R2-1707086.zip	2017/06/16 10:45	32,3 KB
R2-1707087.zip	2017/06/16 10:48	22,4 KB
R2-1707088.zip	2017/06/16 10:48	23,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1707089.zip	2017/06/16 12:07	27,6 KB
R2-1707090.zip	2017/06/16 11:17	100,4 KB
R2-1707091.zip	2017/06/16 12:07	28,4 KB
R2-1707092.zip	2017/06/16 11:17	15,4 KB
R2-1707093.zip	2017/06/16 12:07	27,2 KB
R2-1707094.zip	2017/06/16 11:17	13,7 KB
R2-1707095.zip	2017/06/16 12:07	36,6 KB
R2-1707096.zip	2017/06/16 11:17	15,2 KB
R2-1707097.zip	2017/06/16 12:07	27,8 KB
R2-1707098.zip	2017/06/16 12:07	29 KB
R2-1707099.zip	2017/06/16 12:07	26,9 KB
R2-1707100.zip	2017/06/16 12:07	41,9 KB
R2-1707101.zip	2017/06/16 12:07	27,5 KB
R2-1707102.zip	2017/06/16 11:59	107,6 KB
R2-1707103.zip	2017/06/16 12:07	46,4 KB
R2-1707104.zip	2017/06/16 12:07	76,7 KB
R2-1707105.zip	2017/06/16 12:07	128,2 KB
R2-1707106.zip	2017/06/16 11:22	69,9 KB
R2-1707107.zip	2017/06/16 11:28	21,5 KB
R2-1707108.zip	2017/06/16 11:30	22,6 KB
R2-1707109.zip	2017/06/17 4:59	33,7 KB
R2-1707110.zip	2017/06/17 4:15	35,4 KB
R2-1707111.zip	2017/06/16 21:48	183,5 KB
R2-1707112.zip	2017/06/16 21:48	152,6 KB
R2-1707113.zip	2017/06/16 21:48	24,2 KB
R2-1707114.zip	2017/06/16 21:48	74,3 KB
R2-1707115.zip	2017/06/16 21:48	157,6 KB
R2-1707116.zip	2017/06/16 21:48	42,4 KB
R2-1707117.zip	2017/06/16 21:48	24,4 KB
R2-1707118.zip	2017/06/16 21:48	36,2 KB
R2-1707119.zip	2017/06/16 21:48	47,1 KB
R2-1707120.zip	2017/06/16 21:48	45,3 KB
R2-1707121.zip	2017/06/16 21:48	45,9 KB
R2-1707122.zip	2017/06/16 21:48	74,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1707123.zip	2017/06/16 21:48	74,3 KB
R2-1707124.zip	2017/06/16 21:48	58,8 KB
R2-1707125.zip	2017/06/16 21:48	43,4 KB
R2-1707126.zip	2017/06/16 21:48	41,8 KB
R2-1707127.zip	2017/06/16 21:48	41 KB
R2-1707128.zip	2017/06/16 21:48	125,2 KB
R2-1707129.zip	2017/06/16 21:48	79,3 KB
R2-1707130.zip	2017/06/16 21:48	299,5 KB
R2-1707131.zip	2017/06/16 21:48	57,8 KB
R2-1707132.zip	2017/06/16 12:26	55 KB
R2-1707133.zip	2017/06/16 12:26	25,8 KB
R2-1707134.zip	2017/06/16 12:26	53,5 KB
R2-1707135.zip	2017/06/16 13:08	75,5 KB
R2-1707136.zip	2017/06/16 13:08	71,3 KB
R2-1707137.zip	2017/06/16 12:51	35,8 KB
R2-1707138.zip	2017/06/16 13:08	74,5 KB
R2-1707139.zip	2017/06/16 13:08	96,5 KB
R2-1707140.zip	2017/06/16 12:45	106,2 KB
R2-1707141.zip	2017/06/16 12:45	68,5 KB
R2-1707142.zip	2017/06/16 12:45	25,4 KB
R2-1707143.zip	2017/06/16 12:51	34,8 KB
R2-1707144.zip	2017/06/16 13:08	72,4 KB
R2-1707145.zip	2017/06/16 12:51	36,4 KB
R2-1707146.zip	2017/06/16 13:08	96,8 KB
R2-1707147.zip	2017/06/16 12:51	34,8 KB
R2-1707148.zip	2017/06/16 13:08	103,3 KB
R2-1707149.zip	2017/06/16 12:51	38,2 KB
R2-1707150.zip	2017/06/16 12:51	33,6 KB
R2-1707151.zip	2017/06/16 21:44	68,9 KB
R2-1707152.zip	2017/06/16 21:44	79,6 KB
R2-1707153.zip	2017/06/16 21:44	44,7 KB
R2-1707154.zip	2017/06/16 21:44	104 KB
R2-1707155.zip	2017/06/16 21:44	35 KB
R2-1707156.zip	2017/06/16 21:44	36,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1707157.zip	2017/06/16 21:44	193,5 KB
R2-1707158.zip	2017/06/16 21:44	40,4 KB
R2-1707159.zip	2017/06/16 21:44	86,1 KB
R2-1707160.zip	2017/06/16 21:44	50,9 KB
R2-1707161.zip	2017/06/16 21:44	43,2 KB
R2-1707162.zip	2017/06/16 21:44	174,8 KB
R2-1707163.zip	2017/06/16 21:44	136,5 KB
R2-1707164.zip	2017/06/16 21:44	52,1 KB
R2-1707165.zip	2017/06/16 21:44	102,3 KB
R2-1707166.zip	2017/06/16 21:44	41,3 KB
R2-1707167.zip	2017/06/16 21:44	41,4 KB
R2-1707168.zip	2017/06/16 21:44	44,5 KB
R2-1707169.zip	2017/06/16 21:44	47,8 KB
R2-1707170.zip	2017/06/16 21:44	96,8 KB
R2-1707171.zip	2017/06/16 21:44	73 KB
R2-1707172.zip	2017/06/16 21:44	38,6 KB
R2-1707173.zip	2017/06/16 21:44	161,5 KB
R2-1707174.zip	2017/06/16 21:44	39,7 KB
R2-1707175.zip	2017/06/16 21:44	45,9 KB
R2-1707176.zip	2017/06/16 21:44	41,1 KB
R2-1707177.zip	2017/06/16 13:09	95,6 KB
R2-1707178.zip	2017/06/16 12:58	33,1 KB
R2-1707179.zip	2017/06/16 12:59	33 KB
R2-1707180.zip	2017/06/16 13:08	77 KB
R2-1707181.zip	2017/06/16 13:08	73,5 KB
R2-1707182.zip	2017/06/16 13:08	73,5 KB
R2-1707183.zip	2017/06/16 13:08	72,6 KB
R2-1707184.zip	2017/06/16 13:08	72,9 KB
R2-1707185.zip	2017/06/16 13:08	74,4 KB
R2-1707186.zip	2017/06/16 13:08	122,6 KB
R2-1707187.zip	2017/06/16 23:51	1579,1 KB
R2-1707188.zip	2017/06/16 23:51	53,6 KB
R2-1707189.zip	2017/06/16 23:51	40,5 KB
R2-1707190.zip	2017/06/16 20:16	61,3 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1707191.zip	2017/06/16 20:16	23,7 KB
R2-1707192.zip	2017/06/16 20:16	31,5 KB
R2-1707193.zip	2017/06/16 20:16	104 KB
R2-1707194.zip	2017/06/16 20:16	91 KB
R2-1707195.zip	2017/06/16 20:16	23,4 KB
R2-1707196.zip	2017/06/16 20:16	27,7 KB
R2-1707197.zip	2017/06/16 20:16	151,4 KB
R2-1707198.zip	2017/06/16 20:16	27,3 KB
R2-1707199.zip	2017/06/16 21:44	163,8 KB
R2-1707200.zip	2017/06/16 21:44	185,5 KB
R2-1707201.zip	2017/06/16 21:44	71,1 KB
R2-1707202.zip	2017/06/16 21:44	49,8 KB
R2-1707203.zip	2017/06/20 9:20	53,2 KB
R2-1707204.zip	2017/06/16 22:56	40,1 KB
R2-1707205.zip	2017/06/16 22:42	38,5 KB
R2-1707207.zip	2017/06/16 20:19	125,2 KB
R2-1707209.zip	2017/06/21 13:31	47,9 KB
R2-1707210.zip	2017/06/16 18:13	69,2 KB
R2-1707212.zip	2017/06/16 18:13	158,6 KB
R2-1707213.zip	2017/06/16 18:13	92 KB
R2-1707214.zip	2017/06/16 18:13	593,3 KB
R2-1707215.zip	2017/06/16 18:13	33,4 KB
R2-1707216.zip	2017/06/16 18:13	33,7 KB
R2-1707217.zip	2017/06/16 18:44	28,9 KB
R2-1707218.zip	2017/06/22 10:28	24,8 KB
R2-1707219.zip	2017/06/16 18:13	22,9 KB
R2-1707220.zip	2017/06/16 23:52	100,3 KB
R2-1707221.zip	2017/06/16 23:52	33,7 KB
R2-1707222.zip	2017/06/16 23:52	109,6 KB
R2-1707223.zip	2017/06/16 23:52	55,2 KB
R2-1707224.zip	2017/06/16 23:52	62,2 KB
R2-1707225.zip	2017/06/16 23:52	51,8 KB
R2-1707226.zip	2017/06/16 23:52	40,2 KB
R2-1707227.zip	2017/06/16 16:02	198,3 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1707228.zip	2017/06/16 16:02	495 KB
R2-1707229.zip	2017/06/16 20:19	21 KB
R2-1707230.zip	2017/06/16 19:04	175 KB
R2-1707231.zip	2017/06/16 19:09	103,7 KB
R2-1707232.zip	2017/06/16 18:16	35 KB
R2-1707233.zip	2017/06/16 18:16	50,4 KB
R2-1707234.zip	2017/06/16 22:38	44,1 KB
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R2-1707236.zip	2017/06/16 22:38	36,7 KB
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R2-1707238.zip	2017/06/16 22:38	16 KB
R2-1707239.zip	2017/06/16 22:38	16,2 KB
R2-1707240.zip	2017/06/16 18:16	23,8 KB
R2-1707241.zip	2017/06/16 18:01	41,3 KB
R2-1707242.zip	2017/06/16 22:47	42,8 KB
R2-1707243.zip	2017/06/16 22:47	34 KB
R2-1707244.zip	2017/06/16 22:47	18,2 KB
R2-1707245.zip	2017/06/17 6:09	69,6 KB
R2-1707246.zip	2017/06/17 5:40	217,1 KB
R2-1707247.zip	2017/06/17 6:19	64,8 KB
R2-1707248.zip	2017/06/17 5:57	44,6 KB
R2-1707249.zip	2017/06/17 4:42	237,2 KB
R2-1707250.zip	2017/06/17 6:01	39,9 KB
R2-1707251.zip	2017/06/17 4:36	144,8 KB
R2-1707252.zip	2017/06/17 5:33	95,3 KB
R2-1707253.zip	2017/06/17 5:10	46,4 KB
R2-1707254.zip	2017/06/17 5:01	132,8 KB
R2-1707255.zip	2017/06/17 6:34	170,3 KB
R2-1707257.zip	2017/06/17 1:53	1227,3 KB
R2-1707258.zip	2017/06/17 1:53	60,6 KB
R2-1707259.zip	2017/06/17 1:53	43,9 KB
R2-1707260.zip	2017/06/17 1:53	21,2 KB
R2-1707261.zip	2017/06/17 1:53	52,6 KB
R2-1707262.zip	2017/06/17 1:53	37,2 KB

Petitioners' Exhibit 1008, p. 653
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IPR2024-00997

sort by name/desc	sort by date/desc	sort by size/desc
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R2-1707265.zip	2017/06/17 1:53	43,4 KB
R2-1707266.zip	2017/06/17 1:53	93,7 KB
R2-1707267.zip	2017/06/17 1:53	121 KB
R2-1707268.zip	2017/06/17 1:53	41,5 KB
R2-1707269.zip	2017/06/17 1:53	82 KB
R2-1707270.zip	2017/06/17 1:53	157,8 KB
R2-1707271.zip	2017/06/17 1:53	19,7 KB
R2-1707272.zip	2017/06/16 22:53	302,7 KB
R2-1707273.zip	2017/06/16 22:58	61,2 KB
R2-1707274.zip	2017/06/16 22:14	36,7 KB
R2-1707275.zip	2017/06/16 22:11	62 KB
R2-1707276.zip	2017/06/16 22:20	634,7 KB
R2-1707277.zip	2017/06/16 22:25	167,4 KB
R2-1707278.zip	2017/06/16 23:19	240,7 KB
R2-1707279.zip	2017/06/16 23:17	134,3 KB
R2-1707280.zip	2017/06/16 23:21	46,9 KB
R2-1707281.zip	2017/06/16 23:15	196,7 KB
R2-1707282.zip	2017/06/16 23:09	56 KB
R2-1707283.zip	2017/06/16 23:11	58,5 KB
R2-1707284.zip	2017/06/16 21:44	198,3 KB
R2-1707285.zip	2017/06/16 22:48	182,8 KB
R2-1707286.zip	2017/06/16 22:41	53 KB
R2-1707287.zip	2017/06/16 23:02	164,4 KB
R2-1707288.zip	2017/06/16 23:06	49,5 KB
R2-1707289.zip	2017/06/16 22:02	45,2 KB
R2-1707290.zip	2017/06/17 0:08	18,5 KB
R2-1707291.zip	2017/06/16 20:16	29,4 KB
R2-1707292.zip	2017/06/16 23:46	45,9 KB
R2-1707293.zip	2017/06/16 23:48	152,2 KB
R2-1707294.zip	2017/06/16 23:57	155,9 KB
R2-1707295.zip	2017/06/16 23:52	197,7 KB
R2-1707296.zip	2017/06/16 23:54	129,1 KB

Petitioners' Exhibit 1008, p. 654
AT&T et al v. Asustek Technology
IPR2024-00997

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R2-1707300.zip	2017/06/16 23:32	131,7 KB
R2-1707301.zip	2017/06/16 23:29	43,2 KB
R2-1707302.zip	2017/06/16 23:27	62,2 KB
R2-1707303.zip	2017/06/16 23:25	46 KB
R2-1707304.zip	2017/06/16 21:56	407,4 KB
R2-1707305.zip	2017/06/16 21:56	62,9 KB
R2-1707306.zip	2017/06/16 21:56	85,4 KB
R2-1707307.zip	2017/06/16 21:56	176,4 KB
R2-1707308.zip	2017/06/16 21:56	88 KB
R2-1707309.zip	2017/06/16 21:56	30,5 KB
R2-1707310.zip	2017/06/17 0:29	171,4 KB
R2-1707311.zip	2017/06/16 21:56	38,3 KB
R2-1707312.zip	2017/06/16 21:56	40,2 KB
R2-1707313.zip	2017/06/16 21:56	37,5 KB
R2-1707314.zip	2017/06/16 21:56	79,7 KB
R2-1707315.zip	2017/06/16 21:56	34,7 KB
R2-1707316.zip	2017/06/16 22:42	143 KB
R2-1707317.zip	2017/06/16 22:42	18 KB
R2-1707318.zip	2017/06/16 22:42	16,5 KB
R2-1707319.zip	2017/06/16 22:42	18,6 KB
R2-1707320.zip	2017/06/16 22:42	20,2 KB
R2-1707321.zip	2017/06/17 3:46	20,8 KB
R2-1707322.zip	2017/06/16 22:42	19,1 KB
R2-1707323.zip	2017/06/16 22:42	17,6 KB
R2-1707324.zip	2017/06/16 22:25	155,5 KB
R2-1707325.zip	2017/06/16 22:25	375,9 KB
R2-1707326.zip	2017/06/16 22:25	68,5 KB
R2-1707327.zip	2017/06/16 22:25	99,6 KB
R2-1707328.zip	2017/06/16 22:25	81,8 KB
R2-1707329.zip	2017/06/16 22:25	75,2 KB
R2-1707330.zip	2017/06/16 22:25	69,9 KB

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IPR2024-00997

sort by name/desc	sort by date/desc	sort by size/desc
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R2-1707334.zip	2017/06/17 1:11	33,5 KB
R2-1707335.zip	2017/06/17 1:11	36,6 KB
R2-1707336.zip	2017/06/17 1:11	212,3 KB
R2-1707337.zip	2017/06/17 1:11	258,8 KB
R2-1707338.zip	2017/06/17 1:11	94,7 KB
R2-1707339.zip	2017/06/17 1:11	80,8 KB
R2-1707340.zip	2017/06/17 1:11	56 KB
R2-1707341.zip	2017/06/17 1:38	80,3 KB
R2-1707342.zip	2017/06/17 1:38	35,3 KB
R2-1707343.zip	2017/06/17 1:38	34,8 KB
R2-1707344.zip	2017/06/17 1:38	35,9 KB
R2-1707345.zip	2017/06/17 1:38	35,6 KB
R2-1707346.zip	2017/06/17 1:38	67,8 KB
R2-1707347.zip	2017/06/17 5:47	29 KB
R2-1707348.zip	2017/06/17 3:10	48,8 KB
R2-1707349.zip	2017/06/17 3:10	104,4 KB
R2-1707350.zip	2017/06/17 3:10	31,2 KB
R2-1707351.zip	2017/06/17 3:10	50,9 KB
R2-1707352.zip	2017/06/17 3:10	74,3 KB
R2-1707353.zip	2017/06/17 2:44	40 KB
R2-1707354.zip	2017/06/17 2:44	41,1 KB
R2-1707355.zip	2017/06/17 2:44	67 KB
R2-1707356.zip	2017/06/17 2:44	138,2 KB
R2-1707357.zip	2017/06/17 2:44	39,8 KB
R2-1707358.zip	2017/06/17 2:44	39,3 KB
R2-1707359.zip	2017/06/17 2:44	40,8 KB
R2-1707360.zip	2017/06/17 2:44	699,1 KB
R2-1707361.zip	2017/06/17 2:44	174,6 KB
R2-1707362.zip	2017/06/17 2:44	140 KB
R2-1707363.zip	2017/06/17 2:44	40,4 KB
R2-1707364.zip	2017/06/17 6:21	96,9 KB

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IPR2024-00997

sort by name/desc	sort by date/desc	sort by size/desc
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R2-1707369.zip	2017/06/17 2:45	35,4 KB
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R2-1707371.zip	2017/06/17 2:45	73,4 KB
R2-1707372.zip	2017/06/17 2:45	32,6 KB
R2-1707373.zip	2017/06/17 2:45	81,1 KB
R2-1707374.zip	2017/06/17 2:45	199,3 KB
R2-1707375.zip	2017/06/17 2:45	32,4 KB
R2-1707376.zip	2017/06/17 2:45	76,1 KB
R2-1707377.zip	2017/06/17 5:30	74,8 KB
R2-1707378.zip	2017/06/17 5:30	10,4 KB
R2-1707379.zip	2017/06/17 5:30	34,9 KB
R2-1707380.zip	2017/06/17 4:01	27,3 KB
R2-1707381.zip	2017/06/17 4:01	264,2 KB
R2-1707382.zip	2017/06/17 4:01	32,9 KB
R2-1707383.zip	2017/06/17 4:01	182,5 KB
R2-1707384.zip	2017/06/20 16:09	442,6 KB
R2-1707385.zip	2017/06/17 4:01	32,7 KB
R2-1707386.zip	2017/06/17 5:03	94,7 KB
R2-1707387.zip	2017/06/17 4:01	34,1 KB
R2-1707388.zip	2017/06/17 4:01	94,9 KB
R2-1707389.zip	2017/06/17 4:01	199,1 KB
R2-1707390.zip	2017/06/17 4:01	32,6 KB
R2-1707391.zip	2017/06/21 2:04	22 KB
R2-1707392.zip	2017/06/17 5:47	86,3 KB
R2-1707393.zip	2017/06/17 5:43	36 KB
R2-1707394.zip	2017/06/17 5:43	33,8 KB
R2-1707395.zip	2017/06/17 5:47	28,6 KB
R2-1707396.zip	2017/06/17 5:17	54,9 KB
R2-1707397.zip	2017/06/17 6:21	227,1 KB
R2-1707398.zip	2017/06/17 6:26	37,1 KB

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IPR2024-00997

sort by name/desc	sort by date/desc	sort by size/desc
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R2-1707403.zip	2017/06/17 6:49	99,9 KB
R2-1707404.zip	2017/06/17 6:49	55,5 KB
R2-1707405.zip	2017/06/17 6:49	43,9 KB
R2-1707406.zip	2017/06/17 6:49	42,7 KB
R2-1707407.zip	2017/06/17 6:49	48,8 KB
R2-1707408.zip	2017/06/17 6:49	78,2 KB
R2-1707409.zip	2017/06/17 6:49	105,3 KB
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R2-1707413.zip	2017/06/17 6:49	10,9 KB
R2-1707414.zip	2017/06/17 6:49	123 KB
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R2-1707416.zip	2017/06/17 6:49	150,1 KB
R2-1707417.zip	2017/06/17 6:49	56,4 KB
R2-1707418.zip	2017/06/17 6:49	50,8 KB
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R2-1707421.zip	2017/06/17 6:49	106,9 KB
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R2-1707423.zip	2017/06/17 6:49	131,6 KB
R2-1707424.zip	2017/06/17 6:49	95,9 KB
R2-1707425.zip	2017/06/17 6:49	62,3 KB
R2-1707426.zip	2017/06/17 6:49	40,4 KB
R2-1707427.zip	2017/06/17 6:49	109,9 KB
R2-1707428.zip	2017/06/17 6:49	34,4 KB
R2-1707429.zip	2017/06/17 6:49	38,7 KB
R2-1707430.zip	2017/06/17 6:49	93,4 KB
R2-1707431.zip	2017/06/17 6:49	38,8 KB
R2-1707432.zip	2017/06/17 6:49	30,5 KB

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IPR2024-00997

sort by name/desc	sort by date/desc	sort by size/desc
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R2-1707437.zip	2017/06/17 6:49	39,6 KB
R2-1707438.zip	2017/06/17 6:49	92 KB
R2-1707439.zip	2017/06/17 6:49	78,5 KB
R2-1707440.zip	2017/06/17 6:49	31,6 KB
R2-1707441.zip	2017/06/17 6:49	28,5 KB
R2-1707442.zip	2017/06/17 6:49	57 KB
R2-1707443.zip	2017/06/17 6:21	79,5 KB
R2-1707444.zip	2017/06/23 8:00	26,8 KB
R2-1707445.zip	2017/06/19 7:48	24,2 KB
R2-1707446.zip	2017/06/17 6:53	36,2 KB
R2-1707447.zip	2017/06/17 6:57	28,9 KB
R2-1707448.zip	2017/06/17 7:02	30 KB
R2-1707449.zip	2017/06/19 16:54	12,2 KB
R2-1707450.zip	2017/06/21 8:10	138,5 KB
R2-1707452.zip	2017/06/23 8:00	49,7 KB
R2-1707453.zip	2017/06/22 12:08	12,2 KB
R2-1707454.zip	2017/06/23 8:00	86,5 KB
R2-1707455.zip	2017/06/24 23:50	38,2 KB
R2-1707456.zip	2017/06/26 22:16	137,1 KB
R2-1707457.zip	2017/06/26 22:16	20,3 KB
R2-1707458.zip	2017/06/27 5:02	187 KB
R2-1707459.zip	2017/06/23 8:00	101,2 KB
R2-1707460.zip	2017/06/29 15:52	57,2 KB
R2-1707461.zip	2017/06/23 10:24	18 KB
R2-1707462.zip	2017/06/24 23:51	45,3 KB
R2-1707463.zip	2017/06/29 15:52	11,6 KB
R2-1707464.zip	2017/06/29 15:52	15,5 KB
R2-1707465.zip	2017/06/29 15:52	130 KB
R2-1707466.zip	2017/06/29 15:52	22,4 KB
R2-1707467.zip	2017/06/29 15:52	1350 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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R2-1707469.zip	2017/06/29 15:52	14,8 KB
R2-1707470.zip	2017/06/29 15:52	41,6 KB
R2-1707471.zip	2017/06/29 15:52	620,7 KB
R2-1707472.zip	2017/06/29 15:52	15,8 KB
R2-1707473.zip	2017/06/29 15:52	15,5 KB
R2-1707474.zip	2017/06/29 15:52	18,3 KB
R2-1707475.zip	2017/06/29 15:52	17,6 KB
R2-1707476.zip	2017/06/29 15:52	11,5 KB
R2-1707477.zip	2017/06/29 15:52	54,5 KB
R2-1707478.zip	2017/06/29 15:52	19,5 KB
R2-1707479.zip	2017/06/29 15:52	51,7 KB
R2-1707480.zip	2017/06/29 15:52	158,9 KB
R2-1707481.zip	2017/06/29 15:52	16,2 KB
R2-1707483.zip	2017/06/29 15:52	19,9 KB
R2-1707484.zip	2017/06/29 15:52	7 KB
R2-1707485.zip	2017/06/29 15:52	155,4 KB
R2-1707486.zip	2017/06/29 15:52	36 KB
R2-1707487.zip	2017/06/29 15:53	66,9 KB
R2-1707488.zip	2017/06/29 15:53	16,1 KB
R2-1707489.zip	2017/06/29 15:53	18,2 KB
R2-1707490.zip	2017/06/29 15:53	13,6 KB
R2-1707491.zip	2017/06/29 15:53	729,4 KB
R2-1707492.zip	2017/06/29 15:53	41,4 KB
R2-1707493.zip	2017/06/29 15:53	64,3 KB
R2-1707494.zip	2017/06/29 15:53	53,1 KB
R2-1707495.zip	2017/06/29 15:53	15,9 KB
R2-1707496.zip	2017/06/29 15:53	15,7 KB
R2-1707497.zip	2017/06/29 15:53	16,3 KB
R2-1707498.zip	2017/06/29 15:53	19,5 KB
R2-1707499.zip	2017/06/29 15:53	18,1 KB
R2-1707500.zip	2017/06/29 15:53	217,4 KB
R2-1707501.zip	2017/06/29 15:53	69,6 KB
R2-1707502.zip	2017/06/29 15:53	15,9 KB

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sort by name/desc	sort by date/desc	sort by size/desc
R2-1707503.zip	2017/06/29 15:53	11,2 KB
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R2-1707506.zip	2017/07/18 13:37	18 KB
R2-1707507.zip	2017/07/19 15:50	901,8 KB
R2-1707508.zip	2017/07/21 21:01	1183,3 KB
R2-1707509.zip	2017/07/25 8:58	917,9 KB
R2-1707510.zip	2017/07/28 9:07	599,9 KB
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TDoc_List_Meeting_RAN2-NR#2.xlsx	2021/01/15 20:18	327,8 KB
TDoc_List_Meeting_RAN2-NR#2.zip	2018/01/10 16:48	596,4 KB

1194 items.

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Appendix 25



3GPP_TSG_RAN_WG2 Archives

June 2017, Week 3

New in LISTSERV 17.0 ×

3GPP_TSG_RAN_WG2@LIST.ETSI.ORG

Options: Use Monospaced 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: RAN2#NR_AdHoc (Qingdao) Skeleton Report (v1)
From: Juha Korhonen <Juha.Korhonen@ETSI.ORG>
Reply To: Juha Korhonen <Juha.Korhonen@ETSI.ORG>
Date: Mon, 19 Jun 2017 22:46:16 +0000
Content-Type: multipart/mixed
Parts/Attachments: text/plain (101 bytes) , text/html (2046 bytes) , Skeleton_Report_v1.zip (196 kB)

Dear All,

I have attached the first version of the skeleton report for RAN2#NR_AdHoc in Qingdao.

BR,
Juha

ATOM RSS1 RSS2

Petitioners' Exhibit 1008, p. 663
AT&T et al v. Asustek Technology
IPR2024-00997

Appendix 26

3GPP TSG-RAN WG2 meeting #99 **R2-1707602**
Berlin, Germany, August 21 – 25, 2017

Agenda Item: 2.2
Source: ETSI MCC
Title: Report of 3GPP TSG RAN WG2 NR AdHoc#2 meeting, Qingdao, China

Document for: Approval

Report of 3GPP TSG RAN WG2 NR AdHoc#2 meeting
Qingdao, China
27 - 29 June, 2017

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Petitioners' Exhibit 1008, p. 666
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IPR2024-00997

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Organisation of the meeting

Meeting:	3GPP TSG RAN2 NR AdHoc#2	
Meeting location:	Qingdao, China	
Duration:	27.06 - 29.06.2017	
Host:	ZTE	
TSG RAN WG2 Chairman:	Richard Burbidge (Intel Corporation) (richard.c.burbidge@intel.com)	
TSG RAN WG2 Vice chairman:	Hu Nan (CMCC) (hunan@chinamobile.com)	
TSG RAN WG2 Vice chairman:	Diana Pani (Interdigital Communications (diana.pani@interdigital.com)	
TSG RAN WG2 MCC Support:	Juha Korhonen (ETSI MCC) (juha.korhonen@etsi.org)	
Email reflector:	3GPP_TSG_RAN_WG2@LIST.ETSI.ORG	
Technical documents:	ftp://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_AHs/2017_06_NR/Docs	
Next meetings:	TSG RAN2#99	21.08 - 25.08.2017, Berlin, Germany
	TSG RAN#77	11.09 - 14.09.2017, Sapporo, Japan
	TSG RAN2#99bis	09.10 - 13.10.2017, Prague, Czech Republic

Statistics/Executive Summary

TSG RAN2 NR AdHoc#2 was held in Qingdao, China, hosted by ZTE. The meeting had 2 parallel sessions: The main session handled stage 2, stage 3 control plane and common UP/CP issues. The breakout session discussed stage 3 user plane issues.

- 194 participants (registered: 290 participants).
- 1212 Tdocs allocated with 1192 available contributions. (See the attached tdoc list)
- 24 incoming liaison statements, out of which 22 were noted. The remaining 2 LSin will be handled in RAN2#99.
- 11 outgoing liaison statements.
- 16 email approvals/discussions scheduled after RAN2 NR AdHoc#2 meeting, see section 11.3 for details.
- No CRs were submitted to this meeting

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1 Opening of the meeting (9 AM)

1.1 Call for IPR

The attention of the delegates of this Working Group is drawn to the fact that **3GPP Individual Members have the obligation** under the IPR Policies of their respective Organizational Partners **to inform their respective Organizational Partners of Essential IPRs** they become aware of.

The delegates were asked to take note that they were hereby invited:

- to investigate whether their organization or any other organization owns IPRs which were, or were likely to become Essential in respect of the work of 3GPP.
- to notify their respective Organizational Partners of all potential IPRs, e.g., for ETSI, by means of the IPR Statement and the Licensing declaration forms (http://webapp.etsi.org/Ipr/).

NOTE: IPRs may be declared to the Director-General or Chairman of the SDO, but not to the RAN WG2 Chairman.

1.2 Network usage conditions

The PCG has laid down the following network usage conditions

1. **Users shall not use the network to engage in illegal activities. This includes activities such as copyright violation, hacking, espionage or any other activity that may be prohibited by local laws.**

2. **Users shall not engage in non-work related activities that consume excessive bandwidth** or cause significant degradation of the performance of the network.

Since the network is a shared resource, users should exercise some basic etiquette when using the 3GPP network at a meeting. It is understood that high bandwidth applications such as downloading large files or video streaming might be required for business purposes, but delegates should be strongly discouraged in performing these activities for personal use. Downloading a movie or doing something in an interactive environment for personal use essentially wastes bandwidth that others need to make the meeting effective. The meeting chairman should remind end users that the network is a shared resource; the more one user grabs, the less there is for another. Email and its attachments already take up significant bandwidth (certain email programs are not very bandwidth efficient). In case of need the chair can ask the delegates to restrict IT usage to things that are essential for the meeting itself.

1. DON'T place your WiFi device in ad-hoc mode
2. DON'T set up a personal hotspot in the meeting room
3. DO try 802.11a if your WiFi device supports it
4. DON'T manually allocate an IP address
5. DON'T be a bandwidth hog by streaming video, playing online games, or downloading huge files
6. DON'T use packet probing software which clogs the local network (e.g., packet sniffers or port scanners)

1.3 Other

In accordance with the Working Procedures it is reaffirmed that:

(i) compliance with all applicable antitrust and competition laws is required;

(ii) timely submissions of work items in advance of TSG or WG meetings are important to allow for full and fair consideration of such matters; and

(iii) the chairman will conduct the meeting with strict impartiality and in the interests of 3GPP

Note on (i): In case of question please contact your legal counsel.

Note on (ii): WIDs don't need to be submitted to the RAN2 meeting and will typically not be discussed here either.

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2 General

THANK YOU to companies that request TDoc numbers and submit contributions early before deadline (really appreciated). Will start to refrain from treating late documents.

2.1 Approval of the agenda

A draft schedule for the week is provided as a separate document, distributed via the RAN2 email reflector and made available during the meeting week in the RAN2\Inbox\Chair_note folder.

R2-1706300 Agenda for RAN2 NR Adhoc#2 Chairman agenda
=> Approved

2.2 Approval of the report of the previous meeting

2.3 Reporting from other meetings

2.4 Others

Summary of RAN2 impacting NR items from RAN#76, June 2017 (same as sent via email to reflector)

CSG - RAN agreed not to support CSG in NR Rel-15 but RAN2 is tasked to specify forward compatibility mechanisms so that a feature similar to the current CSG could be introduced in a future release (See RP-171479)

UE categories - In response to the questions raised in our LS, RAN concluded to let RAN WGs decide how the target peak data rate can be supported for LTE-NR DC and NR standalone (e.g. whether the existing concept of UE category is used or a new concept in defining the target peak data rate is introduced). In addition, RAN agreed to have an email discussion until RAN#77 to discuss the actual target peak data rates for LTE-NR DC and NR standalone. (See RP-171480)

Positioning - NR WID was updated to add support for positioning in order to meeting regulatory requirements related to emergency calls. The update assumes that LPP will be re-used to enable RAT independent positioning and RAT dependent positioning based on measurements of E-UTRA cells. (See revised WID in RP-171485) (Note that I do not plan to add positioning to the agenda for the June NR ad hoc)

NR ad hocs - We confirmed the need for a 5 day NR ad hoc in Q1 2018 (22-26 Jan 18) and a 5 day NR ad hoc in Q3 2018 (Date of 2-6 July 18 currently in 3GPP calendar is to be confirmed) (See RP-171509)

Rapporteur changes
Spec former rapporteur proposed new rapporteur
Isolated impact analysis

Note that an isolated impact analysis is required for Rel-8 to Rel-13 CRs from Q2 2016 onwards.
Only corrections where there is a proven problem are allowed for frozen releases (Rel-8 to Rel-13).

RAN2 WG compendium

Latest version can always be found at ftp://ftp.3gpp.org/tsg_ran/WG2_RL2/Org/RAN2_Compendium/

Drafting rules

Note that specification drafting rules in TR 21.801 must be followed when drafting a CR and draft TS/TR.
Latest version can always be found at http://www.3gpp.org/ftp/specs/archive/21_series/21.801/

Time Budget

The time budget endorsed at RAN-76 is available in RP-171478

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10 WI: New Radio (NR) Access Technology

(NR_newRAT-Core; leading WG: RAN1; REL-15; started: Mar. 17; target: Jun. 18: WID: RP-171485)

10.1 Organisational

Incoming LSs, work plan, status from other groups, etc.

R2-1706302 LS on RAT restriction in 5GS (C1-172642; contact: Qualcomm) CT1 LS in
=> Noted

R2-1706303 LS on default access categories (C1-172663; contact: Intel) CT1 LS in
=> Noted

R2-1706304 LS on NR-PBCH content (R1-1709789; contact: Ericsson) RAN1 LS in
=> Noted

R2-1706305 Reply LS on power sharing mechanism between LTE and NR (R1-1709790; contact: NTT DOCOMO) RAN1 LS in
=> Noted

R2-1706306 LS on UL data transmission without UL grant for NR (R1-1709805; contact: Huawei) RAN1 LS in
- Ericsson ask if network doesn't need to be aware of a transmission between this mechanism and SPS. Huawei think this is not the case. In RAN2 we assume there is SPS as in LTE but in RAN1 they are still discussing SPS and UL grant free.
- LG think a difference might be that grant free can be used in inactive.

=> Noted

R2-1706307 Reply LS on the feasibility of DC-related mobility enhancements in NR (R1-1709809; contact: Intel) RAN1 LS in
=> Noted

R2-1706308 LS on the support of supplementary uplink in NR (R1-1709843; contact: CMCC) RAN1 LS in
=> Noted

R2-1706309 Reply to LS on Dual Connectivity with 5GC (R3-172004; contact: Ericsson) RAN3 LS in
- Vodafone ask if this affects RAN2 design. Ericsson explain there is impact that SDAP has to be established in both MCG and SCG.
- Samsung think that we discussed about the switching of flows between the MCG and SCG.

=> Noted

R2-1706310 Response LS on RAN2 LTE-NR interworking procedure related conclusions (R3-172013; contact: Huawei) RAN3 LS in
=> Noted

R2-1706311 Reply LS on the need for EPS Bearer ID knowledge in NG-RAN for (inter-RAT) inter-system handover (R3-172028; contact: Intel) RAN3 LS in
- Huawei think the last part of the RAN3 response is not agreed in RAN2. Intel think this is only in the context of inter-RAT handover.

=> Noted

R2-1706317 LS on Emergency Support in NR (S2-173700; contact: Nokia) SA2 LS in
=> Noted

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R2-1706312 Reply LS on Emergency Support in NR (RP-171434; contact: T-Mobile) RAN LS in
=> Noted

R2-1706313 Reply LS on Closed Subscriber Group in 5GS (R2-1706313; contact: Qualcomm) RAN LS in
=> Noted

R2-1706314 Reply LS on UE categories for NR and LTE-NR Dual Connectivity (RP-171480; contact: NTT DOCOMO) RAN LS in
=> Noted

R2-1706315 LS on NR Edge Computing (RP-171497; contact: Nokia) RAN LS in
=> Noted

R2-1706316 Request to update maximum data rate values in EPS (S2-173685; contact: Vodafone) SA2 LS in
=> Noted

R2-1706318 Response LS regarding RAN support for NW slicing (S2-174051; contact: Nokia) SA2 LS in
=> Noted

R2-1706319 SA2 RRC INACTIVE assumptions (S2-174075; contact: Qualcomm) SA2 LS in
=> Noted

R2-1706320 Reply LS on actions for integrity check failure on SgNB (S3-171484; contact: Huawei) SA3 LS in
- LG think that integrity check failure is checked in PDCP and if SA3 want a different behaviour for MCG and SCG then we may need 2 different behaviours in PDCP. Huawei think the difference is not in PDCP but the actions that RRC needs to take.

=> Noted

R2-1706321 LS on algorithm selection in E-UTRA-NR Dual Connectivity (S3-171485; Qualcomm) SA3 LS in
=> Noted

R2-1707449 LS on Support for fake gNB detection mechanisms (S3-171568, Nokia) SA3 LSin
- Huawei think these solutions will not impact our existing agreements much.

=> Noted

R2-1707477 LS on non-contiguous CA (R1-1711825; contact: AT&T) LS in Rel-15 NR_newRAT-Core To: RAN2, RAN4
=> Noted

Coodrination with other RAN WGs

R2-1706443 RAN WG's progress on NR WI in the May meeting 2017 NTT DOCOMO, INC. (Rapporteur) discussion
=> Noted

R2-1707463 NR topics requiring coordination between RAN1 and RAN2 RAN2 Chair Information
=> Noted

Withdrawn

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R2-1706301 LS on E-UTRA connected to 5GC (C1-172641; contact: Qualcomm) CT1 LS in
- *Related to E-UTRA connected to 5GC. Will be resubmitted to RAN2#99*

10.2 Stage 2 and common UP/CP aspects

For this meeting, proposals to the stage 2 should be submitted with a TP to show the impact to the stage 2 specifications.

10.2.1 Stage 2 TSs and running CR

Latest TS 38.300, TS 37.340 and running CR to 36.300, other rapporteur inputs, anything related to specification methodology. Please submit any new text proposals to the appropriate agenda item.

Including output from email discussion [98#25][NR] TS 38.3800 (Nokia) / [98#54][NR] TS 38.300 RAN3 TP (Nokia)
Including output from email discussion [98#27][NR] TP to 37.340 - option 3 (ZTE)
Including output from email discussion [98#28][NR] TP to 37.340 - option 4/7 (ZTE)

TS 38.300

R2-1706540 Stage 2 Rapporteur (Nokia) TS or TR cover 38.300 0.5.0
=> Noted

R2-1706542 Security Update Nokia, Alcatel-Lucent Shanghai Bell discussion
- Intel think there should be an additional FFS.
- Ericsson think integrity protection for UP should not yet be captured as mandatory. Nokia think SA3 have agreed it is mandatory in eNB and UE. Ericsson agree it will be supported in the protocols and also understand it is for certain use cases such as infrequent data.

=> Revised in R2-1707466 (Offline discussion 02)

R2-1707466 Security Update Nokia, Alcatel-Lucent Shanghai Bell discussion
=> Agreed.

R2-1706595 Draft LS on changing the Neighbour cell Relation acronym to “NCR” Nokia, Alcatel-Lucent Shanghai Bell discussion
=> Approved in R2-1707464

R2-1707296 TP to 38.300 on states Ericsson discussion
- Samsung think the CN/RAN are update wording needs to be improved.
- Nokia think the PLMN select is the only think to add. Huawei agree.

=> Revised in R2-1707465 (Offline discussion 01)

R2-1707465 TP to 38.300 on states Ericsson discussion
=> Noted

R2-1707445 Text proposal for aligning stage2 and stage3 for UE re-selection in INACTIVE Samsung discussion
=> To be considered as part of offline discussion 01

TS 38.340

R2-1706418 TS 37.340 v0.1.1 Rapporteur (ZTE Corporation) draft TS37.340 0.1.1
- ZTE clarify that this only includes the option 3 material from the email discussion

=> Endorsed
=> v0.2.0 can be provided in R2-1707467

R2-1706420 TS 37.340 v0.1.2 Rapporteur (ZTE Corporation) draft TS37.340 0.1.2

R2-1706419 [98#28] Initial Stage2 TP for MN/SN procedures for MR-DC with 5GC Rapporteur (ZTE Corporation) pCR 37.340 0.1.1
=> Endorsed so that RAN3 can review during this week.

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=> Check status in RAN3 at end of week

- Update at end of week: RAN3 have reveiwed and updated and endosed by RAN3.

R2-1707491 [98#28] Initial Stage2 TP for MN/SN procedures for MR-DC with 5GC Rapporteur (ZTE Corporation) pCR 37.340 0.1.1

=> Agreed to be included in the next version of the TS (R2-1707467)

10.2.2 User Plane

10.2.2.1 Bearer type harmonisation

Which bearer types to unify? Which PDCP to use for unified bearers? Signalling aspects such as impact to use of configuration containers?

R2-1707235 Bearer harmonization Ericsson, NTT DOCOMO INC., LG Electronics Inc., Nokia, Alcatel-Lucent Shanghai Bell, Qualcomm Incorporated, KT Corporation, Lenovo, Motorola Mobility discussion

- KDDI support proposal 1 to avoid market fragmentation.
- ZTE have a different approach.

R2-1706980 Consideration on the bearer type harmonisation ZTE CORPORATION discussion

- Discussed jointly with previous document
- Samsung think that ZTE proposal is more modelling but in implementation it would still require to support 4 types and hence prefer the previous split bearer approach.
- Intel think it is best to hide the MN and SN aspect from the UE as this really doesn't matter to the UE.
- ZTE's concern with the other approach is that it introduces new problems such as the keys, etc. One PDCP sounds simple but in practice it is not so simple. E.g. both PDCPs may need to be used at the same time.
- Vodafone think the important thing is to not change PDCP type when changing the bearer types, and hence prefer the Ericsson approach.
- MediaTek agree with Intel and don't see issues with keys.
- CATT wonder how it works with one key per bearer. Does it really hide bearer the change from the UE. Huawei think it doesn’t have to be one key per bearer but one for all split bearers.
- ZTE would like to understand what is meant by single PDCP as UE may need to handle 2 PDCPs at the same time. Wonders which PDCP is used for SRBs.
- LG think that NR PDCP can also be used for LTE SRBs. Huawei agree this could be done but don’t see why it would be necessary to do this hence assume LTE PDCP for LTE SRBs.
- Samsung think we can use NR PDCP for user plane but SRBs would need more discussion.
- Intel think we do need to discuss PDCP for split SRBs.
- ZTE ask why we could change anything for LTE SRBs. Nokia suggest we do not discuss SRBs.

P3

- Huawei think this increases the bearer type changes that need to be supported. Support that there should only be one option.
- Vodafone suggest that NR-PDCP should be used for this case. LG have the same view. Samsung also have the same view and hence the only change of PDCP would be MCG bearer to MCG bearer. Intel think for handover it will always need to be support to change from NR to LTE PDCP.
- Sharp supports proposal 3.
- Qualcomm ask if NR PDCP will need to support Volte. Concerned there could be more overhead with NR PDCP compared to LTE PDCP

P4

- Samsung think we need strong motivation to have key per bearer.
- ZTE wonder why it is important to hide the anchor point from the UE. Huawei think the point is to avoid the bearer type changes but don’t support per bearer keys.

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- Intel think a change from MCG to split bearer will require a re-establishment due to key change. LG thinks what matter is when the key changes.
- Nokia think the 2 keys of LTE baseline might be ok but the concern is that they are bound to the type of bearer.

P5

- Samsung wonder why it is not the MN that decides.
- DT agree that it should be the MN that decides. Huawei also agree it should be decided by MN.

Agreements

1 The same PDCP protocol specification is used for DRBs for MCG split bearer, SCG split bearer and SCG bearer.

2 This PDCP protocol is specified in 38.323 (NR PDCP).

FFS: When EN-DC is configured, whether the MCG bearer only uses one PDCP type or the MCG bearer can use either LTE PDCP or NR PDCP up to the NW decision. Bearer type changes to be supported also need to be considered.

3 For bearers configured with NR PDCP the network configures the UE with which key (from a set of possible keys) to use. FFS the maximum number of possible keys in the set . Ask SA3 for the number of keys to be supported and to define the key derivation? Detailed wording of LS, including sufficient background info, can be worked offline.

4 The location of the PDCP entity is decided by the MN

R2-1707402 Harmonized bearer type Huawei, HiSilicon discussion

P5

- Intel support the proposal.
- ZTE ask if from the LTE point of view it is one or 2 containers. Huawei explain the intent is that the NR PDCP config from SN can be transparent to the MN and also MN can generate the container as well.
- ZTE think the NR PDCP config should be specified in LTE spec and duplicated in NR and LTE specs.
- DOCOMO think without this proposal the MN or SN location of PDCP would be visible to the UE.
- Nokia also support this and think the unification exercise applies to CP and UP.
- MediaTek wonders about version handling for the 2 RRC protocols. Implies some kind of joint version handling.
- Samsung ask if this is a full message or an IE. Huawei explain it is just an IE not a full message. ZTE think this implies that SN provides one full message for lower layer config and a separate container for PDCP. Intel agree some previous decisions are being reconsidered by this process but in this case we maintain the transparency principle.

P6

- CATT ask if the PDCP config could be sent by SN on direct SRB. Huawei think this message requires joint success failure and hence must be sent by MCG.

Agreements

1: NR PDCP configuration is contained in separate NR container different from the NR container for other NR configurations

2: If the anchor is in the MN, NR PDCP config is generated by MN itself. If the anchor is in SN, the SN should generate NR PDCP config and send it to MCG as separate container.

3: In EN-DC, LTE RRC message contains:

- SCG bearer: NR PDCP container + NR configuration container on NR RLC, MAC and physical layers;
- Split bearer: NR PDCP container + LTE configurations on RLC, MAC and physical layers + NR configuration container on NR RLC, MAC and physical layers, etc;
- NR PDCP config carried in the container is an IE.

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- SCG RLC/MAC/Phy/etc config carried on the container is an NR RRC PDU.

FFS Whether there are situations (e.g. PDCP reconfiguration) the NR RRC PDU from the SN can contain a PDCP configuration.

FFS Signalling details of how the PDCP configuration and lower layer configuration are linked.

=> Offline discussion to try to progress the FFS points and maybe further details. (Intel, offline discussion 3)

R2-1707487 Offline discussion #3 on harmonized bearer type Intel Corporation (rapporteur)

Agreements:

1 Include PDCP config also in NR RRC PDU from the SN

2: Assume DRBid is used for the linking between PDCP config and lower layer comfiguration.

Working assumption: For MCG bearer, either LTE or NR PDCP can be used, configurable by the network.

FFS points:

1) which PDCP to use for MCG SRB at connection setup.

2) What mechanism is used (if needed) to indicate to network UE support of NR PDCP during connection setup?

3) whether to use LTE PDCP or NR PDCP for split SRBs

4) Whether to support a mechanism to reconfigure from LTE PDCP to NR PDCP without HO. If so, what would the mechanism look like?

5) discuss further in stage 3 whether to refer to NR RRC for NR PDCP configuration by eNB.

R2-1706571 RRC procedure and signalling for harmonised bearers Ericsson discussion

R2-1707239 Draft LS to SA3 on security key for harmonized split bearer Ericsson discussion

=> To be updated to reflect the discussion above.

=> Revised in R2-1707468 (offline discussion 04)

R2-1707468 Draft LS to SA3 on security key for harmonized split bearer Ericsson discussion

=> Remove ", which could be good to detect, since the network and UE behaviour could be dependent on the cause "

=> Keep the pink highlighted text but remove the comment.

=> Typos to be fixed

=> Approved in R2-1707501

R2-1706568 PDCP type for EN-DC supported environment SHARP Corporation discussion

R2-1706616 Bearer Harmonisation Sony discussion

R2-1707037 RRC aspects of unifying split bearer types Intel Corporation discussion

R2-1707109 Bearer type issues on VoLTE supported in Option4 China Telecom discussion

R2-1707376 Unifying Bearer Types and Related Issues Samsung discussion

10.2.2.2 Bearer type change and L2 handling at mobility

Including output from email discussion [97bis#12][NR] Bearer type change (Huawei)
Including bearer type change for harmonised bearer types.
Including L2 handing at mobility events.

R2-1707403 Summary of email discussion of bearer type change Huawei, HiSilicon discussion

-

Agreement

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1: For SCG bearer, when S-KgNB is changed or PDCP anchor is changed then SCG PDCP re-established, SCG RLC re-established. FFS whether SCG MAC is reset.

=> Offline discussion to try to progress more details (Huawei, offline discussion 5)

R2-1707479 Report for offline discussion 5 on Bearer type change Huawei, HiSilicon

Agreements for EN-DC

1: For handover, for MCG bearer, split bearer and SCG bearer, MCG/SCG PDCP/RLC should be re-established and MCG/SCG MAC should be reset.

2 For SCG bearer, when S-KgNB is changed due to key re-fresh (even if we have per bearer key) or SgNB change then SCG PDCP re-established, SCG RLC re-established, SCG MAC is reset;

Note: if solution for bearer type change is applicable then it could be considered to be used also for this case.

✉ **[NR-AH2#xx][NR/] Bearer type change (Huawei)**

Discuss whether SN change for split bearer or bearer type change for one bearer will impact other bearers or not, and consider possible solutions for this case.

Intended outcome: Report to next meeting

Deadline: Thursday 2017-08-03

R2-1707404 Bearer type change for unified bearer type Huawei, HiSilicon discussion
R2-1706572 Bearer type switching in Dual Connectivity Ericsson discussion
R2-1707051 Impact of PDCP for Bearer Type change Intel Corporation discussion
R2-1706927 Avoiding L2 reset at bearer-type reconfigurations Nokia, Alcatel-Lucent Shanghai Bell discussion
R2-1707050 Impact of RLC/MAC for Bearer Type Change Intel Corporation discussion
R2-1707405 L2 handling upon inter/intra RAT HO for LTE-NR DC Huawei, HiSilicon discussion
R2-1706360 Bearer type change and L2 handling CATT, CATR discussion
R2-1706617 Avoiding L2 reset during security key refresh Sony discussion
R2-1706865 L2 entity handling at bearer type change LG Electronics Inc. discussion
R2-1706992 DRB configuration issues in LTE-NR DC CMCC discussion
R2-1707105 Impact on Control and User Plane procedure due to Intra and Inter CU HO Samsung Electronics Co., Ltd discussion

Withdrawn

R2-1706384 L2 handling for HO CATT discussion

10.2.2.3 Packet duplication - for split SRB

Including control of UL packet duplication for Split SRB.
Maximum 1 tdoc per company

R2-1706652 Consideration on UL packet duplication for split SRB ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

P1

- ZTE explain the purpose of the split SRB was for robustness and so it make sense it also used for duplication.

P3

- LG support to use the same approach for DRBs and SRB and hence support MAC CE. Samsung think that optimisation is not needed for SRN and prefer 3a (always activated).

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CATT have similar view to Samsung, MediaTek also have same view as Samsung. Huawei, Intel, ZTE also support Samsung view.

- Ericsson, Panasonic, Qualcomm, Lenovo support LG view.
- MediaTek think if we enable RRC configuration for DRBs then we could have common treatment.
- CATT think a difference here is whether it applies to EN-DC.
- Samsung think we need to understand if the MAC mechanism always uses a particular leg if duplication is deactivated.
- Ericsson think that for EN-DC the duplication control could go on NR MAC leg. ZTE think this would mean that NR SCG would control the use of duplication which is strange.
- Show of hands for EN DC case:

a/ is not applied for MCG split SRB [12]

b/ is activated/deactivated by RRC [14]

- Show of hands for NR only case:

a/ is activated/deactivated by MAC CE [13]

b/ is activated/deactivated by RRC [15]

Agreements

1: MN determines to use MCG duplication SRB and configures MCG duplication SRB by MN RRC signalling.

2: For all DC cases (all MR-DC and NR-NR DC cases) for 'duplication SRB', UL packet transmission is configured by RRC to use MCG path, SCG path or duplicate on both MCG and SCG.

FFS Duplication on SRB for CA cases

FFS Behaviour in the case of SCG failure when SCG is the configured path.

R2-1707344 Use cases of SRB split and duplication, and its control discussion Samsung Electronics Co., Ltd

P3

- Ericsson thinks this complicates things to do this per message. LG share the same view. CATT have the same view. Intel understand the motivation but PDCP should not depend on RRC messages.

=> Noted

R2-1706385 UL split SRB CATT discussion Rel-15 NR_newRAT-Core

R2-1706630 Split SRB: Remaining issues of initial state, path selection and duplication Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706715 Packet duplication for SRBs Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706928 UL Packet Duplication for Split SRB ITRI discussion NR_newRAT-Core

R2-1706559 Discussions on Routing of UL Split SRB TCL Communication Ltd. discussion NR_newRAT-Core

moved from 10.2.5 to 10.2.2.3

10.2.2.4 Packet duplication - other

Any remaining stage 2 aspects of packet duplication - detailed topics should be discussed in stage 3 user plane.
Maximum 1 tdoc per company

R2-1706866 Remaining issues in packet duplication LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

P2

- Vivo wonder why we don't just have a default initial value. LG think at the time of radio bearer configuration the eNB doesn't know the radio condition.
- Samsung think that activation but default is sufficient. CATT think the network can make decision based on the service type carried by the bearer.

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P4

- Huawei think different bearers have different reliability requirements and hence per bearer control is needed. CATT think there are 2 groups of service (e.g. URLLC and eMBB).
- OPPO think the MAC CE should be per bearer. ZTE also think it should be per DRB. Ericsson also agree it should be per DRB, Panasonic also agree it should be per DRB.
- ASUSTeK think per UE is simple and sufficient.
- LG is concerned about MAC CE size with per DRB and also the decision is based on radio condition more than bearer type and hence per UE make sense. OPPO think MAC CE size is not a serious concern.
- Nokia support that it should be per radio bearer

Show of hands

a/ per DRB control [17]

a/ per UE control [8]

Agreements:

1: MAC CE enables per DRB control of activation/deactivation of packet duplication for DRBs with packet duplication configured by RRC.

R2-1706716 Configuration and control of packet duplication Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

P2

- Ericsson think this is already implicitly agreed. We can just deactivate the logical channel restriction. But agree it doesn't matter which one is used.
- Nokia think this might depend on stage 3 discussion.

P4

- MediaTek wonder how option 2 would work. Would communication be needed between the nodes. There could be conflict between the 2 commands. Huawei think there could be rule to decide how to apply the MN and SN commands.
- Lenovo think the same entity that configures it should send the command.
- CATT agree that option 1 is simpler.
- Nokia think that option 2 can work and some UE rules will be needed in case different control is received from each node. LG agree option 2 can work but one node should control all the bearers. Qualcomm also share LG view. Also think that wherever the bearer is anchored it is always MCG that sends MAC CE.
- NEC think the entity with the PDCP entity should control via MAC CE.

Agreements:

1: In CA, after the duplication is deactivated, the logical channel to carrier mapping restriction is not applied. UE sends new data via one specified logical channel.

FFS Whether RLC transmissions of the second leg are continued - to be concluded in stage 3 UP.

2 UE acts on MAC CEs received from MCG and SCG. No UE behaviour will be specified to manage a conflict between the commands received from MN and SN.

FFS Whether UL packet duplication for spit bearer applies for EN-DC.

R2-1707049 CA packet duplication in dual connectivity Intel Corporation discussion Rel-15 NR_newRAT-Core

P2

- Vivo wonder if this is a split bearer. Intel think the proposal is for the CA case only and not the DC case.
- Huawei wonder what is the motivation. Intel explain this is a simplification to avoid split and CA duplication at the same time.

P4

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- Nokia think we don't need the restriction for NR-NR DC. Xiaomi agree with Nokia. Samsung support the proposal. Ericsson think the restriction would be complex to specify

Agreements
1: CA packet duplication is not applied to LTE CA of EN-DC.
2: In the EN-DC and NG-EN-DC case, CA packet duplication can only be configured for SCG bearer. In the NE-DC case, CA packet duplication can only be configured for the MCG bearer.
3: In the NR-NR DC case, CA packet duplication can only be configured for non-split bearer.

R2-1707172 Packet duplication in CA Ericsson discussion Rel-15 NR_newRAT-Core
P4
- Huawei support the proposal. Think the optimal behaviour could be to have more than 2 links. Also don't see concerns with commonality with DC.
- Nokia think it is not needed to go beyond 2 legs. If more are needed then there is something wrong.
- LG think for DC we have just 2 cell groups and hence we should do the same for CA duplication.
- MediaTek think more than 2 needs more justification and also there is benefit to keep aligned with DC. Qualcomm also don't see the point to have more than 2.
- OPPO think we agree that only 2 RLC entities can be configured.

=> Noted

R2-1706361 Packet duplication configuration and control CATT discussion Rel-15 NR_newRAT-Core
R2-1706545 Initial State of PDCP Duplication Nokia, Mediatek, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT
R2-1706560 Stage 2 topics on duplication Fujitsu discussion Rel-15 NR_newRAT-Core
R2-1706929 Remaining Issues of the Control of UL Packet Duplication ITRI discussion NR_newRAT-Core
R2-1706931 Consideration on configuration and control of PDCP duplication China Telecom discussion
R2-1706945 Activation and Deactivation of UL PDCP duplication ASUSTEK COMPUTER (SHANGHAI) discussion NR_newRAT-Core
R2-1706962 Initial state of UL duplication and Scell state vivo discussion Rel-15 NR_newRAT-Core

=> Moved from 10.2.2.3 to 10.2.2.4

R2-1707260 Stage-2 aspects of data duplication MediaTek Inc. discussion Rel-15 NR_newRAT-Core
R2-1707366 Further Discussion on Packet Duplication Samsung discussion Rel-15 NR_newRAT-Core
R2-1706791 PDCP Duplication in CA SHARP Corporation discussion

- *moved from 10.2.2 to 10.2.2.4*

10.2.2.5 Other

Any remaining stage 2 user plane aspects - detailed topics should be discussed in stage 3 user plane.
Including whether to support PSCell deactivation for EN-DC (discussed in UP session at RAN2#98)

SCell actovation/deactivation

R2-1706832 Discussion on PSCell deactivation NTT DOCOMO INC., KDDI, KT Corporation discussion Rel-15 NR_newRAT-Core

R2-1707191 PSCell deactivation in EN-DC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core
- Discussed jointly with previous paper

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- LG share the view of Nokia that PSCell is not deactivated. Vivo share the same view and think if UE power is to be saved the SCG can be removed.
- Huawei think it doesn't make sense to deactivate PSCell if there is a bearer in SCG.
- DOCOMO think it can be used in the case that the MN and SN nodes are co-located and hence the operation can be coordinated without much complexity.
- LG think that the UE will not be able to perform RACH on PSCell. DOCOMO assume that UE can maintain uplink timing even when PSCell is deactivated and hence RACH is not necessary.
- KT think this is a common deployment and support the proposal from DOCOMO.
- ZTE support Nokia this this is not needed.
- Samsung agree it could be possible in some deployment scenarios and hence prefer Nokia approach for R15.

=> EN-DC PSCell deactivation is not supported in Release 15.

R2-1706746 CA initial state in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1707116 Activation and Deactivation time of Secondary Cells Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707117 [DRAFT] LS on Activation and Deactivation time of Secondary Cells Ericsson LS out Rel-15 NR_newRAT-Core RAN4

Single Tx UE

R2-1706596 Supporting 1Tx UE in EN-DC Nokia, Alcatel-Lucent Shanghai Bell discussion

- *Moved from 10.2.5 to 10.2.2.5*
- Huawei think both RAN1 and RAN4 are discussing and in RAN1 there are different solutions. So difficult for us to analyse without a concrete solution to look at.
- OPPO have similar view to Huawei.
- Apple think in RAN1 only a high level agreement was made and RAN1 are now trying to identify the solutions so it would be better for us to wait for their input.
- DOCOMO think there could be an architecture impact and so we should also look at this.
- Ericsson think there are many issues and it is difficult to progress. Could consider some simple solution. Would like some RAN4 input for how often this is a problem.
- Huawei also think we should look for a simple solution.
- Vivo think we should wait for RAN1.
- Intel think we can wait for RAN1 to make progress and think they understand that it is not only their decision.
- Vodafone wonder if this is just for the inter-mod issue of if it is for other cases as well. Think will need this mode of operation and the question is how to support it.
- AT+T think the 2 tx solution should still be the baseline but the use case for 1 tx might be in RAN4 and can look at addressing these cases. ZTE agree we should work on assumption that 2 tx is the baseline.

=> Noted

R2-1706702 EN-DC for single TX capable UEs Ericsson discussion Rel-15 NR_newRAT-Core

- *Moved from 10.2.5 to 10.2.2.5*

R2-1707439 Support of 1Tx UEs in LTE-NR UL DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706597 Draft LS supporting 1Tx UE with EN-DC Nokia, Alcatel-Lucent Shanghai Bell discussion

- *Moved from 10.2.5 to 10.2.2.5*

R2-1706615 LTE-NR Coexistence Sony discussion

- *Moved from 10.2.14 to 10.2.2.5*

R2-1707423 Consideration on LTE-NR co-existence Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

- *Moved from 10.2.5 to 10.2.2.5*

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Other

R2-1707151 On the addition of enhanced ECN support in NR Ericsson, Vodafone discussion Rel-15 NR_newRAT-Core

- Fujitsu think ECN is a performance enhancement for TCP but think we agreed not to do this for TCP throughput. ECN is agnostic to the transport layer but can be used for voice for example.
- Sharp doesn't think this is needed and it can work with RoHC
- Intel think that ECN and Rel-14 RAN based codec can be supported by this optimisation of ECN is not needed for Rel-15. Huawei wonder whether we support Rel14 RAN based codec adaptation.
- Vodafone support the proposal and think it can work with any IP transport protocol.
- CMCC think ECN is not so important but RAN based adaptation should be supported in NR first release.
- Samsung think it is up that IETF specs do not say when the ECN bit shall be set.
- Ericsson explain the Rel-8 style of ECN support has no impact on the radio. But if we want to have improved support then some radio interface impact is needed to enable the ECN bit to be set quickly. In NR we risk worse performance than LTE.
- MediaTek think this is an optimisation that will require a lot of discussion that would be best to avoid in this release.

=> Offline to conclude whether to continue to look at this (Ericsson, offline discussion 6)

- Update from offline: Should be postponsed to the next meeting

=> Discussion postponed to the next meeting.

R2-1707014 ECN and RAN-assisted codec adaptation Intel Corporation discussion Rel-15 NR_newRAT-Core

R2-1707407 Overall L2 consideration for EN DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Late

R2-1707015 Support of PSCell deactivation for EN-DC Intel Corporation discussion Rel-15 NR_newRAT-Core

R2-1707455 BSR enhancements for pre-processing MediaTek Inc. discussion

10.2.3 MN/SN measurement coordination

This topic may be deferred until we receive feedback from RAN4 to the questions we asked from RAB#98.
Maximum 1 tdoc per company

R2-1706347 Measurement Gap Configuration in MR-DC OPPO discussion NR_newRAT-Core

R2-1706446 Considerations for the MN and the SN to configure measurement objects consistently on the same carrier Spreadtrum Communications discussion Rel-15

R2-1706920 Available NR frequencies in SN LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1706997 Measurement coordination between LTE and NR CMCC discussion Rel-15 NR_newRAT-Core

R2-1707318 Measurement capability change in LTE-NR DC Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1707408 Measurement coordination for LTE-NR DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Late

R2-1706598 MR-DC measurement coordination aspects Nokia, Alcatel-Lucent Shanghai Bell discussion

R2-1707208 EN DC UE capability coordination related to measurements Samsung Telecommunications discussion Rel-15

Withdrawn

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R2-1706653 Consideration on the measurement object and measurement gap in LTE/NR tight interworking
ZTE CORPORATION discussion Rel-15 NR_newRAT-Core
=> Withdrawn

10.2.4 MN/SN procedures

Including output from email discussion [98#26][NR] SN/MN information exchange (Samsung)
Any remaining aspects of MN/SN procedures, stage 2 signalling flows, information passed between nodes, etc.

R2-1707209 Summary of email discussion [98#26][NR] SN/MN information exchange Samsung Telecommunications discussion Rel-15
P1

- Samsung thought the original intent was that MN would be allowed to initiate inter-freq mobility.
- Intel think the inter-freq case is MN initiated SN change. Samsung think the different carrier might not be a different SN, it could be within the same SN. NEC also understand that inter-freq case could be SN change. Nokia think within an SN the SN could trigger an inter-freq change.

Agreements related to SCG cell related parameters (at least for EN-DC)

1 RAN2 confirm that MN only initiates SN addition/ release i.e. that MN initiated SCG addition/ release is not supported
2.1 (At SN addition) MN provides measurement results rather than explicitly indicating the SCG cell to be added
2.2 No further SCG cell related parameters(beyond the measurements) need to be exchanged (i.e. no need for inter-node signalling regarding SCG cell addition assuming UE capability related info is indicated differently)
3 Measurement results provided by MN to SN at SN addition are specified by RRC (inter node message). FFS whether encoding of measurements is defined in NR or LTE RRC.

Agreements related to bearer related parameters (at least for EN-DC)

1 In case of EN-DC, at DRB configuration MN provides to SN the identity of DRB to be added. FFS whether any further information is transferred e.g. DRB type
2 In case of EN-DC, MN provides to SN QoS attribute information (same information as for LTE DC) of bearers to be added

FFS: RAN2 will discuss further and conclude if MN should provide SRB attribute information (i.e. for MCG split SRB case)

FFS: Which protocol (RRC of Xx) to use for the transfer of the RB related information RAN2 is requested to further discuss and conclude whether or not to conclude only after sufficient progress is made for all relevant cases (SRB attributes, QF information)

Agreements related to other general parameters (at least for EN-DC)

1 (At SN addition) MN provides to SN the SN UE capabilities.
2 SN provides the SCG configuration (transparently) to MN, for the case that the SCG configuration is provided to the UE via the MN
3 MN may provide an SCG configuration restriction to SN (signalling details FFS). SN may provide information indicating what SCG configuration restriction it would like to be alleviated/ reduced (signalling details FFS)
4 Inter-node transfer of SN UE capabilities and SCG configuration information is specified by RRC (inter node message). MN transparently forwards these parameters (i.e. SN UE capabilities received from UE is transparently forwarded to SN, SCG configuration received from SN is transparently forwarded to UE).

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5 MN may provide to SN an "SCG change" indication upon MN initiated SCG modification. SN may provide to MN an "SCG change" indication upon SN initiated SCG modification.

FFS: SCG change still needs to be defined for NR cases

6 Inter-node information transfer regarding MBMS interest is not in scope of REL-15

7 Status of feature make before brake should be concluded before progressing related inter-node transfer

8 MN may provide UE AMBR and serving PLMN upon SCG addition and MN initiated SCG modification

9 Both MN and SN may include reject cause in failure messages

10 Inter-node transfer of SCG change indication, UE AMBR, serving PLMN and reject cause is specified by Xx

R2-1706858 Allowing mapping of default bearer on SCG during Initial Context Setup Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

- moved from 10.2.5 to 10.2.4

- Qualcomm agree with the proposal and thinks that LTE DC allows this.
- Intel think this would be a blind addition of DC as there would be no measurement results in the MN.
- Ericsson also agree with Qualcomm.
- Huawei support the proposal.
- LG think this was previously agreed not to do, and no sure of the use case.
- Samsung think we should not add anything special to support this.
- Intel wonder if we want to add this for a very limited use case that the network can do a blind SCG setup. Huawei thing this could be possible in e.g. a co-located situation. Lenovo think it should be possible to do without measurements.
- Ericsson also think this is possible without measurements.
- Nokia think some quick measurements might be possible to be used by the MN. Assume the blind addition is the use case.
- NEC don't see a use case. Last time we agreed all bearers could be moved to SCG after MCG is setup.
- Intel think it is not clear that this case is supported today.

=> Offline discussion to try to conclude (offline discussion 10)

- Update from offline: Summary in R2-1707486

R2-1707486 Offline discussion #10 Nokia (rapporteur)

Agreements

1: At least for EN-DC, the MN can perform a blind addition of the SN and use the first RRC reconfiguration message following RRC connection establishement to carry the corresponding SCG configuration. (No additional functionality will be defined enable this)

This supercedes the previous agreement on this topic.

R2-1706955 MN-initiated SN change considerations HTC Corporation discussion NR_newRAT-Core

- ZTE support the proposal although details can be discussed.
- Intel think this is needed if delta configuration is needed for MN initiated SN change. ZTE agrees that delta configuration is needed to be supported.
- Qualcomm also agree this is needed for delta configuration. Lenovo also agree
- Huawei think that a different approach would be that SCG always forwards the latest SCG configuration to the MN. This would avoid a request/response procedure.

Agreements

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1: To support delta signalling at MN initiated SN change, MN must have the current SCG configuration in the SN in order to support the MN-initiated SN change.

FFS: Signalling to support this.

=> FFS can be discussed offline as part of drafting of LS.

=> Draft LS in R2-1707472 (HTC, offline discussion 11)

R2-1707472 [DRAFT][LSout to RAN3] HTC LS out Rel-15 NR_newRAT-Core To: RAN3

=> Add sentence to explain that MN initiated SN change is mainly for load balancing purpose.

=> Revised in R2-1707495

R2-1707495 [DRAFT][LSout to RAN3] HTC LS out Rel-15 NR_newRAT-Core To: RAN3

=> Approved in R2-1707502

R2-1706573 Transmission of NR RRC measurement configuration and reports in EN-DC Ericsson discussion Rel-15 NR_newRAT-Core

- LG support the proposal as this was the main reason for SCG SRB.
- CATT ask even if the measurement was received via MCG then the reporting is still mapped to SCG SRB.
- Interdigital support the proposal as there are cases the reconfiguration would be received via MN but we don't want the reporting to MN.
- CATT would prefer an explicit indication which SRB to be used for the reporting. Samsung also proposed an explicit configuration but this proposal is also acceptable.

Agreements

1 For NR RRC measurements configured by SN (whether received via MN or direct from SN), reports are mapped to SCG SRB, if configured.

R2-1706348 SN ConnectivityHandling in Suspend/Inactive State OPPO discussion NR_newRAT-Core

R2-1706351 SN Addition Enhancement OPPO discussion NR_newRAT-Core

R2-1706569 Secondary node change procedure for 0ms interruption time in LTE-NR tight interworking TCL Communication Ltd. discussion NR_newRAT-Core

R2-1706574 Race conditions in case of SgNB release Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706618 Intra SN mobility and MN involvement Sony discussion Rel-15 NR_newRAT-Core

R2-1706650 Consideration on the LTE/NR tight interworking with NG-C ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

=> revised to R2-1707452

R2-1707452 Consideration on the LTE/NR tight interworking with NG-C ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1706651 Consideration on the SN RRC message indirect forward ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1706655 Consideration on the intra-MN handover without SCG change involved ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1706656 Consideration on the counter check procedure in LTE/NR tight interworking ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1706660 Discussion on data forwarding in LTE/NR tight interworking ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1706678 MN-SN Information Exchange for LTE-assisted NR Initial Access AT&T discussion

R2-1706700 Split SRB: HO command duplication Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706876 MN/SN Procedures for MR-DC Qualcomm Incorporated discussion

R2-1706936 SN Measurement report transmission path selection in EN-DC Samsung discussion NR_newRAT-Core

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R2-1706937 [Draft] LS on the support of SN modification call flow Samsung discussion NR_newRAT-Core
R2-1706942 SN continuation on MN failure in EN-DC operation Samsung discussion NR_newRAT-Core
R2-1706943 SN modification call flow: SCG DRB release case Samsung discussion NR_newRAT-Core
R2-1706953 SN RRC messages considerations in SN modification HTC Corporation discussion NR_newRAT-Core
R2-1706989 MN handover to the serving SN frequency CMCC discussion Rel-15 NR_newRAT-Core
R2-1706991 Flow control function enhancement in LTE-NR DC CMCC discussion Rel-15 NR_newRAT-Core
R2-1707089 Inter-RAT Mobility for EN-DC Samsung Electronics Co., Ltd discussion
R2-1707103 Measurement Configuration for NR SCG Addition Samsung Electronics Co., Ltd discussion
R2-1707104 Discussion on Inter MN handover without SN change Samsung Electronics Co., Ltd discussion
R2-1707132 Provision of measurement results to MN LG Electronics Inc. discussion Rel-15 NR_newRAT-Core
R2-1707205 Clarification on EN-DC procedures Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707236 SCG bearer establishment Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707384 Consideration on SN change in LTE/NR tight interworking ZTE CORPORATION discussion Rel-15 NR_newRAT-Core
R2-1707406 Consideration on DRX for EN-DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1707409 Direct SCG (split) bearer setup in EN-DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1707410 Inter-node message design for LTE-NR DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1707411 Procedure of Secondary Node change Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1707421 UE-AMBR enforcement in EN-DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Withdrawn

R2-1707206 Race conditions in case of SgNB release procedures Ericsson discussion Rel-15 NR_newRAT-Core
=> Withdrawn

10.2.5 NSA operation - other aspects

Any remaining stage 2 aspects of SCG SRB, split SRB, SN/MN failure handling, security, etc

Security

R2-1706703 Security in LTE-NR interworking Ericsson discussion Rel-15
P1
- Qualcomm think that echo back would be needed in this case as the UE capabilities can be transferred before security is started.
- Nokia think that echo back actually causes problems and so the preference is still to use NAS.
- Huawei have the same view as Nokia. We should also consider the inter-RAT HO case.
- Intel also prefer to support NAS. Without echo back we would need some other restriction that capabilities are exchanged after SMC.
- Ericsson also support the NAS capabilities but we need to progress.
- Qualcomm think the SA3 LS is asking us if there is any problem with transfer in AS.

=> Noted

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R2-1706704 [DRAFT] Reply LS on algorithm selection in E-UTRA-NR Dual Connectivity Ericsson discussion Rel-15

=> Add that today the UE capability enquiry/response procedure can be unprotected.

=> Ask how NR security capabilities would be handled for inter-RAT handover from LTE to NR.

=> Revised in R2-1707473 (offline discussion 12)

R2-1707473 [DRAFT] Reply LS on algorithm selection in E-UTRA-NR Dual Connectivity Ericsson discussion Rel-15

=> Typos to be fixed

=> Approved in R2-1707496

R2-1706894 Consideration on MN&UE action in case of DRB integrity protection failure ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

P1

- Intel think this is a principle but we don't know yet the implications.

P2

- Ericsson think we should first ask a general question on behaviour at DRB IP failure.
- Huawei think this is similar to counter check that the network should be informed but no other actions is needed. Intel could also support this view. Do not want to have to identify which leg the error occurs on.

Agreements on questions to ask SA3
1 What should be the network and UE behaviour on DRB IP check failure (options at least including discarding of the packet, triggering some kind of failure handling (e.g. RLF or SCG failure) or something between these extremes). Also ask if behaviour relates to one DRB or all DRBs.
2 Any differences in behaviour for the case that the DRB is anchored in MN or SN?
3 Inform SA3 that as IP check is performed at PDCP, in the case of a split bearer it is RAN2 preference that the network and UE do not need to determine on which leg the IP check failure originated from.
4 Inform SA3 that IP check failure might also occur in case of HFN desync.

=> Questions to be added to LS on key derivation for unified bearer (R2-1707467)

R2-1706386 Transmission of NR security information in NSA CATT discussion Rel-15 NR_newRAT-Core

R2-1706575 Handling of DRB integrity protection failure Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706657 Consideration on SRB integrity protection failure ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1706842 NSA Operation: Integrity Check Failure Handling Samsung India discussion

R2-1706964 Further consideration on integrity check failure vivo discussion Rel-15 NR_newRAT-Core

R2-1707238 Draft LS to SA3 on handling of DRB integrity check failure Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707322 NR security capability signalling - LS S3-171485 relevant Qualcomm Incorporated discussion

- *moved from 10.1 to 10.2.5*

R2-1707414 Security capability handling for tight interworking Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1707413 Draft response LS on algorithm selection in E-UTRA-NR Dual Connectivity Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1707415 S-KeNB related issues for LTE-NR interworking Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

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R2-1707419 Counter check in LTE-NR DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

SCG failure handling

R2-1706633 Measurement in case of S-RLF Ericsson discussion Rel-15 NR_newRAT-Core

- moved from 10.2.4 to 10.2.5

P1

- Intel ask if the proposal is to continue the measurements or to start the measurements at that time. Ericsson view it as a trigger to perform the measurements.
- CATT think in LTE the UE just continues the measurements that were currently ongoing.
- Samsung think this is not an observable UE behaviour.

P2

- LG think the UE only needs to report results on the SN frequency.
- Intel agree that the minimum needed is the frequency used by the SN.
- Vivo support proposal 2
- Huawei think that the UE can just report a configured number of the best cells.
- CATT support the proposal and think also in cases other than S-RLF it is useful to include this information.
- Nokia understand that if SCG failure occurs then all SN messages fall back to using the MCG path. CATT think the UE will not have to report anything unless the network takes action. Ericsson don't see the need to keep sending SN measurement reports after the failure.
-

Agreements:

1 For all SCG failure cases, the UE maintains the current measurement configurations from both the MN and the SN (i.e. UE does not take autonomous action) and UE continues measurements based on configuration from the MN.

FFS whether the UE continues measurements based on configuration from the SN

2 UE includes in the SCGFailureInformation message the measurement results available according to current measurement configuration of both the MN and the SN.

3 The MN handles the SCGFailureInformation and may decide to keep, change, or release the SN/SCG. The measurement results according to the SN configuration can, in all cases, be forwarded to the old SN and/or to the new SN.

FFS if a different SN can interpret the measurement results based on the configuration from the old SN

4 The UE includes two measurement results in the SCGFailureInformation message: 1) measurement results according to the MN configuration encoded in LTE RRC format, and 2) measurement results according to the SN configuration

FFS Whether the measurement results according to the SN configuration are encoded in NR RRC format and included in a container

R2-1707417 SCG recovery upon SN failure for EN-DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706843 Discussion on S-RLF NTT DOCOMO INC. discussion Rel-15 NR_newRAT-Core

R2-1707091 SCG Failure Handling Samsung Electronics Co., Ltd discussion

R2-1707148 Handling of SRBs in connection re-establishment LG Electronics France discussion Rel-15 NR_newRAT-Core

R2-1707377 SCG failure indication from MN to SN NEC discussion Rel-15 NR_newRAT-Core

R2-1707378 DRAFT LS on SCG failure indication in LTE-NR DC NEC LS out Rel-15 NR_newRAT-Core RAN3

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R2-1707422 Configuration failure handling in LTE NR DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

SCG SRB

R2-1707418 Remaining issues on SCG SRB Configuration Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

P3

- LG think an except would be for the SCG SRB release case. If the SN sends the release then the complete must go to the MN. Huawei think that SCG SRB release can be sent via the MN to avoid this case.

P5

- Ericsson think this conflicts with agreement to use same logical channel id for split SRB1 and split SRB2.

P7

- Intel think the SCG SRB is not critical for option 4. Huawei think it is not for free as it impacts LTE.
- LG prefer not to support for option 4.
- Huawei don't see the need for this for option 4 and also prefer not to impact LTE. ZTE wonder if this means we cannot support SN initiated SN change. Huawei think it could still go via MN.

Agreements

1 The UE sends RRCConnectionReconfigurationComplete message on the same SRB as receiving RRCConnectionReconfiguration message. And there are NO any exceptional cases for sending the complete messages.
2 LCID to be used for SCG-SRB and the SCG legs of the MCG split SRBs (SRB1 and SRB2) will be fixed in the spec.
3 SCG SRB is not supported on LTE (i.e. for NE-DC)

=> Offline discussion to conclude on the terminology to use for SCG-SRB and the SCG legs of the MCG split SRBs (SRB1 and SRB2). (Huawei, offline discussion 13)

- Update from offline:

Agreements

1 "SRB3" to be used for SCG-SRB
2 If we find that we need to use a term for SRB1[2] leg on SN then "SRB1S"[SRB2S] will be used.

R2-1706388 Remaining issues of SCG SRB for IWK CATT discussion Rel-15 NR_newRAT-Core
R2-1706627 SCG SRB setup procedure Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706856 Comparison of RRC reconfiguration latency for SCG SRB with MCG routed SRB Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT
R2-1706857 Further considerations for SCG SRB and RLF handling Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

Split SRB

R2-1706558 Uplink Path for Split SRB MediaTek Inc. discussion Rel-15 NR_newRAT-Core
R2-1706689 Configuration and Routing for Split SRB InterDigital discussion Rel-15 NR_newRAT-Core
R2-1706631 Split SRB transport over X2 Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706877 Considerations on SRB split bearer and direct bearer Qualcomm Incorporated discussion
R2-1707420 Support of MCG split SRB and SCG SRB in SgNB Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

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Other

R2-1706389 Transmission of NR UE capability CATT discussion Rel-15 NR_newRAT-Core

R2-1706453 IDC support for IMD and harmonics due to uplink transmission in MR-DC NTT DOCOMO, INC. discussion Rel-15 NR_newRAT-Core

R2-1706628 RRC race conditions in LTE-NR interworking Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706634 RRC suspend/resume in LTE-NR tight interworking Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706635 Addition, modification and release of DRBs in EN-DC Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706892 MR-DC Mode in Inactive Qualcomm Incorporated discussion

R2-1707083 Discussion on measurement configuration enhancements for INACTIVE state Guangdong OPPO Mobile Telecom. discussion Rel-15 NR_newRAT-Core

R2-1707345 Transmission path of NR RRC messages Samsung Electronics Co., Ltd discussion

R2-1707353 NR PHR for EN-DC Samsung Electronics discussion

R2-1707416 DL Flow control for EN-DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1707448 Support of full configuration HTC Corporation discussion Rel-15

Withdrawn

R2-1706387 SCG failure for IWK CATT discussion Rel-15 NR_newRAT-Core
=> Withdrawn

10.2.6 UE capabilities

10.2.6.1 NR UE capabilities

Structure of information, including capability size reduction
Maximum 1 tdoc per company
Size reduction

R2-1707021 UE capability signaling reduction Intel Corporation discussion Rel-15 NR_newRAT-Core

P1

- KDDI support proposal 1 as a simple way to reduce the capability size.
- DOCOMO ask if this is the same as for Rel-14 LTE. Intel explain the concept is the same. P1 is exactly the same but the intention is to reduce the option compared to Rel-14 to only request the superset BC. For P3 the intention is to merge the different options in LTE.
- Ericsson think this approach evolved in LTE as a fix but for NR we can do something different. We should try to cure the problem.
- LG agree with Ericsson view.
- DOCOMO can agree with proposals 1-3 and consider the LTE mechanism as baseline for NR. But need to consider capabilities are per BC.
- CATT is ok with P1 but also interested in reducing the baseband part.
- Qualcomm can agree with P1 to P3. Nokia also agree to start with the LTE baseline.
- MediaTek also support the proposal.

P4

- Nokia support to discuss this

Agreements for NR UE capabilities:

1: NR will support gNB requested band combination signalling.
2: For gNB requested band combination signalling the gNB can provide super-set BCs.
3 UE can skip subset of band combinations if corresponding UE capabilities are the same.

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4	RAN2 aim not to duplicate band combinations to indicate the combination of DL bands and UL bands.
5	RAN2 aim to introduce per UE baseband capabilities separated from the band combinations (e.g. FD-MIMO capabilities, number of CSI processes, etc) and minimise per band combination signalling.

✉ **[NR-AH2#xx][NR/] UE capabilities (Intel)**
Progress the possible solutions for introducing per UE baseband capabilities separated from the band combinations and minimise per band combination signalling (i.e. related to agreement 5 for R2-1707021). Aim to decide the high level solution in August meeting.
Intended outcome: Report to next meeting
Deadline: Thursday 2017-08-03

R2-1706576 UE Capability Signalling Structure for NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707210 NR UE capabilities, size reduction and simplification Samsung Telecommunications discussion Rel-15

- Nokia ask who assigns the model identifier. Samsung think one option could be a hash function based on the actual UE capabilities. Nokia wonder if a hash function would be unique. Samsung think not unique but likelihood of clash could be very small.
- Samsung clarify if there are many UEs of the same model then the network only needs to store once.
- Qualcomm support this direction and wonder if IMEI-SV could be used that is available as NAS.
- LG think that some UEs cannot be managed based on the model ID.
- Intel think the approach seems reasonable but need to be careful this is a unique ID. Also wonder if this works with network request BC signalling.
- Ericsson support this direction and the details can be worked on.
- Chair wonders how it works if the UE wants to detach and re-attach with different capabilities. Qualcomm explain in their approach the static capabilities would include a number of sets that the UE can move between. So not relying on the detach and re-attach approach.
- Nokia wonder for which use case this is needed.
- Vodafone think we can think a bit more about this proposal but it is difficult to find an identifier to work in all cases. Not sure a general solution should rely on IMEI-SV.

=> Noted.
=> Can be discussed again at future meeting.

R2-1706329 Discussion on Downsizing of UE Capability Report OPPO discussion
R2-1706390 Consideration on NR static UE capability CATT, CATR discussion Rel-15 NR_newRAT-Core
R2-1706795 NR UE Capability Size Reduction LG Electronics Finland discussion Rel-15 NR_newRAT-Core
R2-1707424 Reduction capability size for SA NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

10.2.6.2 UE capability coordination

Including output from email discussion [98#29][NR] Capability coordination (DOCOMO)
Maximum 1 tdoc per company

R2-1706454 Summary of email discussion [98#29][NR] Capability coordination NTT DOCOMO, INC. (Email discussion rapporteur) report Rel-15 NR_newRAT-Core
=> *Revised to R2-1707459*

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R2-1707459 Summary of email discussion [98#29][NR] Capability coordination NTT DOCOMO, INC. (Email discussion rapporteur) report Rel-15 NR_newRAT-Core

P2

- Intel think the open issues should first be resolved before agreeing to P2.
- LG ask if the index refers to the band combination. DOCOMO explain that it at least refers to the BC and maybe some other information as well depending on the details.

P2a

- Qualcomm think the intra-band case needs to be solved for all solutions as today we only consider bands but this would need some coordination based on carrier. DOCOMO explain this could be resolved in the legacy LTE approach as the MCG/SCG configuration would be visible in the other node.
- Intel think if the approach is extended to include various additional information then it looks similar to the current band combination.
- Huawei think the index approach will end up similar to LTE baseline.

Agreements:

1: In case of NE-DC, for each NR BC in the UE capabilities at least the possible LTE frequency bands that can operate with this NR BC should be visible to the NR MN.

2: For MR-DC, capability signalling and coordination will support shared baseband capabilities between LTE and NR. The exact capabilities for coordination should FFS and dependent on RAN1/4 discussion.

3: RAN2 continues to work on capability coordination not requiring MN and SN comprehend each other's UE configuration (e.g. the index based coordination).

4: For the index-based coordination, the following open issues need to be resolved:

- How can the LTE/NR MN learn the possible NR/LTE frequency bands that can operate with LTE/NR BC? (e.g. For each index there is a frequency list of the NR/LTE frequency bands that can be understood by the MN, frequency part is visible to both MN and SN)
- How to address baseband capability dependency between LTE and NR (Proposal 4)? (Depends on outcome of RAN1/4 discussion)
- How can the MN/SN decide MCG/SCG configuration if LTE-NR band combination is defined within the same frequency band?
- If the above issues cannot be resolved then the fallback will be to use the LTE baseline.

=> Contributions on how to address the open issues listed in 4 can be submitted to next meeting (with sufficient detail that we can make a decision).

=> Ask RAN1/4 if there will be baseband capabilities that can be shared between LTE and NR (other than MIMO capability for which RAN4 has already responded). Draft LS in R2-1707475 (Nokia, offline discussion 15)

R2-1707475 [DRAFT] [LS to RAN1/4 on whether there will be baseband capabilities that can be shared between LTE and NR] Nokia LS out Rel-15 To: RAN1, RAN4

✉ **[NR-AH2#xx][NR] LS to RAN4 on capability sharing (Nokia)**
Intended outcome: Approved LS
Deadline: Thursday 2017-07-06

R2-1707140 LTE/NR UE capability dependency and coordination Qualcomm Incorporated discussion Rel-15 NR_newRAT

R2-1706577 UE Capability Coordination for LTE/NR interworking Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706859 UE capability structure and coordination aspects for MR-DC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1706658 Consideration on the capability coordination in LTE/NR tight interworking ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1706679 UE capability indication of bearer split for LTE-NR Dual Connectivity AT&T discussion

R2-1706796 Capability Coordination in EN-DC LG Electronics Finland discussion Rel-15 NR_newRAT-Core

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R2-1707425 Capability design for LTE NR DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Late

R2-1707211 EN DC UE capability coordination, index based Samsung Telecommunications discussion Rel-15

10.2.6.3 Temporary capability restriction

Maximum 1 tdoc per company

R2-1706359 Requirement to Capability Retrieval framework Vodafone, Deutsche Telekom, Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1707141 Temporary NR UE capability restriction Qualcomm Incorporated discussion Rel-15 NR_newRAT

R2-1706797 Assistance Information for Temporary Capability Restriction LG Electronics Finland discussion Rel-15

R2-1707426 UE temporary access capability restriction Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706391 UE capablility temporary restrictions CATT discussion Rel-15 NR_newRAT-Core

R2-1706578 UE Capability Restrictions Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706659 Consideration on the capability restriction update procedure in LTE/NR tight interworking ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1707023 Temporary UE capability restriction Intel Corporation discussion Rel-15 NR_newRAT-Core

R2-1707212 Network control of UE capability suspension Samsung Telecommunications discussion Rel-15

R2-1706979 UE radio access capabilities change vivo discussion Rel-15 NR_newRAT-Core

=> Moved from 10.4.3 to 10.2.6.3

10.2.6.4 Other

Any other aspect related to UE capabilities

UE categories

R2-1706554 On UE Category MediaTek Inc. discussion Rel-15 NR_newRAT-Core

moved from 10.2.6.1 to 10.2.6.4

revised to R2-1707453

R2-1707453 On UE Category MediaTek Inc. discussion Rel-15 NR_newRAT-Core

moved from 10.2.6.1 to 10.2.6.4

P1

- Intel support proposal 1. DOCOMO also. Vodafone also. Nokia also support this.
- LG think it is possible to implement NR and LTE separately and it can be coordinated with separate information. MediaTek think this related to other proposals.
- Nokia think the combination for EN-DC might be a combination of an LTE and NR one.
- DT support the proposal.
- T-Mobile think that UE categories can hold back innovation and UEs should just indicate peak data rate. Vodafone thought that keeping categories was an understanding in RAN and we discuss the structure and think 3 categories would be suitable.
- Qualcomm support but think it doesn't mean that we define an EN-DC specific category.
- Samsung think we should consider we might have an NR category it might not be the same as LTE category.

=> Offline discussion. Should at least discuss how an NR category would differ from an LTE category. Then discuss whether a different category for EN-DC would be needed (for case the EN-DC capability is different from the sum of LTE and NR category) (MediaTek, offline discussion 14, Thursday morning coffee break)

- Outcoem of offline in R2-1707484

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Agreements
1 NR UE Category is supported and at least associated with a peak data rate.

R2-1707484 Offline discussion 14 report – UE category MediaTek Inc.
=> Topic will be discussed again at the next meeting.
=> Contributions may include stage 3 signalling examples to show the impacts.

R2-1707234 On the need for UE categories Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706603 UE categories for LTE-NR DC Nokia, Alcatel-Lucent Shanghai Bell discussion
moved from 10.2.6.1 to 10.2.6.4
R2-1707022 UE category for LTE-NR DC Intel Corporation discussion Rel-15 NR_newRAT-Core
R2-1707391 UE categories for EN DC and NR Samsung Electronics Co., Ltd discussion Rel-15 NR_newRAT-Core
moved from 10.4.3.1 to 10.2.6.4

Other
R2-1706579 UE Capability Compression Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707142 Reducing the size of UE capabilities Qualcomm Incorporated discussion Rel-15 NR_newRAT
R2-1707427 Network handling on UE static access capability Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

10.2.7 Mobility mechanisms - basic handover

Any remaining stage 2 aspects of 'basic' handover in SA and SCG change in NSA (e.g. procedure to access the target cell, etc), including beam related information to include in the command. Note
Maximum 1 tdoc per company
R2-1706705 Baseline handover procedure for inter gNB handover in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> Offline activity to ensure that the NR stage 2 is consistent with the LTE baseline stage 2 description. Aim that the 2 descriptions are at the same level and nothing missing from NR stage 2. Should also ensure that previous agreements and the agreements from this meeting have been captured. Outcome should be a TP to 38.300. If discussion identifies stage 3 aspects that could be agreeable then they can be discussed. (Huawei, offline discussion 16)

Agreements:
1 Measurement information (including beam information if there are beams in the network) reported by the UE can be included the HANDOVER REQUEST message sent to the target.
2 The handover command includes all necessary parameters (at least new C-RNTI, target gNB security algorithm identifiers, and optionally a set of dedicated RACH resources (RAN2 understand this could be time/frequency/sequence but decision is up to RAN1), etc.).
FFS How the UE uses the set of dedicated RACH resources and common RACH resources,
FFS How the UE knows the common RACH resources.
3 Handover command can include association between RACH resources and SS blocks.
4 Handover command can include association between RACH resources and CSI-RS configuration(s), if RAN1 conclude that such association is possible.
FFS How the UE selects the beam and RACH resources to be used to access from the information included in the handover command. This could be specified behaviour, or

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specified behaviour with some parameter(s) than can be controlled by the network, and can be discussed is some aspects might be left to UE implementation.
5 Timer based handover failure procedure like LTE (T304) is supported in NR.
6 RRC connection re-establishment procedure should be used for recovering handover failure.

=> Draft LS in R2-1707476 to RAN1 to provide the RAN1 relevant aspects of the above agreements (Ericsson, offline discussion 17)

R2-1707476 [DRAFT][LS to RAN1 to provide the RAN1 relevant aspects of the agreementsfor on inter-gNB handover] Ericsson LS out Rel-15 NR_newRAT-Core RAN1

=> Remove the notes so we only send pur agreemenst

=> Approved in R2-1707503

R2-1707485 Text proposal to TS 38.300 on baseline handover procedure for inter gNB handover in NR Huawei, HiSilicon

✉ **[NR-AH2#xx][NR] TP Baseline handover procedure (Huawei)**
TP to update stage 2 based on agreements from this meeting.
Intended outcome: Agreeable to next meeting.
Deadline: Thursday 2017-08-03

✉ **[NR-AH2#xx][NR] Baseline handover procedure (Ericsson)**
Progress details of the information to be carried over Xx and RRC for handover.
Intended outcome: Report to next meeting
Deadline: Thursday 2017-08-03

R2-1706435 Handover in NR Considering Multiple-beam Operation MediaTek Inc. discussion NR_newRAT-Core

R2-1706450 General framework for the handover procedure in NR Samsung discussion Rel-15 NR_newRAT-Core

R2-1706663 Basic inter-gNB handover procedure ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1706904 Analysis on NR handover in multi-beam operation Lenovo, Motorola Mobility discussion Rel-15 NR_newRAT-Core

R2-1707012 Basic handover procedure in NR Intel Corporation discussion Rel-15 NR_newRAT-Core

R2-1707133 Basic handover procedure considering beam LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1707276 Further details of handover execution Ericsson discussion Rel-15 NR_newRAT-Core

Withdrawn

R2-1706392 Handover in intra-gNB HOCATT discussion Rel-15 NR_newRAT-Core
=> Withdrawn

10.2.8 Mobility mechanisms - other

Note decisions at RAN2#97bis to progress the basic HO mechanism and only when stable to discuss conditional handover and potential optimisations to target close to 0ms or 0ms interruption.

R2-1706455 Cell global identity and ANR functionality Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

- Vodafone think for option 3 we just need a GCI from SIB1.

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- Vivo think this is needed for option 3.
- Ericsson think this is needed for EN-DC and hence SIB1 would be needed by December.
- Huawei see some value but wonder if it would be ok if ANR support is only added after the December deadline for option3.
- TMO US support to have this for EN-DC.
- LG think if we do support this in Rel-15 then an option would be to target the ANR functionality by end of Rel-15.
- Intel think the critical question whether we define SIB1 by December.
- OPPO support ANR in this release but this function can be after December.
- Huawei think ANR should be common for NSA and SA.

Agreements
1 LTE inter-RAT ANR framework is extended to cover NR (target to complete this at end of Rel-15, not December 2017)

R2-1706393	Sync state in connected mode	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1706436	Mobility Enhancement for '0ms Interruption' HO	MediaTek Inc.	discussion		NR_newRAT-Core
R2-1706451	Mobility enhancements for NR	Samsung	discussion	Rel-15	NR_newRAT-Core
R2-1706452	Mobility enhancements for NR NSA	Samsung	discussion	Rel-15	NR_newRAT-Core
R2-1706489	Conditional handover – basic aspects and feasibility in Rel-15	Nokia, Alcatel-Lucent Shanghai Bell	discussion	Rel-15	NR_newRAT-Core
R2-1706625	0 ms interruption support during handover procedure in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1706626	RACH-less HO in NR when UE is in CA or DC	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1706676	Discussion on single connected handover	ZTE CORPORATION	discussion	Rel-15	NR_newRAT-Core
R2-1706690	Conditional Reconfiguration for NR	InterDigital	discussion	Rel-15	NR_newRAT-Core
R2-1706706	Support for multi-connectivity with multiple MAC entities per NR cell	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706707	Comparison of 0ms interruption solutions	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706708	3 Types of HO in NR	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706709	SgNB to MgNB reconfiguration for 0ms interruption handover	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706710	Robust data transmission during handover using packet duplication	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706711	Further discussion on Conditional HO	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706714	Allocation of appropriate RACH resources for handover	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706752	Discussion on feasibility of DC-based mobility enhancement	Samsung	discussion	Rel-15	NR_newRAT-Core
R2-1706835	Cell identification in NR	Nokia, Alcatel-Lucent Shanghai Bell	discussion	Rel-15	NR_newRAT-Core
R2-1706935	Introduction of UE autonomous handover	Samsung	discussion		NR_newRAT-Core
R2-1706939	Operational aspects of conditional handover mechanism	Samsung	discussion		NR_newRAT-Core
R2-1706940	Problem of DC enhancement for 0 ms interruption time	Samsung	discussion		NR_newRAT-Core

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R2-1706944 The feasibility of intra-frequency dual connectivity in NR-NR DC Samsung discussion NR_newRAT-Core
R2-1707108 Discussion on conditional handover KT Corporation discussion
R2-1707134 Conditional handover procedure LG Electronics Inc. discussion Rel-15 NR_newRAT-Core
R2-1707213 Support of multiple MAC entities per cell Samsung Telecommunications discussion Rel-15
R2-1707227 Discussion on Conditional Handover in NRASTRI, TCL Communication Ltd. discussion
R2-1707274 Enhancing Handover Failure Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707275 Conditional Handover Ericsson, Qualcomm, KT, AT&T, KDDI discussion Rel-15 NR_newRAT-Core
R2-1707277 Contents of handover preparation Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707325 Discussion on Adaptation of Measurement Related Parameters for Different Mobility Scenarios Samsung Electronics discussion
R2-1707326 The Necessity of T312 in NR Samsung Electronics discussion
R2-1707327 Conditional Handover: Event Design Aspects Samsung Electronics discussion
R2-1707328 Beam Refinement Considering RRM Measurement based on Idle Mode RSSamsung Electronics discussion

10.2.9 Mobility - RLM,RLF

Any remaining stage 2 aspects of radio link monitoring procedure and criteria for declaring radio link failure.
Maximum 1 tdoc per company

R2-1706394 RLC failure and RLF CATT discussion Rel-15 NR_newRAT-Core

Agreements
1: For the split bearer, RLC failure is detected upon the reaching of maximum ARQ retransmission and RLF is triggered, i.e. SCG RLC failure triggers SCG RLF, and MCG RLC failure triggers MCG RLF.
FFS whether maximum ARQ retransmission is only criteria for RLC failure
2: For the duplicate bearer using DC, RLC failure is detected upon the reach of maximum ARQ retransmission and RLF is triggered, i.e. SCG RLC failure triggers SCG RLF, and MCG RLC failure triggers MCG RLF.
FFS Behaviour for duplicate bearer using CA

R2-1706909 Considerations of RLM/RLF in NRQualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1706437 RLM/RLF and Beam Failure Recovery MediaTek Inc. discussion NR_newRAT-Core

Agreements
1: RAN2 understand that beam failure recovery (L1 or MAC) and RLF (RRC) are performed in different layers.
=> RAN2 will discuss again when RAN1 have provided more information on beam recovery.

R2-1706675 Consideration on the RLF and beam failure in NR ZTE CORPORATION discussion Rel-15 NR_newRAT-Core
R2-1706680 Beam Failure Recovery Mechanism and RLF AT&T discussion
R2-1706691 RLM/RLF for NR InterDigital discussion Rel-15 NR_newRAT-Core
R2-1706745 RLF for NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

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R2-1706805 Enhancement RRC Connection Re-establishment in NR LG Electronics Finland discussion NR_newRAT-Core
R2-1706855 UE measurements upon S-RLF for MR-DC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT
R2-1706938 NR RLM and RLF procedure Samsung discussion NR_newRAT-Core
R2-1706965 RLF with beam recovery vivo discussion Rel-15 NR_newRAT-Core
R2-1707052 Beam failure and radio link failure handlings Intel Corporation discussion Rel-15 NR_newRAT-Core
R2-1707107 Considerations on RLC failure handling KT Corporation discussion
R2-1707272 Remaining stage-2 aspects of RLM and RLF in NR Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707273 TP on Radio Link Failure for 38.300 Ericsson discussion Rel-15 NR_newRAT-Core

10.2.10 Mobility without RRC involvement

AI is a placeholder for when RAN1 has made progress on beam management. Any RAN2 contributions should focus on the RAN2 implications as a consequence of RAN1 agreements - do not submit duplicates of RAN1 documents here.

R2-1706396 Beam management CATT discussion Rel-15 NR_newRAT-Core
R2-1706438 Considerations on Beam Management Framework MediaTek Inc. discussion NR_newRAT-Core
R2-1706662 Consideration on CSI-RS for beam management ZTE CORPORATION discussion Rel-15 NR_newRAT-Core
R2-1706718 RAN2 aspects of DL beam management Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706719 RAN2 aspects of UL beam management Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706720 CSI-RS configuration for beam management Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706721 Consideration on DRX with beam management Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706905 Resource configuration for beam failure recovery request Lenovo, Motorola Mobility discussion Rel-15 NR_newRAT-Core
R2-1706908 Beam refinement after beam recovery or scheduling request Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core
R2-1706911 Beam management and C-DRX operation Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core
R2-1706912 Measurement reporting and beam refinement during RACH Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core
R2-1706917 Impact of beam management on RAN2 LG Electronics Inc. discussion Rel-15 NR_newRAT-Core
R2-1706926 Beam recovery request Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core
R2-1706949 Beam management in NR Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706950 Beam recovery in NR Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707001 Random access procedure for beam recovery request Lenovo, Motorola Mobility discussion Rel-15 NR_newRAT-Core
R2-1707053 RAN2 implications from CSI-RS acquisition, beam managements and L3 mobility. Intel Corporation discussion Rel-15 NR_newRAT-Core
R2-1707197 Beam management Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core
R2-1707198 Beam Recovery in NR Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core
R2-1707304 Relationship of NR Beam Recovery and RLF procedures Samsung Electronics discussion
R2-1707305 NR L1/L2 beam recovery procedure Samsung Electronics discussion
R2-1707306 NR C-DRX operation considering beamforming Samsung Electronics discussion

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R2-1707307 NR downlink beam management signal Samsung Electronics discussion

Withdrawn

R2-1706395 Beam recovery failure and RLF CATT discussion Rel-15 NR_newRAT-Core
=> Withdrawn

10.2.11 Mobility - Inter-RAT

Connected mode mobility between NR and E-UTRA

Including inter-RAT NR measurements to be added to E-UTRA for purpose of NSA operation as well as for the purpose of inter-RAT handover from E-UTRA to NR. Inter-RAT E-UTRA measurements to be added to NR for the purpose of inter-RAT handove from NR to -E-UTRA can be discussed on 10.4.1.3.6

Inter-RAT E-UTRA measurements

R2-1707204 Mobility events for EN-DC procedures Ericsson discussion Rel-15 NR_newRAT-Core

- *Moved from 10.2.5 to 10.2.11*

P3

- Intel think SN release can be triggered by the SN itself. Samsung wonder if there is a need for MN to trigger a release based on RRM. Ericsson think both MN and SN triggered release is needed in case the report doesn't reach the SN.
- CATT also see the need to support this.
- Huawei think we agreed that both MN and SN trigger release and can be triggered by RRM.
- ZTE think that SN triggered release based on RRM is sufficient.
- LG agree the intent and think that B1 with report on leave can be used.
- Nokia think the SN can do the release and not critical to have the MN do the release based om measurements
- Vivo support the proposal.
- Qualcomm thinks this might conflict with SN initiated PSCell change. Huawei think this can be addressed by the MN.
- OPPO think the SN can manage this.

P5

- Samsung ask if this is for the inter-freq case.
- Intel wonder if A3 could be used. Huawei assume that A3 would be used.
- Qualcomm think the previous agreement was that MN can trigger based on load balancing and this event would not be needed for this case. Thinks that the MN should need to consider the measurement of PSCell.
- Samsung think B1 is enough for load balancing purposes. ZTE also agree with Qualcomm and Samsung.
- Huawei think the previous agreement was not that MN can only trigger for load balancing.
- Nokia think this would need 2 measurement objects and hence very different from our current framework.

Agreements

1 LTE inter-RAT measurement trigger event B1 for NR to be supported

FFS Whether a measurement trigger event is needed in LTE which is triggered when NR PSCell becomes worse than an absolute threshold.

FFS A measurement trigger event is needed in LTE which is triggered when NR PSCell becomes worse than absolute threshold1 and NR neighbour cell on a different carrier becomes better than absolute threshold2.

R2-1706397 Inter-RAT measurement CATT discussion Rel-15 NR_newRAT-Core

R2-1706654 Discussion on requirement of measurement in E-UTRAN ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

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R2-1706731 Events and measurements for handover from E-UTRA to NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1707437 Measurement Events for LTE NR-DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706963 measurement Event for EN-DC vivo discussion Rel-15 NR_newRAT-Core
- *Moved from 10.2.3 to 10.2.11*
R2-1707048 Inter-RAT measurement for EN-DC Intel Corporation discussion Rel-15 NR_newRAT-Core
- *Moved from 10.2.3 to 10.2.11*
R2-1707089 Inter-RAT Mobility for EN-DC Samsung Electronics Co., Ltd discussion
- *Moved from 10.2.4 to 10.2.11*
R2-1707103 Measurement Configuration for NR SCG Addition Samsung Electronics Co., Ltd discussion
- *Moved from 10.2.4 to 10.2.11*

Other
R2-1706669 PDCP SN handling for inter-RAT mobility ZTE CORPORATION discussion Rel-15 NR_newRAT-Core
R2-1706670 Consideration on Inter-RAT mobility between eLTE and NR ZTE CORPORATION discussion Rel-15 NR_newRAT-Core
R2-1706712 Inter-RAT handover between LTE and NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706808 Inter-RAT Intra-5G CN mobility between NR and LTE LG Electronics Inc. discussion Rel-15 NR_newRAT-Core
R2-1706809 Inter-RAT Inter-CN mobility between NR and LTE LG Electronics Inc. discussion Rel-15 NR_newRAT-Core
R2-1706864 Inter-RAT mobility between NR and eLTE for Inactive state LG Electronics Inc. discussion Rel-15 NR_newRAT-Core
R2-1706891 Mobility between E-UTRAN and NR Qualcomm Incorporated discussion
R2-1706916 NR inter-RAT mobility to CSG cell LG Electronics discussion
R2-1706990 0ms interruption time for inter RAT handover CMCC discussion Rel-15 NR_newRAT-Core
R2-1707085 Discussion on measurement events in NR Guangdong OPPO Mobile Telecom. discussion Rel-15 NR_newRAT-Core
R2-1707093 Speed Dependent Procedures for Inter-RAT Mobility Samsung Electronics Co., Ltd discussion
R2-1707150 Inter-RAT mobility from RRC_INACTIVE LG Electronics France discussion NR_newRAT-Core
R2-1707230 Inter-system and inter-RAT mobility between NR and LTE Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707231 Lossless intra-system handover with 5G-CN Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707294 UE context handling during inter RAT handover Ericsson discussion Rel-15 NR_newRAT-Core

10.2.12 Slicing

How much slicing is visible to UE AS, partitioning of random access resources, separation of access control parameters, any impact to idle mobility, etc
Including output from email discussion [97bis#14][NR] Slicing (Xiaomi)

Email discussion
R2-1706871 Report of Email discussion on NR Slicing Beijing Xiaomi Mobile Software report Rel-15

Idle mode behaviour
R2-1707094 Demerits of using Slice information for Cell selection Lenovo, Motorola Mobility discussion NR_newRAT-Core

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R2-1706325 Slice availability Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706775 Slice Availability for Cell (Re-)Selection Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706421 Idle mobility aspects to support network slicing Samsung discussion Rel-15
R2-1706960 Cell selection/reselection with network slicing vivo discussion Rel-15 NR_newRAT-Core

Signalling of slice info
R2-1706982 Slice assistance Information over RRC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core
R2-1706324 Signalling aspects of network slicing Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706614 NSSAI in MSG5 Sony discussion Rel-15 NR_newRAT-Core
R2-1706774 Further Discussion on Slice Selection Information over RRC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1707178 AMF selection based on assistance information LG Electronics discussion
R2-1707343 Slice Information in RRC Samsung Electronics Co., Ltd discussion

Other
R2-1706326 Access control and resource isolation for slicing Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706327 Separate RACH or not for supporting different services/slices Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706330 Discussion on Issues of Network Slicing OPPO discussion
R2-1706422 Connected mobility aspects to support network slicing Samsung discussion Rel-15
R2-1706442 Impacts of network slicing in RAN area Gemalto N.V. discussion
R2-1706776 What is RAN part of a network slice Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706777 UE Awareness of Network Slice Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706879 Support of Network Slicing in NG-RAN Qualcomm Incorporated discussion
R2-1706899 Consideration on the NW slice in RAN ZTE CORPORATION discussion Rel-15 NR_newRAT-Core
R2-1706906 Discussion on UE RRC Modeling to Support Multiple Slices Shenzhen Coolpad Technologies discussion Rel-15 NR_newRAT-Core
R2-1706981 Initial radio resource isolation for slicing Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core
R2-1707342 Slice Awareness in Initial Access Samsung Electronics Co., Ltd discussion

10.2.13 QoS

Any remaining stage 2 aspects (for detailed aspects please use appropriate stage 3 agenda item) - detailed topics should be discussed in stage 3 user plane

Note agreement at RAN2#97bis that QoS flow remapping at handover will be discussed when flow remapping not at handover has been progressed within user plane session.

QoS operation with DC
R2-1706780 QoS Support for NR/NR DC Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

P1
- ZTE wonder if the SN can decide whether to keep of move a QoS flow back to the MN.
- Huawei think the MN can also decide to take back a QoS flow. ZTE think the SN might have better knowledge than the SN.
- CATT think the SN knows the radio resources of the cell and hence should be able to request he MN and then the MN makes the final decision.

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- Samsung think on radio we only have QoS at level of DRB and hence there should be no need for SN to want to move a flow back.
- Huawei think only a single node should be in communication with CN.
- LG think that MN should control the mapping of QoS flow.
- Huawei think the new flows will always go to the default bearer which would be either MN or SN.
- Update from offline discussion: At SN addition and at new PDU session establishment then people can agree that MN makes the decision which flows go to SN, but when all flows are mapped to SN then could not decide and for the remapping from SN to MB could not decide.
- MediaTek think it should also be agreed that these decisions will have no UE impact. Intel think it was not fully clear if this was agreeable but do support it.

=> Offline discussion to progress further (Offline discussion 07)

Agreements
1 At SN addition and at new PDU session establishment then MN makes the decision which QoS flows are moved SN
FFS Whether the SN can reject the movement of a QoS flow.
2 Irrespective of which node makes the decision of where a QoS flow is mapped (to MN or SN) then RAN2 will aim that the RRC signalling is the same.

R2-1707493 Offline discussion 7 – QoS support in NR DC Huawei, HiSilicon

Agreements
1: The MN makes the decision to move ongoing/existing QoS flows to the SN (this agreement does not imply whether the QoS flow is moved by moving a single flow or by moving a whole bearer)
FFS Whether MN or SN takes the decision for flows being moved from SN to MN
2: The SN can reject the addition of a QoS flow, and inform the MN.
3: The DRB level offloading (i.e. offloading all QoS flows of a DRB) is supported between the MN and SN.
FFS: The QoS flow level offloading between the MN and SN, and if supported then whether lossless handover can be supported.
4: The lossless handover user plane procedure could be reused for DRB level offloading, if mapping is maintained in the target node.
FFS: If the case where mapping is not maintained can support lossless handover
5: The SN is responsible for the DRB management (e.g., setup, modify, release) of SCG/SCG-split bearers, and the QoS flow -> DRB mapping at the SN

R2-1707036 5G QoS with DC Intel Corporation discussion Rel-15 NR_newRAT-Core

R2-1707214 MR DC 5GCN: node roles wrt QoS flows Samsung Telecommunications discussion Rel-15

R2-1706546 Traffic Offloading in NR DC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

- *moved from 10.2.2.5 to 10.2.13*

Other

R2-1706863 SDAP configuration LG Electronics Inc. discussion NR_newRAT-Core

=> Can be discussed further in UP session.

R2-1706781 GBR QoS Flows for UL Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

- MediaTek think UE doesn't do this in LTE. Think the gNB should be able to take care of this.
- Ericsson have the same view that the gNB should take care of this. It could also be used by the application itself.
- Qualcomm think this info is useful for the UE.

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- Lenovo think that the network should take care of this.
- CATT think that the network should manage this. Samsung have the same view.

=> Noted

R2-1706778 Further QoS parameters for RAN Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

P1

- Nokia thinks this was discussed in the email discussion and it was not agreed.
- Huawei think this is needed to enable RAN to decide whether to enable or disable PDCP in order delivery.
- Ericsson don't think it is needed
- LG think the previous agreement was that it is desirable to be able to disable reordering.
- Ericsson think the reordering could be disabled in order to meet delay requirements.

=> Offline discussion to concluded whether RAN2 need to take any action regarding the Generic QoS Profile per PDU Session. (offline discussion 8)

R2-1707494 Offline discussion 8 – Generic QoS profile per PDU session Huawei, HiSilicon

=> Email discussion from UP session will already cover this point..

R2-1706779 LS on Delivery Order Parameter Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706961 Consideration for additional QoS parameter vivo discussion Rel-15 NR_newRAT-Core

R2-1706362 Default profile and DC QoS CATT discussion Rel-15 NR_newRAT-Core

R2-1706543 Default QoS Profile Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1706544 New QoS flow on the Default Bearer Nokia, Mediatek, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1707031 DRB properties with 5G QoS Intel Corporation discussion Rel-15 NR_newRAT-Core

Late

R2-1706889 Inactivation timer for the reflective QoS rules Samsung discussion Rel-15 NR_newRAT-Core

10.2.14 Other

Other stage 2 aspects such as PWS, Security, etc

UE identities

R2-1706810 Radio network identities for NR Samsung discussion Rel-15 NR_newRAT-Core

R2-1706492 Text Proposal for Stage 2 on UE identities in NG-RAN Ericsson discussion Rel-15 NR_newRAT-Core

Security

R2-1706328 Key refresh in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707429 Integrity protection and Counter Check Procedure for NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1707034 Forward compatibility for flexible security termination point Intel Corporation discussion Rel-15 NR_newRAT-Core

R2-1706322 Support of fake gNB detection mechanisms Ericsson discussion

moved from 10.1 to 10.2.1.4

R2-1706323 Draft Reply LS on support of fake gNB detection mechanisms Ericsson discussion

moved from 10.1 to 10.2.1.4

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R2-1707323 NR security input parameters – LS S3-170951 relevant Qualcomm Incorporated discussion
moved from 10.1 to 10.2.1.4

=> RAN2 confirms that RAN2 does not see any problem with the SA3 working assumption for EN-DC and other non-standalone options.
=> Draft LS in R2-1707478 (Qualcomm, offline discussion 18)

R2-1707478 [DRAFT][LS to confirm that RAN2 does not see any problem with the SA3 working assumption] Qualcomm LS out Rel-15 NR_newRAT-Core To: SA3
=> Approved in R2-1707498

R2-1706713 Security Key change without L2 reset Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706845 NR Security: DRB based Enabling/Disabling of UP Security Samsung India discussion
R2-1706847 NR Security: Support of Counter Check Procedure Samsung India discussion
R2-1707032 UE behaviour on Integrity check failure for DRBs Intel Corporation discussion Rel-15 NR_newRAT-Core
R2-1707430 Re-establishment upon integrity check failure Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1707431 Draft LS to SA3 on reestablishement upon integrity check failure Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1707462 Discussion on Fake gNB detection Lenovo, Motorola Mobility Discussion
- *Late document*

PWS
R2-1707241 Public Warning System in NR Ericsson, NTT DOCOMO INC., SoftBank discussion Rel-15 NR_newRAT-Core
R2-1707428 Public Warning system for NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Other
R2-1706747 Automatic Neighbour Relation in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706941 RLF Procedure for NR-NR Dual connectivity Samsung discussion NR_newRAT-Core
R2-1707136 AS context in RRC_IDLE LG Electronics France discussion Rel-15 NR_newRAT-Core
R2-1707179 Supporting IMS Emergency services in NR LG Electronics discussion
R2-1707199 NR support on RAT-independent and E-UTRAN-dependent positioning methods Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707200 Network based NR CID and cell portion positioning and other LPPa messages Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707242 Support for IMS Emergency calls in NR Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707282 Neighbor relation establishment in SA NR Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707283 Neighbor relation establishment in NSA LTE-NR Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707308 NR mobility for TRxP and/or DU change Samsung Electronics discussion
R2-1707309 Identities of the NR-SS and CSI-RS for RRM Measurement Samsung Electronics discussion
R2-1707354 Further discussion on Carrier Aggregation baseline in NR Samsung Electronics discussion
R2-1707355 RAN2 aspect on fast carrier switch Samsung Electronics discussion
R2-1707356 Needs of Fast Carrier Switch in NR Samsung Electronics discussion
R2-1707357 Indication signalling for uplink waveform Samsung Electronics discussion

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R2-1707358 Reference waveform for uplink transmission Samsung Electronics discussion
R2-1707367 Mobility Evaluation Methodology for NR Samsung discussion Rel-15 NR_newRAT-Core
R2-1707412 Discussion on the support of SCG SRB for Intra-NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1707432 Support LTE Rel-14 eVoLTE for SA NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

10.3 Stage 3 user plane

Documents in this agenda item will be handled in the user plane break out session

10.3.1 MAC

10.3.1.1 TS

Latest TS 38.321, rapporteur inputs, etc
Including output from email discussion [98#35][NR/UP] – Running TS 38.321 - Samsung

R2-1706608 Draft TS 38.321 v0.0.4 Samsung (Rapporteur) draft TSRel-15 38.321 0.0.4 NR_newRAT-Core
=> Update editors note in 5.3.2.1 from assumption to agreement
=> The TS is endorsed in 38.321 0.1.0 with the change above in R2-1707471

R2-1706609 Small issues from email discussion [98#35] (running 38.321) Samsung discussion Rel-15 NR_newRAT-Core
Proposal 1: To use decimal values if they are defined/specified by RAN2. If the values are defined or used with other numerations (e.g. binary/ hexadecimal) in other WGs, RAN2 may follow their notation.
=>No support to use decimal
Proposal 2: To confirm the three-step LCP procedures defined in LTE are used as a bassline (as captured in the running TS).
=> confirmed
Proposal 3: To apply the LCP procedures to "relevant" (i.e. not all as in LTE) logical channels across all the steps. Detailed definition of "relevant" is FFS.
=> wait for further progress on LCP restriction definition
Proposal 4: To confirm the four rules for LCP defined in LTE are re-used as it is.
- Huawei is concerned that the fourth rule should say remaining size is larger. Samsung thinks that the text was imported for a specific case but we should check it.

=> confirmed and check if further update is needed to the fourth rule.
Proposal 5: To confirm that to allocate a logical channel to an LCG is optional (as in LTE).
=> confirmed
Proposal 6: To confirm that to BSR cancellation part is re-used as defined in LTE.
=> this will be discussed based on company contributions
Proposal 7: To re-use the MAC reconfiguration procedures as defined in LTE.
=> confirm
Proposal 8: To confirm that if SPS is disabled (released), the corresponding configured grant or configured assignment shall be discarded (as in LTE).
- LG thinks that we should clean the terminology for SPS.

=> confirm
Proposal 9: The term 'enabled/ disabled' used in LTE for SPS is replaced with 'setup/ released' for NR (if we reuse the LTE text for SPS).
=> The terminology should be cleaned up:
Proposal 10: To re-use LTE text for the SPS confirmation part.
- Huawei would like to ensure that this is pending RAN1 input as well and capture it as an editor's note.

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=> confirm

Proposal 11: To confirm that HARQ feedback for the MAC PDU containing Activation/Deactivation MAC CE shall not be impacted by PCell, PSCell and PUCCH SCell interruptions due to SCell activation/deactivation (as in LTE).

Proposal 12: To re-use the LTE text for handling of unknown, unforeseen and erroneous protocol data.

=> this will be discussed later

Proposal 13: To use the term 'MAC subheader' when referring the header in MAC sublayer.

Proposal 14: To confirm that the MAC entity shall ignore the value of Reserved bits of the value in downlink MAC PDUs (as in LTE)

=> confirm

Proposal 15: To use the term 'MAC subPDU' to describe a set of MAC subheader and possibly MAC SDU/CE/padding.

=> the term MAC subPDU is used

Proposal 16: To confirm that the MAC entity transmits one MAC PDU per TB (as in LTE).

=> confirm

=> Noted

R2-1706851 Clean-up of SPS-related terminology in NR LG Electronics Inc. discussion NR_newRAT-Core

=> Not treated

10.3.1.2 MAC architecture

Contributions on MAC modelling of PDCCH monitoring/TTI length

Note: specific issues related to CA (e.g. RAR, SR, DRX, etc.) and duplication should be submitted under the dedicated AI. Modelling of numerology/TTI length should be submitted under LCP

Not treated

R2-1706648 Consideration on the MAC modeling of PDCCH monitoring/TTI length ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1707121 Details of PDCCH monitoring patterns Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706424 Draft LS to RAN1 on the time unit definition Samsung discussion Rel-15

R2-1706425 Further details on indication for scheduling Samsung discussion Rel-15

R2-1707007 MAC modelling of PDCCH monitoring/TTI length Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

10.3.1.3 MAC PDU format

Contributions on placement of MAC CE for UL and whether enhancements to parse from the end of the MAC PDU are allowed. TP for enhancements should be included with contribution.

Contributions on remaining open issues on MAC headers: two allowed size(s) of L field and whether L field is present for padding, whether the LCID space is shared between LCH and MAC CE.

Contributions on need to minimize MAC sub-header overhead (justification/motivation and solution). Note MAC concatenation optimizations are not to be supported.

R2-1706583 Handling of UL MAC CEs Nokia, Alcatel-Lucent Shanghai Bell, CATT, Fujitsu, Intel, MediaTek Inc., NEC, NTT DOCOMO INC., Samsung, ZTE discussion Rel-15 NR_newRAT

Proposal: UL MAC CEs are multiplexed after all MAC SDUs and before the padding in the MAC PDU

=> Noted

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R2-1707224 MAC PDU format LG Electronics Inc., Lenovo, Ericsson, Panasonic discussion NR_newRAT-Core

=> Noted

Discussion on MAC CE

Option 1: UL MAC CEs are multiplexed after all MAC SDUs and before the padding in the MAC PDU and no Length indicator is place at the end of PDU. [15]

Option 2: MAC PDU includes a MAC CE Length field indicating the length of the MAC CEs included at the end of the MAC PDU. Padding is placed after all MAC SDUs and before MAC CEs [8]

R2-1706363 The usage of LCID field in MAC sub-header CATT discussion Rel-15 NR_newRAT-Core

Proposal 1: The LCID values should be shared between MAC SDUs and MAC CEs as in LTE.

Proposal 2: One LCID for MAC CE could be reused for the same type of MAC CEs, such as one LCID for BSR MAC CEs, and CE Type field for further specific MAC CE indication.

- Huawei asks what the difference is between this and extending LCID. LG thinks that using the LCID is preferred since we extended the field to 6. Ericsson and Lenovo agrees with LG
- Oppo thinks that are two options one LCID for activation/deactivation and second option one LCID for each.

=> Noted

R2-1706456 Padding placement and MAC PDU Format Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Proposal: As in LTE, L field is not necessary for padding in the padding subheader.

- Qualcomm thinks that L field is needed. Nokia thinks that given the agreement we made, the L field is not needed.

=> Noted

R2-1707114 MAC sub-header format Ericsson discussion Rel-15 NR_newRAT-Core

Proposal 1 Two length values are used for the Length field: 8 and 16 bits.

- Nokia, QC and LG prefer 7 and 15. Samsung thinks that 15 is fine but instead of 7, 8 is preferable. CATT, ZTE agrees with 8 and 16. Nokia thinks that 8 and 15 would result in different formats. Samsung doesn't think that's the case.

Proposal 2 For variable-length MAC CEs, the Length field is limited to 8 bits.

- Nokia asks what is the motivation to limit

Proposal 3 Padding sub-header does not include length-field.

Proposal 4 The F-field should contain 2 bits and indicates a) Length field absent; b) Length field present, 1 byte; c) Length field present, 2 bytes.

- Mediatek, CATT, Nokia, Lenovo, LG, think one bit is enough. Oppo thinks that the F field is already 2 in LTE.

=> Noted

R2-1706995 Optimization for L field design in NR CMCC discussion Rel-15 NR_newRAT-Core

=> Noted

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On the need for optimizations

Option: removing LCID for consecutive MAC SDUs.

Option: removing L field

- MEdiatek thinks this is an optimization and no need for this release.
- CATT, Nokia thinks we should optimize but there are other ways, like re-moving the LCID
- LG, QC, Intel think this is not necessary since we already optimized by removing RLC concatenation.
- Nokia explains that the purpose is to optimize the headers and not concatenate

Agreements

1. UL MAC CEs are multiplexed after all MAC SDUs and before the padding in the MAC PDU and no Length indicator is place at the end of PDU
2. The LCID values are shared between MAC SDUs and MAC CEs as in LTE. The LCID reserved values are in the middle like LTE.
3. The LCID values are used to distinguish types of MAC CEs like in LTE
4. As in LTE, L field is not necessary for padding in the padding subheader
5. The details of the header fields lengths are FFS
6. F field contains one bit
7. As a baseline, the MAC header is not further optimized

R2-1707492 MAC subheader comeback Ericsson (rapporteur)

=> We will decide from the two options in this paper next meeting

=> Noted

R2-1706342 Uplink MAC CE placement and indicator OPPO discussion

R2-1706364 LCID for MAC SDU CATT discussion Rel-15 NR_newRAT-Core

R2-1706457 LCID space for MAC CE and data Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706458 Consideration on simultaneous multi-TB transmission Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706517 Preventing out of order MAC CEs in NR Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

=> Withdrawn

R2-1706584 Further details on MAC PDU format Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1706585 LCID omitting for MAC PDU Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1706644 Consideration on the MAC PDU format ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1706802 Remaining Issues about MAC PDU Format Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1707008 Discussion on padding ITRI, ASUSTEK discussion NR_newRAT-Core

R2-1707061 Placement of RLC segment in MAC PDU vivo discussion

R2-1707102 MAC PDU format PANASONIC R&D Center Germany agenda

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R2-1707111	MAC PDU format for UL	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1707112	Text proposal for UL MAC PDU format	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1707115	Text proposal for MAC sub-header format	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1707118	MAC PDU discard due to unknown MAC CEs	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1707245	Discussion on L-field in MAC PDU	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1707375	UL MAC CE Processing	Samsung	discussion	Rel-15	NR_newRAT-Core
R2-1707380	Padding in NR	Samsung Electronics Co., Ltd	discussion	Rel-15	NR_newRAT-Core

10.3.1.4 Random access

10.3.1.4.1 Differentiation of RA parameters

Contributions on need of mutiple RA parameter/resource configuration and the parameters requiring differentiation (e.g. backoff, power, preamble sets, numerology specific parameters, etc)

Note: Need of different RACH configuration in support of different services/slices will be discussed in main/CP seession

R2-1706518 Differentiated random access for NR — Qualcomm Incorporated — discussion — Rel-15 — NR_newRAT-Core

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- Huawei shares the view that different triggers can use different parameters but we shouldn't preclude PRACH partition.
- Asustek wonders which parameters could be included. Qualcomm thinks that any parameters can be included and we can discuss which ones.
- Lenovo asks if this is more for connected mode. QC doesn't think it has to be. Lenovo indicates that we don't have LCH prioritization in IDLE.

=> Noted

R2-1707029 Differentiation of RACH parameters — Intel Corporation — discussion — Rel-15 — NR_newRAT-Core

Proposal 1: *NR shall support service based configuration of RACH parameters to enhance the reception of PRACH preamble, at least for the following RA triggers:*

- *RRC Connection Re-establishment procedure*
- *UL data arrival during RRC_CONNECTED*
- *Handover*
- *RRC Connection Establishment (from IDLE mode)*

- LG asks why we would differentiate maxpreamble number. Intel explains that it is related to the power ramping

=> Noted

Discussion on parameter differentiation

- Nokia doesn't see the need to differentiate parameters for different triggers
- InterDigital thinks that it should include different preambles so the network can distinguish the service from the preamble. One use case is for handover.

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- Samsung thinks it is not needed since anyways for URLLC the requirements will not be met with random access. ZTE agrees.
- LG thinks we should support differentiation and not only for service type. It can be based on events.
- Lenovo thinks that we should consider the SI request.
- Ericsson is supportive of some type of differentiation.
- Asustek also supports and indicates that we may have even more triggers from RAN1 like beam recovery.
- Mediatek thinks that we should be careful and understand the gains and we will end up in endless discussions on triggers. LG indicates that distribution would be the main reason rather than latency.
- CATT thinks that in critical communication requirements it is mandated to provide prioritize access. Lenovo thinks that this would not be met with RA.
- Vivo thinks that we need different parameters for SI request and beam recovery.
- Nokia thinks that there is no motivation or data analysis to motivate this.
- LG thinks that we are differentiating SR but not RA.

=> Companies are encouraged to come with a converged solution (including the parameters that require differentiation and the triggers) and stage 3 details.

R2-1707010 Discussion on RA backoff in NR ASUSTEK COMPUTER (SHANGHAI), ITRI discussion
NR_newRAT-Core

=> Noted

R2-1706848 Prioritized RA procedure LG Electronics Inc. discussion

R2-1706874 PRACH preambles and MSG3 size Samsung India discussion

- Huawei thinks that we should analyse the need to separate the resources and then we can send an LS
- LG thinks that we should limit to two groups for msg3 and if RAN1 increases number of preambles we can discuss later. InterDigital thinks two are sufficient.
- Huawei explains that there are two different new use cases, transition to INACTIVE and SI request. Lenovo explains that during email discussion there was no need to indicated SI request msg 3 size.
- LG thinks that RAN1 should increase the number of preambles as we have more use cases.
- Ericsson thinks that we should have a configurable number of msg3 size groups (more than 2)

=> Noted

=> Two preamble groups for msg3 size indication is sufficient as a baseline

=> Send LS to RAN1 to inform them of the RAN2 agreed reasons to partition preamble resources (including msg1 based SI-request and contention-free access)

- Inform them that RAN2 expects RAN1 to make the final decision on whether multiple preamble transmission is beneficial. Input by August meeting would be preferred.
- *Include agreement "The RAR window starts a fixed duration after the preamble transmission occasion, irrespective of if there are several PRACH configurations. From the RAN2 perspective, it is beneficial to be as low as possible. Ask RAN1 what is the lowest processing time the UE can assume.*

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R2-1707481 [draft] LS to RAN1 on Random Access Samsung

- Ericsson thinks that we should include the “possibly zero”

=> Copy paste the agreement from RAN2

=> The LS is agreed with the change above in R2-1707497

Not treated

R2-1706355	Consideration on Backoff of Random Access	OPPO	discussion		
R2-1706365	Consideration on BI	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1706534	Random Access in NR: Service Differentiation Aspects	Samsung Electronics Co., Ltd	discussion	Rel-15	NR_newRAT-Core
R2-1706685	RACH Configuration for NR	InterDigital	discussion	Rel-15	NR_newRAT-Core
R2-1706849	Preamble partition	LG Electronics Inc.	discussion	NR_newRAT-Core	
	=> Withdrawn				
R2-1706998	Considerations of RACH resource partitioning for NR	CMCC	discussion	Rel-15	NR_newRAT-Core
R2-1707005	Aspects on access procedure with multiple numerologies	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1707086	Discussion on multiple random access parameters in NR	ASUSTEK COMPUTER (SHANGHAI)	discussion	NR_newRAT-Core	
R2-1707127	Service Priority Handling in Random Access	Ericsson	discussion	Rel-15	NR_newRAT-Core

10.3.1.4.2 Random access in presence of multi-beam operation

RAR behaviour in case of multiple beams and other beam aspects related to random access procedure (Focus should be on RAN2 specific aspects we can progress on). Contributions dependent on RAN1 progress will not be treated.

R2-1707078	RACH procedure of multiple preambles transmission	vivo	discussion
	=> Noted		
R2-1707131	Multiple Preamble Transmissions in NR Random Access	Ericsson	discussion Rel-15 NR_newRAT-Core
	=> Noted		

Discussion

Is it beneficial from RAN2 perspective to have the use of multiple preambles before the end of the RAR window configurable by the network, pending RAN1 progress.

- Huawei thinks that it is premature for RAN2 to agree. Samsung would like to only support it for beamforming.
- LG would like to point out that multiple preamble transmission would be different than MTC preamble repetition.
- CATT asks why the network is controlling this. Ericsson would like to avoid cases where the UE is transmitting multiple preambles for no reason.
- Mediatek thinks that we should let RAN1 discuss configurability. Nokia thinks we should first know how it works.

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=> RAN2 expects RAN1 to make the final decision on whether multiple preamble transmission for beamforming is beneficial before RAR reception. Input by August meeting would be preferred.

Not treated

R2-1707129 On Multiple PRACH Resource Type in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706686 Power Ramping with multi-beam operation InterDigital discussion Rel-15 NR_newRAT-Core

R2-1706462 Impact of Multi-beam operations to Power ramping for RACH Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706461 Impact of beamforming to RACH procedure Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706535 Random Access Procedure – Access Delay Minimisation Samsung Electronics Co., Ltd discussion Rel-15 NR_newRAT-Core

R2-1706987 Potential impact of multiple/repetated preambles on RA LG Electronics Inc. discussion NR_newRAT-Core

R2-1707028 Random Access Multi-beam aspects Intel Corporation discussion Rel-15 NR_newRAT-Core

R2-1707265 MAC design for beamformed RACH MediaTek Inc. discussion Rel-15 NR_newRAT-Core

R2-1707279 Higher layer implications of beamforming during random access Ericsson discussion Rel-15 NR_newRAT-Core

10.3.1.4.3 Random access procedures

Contributions on further details of random access procedures, focusing on 1) Indication of msg3 size 2) power ramping for msg1 transmission 3) Content of RAR and 4) Contention resolution

R2-1707126 Random Access in NR Ericsson discussion Rel-15 NR_newRAT-Core

Proposal 2: The RAR window starts a fixed duration after the preamble transmission occasion, irrespective of if there are several PRACH configurations.

- QC understood that we already agreed. Ericsson just wanted to ensure that it included the case of several PRACH configurations
- LG has a preference that the fixed duration is zero.

Proposal 4 The RAR window starts immediately after the preamble transmission.

- Samsung is concerned that some processing time is needed for msg1. Nokia thinks that the value should be decided by RAN1. LG thinks that it maybe complex to decide the value since there is different processing times.
- Blackberry thinks that this is tradeoff between power saving and latency. LG thinks that power saving is very small anyways.
- Fujtitsu thinks RAN1 should decide.

Proposal 5 Similar as in LTE, there is no HARQ for RAR transmission in NR.

- vivo supports the proposal.
- Vivo thinks that HARQ process ID 0 should be used for msg3. Ericsson thinks that is not needed as we may be able to indicate it in the RAR. Blackberry thinks that also depends on whether we have a single design for the grant.

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=> Noted

Agreements
1. The RAR window starts a fixed duration after the preamble transmission occasion, irrespective of if there are several PRACH configurations. From the RAN2 perspective, it is beneficial to be as low as possible, possibly zero. Ask RAN1 what is the lowest processing time the UE can assume.
2. Similar as in LTE, there is no HARQ for RAR transmission in NR.

Not treated

R2-1707027	NR RA Procedural Aspects	Intel Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1706464	On potential issues for Signaling Msg 3 size in NR	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1707316	RA contention mitigation in NR	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT-Core
R2-1706532	Random Access Procedure for RRC INACTIVE State	Samsung Electronics Co., Ltd	discussion	Rel-15	NR_newRAT-Core
R2-1706336	Random Access and Collision Detection enhancements	SHARP Corporation	discussion		
R2-1706366	Random Access Procedure	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1706463	Contention resolution for random access	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706533	Random Access in NR: RAR Contents	Samsung Electronics Co., Ltd	discussion	Rel-15	NR_newRAT-Core
R2-1706586	Preamble partitioning for Msg3 size indication	Nokia, Alcatel-Lucent Shanghai Bell	discussion	Rel-15	NR_newRAT
	=> moved from 10.3.1.4				
R2-1706846	Consideration on Random Access Response in NR	LG Electronics Inc.	discussion		NR_newRAT-Core
R2-1706966	Counter Design for Random Access Procedure	vivo	discussion	Rel-15	NR_newRAT-Core
R2-1707006	Consideration on random access procedure without multi-beam operation	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1707067	Content of RAR in NR	vivo	discussion		
R2-1707081	Clarification on the PRACH resource selection of multiple beams	vivo	discussion		
R2-1707125	Indicating Message 3 size	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1707246	Discussion on RAR window	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core

10.3.1.4.4 Other aspects related to RA

Not treated

R2-1706536	Random Access in NR – Flexible UE Bandwidth Aspects	Samsung Electronics Co., Ltd	discussion	Rel-15	NR_newRAT-Core
R2-1706460	RACH backoff	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core

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10.3.1.5 SR

Details of SR procedures, including triggers, timers, cancelations and retransmissions. Behaviour in case of multiple SR triggers and how to determine in which SR resource to transmit.

Granularity of SR configuration for a logical channel

R2-1706367 Further Consideration on Multiple SR Configurations CATT discussion Rel-15 NR_newRAT-Core

Proposal 1: It is expected that an SR configuration will consist of a set of UL resources allocated on a single and same TTI/numerology.

Proposal 2: In NR a linkage between SR configuration and TTI/numerology type should be defined. For a triggered SR, UE should use the SR configuration linked with the TTI/numerology supported by the LCH that triggers this SR.

- Mediatek asks what happens if the LCH has more than one allowed TTI/numerology. CATT explains that there are multiple options.

=> Noted

R2-1706641 Consideration on the SR in NR ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

In case multiple SRs are configured, for each LCG, there will be a mapping between LCGs and SR resource and the mapping should be configured by RRC signalling

=> Noted

Two options for SR configuration :

1. *SR configuration is mapped to a "numerology/TTI"*
2. *SR configuration is mapped to LCH(s)*

- LG prefers option two. Ericsson as well. Further SR is more linked to BSR.
- Lenovo thinks that if we go with option 2 then the network has to map LCH to LCG based on numerology instead of priority, which wasn't the intention of the original agreement on SR.
- InterDigital thinks it would be good to have similar linkage to LCP.
- ZTE thinks that LCG will be reported in the BSR, so anyways the network should group LCHs with similar numerology on the same LCG
- Mediatek thinks that BSR is linked with LCG so we should do the same for SR.

Can a logical channel be mapped to more than one SR configuration.

- Mediatek wonders why limit for the logical channels that can use any numerology. LG thinks it is more complex
- ZTE explains that we allow multiple SR configurations for different carriers.
- HTC thinks we should restrict to one
- Huawei thinks that the purpose of multiple SR configuration is not distinguish between LCH but rather the numerology the UE can use.
- Samsung sees Huawei's reasoning.
- Intel and QC thinks that it should be mapped to one SR
- Mediatek thinks that gNB can anyways decide to how many SR resources the LCH is mapped to. Futjistu agrees.
- Ericsson is concerned that it may be complex to cover all the cases and how the UE reacts.

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Discussion on what happens if there is a SR resource but a LCH is not mapped to any

- Lenovo asks if we will have cases in which for some logical channels you trigger SR and for some RACH.
- Nokia thinks that it is up the network how it configures.
- Blackberry thinks that we should RACH only if we don't have any configured SR.
- Mediatek thinks that we should leave it up the gNB implementation
- Ericsson thinks that the UE shouldn't trigger RACH

Agreements:

1. In case multiple SRs are configured, for each LCH, there will be a mapping between LCHs and SR configuration and the mapping should be configured by RRC signalling. FFS if grouping is needed.
2. A logical channel can be mapped to none or one SR configuration. FFS if a logical channel can be mapped to more than one SR configuration.

Not treated

R2-1706986	SR trigger and cancellation	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706519	Granularity of SR configurations	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT-Core
R2-1706587	Details on multiple SR configurations	Nokia, Alcatel-Lucent Shanghai Bell	discussion	Rel-15	NR_newRAT
R2-1706639	General details of SR procedure in NR including SR triggers and timers	Samsung R&D Institute UK	discussion		
R2-1706640	Behaviour in case of multiple SR triggers and collision resolution	Samsung R&D Institute UK	discussion		
R2-1706900	Support of multiple SR configurations	Huawei, HiSilicon	discussion	NR_newRAT-Core	
R2-1706932	Consideration on multiple SR configurations	ASUSTEK COMPUTER (SHANGHAI)	discussion	NR_newRAT-Core	
R2-1706957	Discussion on details of SR procedures	HTC Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1706958	Discussion on resource selection for SR transmissions	HTC Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1707024	Handling multiple SR configurations	Intel Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1707072	Enhanced SR in NR	vivo	discussion		
R2-1707169	SR concept in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1707221	Support of selective SR	LG Electronics Inc.	discussion	NR_newRAT-Core	
R2-1707267	SR design for multiple numerologies	MediaTek Inc.	discussion	Rel-15	

10.3.1.6 BSR

Including output from email discussion [98#38][NR/UP] – BSR triggers – Huawei

BSR triggers and timers, and cancelations

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Details of BSR formats (long/short/truncated)

R2-1706465 Summary of [98#38][NR/UP] –BSR triggers Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
=>Noted

Agreements
=> No new BSR triggers in addition to LTE are needed

R2-1706619 Discussion and proposal to UE Overheat issue Sony discussion Rel-15 NR_newRAT-Core

- QC thinks that this is not an effective approach and we should use a similar approach as LTE
- Vivo thinks that we discussed this extensively in LTE

=> The overheating issue should be discussed in the joint session first

=> Noted

Not treated

R2-1706337 BSR enhancements with multiple numerologies SHARP Corporation discussion
R2-1706357 Discussion on BSR format OPPO discussion
R2-1706368 BSR MAC CE format CATT discussion Rel-15 NR_newRAT-Core
R2-1706466 Enhancements for BSR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706467 BSR triggering and cancellation Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706468 Flexible length BSR format Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706520 BSR cancellation conditions Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core
R2-1706521 On BSR formats Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core
R2-1706547 Buffer Status Reports Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT
R2-1706548 Draft LS to RAN1 on Transport Block Sizes Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT
R2-1706642 Consideration on the triggering of BSR ZTE CORPORATION discussion Rel-15 NR_newRAT-Core
R2-1706833 Way forward on BSR NTT DOCOMO INC. discussion Rel-15 NR_newRAT-Core
R2-1706873 Discussion on BSR trigger Beijing Xiaomi Mobile Software discussion Rel-15
R2-1706901 BSR enhancements with multiple numerologies Huawei, HiSilicon discussion NR_newRAT-Core
R2-1706951 New BSR triggering for default DRB ITL discussion Rel-15
R2-1706959 Discussion on BSR format for NR HTC Corporation discussion Rel-15 NR_newRAT-Core
R2-1707025 BSR enhancements Intel Corporation discussion Rel-15 NR_newRAT-Core
R2-1707064 BSR trigger due to QoS flow in NR vivo discussion
R2-1707065 BSR format in NR vivo discussion
R2-1707101 BSR for Multiple Numerology Operation Samsung Electronics Co., Ltd discussion
R2-1707164 BSR triggering aspects Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707165 BSR formats in NR Ericsson discussion Rel-15 NR_newRAT-Core

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R2-1707222 BSR format with increased LCG LG Electronics Inc. discussion NR_newRAT-Core

R2-1707223 Need of delayed BSR LG Electronics Inc. discussion NR_newRAT-Core

R2-1707331 Potential Issues for BSR Latency Reduction Samsung Electronics discussion

R2-1707381 Discussion on BSR formatSamsung Electronics Co., Ltd discussion Rel-15 NR_newRAT-Core

R2-1707382 Discussion on BSR triggers Samsung Electronics Co., Ltd discussion Rel-15 NR_newRAT-Core

R2-1707455 BSR enhancements for pre-processing MediaTek Inc. discussion NR_newRAT-Core

late

10.3.1.7 LCP

Contributions on modelling of abstraction of numerology/TTI based on profiles/index. Parameters needed to be included in the profile/index.

LCP in the presence of multiple grants (whether some grant prioritization guidelines need to be specified)

Need for further enhancements to deal with cases where LCHs map to multiple profiles/indices

Contributions should include TPs for their proposals

R2-1706588 Details on LCP Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

Proposal 1*: only numerology and TTI length restriction for LCHs needs to be taken into account in LCP as already agreed before and no other information is introduced.*

Proposal 2*: numerology and TTI length are implicitly known based on the resource allocation and indicated by PHY to MAC.*

- LG asks if the UE has to figure out the numerology and TTI from the resource. Nokia thinks that this can be decided by RAN1.

Proposal 3*: carrier restriction together with TTI length restriction is enough to be introduced for LCH to numerology/TTI length mapping.*

- Mediatek asks why we need both TTI and numerology. Nokia explains that you can have different TTI lengths for the same numerology.
- Lenovo asks if the assumption is that one carrier has one subcarrier spacing and we haven't agreed to have carrier restriction other than for duplication.

=> Noted

R2-1706681 Logical Channel Selection Restrictions in LCP InterDigital discussion Rel-15 NR_newRAT-Core

- Lenovo asks if there is some additional steps/processing from the UE to map the numerology/TTI to a profile ID. Thinks that this steps are not really necessary.
- InterDigital thinks that RAN1 should be involved and the steps are not too complexed.
- Mediatek supports
- Huawei thinks that if RAN1 decided to include this profile ID then the MAC doesn't even need to know the parameters or discuss the parameters. Huawei thinks that these parameters are already signalled.

=> Noted

R2-1707119 Logical Channel Prioritization and Transmission Profiles Ericsson discussion Rel-15 NR_newRAT-Core

=> Noted

Discussion on LCP

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Parameters needed for restriction or "transmission profile"

1. *Numerology*
2. *TTI*
3. *Power ?*
4. *Carrier restrictions ?*
5. *K ?*

- Huawei thinks that the carrier restriction parameter is also needed or included in the profile
- Huawei further thinks that the K should also be considered.
- CATT thinks that there could be even more parameters and we should decided from RAN2 point of view what is important.
- Mediatek wonders if we should distinguish the nature of the grant (e.g. grant-free)
- InterDigital and LG think that we can start with numerology and TTI and tell RAN1.
- Ericsson thinks that it would be nice to see a text proposal from other companies.
- ZTE thinks that using a profile is simpler.
- Lenovo thinks there is additional processing as there needs to be a table in PHY to translate parameters to profile.
- CATT thinks that there needs to be more parameters to take into account and a profile would be simpler.
- Qualcomm thinks that numerology and TTI are sufficient.
- MEdiatek from a MAC modelling perspective we should adapt the profile and how the MAC gets the parameters is a different question.
- HTC thinks that it is simpler to map TTI to LCH directly rather than using a profile.
- Huawei thinks that we need to consider both the interval and TTI and these parameter would just need to be forward from PHY layer
- Samsung thinks we should capture how to derive TTI length. Intel thinks RAN1 will derive it and MAC just knows.
- InterDigital thinks that we should inform RAN1 about our agreement and the need to get numerology and TTI from layer 1. Intel and Lenovo thinks that we don't need to ask them yet. Huawei would like to ask if K2 impacts the TTI length.

R2-1706903 UE handling on multiple grants Huawei, HiSilicon discussion NR_newRAT-Core

-

Proposal 1 : Joint processing of UL grants is allowed only when the UL grants are mapped to the same grant information.

- LG thinks that joint processing should still be allowed similar to LTE
- Ericsson asks what is grant information. Huawei explains it is like same "profile"

Proposal 2: When multiple grants from different carrier/with different grant information are received simultaneously, the processing order of UL grants may be determined either by network configuration, or by pre-defined criterion.

- CATT thinks that this shows that even if we leave it up to UE implementation the MAC should have some information from PHY layer to know how to prioritize. Intel thinks that the MAC just has to satisfy to latency requirements. Lenovo thinks that the UE can be aware of K2 based on UE implementations.
- Ericsson thinks that we can couple it to the transmission profiles.

=> Noted

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Show of hands

When multiple grants are received at the same time

1. *It is up to UE implementation [12]*
2. *Specify processing order of UL grants [10]*

- Mediatek asks if we can have an email discussion
- Nokia thinks that modelling can only be discussed after parameters are decided.
- Ericsson thinks that we should first align with RAN1 and next meeting we can develop ideas further.

✉ **[NR UP] LCP - Mediatek**

- Discuss parameters needed to be visible to the MAC and purpose
- Options for processing order of grants
- Modelling options if possible (second/third phase)

Agreements:
1. At least numerology and TTI length are included/taken into account for restriction for LCP.
FFS if any other parameters need to be considered for LCP
FFS how LCP is modelled
FFS how the UE processes multiple UL grants and what parameters need to be visible to the MAC

R2-1707120 Prioritization in MAC Ericsson discussion Rel-15 NR_newRAT-Core

=> Not treated

R2-1707016 UL grant processing order Intel Corporation discussion Rel-15 NR_newRAT-Core

=> Not treated

R2-1707264 Enhancements to logical channel prioritization MediaTek Inc. discussion Rel-15 NR_newRAT-Core

- Lenovo thinks that for LTE is already on average as it can go negative.

=> No support

=> Noted

Not treated

R2-1706343 Abstract profile for NR LCP OPPO discussion

R2-1706369 TTI/Numerology abstraction for MAC CATT discussion Rel-15 NR_newRAT-Core

R2-1706469 Grant information parameters considered for LCP Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706470 LCH skipping during LCP Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706471 Values of parameter X in LCP Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

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R2-1706472	Token Bucket accumulation for LCP	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1706473	Priority order between data and MAC CE	Huawei, HiSilicon	discussion	Rel-15 NR_newRAT-Core
R2-1706522	LCP with the presence of multiple grants	Qualcomm Incorporated	discussion	Rel-15 NR_newRAT-Core
R2-1706682	LCP for LCHs with Multiple RRC Configured Mappings	InterDigital	discussion	Rel-15 NR_newRAT-Core
R2-1706753	Modelling of Abstraction-based Approach with Profile/Index for LCP	Samsung Electronics	discussion	
R2-1706754	The Impact of Processing Order of UL Grants on LCP	Samsung Electronics	discussion	
R2-1706883	LCP procedure with multiple numerologies	Lenovo Mobile Com. Technology	discussion	Rel-15 FS_NR_newRAT
R2-1706896	Consideration on the LCP procedure	ZTE CORPORATION	discussion	Rel-15 NR_newRAT-Core
R2-1706902	Further discussion on LCP with multiple numerologies	Huawei, HiSilicon	discussion	NR_newRAT-Core
R2-1706907	LCP for multiple numerologies	SHARP Corporation	discussion	Rel-15 NR_newRAT-Core
R2-1707074	PDCP duplication impacts on LCP	vivo	discussion	
R2-1707100	MAC CE Processing for Multiple Grant Reception	Samsung Electronics Co., Ltd	discussion	
R2-1707220	Numerology impact on UL grant	LG Electronics Inc.	discussion	NR_newRAT-Core
R2-1707266	MAC layer architecture for multiple numerologies	MediaTek Inc.	discussion	Rel-15 NR_newRAT-Core
R2-1707350	Logical Channel Prioritization Procedure in NR	Convida Wireless	discussion	Rel-15 NR_newRAT-Core
R2-1707374	Analysis of Skipping Segmentation	Samsung	discussion	Rel-15 NR_newRAT-Core
R2-1707398	draft LS on grant information	Huawei, HiSilicon	LS out	NR_newRAT-Core RAN1

10.3.1.8 SPS/Grant-free

Need for multiple SPS configuration for different grant types/profiles (e.g. numerology/TTI length)

Understand difference between SPS and Grant-free scheme and whether they will be handled as one scheme or as different schemes – taking into account RAN1 progress. Focus should be on RAN2 specific aspects to progress SPS and if any feedback to RAN1 is required.

R2-1707247 Grant-free/SPS resource configuration Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Proposal 1: SPS and grant free have different MAC operation modelling in MAC layer.

- LG understands that grant free is shared and SPS is dedicated.
- Ericsson asks how the inactive UEs can use the grant if they are not timing aligned.
- Huawei indicates that RAN1 is working on that.

Proposal 2: grant free is used as the baseline for URLLC and inactive state UE.

Proposal 3: Grant free and SPS are specified as separate mode in NR.

- Samsung asks if the grant free and SPS are specified differently in MAC. Huawei thinks that we should first understand the functionality.
- At least the RRC configuration will be different and further with or without L1 signaling.
- CATT doesn't see too much difference between SPS and grant-free. Huawei explains that there may be differences like UE Identification for contention resolutions.

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- Nokia doesn't think that some MAC operations need to be differentiated. Huawei thinks that HARQ functions are also still being discussed by RAN1. There may even be difference for LCP between the two.
- Vivo thinks that we can try to unify some of the functionality.
- Ericsson thinks that we wouldn't need any different modelling in MAC, the RRC configuration can provide the relevant information.
- Qualcomm thinks there is no fundamental difference between and we should try to unify.
- MEdiatek agrees to unify and we shouldn't have too many mechanism.
- InterDigital think we should be careful to consider all the differences between the schemes.

=> Noted

Agreements
=> Modelling in the MAC for grant-free will be discussed after the difference between the two schemes is better understood pending RAN1 progress. RAN2 will aim to have a unified MAC operation for common functionalities between grant-free and UL SPS with understanding that there can be differences after input from RAN1.
=> RAN2 understands that to support UL SPS similar to LTE a mode of operation in which RRC configuration (with no initial PHY resources) with L1 activation/deactivation needs to be supported. RAN2 will continue discussion on UL SPS, with LTE functionality.
=> A common RRC signalling can be design to allow the configuration of different UL transmissions schemes.

=> Send LS to RAN1 – Huawei

- Provide agreements
- Including agreement that periodicity is provided in RRC configuration for UL SPS.
- Indicate that RAN2 will support the new mode of operation agreed in RAN1
- Indicate that RAN2 in additiona has agreed to support UL SPS with LTE functionality as baseline. That would correspond to a mode in which PHY parameters (e.g. MCS/RBs) are not provided in initial RRC configuration and L1 will provide resource, similar to UL SPS.
- Action: ask to take our decisions into account

R2-1707474 Draft Reply LS to RAN1 on UL data transmission without UL grant for NR

=> Remove the highlight in the document

=> the LS is approved in R2-1707499 with the change above

R2-1707174 Grant Free and Semi-Persistent Scheduling in NR Ericsson discussion Rel-15 NR_newRAT-Core

=> Not treated

R2-1706370 Discussion on multiple SPS CATT discussion Rel-15 NR_newRAT-Core

Proposal 1: Multiple SPS for one UE should be configured in NR.

- QC doesn't see a use case to support multiple SPS and we should stick to the LTE baseline. Nokia and Mediatek agrees.
- Huawei thinks that multiple SPS is more traffic model driven, for V2X it mades sense but for this use cases there isn't much gains.
- InterDigital asks what happens if we have multiple numerologies in a cell.
- Ericsson, ZTE and LG think that we should have one per cell group.

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Proposal 7: SPS configuration/transmission on SCell should be supported.

- Ericsson thinks it would be useful to have the SPS on SCell or SCG. Huawei thinks that for URLLC grant free will be used.

=> Noted

Agreements
- Multiple SPS for the same cell will not be supported.
- SPS on PSCell will be supported
FFS if SPS on SCell will be supported

Not treated

R2-1707030	SPS enhancements for VoIP	Intel Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1707097	Retransmission Aspects for Uplink SPS	Samsung Electronics Co., Ltd	discussion		
R2-1707332	Potential Issues for UL Transmision with Shared UL Grant among Multiple UEs	Samsung Electronics	discussion		
R2-1706417	Grant-free transmission and SPS	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1706448	Discussion on UL grant-free transmission	Spreadtrum Communications	discussion	Rel-15	
R2-1706589	Unified SPS and Grant-free operation	Nokia, Alcatel-Lucent Shanghai Bell	discussion	Rel-15	NR_newRAT
R2-1706645	Consideration on the multiple SPS and grant free	ZTE CORPORATION	discussion	Rel-15	NR_newRAT-Core
R2-1706687	SPS and grant-free operation in NR	InterDigital	discussion	Rel-15	NR_newRAT-Core
R2-1707011	Considerations on multiple SPS configurations in NR	Samsung R&D Institute UK	discussion		
R2-1707062	Working assumption for Inactivity timer in UL SPS	vivo	discussion		
R2-1707063	UL grant-free resource configuration	vivo	discussion		
R2-1707095	Draft LS to RAN1 on SPS and Grant-free Transmission	Samsung Electronics Co., Ltd	discussion		
R2-1707098	Uplink SPS and Grant-free Transmission Aspects	Samsung Electronics Co., Ltd	discussion		
R2-1707158	SPS enhancements in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1707175	General HARQ aspects of SPS UL	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1707176	Enhanced HARQ feedback mode in SPS	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1707226	Collision control in use of grant free transmission	LG Electronics Inc.	discussion		NR_newRAT-Core
R2-1707268	Comparison of SPS and grant-free schemes	MediaTek Inc.	discussion	Rel-15	
R2-1707269	On the UE behaviour regarding grant-free transmissions	MediaTek Inc.	discussion	Rel-15	NR_newRAT-Core

10.3.1.9 HARQ

Topic will be handled with lower priority depending on RAN1 progress

Not treated

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R2-1706834	Asynchronous HARQ impact on the Msg3	LG Electronics Inc.	discussion		NR_newRAT-Core
R2-1707003	HARQ with multiple numerologies	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1707128	HARQ configurations in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1707130	Investigation on UP Latency	Ericsson	discussion	Rel-15	NR_newRAT-Core

R2-1706426	HARQ for Numerology Multiplexing	Samsung	discussion	Rel-15	
R2-1706646	Consideration on the HARQ for SPS	ZTE CORPORATION	discussion		Rel-15 NR_newRAT-Core
R2-1707066	HARQ process for UL grant-free transmission	vivo	discussion		
R2-1707099	HARQ Procedure for URLLC-eMBB Multiplexing	Samsung Electronics Co., Ltd	discussion		
R2-1707113	[DRAFT] LS on HARQ RTT and transport layer performance	Ericsson	LS out	Rel-15	NR_newRAT-Core RAN1

10.3.1.10 DRX

Need for multiple DRX configuration/parameters and what parameters can be different – some dependencies on RAN1 design of control channel monitoring and handling of multiple numerologies

Whether one or more than one DRX configuration can be active at a time

R2-1706750	Consideration for DRX in NR	LG Electronics Mobile Research	discussion		Rel-15 NR_newRAT-Core

=> Noted

R2-1707026	C-DRX enhancement in NR	Intel Corporation	discussion	Rel-15	NR_newRAT-Core

Proposal 1. A UE uses only one DRX configuration at a time.

- ZTE ask if this applies to one carrier

Proposal 2. Lower layer signaling (e.g., MAC CE signaling) is used for indicating a DRX configuration to be used by a UE if reliability issue can be addressed.

- Mediatek doesn't support this
- Nokia asks if this is similar to LTE MAC CE. Intel explains that it is a little different as it is used to switch quickly between configurations.

Proposal 3. The unit of ON duration timer and DRX inactivity timer is in number of PDCCH slots of the reference numerology.

- Ericsson wonders what is meant by PDCCH slot and if is related to PDCCH monitoring.

=> We will wait for RAN1 feedback

Proposal 4. Unit of DRX retransmission timers is in the number of the TTI length of the TB that started the retransmission timer.

Proposal 5. Unit of short and long DRX cycles is in the number of subframes.

=> Noted

Discussion on multiple configuration other than long and short for a single MAC entity

- Ericsson, Mediatek, Nokia agrees with Intel.
- Samsung understands that each configuration can correspond to a service and asks if there is a new DRB does the network need to provide a new configuration.

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- Samsung supports single configuration
- CATT supports multiple configuration but one active at a time
- Qualcomm thinks that having multiple configuration can have substantial power saving and is concerned with reliability of MAC CE.
- Nokia thinks that the baseline is one and we should be careful how much we gain in the field.
- Huawei thinks that multiple configuration are not needed
- Oppo thinks that multiple configuration should be supported and one active at a time.
- InterDigital thinks that with a single configuration the UE will be forced to do blind decoding on all PDCCH and will have big power saving impacts.
- CMCC thinks that LTE is already quite complex and we should not make it more complex.

Show of hands:

Option 1. Single configuration, like LTE (12)

Option 2. Multiple configuration with one active at a time (8)

Option 3. Multiple configuration with more than one active at time (union of DRX configurations) (6)

Agreements:

1. As a baseline, a single DRX configuration like in LTE will be supported.
2. The DL and UL HARQ RTT timer are not static values. FFS if the timer is removed or how it is set.

R2-1707123 DRX with Asynchronous HARQ Ericsson discussion Rel-15 NR_newRAT-Core

- Vivo is concerned that if we remove the HARQ TTI we have to consider when we start rtx timers. Ericsson thinks this is like HARQ RTT is set to zero.
- ZTE thinks this is used for other purposes.
- Blackberry thinks that this is again a tradeoff. We should maybe consider a minimum.
- Ericsson thinks that in LTE HARQ RTT is static
- Huawei thinks that the interval to monitor should be bigger than K2.
- LG thinks we should avoid having complex definition of HARQ RTT depending on different frame structures.

=> Noted

R2-1706524 Wake-Up Schemes for DRX in NR Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

- LG understands that if the UE receives the wake up signalling the UE will stop monitoring the onDuration and if it doesn't receive the UE continues to monitor.

=> We will wait for RAN1 to progress and agree on support of wake-up signal before considering further RAN2 impacts

=> Noted

Not treated

R2-1706423 Power saving for wideband NR carrier Samsung discussion Rel-15

R2-1706474 DRX configuration in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

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R2-1706354 DRX enhancement in NR OPPO discussion

R2-1706371 Discussion on DRX CATT discussion Rel-15 NR_newRAT-Core

R2-1706523 Multiple C-DRX configuration in NR Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1706525 Time units of DRX configuration parameters Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

=> Withdrawn

R2-1706590 DRX for NR Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1706647 Consideration on the DRX ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1706683 C-DRX with Multiple Configurations InterDigital discussion Rel-15 NR_newRAT-Core

R2-1706684 Power Savings for Carrier Aggregation in NR InterDigital discussion Rel-15 NR_newRAT-Core

R2-1706755 Discussion on DRX enhancements for NR Potevio discussion

R2-1706823 Way forward for NR C-DRX Samsung Research America discussion NR_newRAT-Core

R2-1707073 Discussion on NR DRX configuration in RRC_CONNECTED state vivo discussion

R2-1707122 DRX Enhancements for NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707124 DRX with short on-duration and Wake-up signaling Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707396 Beam Operation Impact for DRX in NR National Taiwan University discussion NR_newRAT-Core

10.3.1.11 Impact of PDCP duplication on MAC

Impact of PDCP duplication on the MAC – including LCP, SR, BSR, and activation/deactivation using MAC CE

R2-1706344 The impact of duplication on MAC OPPO discussion

Proposal 1 A flag to explicitly indicate which carriers are allowed per duplicated logical channel should be introduced.

- Mediatek thinks that we can use the logical channel restriction. We should finish the discussion on that first. CATT thinks that carrier restrictions should not be part of the transmission profile.
- Nokia indicates that it was already agreed that RRC configures the carrier restrictions. Oppo explains that we need to discuss the details. Lenovo thinks we can use the same as LTE LAA.

Proposal 4 The LTE BSR and SR trigger mechanism can be used for the packet duplication transmission, no enhancements are needed.

- Huawei and Vivo thinks that with duplication the UE may have to trigger two BSRs.
- Mediatek thinks that you don't have to associate a logical channel to a LCG so the UE doesn't have to report a BSR. This can be up to gNB implementation.

Proposal 5 The activation/deactivation of packet duplication, MAC CE should contain a bitmap corresponding to all the DRB configured with duplication.

- Ericsson thinks that it is simpler to indicate a logical channel ID and avoid using DRB IDs. Mediatek thinks that is a bit strange to indicate DRB ID since we are duplicated DRs and not LCID. A bitmap is not really needed.
- Oppo thinks that if we use a bitmap then it doesn't matter too much whether it is DRB or LC ID.

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- Nokia thinks that a bitmap of 8 bits is more efficient. LG thinks this would require a mapping rule between the DRB and bitmap. And in that case we need 32 bit bitmap.

Proposal 6 For deactivation MAC CE, the logical channel ID to be deactivated should be at least contained.

- Nokia thinks that it doesn't matter which one you deactivate as long as there is a rule. Mediatek thinks that this can be handled by RRC configuration.
- QC asks what is the behaviour for CA case and if we need to remap. LG understands that when the second leg is deactivated the UE stops using that leg, it is gone.

=> Noted

Agreements:
1. Logical channel prioritization takes into account the all the restrictions configured for the logical channels.
2. The LTE BSR and SR trigger mechanism can be used for the packet duplication transmission. no enhancements are needed.
3. For activation/deactivation MAC CE contains a bitmap corresponding to DRBs configured with duplication.
4. Which logical channel is used for duplication leg is based on RRC configuration for CA and DC.
FFS if fall back to split bearer is supported for DC.

Not treated

R2-1706643	Consideration on the impact of PDCP duplication on MAC	ZTE CORPORATION	discussion	Rel-15	NR_newRAT-Core
R2-1706867	Packet duplication with implicit SCell deactivation	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1707262	MAC CE design for duplication	MediaTek Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1707173	MAC impact of PDCP duplication	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1706372	Impact of PDCP duplication on MAC	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1706475	BSR procedure for data duplication	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706476	LCP for packet duplication	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706477	Reliability enhancement for MAC CEs	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706526	Impact of PDCP duplication on BSR in the CA case	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT-Core
R2-1706561	MAC CE for duplication (de)activation	Fujitsu	discussion	Rel-15	NR_newRAT-Core
R2-1706591	Further details on duplication with CA	Nokia, Alcatel-Lucent Shanghai Bell	discussion	Rel-15	NR_newRAT
R2-1707068	ActivationDeactivation of Packet Duplication	vivo	discussion		
R2-1707365	BSR for PDCP Duplication	Samsung	discussion	Rel-15	NR_newRAT-Core

10.3.1.12 PHR

Note this AI is down prioritized and will only be treated if RAN1 has made progress and if some input from RAN2 is needed.

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Not treated

R2-1706478 PHR reporting in different TTI lengths Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706516 PHR for UL Split Bearer Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1706610 PHR triggering events for NR Samsung discussion Rel-15 NR_newRAT-Core

R2-1706611 Baseline PHR format for NR Samsung discussion Rel-15 NR_newRAT-Core

R2-1706612 Draft LS on PHR details for NR and RAN4 - Samsung LS out Rel-15 NR_newRAT-Core RAN1

R2-1706688 Power headroom reporting for NR InterDigital discussion Rel-15 NR_newRAT-Core

R2-1706884 PHR for NR CA Lenovo Mobile Com. Technology discussion Rel-15 FS_NR_newRAT

R2-1707002 Consideration on PHR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1707359 PHR triggering event for beam change Samsung Electronics discussion

R2-1707360 Extended PHR considering beam and TRxP change Samsung Electronics discussion

10.3.1.13 Other

Other aspects not included in the detailed agenda items.

R2-1706825 On the very long DRX cycle Samsung Research America discussion NR_newRAT-Core

*The longer DRX cycle defined in LTE eDRX is supported also in NR. The value of the maximum DRX cycle in NR is FFS. The baseline is the DRX cycle in Rel-13 eDRX, i.e. up to 43.69 min in IDLE and up to 10.24 sec in Connected***.**

- Mediatek and QC thinks that SA2 has to work on long eDRX as there are system impacts.
- Mediatek asks what would be the impact of supporting long DRX for connected mode. Ericsson asks if RAN1 has had any discussion. Mediatek thinks it is the same SFN as LTE

=> The maximum value of long DRX cycle in connected mode can be as long as NR SFN can provide. The possible value ranges are FFS.

=> eDRX values for IDLE mode are not supported in this release of NR.

=> Noted

R2-1707168 UP timers in MAC Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707290 Ordering of Carriers Qualcomm Incorporated discussion Rel-15

R2-1707333 Initial state of SCell LG Electronics Inc. discussion NR_newRAT-Core

R2-1706427 RAN2 consideration for bandwidth part in NR Samsung discussion Rel-15

R2-1706827 On the TTI and Subframe in NR Samsung Research America discussion NR_newRAT-Core

R2-1706828 [Draft] LS on the TTI definition Samsung Research America discussion NR_newRAT-Core

R2-1707004 Considerations on TA maintaining with multi-beam operation Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1707071 Discussion on multiple TAs on multiple beams vivo discussion

R2-1707346 RAN2 consideration on user plane latency enhancement Samsung Electronics Co., Ltd discussion

R2-1706459 Numerology impacts on L2 timer for NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> moved 10.3.1.4.1

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10.3.2 RLC

10.3.2.1 TS

Latest TS 38.323, rapporteur inputs, etc

Including output from email discussion [98#36][NR/UP] – Running TS 38.322 – Mediatek

R2-1707257 Draft TS for 3GPP TS 38.322 specification MediaTek Inc. draft TSRel-15 38.322 0.1.0 NR_newRAT-Core

=> the TS is endorsed

R2-1707259 RLC AM state variables MediaTek Inc. discussion Rel-15 NR_newRAT-Core

- LG thinks we should remove _Next from some variables (e.g. RX_Next_Status_Trigger)
- Huawei thinks "Rcvd" should be removed as we already have RX.

=> The variables are endorsed as in TP

10.3.2.2 RLC header format

Remaining details of RLC STATUS REPORT format (e.g. NACK SN range) and final format

RLC PDU data format remaining details (e.g. SN length for AM). Note for RLC UM SN contributions should be under RLC UM AI since the SN length depends on whether it will always be present or not.

R2-1707258 RLC STATUS PDU format MediaTek Inc. discussion Rel-15 NR_newRAT-Core

=> moved from 10.3.2.1

Proposal 1: The NR RLC STATUS PDU retains the D/C, CPT, ACK_SN, NACK_SN, SOstart, and SOend fields with the same interpretation as in the LTE RLC STATUS PDU.

- Qualcomm thinks that the definition of SOstart and SOend would be slightly different.
- Vivo thinks that we have already agreed to these fields to follow LTE.

Proposal 2: The NACK range field can be associated with a set of SOstart and SOend fields to indicate the segment offsets for the "first" and "last" RLC SDU segments in a set of consecutively lost RLC PDUs.

- Huawei thinks that we can used the E field to indicate whether SO field is present or not. Mediatek thinks it is an option but since we agreed to use LTE we didn't change it in the proposal.
- Ericsson asks if this byte aligned. Mediatek thinks at the end it will be, it's just an example.

=> The TP is endorsed (not including the figure)

=> Editor's note – E1-2 field definition may be revisited

=> Noted

Agreements
1. The NR RLC STATUS PDU retains the D/C, CPT, ACK_SN, NACK_SN, SOstart, and SOend fields with the similar inerpretation as in the LTE RLC STATUS PDU.
2. The NACK range field can be associated with a pair SOstart and SOend fields to indicate the segment offsets for the "first" and "last" RLC SDU segments in a set of consecutively lost RLC PDUs.

R2-1706373 NR RLC header format CATT discussion Rel-15 NR_newRAT-Core

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Proposal1: 12 and 18 bit RLC SN is used for NR.

- LG thinks this is ok for RLC AM

Proposal2: Only 16 bit SO is used in NR for both AM and UM.

- Huawei thinks that this is related with super jumbo frame. Samsung thinks we should decouple the discussion.
- Vivo thinks this already supports the jumbo frame. LG explains that it is mainly for byte alignment.

Proposal3: Only 10 bit NACK_RANGE is used in NR for status PDU.

- LG thinks 10 bits is quite large. There shouldn't be so many missing PDU, 6 is enough. Huawei thinks for byte alignment can be 8.
- Oppo thinks that 10bits only supports 1024 missing PDU and it is not enough, 12 is more suitable
- Nokia thinks that if we want to byte aligned the RLC STATUS PDU fields we should have different sizes for 12 and 18bits.

=> Noted

Agreeements
1. 12 and 18 bit RLC SN is used for RLC AM NR. SN for RLC UM is FFS
2. Only 16 bit SO is used in NR for both AM and UM.
3. NACK_RANGE size is FFS – depends on byte alignment and full RLC STATUS format

Not treated

R2-1706593 Segmentation implications to RLC status reporting Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1707336 RLC data PDU format for NR LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1706345 The format of RLC STATUS PDU OPPO discussion

R2-1706479 RLC status PDU format Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706480 RLC SN length Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706592 Further details of RLC header fields Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1707106 Some remaining issues on RLC status PDU format KT Corporation discussion

R2-1707162 RLC Status Report format Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707163 RLC Segmentation details Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707170 RLC UM PDU format Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707248 SO-field size in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1707335 RLC field size for NR LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1707336 RLC data PDU format for NR LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1707337 RLC STATUS PDU format for NR LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1707373 RLC Status PDU for NR Samsung discussion Rel-15 NR_newRAT-Core

R2-1707383 NR RLC/PDCP header formats Samsung Electronics Co., Ltd discussion Rel-15 NR_newRAT-Core

R2-1706803 RLC Status PDU format Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

=> moved from 10.3.2.3

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10.3.2.3 RLC UM operation

Including output from email discussion [98#39][NR/UP] – RLC UM – Qualcomm

RLC UM receive operation (Whether to include SN in every PDU and How to perform re-assembly (move receive window only or use timer). Note enhancements of this functions when SN is not always presents should have stage 3 proposals.

R2-1706794 E-mail discussion summary of RLC UM Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

- Ericsson, Samsung is concerned about Option 2 as we haven't fully understood the impact.
- Sequans, Intel, and Futjitsu thinks that Option 1 is already quite easy and clear.
- Huawei doesn't see the complexity.
- LG supports option 2.
- ZTE thinks that we can save processing time.

=> Noted

Option:

1. *RLC UM with SN (9)*
2. *RLC UM without SN (14)*

Agreements

1. RLC UM without SN for the complete SDU is selected. FFS which options is selected
2. SI field is included in RLC UM header to differentiate complete RLC SDU, the first SDU segment, the middle SDU segment, and the last SDU segment.
   - The header of unsegmented SDU contains only SI field.
   - The header of first segment contains only SI field and SN.
   - The header of middle and last segment contains SI field, SN, and SO.

R2-1706996 Further thoughts on RLC UM segmentation CMCC discussion Rel-15 NR_newRAT-Core

- LG thinks that this proposals would only be applied to RLC UM and that would add complexity to specify two different procedures for UM and AM.
- CMCC thinks this removes overhead.
- Huawei thinks we can consider it since anyways we have different UM and AM operation

=> Noted

Not treated

R2-1706374 NR RLC UM SN removal CATT, OPPO discussion Rel-15 NR_newRAT-Core

=> moved from 10.3.2.2

R2-1706346 NR RLC UM operation OPPO discussion

R2-1706375 NR RLC UM receive operation CATT discussion Rel-15 NR_newRAT-Core

R2-1706481 RLC UM operation in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706594 Preprocessing of the first segment in UM Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

R2-1707017 RLC UM operation in NR Intel Corporation discussion Rel-15 NR_newRAT-Core

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R2-1707171	RLC UM open issues	Ericsson	discussion	Rel-15 NR_newRAT-Core
R2-1707338	Multiple reassembly timers for RLC UM	LG Electronics Inc.	discussion	Rel-15 NR_newRAT-Core
R2-1707385	NR RLC UM receive window	Samsung Electronics Co., Ltd	discussion	Rel-15 NR_newRAT-Core
R2-1707387	RLC UM receive window operation	Samsung Electronics Co., Ltd	discussion	Rel-15 NR_newRAT-Core
R2-1707400	RLC UM operation for NR	Sequans Communications	discussion	Rel-15 NR_newRAT-Core

10.3.2.4 Impact of PDCP duplication to RLC

R2-1707249 RLC behavior for duplicate activation and deactivation Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Proposal 1: The SNs of the two duplicate should be independently assigned: once receiving activate command, the secondary RLC establishes and RLC SN begins from 0.

- Vivo thinks it is coupled with deactivation.

=> Noted

R2-1706549 Duplication impacts to RLC Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

Proposal 1: in CA, do not consider RLF detected when reaching the maximum number of retransmission for a PDCP duplicate.

- Asustek indicates that this was discussed in the main session and they didn't agree.
- Huawei thinks that regardless of duplication or not, max retx should trigger RLF.
- LG and Ericsson agree that it should trigger RLF.
- Mediatek asks if we support duplication for AM. ZTE thinks we should for SRB.
- LG thinks that if RLC on SCG fails we will trigger SCG RLF.
- LG thinks that we should trigger re-establishment if the RLF is detected on the MCG even for CA. Nokia thinks that we shouldn't tear down the whole connection because one carrier failed. It's a similar reasoning as Rel-10 for CA, we only declare RLF on PCell.
- Samsung, Blackberry thinks this is a rare case, so we shouldn't optimize.
- Lenovo thinks that we should follow the CA principles.
- KT supports proposal 1
- Vivo and Ericsson thinks is an optimization.
- Qualcomm, InterDigital, Xiaomi, CATT, OPPO, CMCC agrees with Nokia's view. There is no point to do RLF if we are duplicating.
- Huawei also doesn't thinks we should re-establish the whole link and do RLF.

Proposal 2: deactivation of duplication does not impact RLC operation.

- Lenovo asks what happens if PDUs are stuck in the buffer and then RLC is reactivated, is the UE going to continue the transmissions.

=> Noted

Agreements

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1. FFS in CA, as a baseline RLF is not triggered when reaching the maximum number of retransmission for a PDCP duplicate
2. SNs of the two duplicate legs should be independently assigned

Not treated

R2-1707340 Reaching maximum number of RLC retransmission with PDCP duplication LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1706376 Impact of PDCP duplication on RLC CATT discussion Rel-15 NR_newRAT-Core

R2-1706562 RLC procedural text for duplication Fujitsu discussion Rel-15 NR_newRAT-Core

R2-1707261 Data duplication in NR UP MediaTek Inc. discussion Rel-15

R2-1707372 RLC Max Number of Retransmissions and RLF for PDCP Duplication Samsung discussion Rel-15 NR_newRAT-Core

10.3.2.5 Other

Not treated

R2-1706377 NR RLC AM operation on VR(H) and status reporting CATT discussion Rel-15 NR_newRAT-Core

R2-1706804 Further details of RLC polling Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1707167 UP timers in RLC Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707334 Clarification on maximum data field size of a RLC PDU LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1707339 Consideration on SN wrap around problem LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

10.3.3 PDCP

10.3.3.1 TS

Latest TS 38.323, rapporteur inputs, etc

Including output from email discussion [98#37][NR/UP] – Running TS 38.323 – LG

R2-1706868 NR PDCP specification LG Electronics Inc. draft TS Rel-15 38.323 0.1.0 NR_newRAT-Core

=> The TS is endorsed

Not treated

R2-1707291 Alternative TP for Running TS 38.323 Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1707069 NR PDCP related procedures specification vivo discussion

R2-1707070 Draft LS on PDCP related procedures vivo discussion

R2-1707155 PDCP modelling issues Ericsson discussion Rel-15 NR_newRAT-Core

10.3.3.2 PDCP PDU formats

Remaining issues related to PDCP Data and Control PDU format

Support for jumbo frames and max size supported for data and control PDUs

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R2-1706649 Consideration on the PDCP status report ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

=> No support for the proposal

=> Noted

R2-1707250 Discussion on jumbo packet in PDCP Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Proposal 1: The support for super jumbo frame (64kB) should not be UE capability issue and this feature should be supported for all the UEs in NR

- LG doesn't see the gain to support. There are some issues in supporting it, especially if there is a mix of packet sizes. The small packets are delayed.
- Intel, NTT Docomo agrees with LG and asks what are the gains when compared to jumbo frames.
- ZTE thinks that super jumbo frame has impacts to CN

=> Super jumbo frames are not supported

=> Noted

R2-1707018 Maximum PDCP SDU size Intel Corporation discussion Rel-15 NR_newRAT-Core

=> Noted

R2-1706482 Retention of P-field in DRB PDCP data PDU Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

- CATT also sees an another case for RLC UM duplication. QC also sees a benefit.

=> Noted

Not treated

R2-1706378 Polling in PDCP PDU CATT discussion Rel-15 NR_newRAT-Core

R2-1706811 Support of super jumbo frame and PDCP control PDU length LG Electronics France discussion Rel-15 NR_newRAT-Core

R2-1707370 PDCP SN Size for UM Samsung discussion Rel-15 NR_newRAT-Core

R2-1707371 Detail of PDCP Status Report Samsung discussion Rel-15 NR_newRAT-Core

10.3.3.3 PDCP receive operation

Including output from email discussion [98#40][NR/UP] – PDCP receive operation – LG

Re-ordering to be discussed as a function of the conclusion of the email discussion

R2-1706869 E-mail discussion summary of PDCP receive operation LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

- LG considers PUSH based window simpler after drafting the TP.
- Huawei thinks that PUSH window is more motivated. PULL based window has some problems.
- Ericsson thinks that are a number of arguments to support.
- Qualcomm supports PUSH after carefully considering all sides
- Intel prefers PULL like LTE, and see no problems.
- Oppo doesn't see too much a difference between the two.
- CATT and Nokia thinks that we shouldn't compare too much to LTE as it is different anyways.

=> PUSH window with text in R2-1706869 is supported and endorsed

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=> Noted

R2-706338 Discussion on single PDCP receive operation OPPO discussion Rel-15 NR_newRAT-Core

=> Noted

R2-1707154 PDCP reception algorithm Ericsson discussion Rel-15 NR_newRAT-Core

=>Noted

R2-1707443 Disabling of PDCP reordering Sequans Communications discussion Rel-15 NR_newRAT-Core

=> moved from 10.3.3.5

=>Noted

R2-1707251 The PDCP receive window management Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

- Samsung and Vivo thinks that the duplicate case includes handover case and should be decompressed. Huawei explains that there is nothing new from LTE.
- LG summarizes that according to email discussion nothing needs to be done.

=> For outdated and duplicated case the UE does not decipher or decompress

=> Noted

Agreements

1. Out-of-order delivery is configurable by RRC
2. Out of order delivery does not affect window status, i.e. RX_DELIV
3. Integrity verification, if applicable, is applied at reception of a PDU. Following LTE, it is applied also for PDUs received out of the window and/or duplicates (that are already stored)

Not treated

R2-1707194 De-activation of re-ordering in PDCP Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1706339 Discussion on out-of-sequence delivery by PDCP OPPO discussion Rel-15 NR_newRAT-Core

R2-1706379 PDCP receive operation CATT discussion Rel-15 NR_newRAT-Core

R2-1706629 Handling of duplicates and out of order PDUs for LTE-NR interworking Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707019 PDCP receive operation in NR Intel Corporation discussion Rel-15 NR_newRAT-Core

R2-1707196 PDCP receive operation Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1707252 PDCP reordering enabling and disabling Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1707401 PDCP reordering operation Sequans Communications discussion Rel-15 NR_newRAT-Core

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10.3.3.4 UL data split

Whether data buffer status is used as a threshold or if other parameters are used (e.g. delay or data rates) and any further enhancements to allow for pre-processing and link performance.

R2-1706800 Uplink switching Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

- Mediatek asks if the switching is always controlled by RRC configuration. QC explains there are multiple models.
- CATT asks if this is change UL split. QC thinks this is a simplification of UL switch.
- Lenovo thinks that this can be achieved using the existing threshold behaviour. QC thinks that it is possible but we have to make sure to add the desired path indication in the signalling if we go the LTE way.
- ZTE would like to have a unified solution similar to activation/deactivation

=> Noted

R2-1707190 Pre-processing with UL data split Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

Proposal: In NR, the transmitting PDCP entity shall submit PDCP PDUs to lower layers only when requested by lower layers.

- Mediatek asks if the implication is that we should not pre-process. Nokia explains you can still pre-process PDCP(cipher) and headers and send the data at the MAC layer when needed.
- LG thinks this is reasonable since the heaviest part of processing is PDCP.
- Lenovo thinks that in case pre-processing would have been possible in LTE. Nokia thinks its not possible because of the way we segment.

=> Noted

R2-1706880 Pre-processing for UL split bearer operation Lenovo Mobile Com. Technology discussion Rel-15 FS_NR_newRAT

- CATT asks if we have to specify when the UE measures the buffer. Lenovo thinks it is up to UE implementation
- LG thinks this is quite complex.
- QC asks what happens if the gNB doesn't give the grant in the pre-processed leg. Lenovo thinks that this would limit the amount of data suffering from this.
- MEdiatek thinks we should be careful to dictate how much pre-processing the UE can do. We can let the UE determine its capacity. Lenovo understood that we should limit the amount of pre-processing
- Sequans supports the idea and limit the amount of pre-processing in the UE.
- InterDigital asks how does the network know how to set the threshold. Lenovo thinks it can depend on max grant, UE capability.

=> Noted

R2-1707388 Hybrid solution for NR DC Samsung Electronics Co., Ltd discussion Rel-15 NR_newRAT-Core

- Vivo thinks we should have two thresholds.
- Huawei thinks this is a good idea. LG and Intel support this solution.
- Mediatek thinks that this doesn't solve the main issue related to pre-processing. Also not clear how the network sets this hard split threshold.

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- CATT thinks that no specification impact is needed. The UE can pre-process blocks separately.
- Ericsson doesn't think the hard split is necessary and difficult to set.
- Sequans thinks that Lenovo's proposal provides a good compromise.
- Ericsson thinks that the UE should not allocate more than half PDCP SN space.
- Samsung explains the concequence is that pre-processing will be limited and SCG bearer would have to be configured to make full use of pre-processing. We can make it better in Rel-16.

=> Noted

Agreements
1. The LTE threshold based mechanism is used for UL bearer split.
2. Pre-processing is allowed in the split bearer case, similar to single carrier case. How much pre-processing is done is left to UE implementation.
3. PDCP should ensure that not more than half PDCP SN space is allocated

R2-1707225 Threshold for UL split with pre-processing LG Electronics Inc. discussion NR_newRAT-Core

Proposal: The PDCP is configured with a time period over which the PDCP counts the amount of PDCP SDUs arrived in the PDCP.

- LG points out that this is also for fast scheduling and not just pre-processing
- Mediatek shares the concerns but the solutions may need more thinking.
- Sequans also thinks for NR it may be a problem but they have a different solution
- Lenovo also thinks that the threshold needs to be revisited.
- CATT thinks we should keep the threshold.
- QC thinks that this is assuming a certain implementation.

=> Noted

Not treated

R2-1707397 NR UL data split operation Sequans Communications discussion Rel-15

R2-1706844 Way forward on UL bearer split NTT DOCOMO INC. discussion Rel-15 NR_newRAT-Core

R2-1707075 Allowing pre-processing on UL split bearer vivo discussion

R2-1707082 UL path change conditions for split bearer vivo discussion

R2-1707153 PDCP UL data split Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707192 PDCP trigger for uplink splitting Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1707253 Pre-processing UL split operation Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1707263 BSR enhancements for UL pre-processing in single and dual connectivity MediaTek Inc. discussion

R2-1707364 Threshold for NR UL data split operation Sequans Communications discussion Rel-15 NR_newRAT-Core

R2-1707389 Clarification on threshold based solution for UL split bearer Samsung Electronics Co., Ltd discussion Rel-15 NR_newRAT-Core

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10.3.3.5 PDCP duplication

Impacts related to PDCP duplication

Not treated

R2-1706483	PDCP operation for packet duplication	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706550	Duplication impacts to PDCP	Nokia, Alcatel-Lucent Shanghai Bell	discussion	Rel-15	NR_newRAT
R2-1707157	PDCP data volume reporting in duplication	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1706380	PDCP status report and structure for duplication	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1706484	PDCP data volume calculation	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706563	Feedback for PDCP duplication	Fujitsu	discussion	Rel-15	NR_newRAT-Core
R2-1706870	Packet duplication in PDCP	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1707076	Clarification on the data available for transmission for PDCP duplication	vivo	discussion		
R2-1707368	PDCP Duplication Operations	Samsung	discussion	Rel-15	NR_newRAT-Core

10.3.3.6 Other

Including reconfiguration to PDCP SN length

R2-1706485	PDCP discard mechanism	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core

=>Noted

R2-1706564	Pre-prosessing and PDCP discard	Fujitsu	discussion	Rel-15	NR_newRAT-Core

PDCP SR is used for SDU discard notification in the transmitting side to avoid unnecessary reordering in the receiving side.

- LG thinks that SDU discard can be handled by UE implementation, since the UE can discard and re-allocate SN. Huawei explains that this for non-UL split. LG thinks that this still applies.
- Lenovo thinks for NR it is different. The UE can pre-process and submit data to RLC.
- QC and Oppo also agree and some solution is needed.
- Mediatek doesn't thinks anything needs to specified. Smart UE implementation can handle it.

=> Noted

R2-1706582	Discussion on PDCP reconfiguration of SN length	OPPO	discussion	Rel-15	NR_newRAT-Core

Do we allow SN change within NR?

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- LG thinks that we should only consider the EN-DC and within NR SN change is not a problem.
- Oppo and Ericsson thinks that the change can occur within NR.
- Ericsson thinks it is beneficial for the HO cases.
- ZTE thinks for the HO case full configuration is enough.
- Intel, Samsung, QC don't think there is a case and a need to optimize.
- Huawei shares the view that it is useful for HO case.
- LG explains that we didn't introduce this in LTE as the SN size is QoS dependent.
- Ericsson thinks that it can inter-vendor cases

=> As a baseline, lossless SN re-configuration is not supported for RLC AM

=> Noted

R2-1707193 Reconfiguration to Shorter SN Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

=> Noted

Not treated

R2-1707152 PDCP lossless SN reconfiguration Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707369 Discussion on PDCP SN Reconfiguration Samsung discussion Rel-15 NR_newRAT-Core

R2-1706801 Moving Reordering Window at NR PDCP Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1707077 RoHC issue on NR PDCP vivo discussion

R2-1707156 PDCP feedback Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707166 UP timers in PDCP Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706812 Reconfiguration of PDCP SN LG Electronics France discussion Rel-15 NR_newRAT-Core

R2-1706887 PDCP discard timer for NR Lenovo Mobile Com. Technology discussion Rel-15 FS_NR_newRAT

R2-1707195 PDCP flow control for split bearers mapped on RLC UM Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1707254 The ROHC configuration issue Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1707255 PDCP SN reconfiguration Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1707390 Out-of-sequence delivery in PDCP Samsung Electronics Co., Ltd discussion Rel-15 NR_newRAT-Core

R2-1707394 Configuration and reconfiguration of PDCP SN length HTC Corporation discussion Rel-15

R2-1707399 PDCP Header Compression for QoS flows HTC Corporation discussion Rel-15

10.3.4 QoS layer

10.3.4.1 TS

Latest TS 37.3xx, rapporteur inputs, etc

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R2-1707451 Draft TS for 3GPP SDAP specification Huawei (Rapporteur) draft TSAgreement

=> The TS is moved to email discussion

10.3.4.2 Header Format

Details of header format only. Presence/need of fields and handling of re-mapping should be discussed in Other AI

Not treated

R2-1706381 SDAP header format CATT discussion Rel-15 NR_newRAT-Core

R2-1706555 QoS layer header format Samsung discussion Rel-15 NR_newRAT-Core

R2-1706666 Discussion on the SDAP PDU format ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1706782 SDAP Header Format Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706783 QoS Flow ID in SDAP Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706784 Use of Shorter QoS Flow ID Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706798 Further considerations of SDAP header Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1706852 SDAP PDU format LG Electronics Inc. discussion NR_newRAT-Core

R2-1706910 SDAP PDU format OPPO discussion

R2-1706994 SDAP header format optimization CMCC discussion Rel-15 NR_newRAT-Core

R2-1707159 SDAP Header Format Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707351 SDAP Header Format Convida Wireless discussion Rel-15 NR_newRAT-Core

10.3.4.3 Other

Discussion depends on the answers from SA2

QoS flow remapping within the same cell. Aspects related to handover can be progressed after same cell remapping is more stable.

Precedence of QoS flow to DRB mapping between RRC configured and AS reflective QoS

R2-1706785 Impact of NAS Reflective QoS on RAN Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Proposal 2: The no SDAP header format could not be used when UP-controlled or CP-controlled NAS reflective QoS is applied.

=> Noted

R2-1706556 Further considerations on the reflective QoS Samsung discussion Rel-15 NR_newRAT-Core

Proposal 1: A UE shall know (shall be informed) when it is needed to update mapping information and shall not apply reflective QoS actions for every incoming packet.

- Mediatek thinks it is reasonable that the UE is not updating the filters every packet.
- TCL agrees it doesn't have to be for every packet.

Proposal 2a: It is up to the RAN to decide when to start/stop including the reflective QoS indicator into the SDAP header.

- Samsung explains this is for DL and it is up to the network for how many packets it includes it for.
- Huawei asks if the intention is to have a dynamic header.

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- Mediatek asks if this is related to AS or NAS.
- Mediatek says for the AS level it can be up to the RAN. For NAS it is not clear.
- Qualcomm doesn't see the motivation to have only AS reflective.
- Ericsson wonders if we would have to reconfigure the SDAP header. Samsung doesn't thinks that the header will vanish.
- CATT that when NAS reflective QoS is activate the AS always has to include the Qflow id

=> Noted

R2-1706826 Further discussion on Reflective QoS LG Electronics Inc. discussion NR_newRAT-Core

=> Noted

R2-1706668 Discussion on reflective QoS ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

- LG doesn't thinks is necessary as gNB can use RRC signalling.
- TLC thinks it is related to the length of QoS flow ID.

=> Noted

R2-1706551 Transparent Mode Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT

Proposal 1: a transparent mode (TM) is defined for SDAP.

Proposal 2: TM mode is configured by RRC.

- Vivo and Ericsson agree. Mediatek points out that this makes sense if the gNB is made aware of NAS reflective QoS.
- LG wonders what the functionality would be for SDAP TM. Nokia explains one functionality is routing.
- Huawei thinks that we should have a RRC configuration.

=> Noted

R2-1706789 Initiation of SDAP Entity Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

=> *Noted*

Agreements:

1. There is a need to tell the UE that it has to update the mapping rule. For the AS reflective QoS it is up to the RAN to decide when to update the mapping rules. FFS on the details of the header format.
2. It is up to the RAN to decide when and which mechanism, explicit RRC re-configuration and/or AS reflective QoS, should be used to provide mapping information to the UE.
3. A UE follows the latest QoS flow to DRB mapping information regardless of the fact whether it was explicit RRC or AS reflective QoS.
4. Whether a SDAP header is present or not is configured by RRC per DRB
5. The gNB indicates to UE using RRC signaling the default DRB for a PDU session.
6. RAN decides and configures the default DRB for a PDU session.

✉ **[NR UP] LS to SA2 – Huawei**

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- Provide agreements to SA2.
- Related to agreement 6 – ask SA2 about RAN awareness of the default QoS for the PDU session
- one week after the meeting

Not treated

R2-1706356	Discussion on reflective QoS	OPPO	discussion		
R2-1706382	QoS remapping	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1706383	Reflective QoS	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1706440	QFI Presence for AS Level Reflective QoS	TCL Communication Ltd.	discussion	NR_newRAT-Core	
R2-1706441	Flexible QFI Presence Solutions for AS Level Reflective QoS	TCL Communication Ltd.	discussion	NR_newRAT-Core	
R2-1706552	QoS Flow Relocation	Nokia, Alcatel-Lucent Shanghai Bell	discussion	Rel-15	NR_newRAT
R2-1706553	Reflective QoS in AS	Nokia, Alcatel-Lucent Shanghai Bell	discussion	Rel-15	NR_newRAT
R2-1706557	Re-configuration scenarios for the NR QoS framework	Samsung	discussion	Rel-15	NR_newRAT-Core
R2-1706604	AS reflective QoS	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1706667	Discussion on QoS flow-DRB remapping	ZTE CORPORATION	discussion	Rel-15	NR_newRAT-Core
R2-1706786	Reflective Mapping in AS	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706787	QoS Flow to DRB Re-Mapping	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706788	Lossless Handover of QoS Flow	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706790	Notification control	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706799	Precedence order of RRC configured mapping and reflective mapping	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT-Core
R2-1706815	QoS flow to DRB remapping	LG Electronics France	discussion	NR_newRAT-Core	
R2-1706817	Location of QoS Flow ID in UL and DL packet	LG Electronics France	discussion	Rel-15	
R2-1706850	Configurability for UL QoS flow ID marking	LG Electronics Inc.	discussion	NR_newRAT-Core	
R2-1706853	Precedence of the RRC configured mapping and reflective QoS	LG Electronics Inc.	discussion	NR_newRAT-Core	
R2-1706875	Consideration on QoS flow ID	Beijing Xiaomi Mobile Software	discussion		
R2-1706999	QoS flow ID presence in the AS Reflective QoS	CMCC	discussion	Rel-15	NR_newRAT-Core
R2-1707035	AS reflective mapping and precedence handling	Intel Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1707079	Discussion on SDAP modeling	vivo	discussion		
R2-1707080	Draft LS on NAS AS interaction for SDAP entity	vivo	discussion		
R2-1707160	Reflective QoS and Flow-ID	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1707161	QoS Flow Remapping Within the Same Cell and in Handover	Ericsson	discussion	Rel-15	NR_newRAT-Core

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R2-1707270 Clarification of NAS Reflective QoS MediaTek Inc. discussion Rel-15 NR_newRAT-Core

R2-1707271t Remaining issues for AS reflective mapping MediaTek Inc. discussion Rel-15

10.4 Stage 3 control plane

10.4.1 RRC

10.4.1.1 TS

Latest TS 38.331, other rapporteur inputs, etc. Please submit any new text proposals to the appropriate agenda item. Note specification methodology has been given a separate AI for RRC.

R2-1707187 TS 38.331 Ericsson draft TR Rel-15 38.331 0.0.4 NR_newRAT-Core

- Nokia point out that the capabilities should be separated.

=> Noted

10.4.1.2 Specification methodology

R2-1706599 Tagging of ASN.1 in NR RRC Nokia, Alcatel-Lucent Shanghai Bell discussion

R2-1706600 Terminology for NR RRC Nokia, Alcatel-Lucent Shanghai Bell discussion

R2-1707188 RRC methodology Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707189 Text proposal on TS 38.331 guidelines Ericsson discussion Rel-15 NR_newRAT-Core

=> Revised in R2-1707470

R2-1707470 Text proposal on TS 38.331 guidelines Ericsson, Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

- Samsung think that sometimes the Info suffix is useful, if there is additional information associated with something in the list (e.g. PLMN Info list). Nokia agree it is sometimes useful but in many cases it is not needed.

=> Agreed

R2-1707033 Default Need code Intel Corporation discussion Rel-15 NR_newRAT-Core

R2-1707440 Need codes and conditional codes in NR ASN.1 Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1707215 Specification improvements for NR RRC Samsung Telecommunications discussion Rel-15

Withdrawn

R2-1707256 Need codes and conditional codes in NR ASN.1 Huawei, HiSilicon discussion

=> Withdrawn

10.4.1.3 Connection control procedures

10.4.1.3.1 Connection control procedures email

Output from email discussion [98#30][NR] RRC Connection Control (Intel)

R2-1707038 Email discussion report on [98#30][NR] RRC Connection Control Intel Corporation discussion Rel-15 NR_newRAT-Core

R2-1707297 Text proposal to RRC connection control Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706434 Further considerations on transition from INACTIVE to IDLE Samsung discussion Rel-15 NR_newRAT-Core

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R2-1706620 UE capability in NR RRC connection request Sony discussion Rel-15 NR_newRAT-Core

R2-1707361 RRC connection control from INACTIVE Samsung Electronics discussion

=> *Revised to R2-1707450*

R2-1707450 RRC connection control from INACTIVE Samsung Electronics discussion

10.4.1.3.2 Connection control message harmonisation

Harmonisation/merging of messages to be used for different procedures, UE identity and other message content to be used in different cases, etc.

Maximum 1 tdoc per company

R2-1707232 Harmonization of the RRC procedures Nokia discussion Rel-15 NR_newRAT-Core

R2-1707216 Further discussion on merging NR RRC messages Samsung Telecommunications discussion Rel-15

R2-1706398 RRC connection re-establishment and resume procedures in NR CATT discussion Rel-15 NR_newRAT-Core

R2-1706692 Alignment of Common Messages for Connection Control Procedures InterDigital discussion Rel-15 NR_newRAT-Core

R2-1706722 Consideration on the procedure design for transition from INACTIVE to CONNECTED state and for RRC connection re-establishment Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706988 Harmonised Connection Control Messages CMCC discussion Rel-15 NR_newRAT-Core

R2-1707039 Common RACH RRC Msg.3 and UE ID Intel Corporation discussion Rel-15 NR_newRAT-Core

R2-1707087 RRC Service Request MediaTek Inc. discussion

R2-1707149 Simplification of RRC messages for NR LG Electronics France discussion NR_newRAT-Core

R2-1707292 Harmonizing of the RRCConnection, Reestablishment and Resume procedures Ericsson discussion Rel-15 NR_newRAT-Core

10.4.1.3.3 Connection reconfiguration

Will same reconfiguration message be used for reconfigurations in SA and in NSA? Structure/content of that message.

R2-1707217 Radio configuration high level information structure Samsung Telecommunications discussion Rel-15

P2

- Ericsson have a slightly different structure as we have agreed the PDCP configuration is separate. And also it makes sense to have RLC and logical channel configuration be grouped together.

P13

- Ericsson agree to group the but that actual configuration could be the same for MCG and SCG. Samsung think it would be good to avoid as many different versions as were added for LTE.

P14

- Nokia think that for SCG SRB then a message should be used.
- Ericsson think we also need to consider other DC cases of only EN-DC when making this decision.
- Intel think we previously agreed that it could be a complete message and prefer not to revisit.

Agreements
1 Introduce a 'field' covering the MCG configuration and a 'field' covering the SCG configuration.
FFS whether we introduce a list of size 0..1 SCGs for possible future extension to MC.

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R2-1707201 NR RRCConnectionReconfiguration procedure and signalling baseline Ericsson discussion Rel-15 NR_newRAT-Core

P1

- Intel support the proposal and it is similar to that for DC but here we always use the structure even when DC is not used.
- DOCOMO also support the proposal and think it is consistent with agreement that PDCP config is in a container.
- Nokia wonder if the PDCP container goes in the master message or the embedded secondary message. Does PDCP always go in one place. Intel understand that all the radio bearers would be in the same message from the master with parts from MCG and SCG. Intel have the same understanding.
- Nokia wonder if the LTE MN needs to build a full NR RRC message just to configure PDCP.
- Samsung understand this would be 5 lists for NR-NR DC. A PDCP list, 2 RLC/logical channel lists, and 2 lists of cells

=> Noted

✉ **[NR-AH2#xx][NR] RRCConnectionReconfiguration structure (Ericsson)**

Progress the high level structure of the RRCConnectionReconfiguration message. Could also start to draft ASN.1 text.

Intended outcome: Report and possible TP to next meeting

Deadline: Thursday 2017-08-03

R2-1706399 RRC connection reconfiguration procedure in NSA CATT discussion Rel-15 NR_newRAT-Core

R2-1706748 MCG/SCG configuration for LTE-NR Dual Connectivity NTT DOCOMO, INC. discussion Rel-15 NR_newRAT-Core

R2-1706749 Improvement on capturing bearer (re)configuration procedures for LTE-NR Dual Connectivity NTT DOCOMO, INC. discussion Rel-15 NR_newRAT-Core

R2-1707047 RRC Connection Reconfiguration for EN-DC operation Intel Corporation discussion Rel-15 NR_newRAT-Core

R2-1707202 Procedures for RRCConnectionReconfiguration and HO Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707319 Enhance RRC configuration procedure Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1707393 RRC message structure and transport for NSA HTC Corporation discussion Rel-15

R2-1707434 Reconfiguration message for SA and NSA Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1707442 Necessary RRC procedures and functionality for NSA and SA Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

10.4.1.3.4 Connection control procedures - other

Other aspects of connection control procedures, state transitions, etc

Security for Inactive to Connected

R2-1707298 Addressing key FFS in email discussion [98#30][NR] RRC Connection Control Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706724 Security of INACTIVE to CONNECTED state transition Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706806 Security procedure from RRC_INACTIVE state in NR Samsung India discussion

R2-1707040 Security optimizations when resuming or re-establishing Intel Corporation discussion Rel-15 NR_newRAT-Core

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R2-1707041 [DRAFT] LS on security when resuming or re-establishing Intel Corporation discussion Rel-15 NR_newRAT-Core
R2-1706838 Security in inactive state Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core
R2-1707446 Draft LS to SA3 on inactive to connected state transition Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

Other

R2-1707303 UE Context ID discussion Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706433 On terminology for the NR RRC states Samsung discussion Rel-15 NR_newRAT-Core
R2-1706350 Assisted Information for State Transition from CONNECTED to INACTIVE OPPO discussion NR_newRAT-Core
R2-1706400 Open issues on state transition from INACTIVE to CONNECTED CATT discussion Rel-15 NR_newRAT-Core
R2-1706449 Inactivity-based transition to a power efficient state Samsung discussion Rel-15 NR_newRAT-Core
R2-1706632 Multiplexing NAS messages with MSG3 Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706693 Timer-Based Inactivation for NR InterDigital discussion Rel-15 NR_newRAT-Core
R2-1706723 State transition between RRC CONNECTED and INACTIVE Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706725 State transition from INACTIVE to IDLE Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706726 UE behaviour upon leaving RRC_CONNECTED state Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706878 Consideration on the triggers of transiting UE from INACTIVE to IDLE Beijing Xiaomi Mobile Software discussion Rel-15
=> *Revised to R2-1707458*
R2-1707458 Consideration on the triggers of transiting UE from INACTIVE to IDLE Beijing Xiaomi Mobile Software discussion Rel-15
R2-1706930 Discussion on RRC State Transition between Connected and Inactive ITRI discussion NR_newRAT-Core
R2-1706967 UE AS context retrieve failure vivo discussion Rel-15 NR_newRAT-Core
R2-1707084 Discussion on UE release from INACTIVE to IDLE Guangdong OPPO Mobile Telecom. discussion Rel-15 NR_newRAT-Core
R2-1707088 Generic Access Barring MediaTek Inc. discussion
R2-1707228 Mechanism design to avoid unnecessary inter-gNB mobility upon state transitions in NR ASTRI, TCL Communication Ltd. discussion
R2-1707233 RRC Connection establishment procedures Nokia discussion Rel-15 NR_newRAT-Core
R2-1707240 RRC connection release and inactivation procedures Nokia discussion Rel-15 NR_newRAT-Core
R2-1707341 RAN2 consideration on control plane latency enhancement Samsung Electronics Co., Ltd discussion
R2-1707362 Information to include within RRC Activation and Inactivation Samsung Electronics discussion
R2-1707435 Draft LS to RAN1 on MSG3 size Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1707436 Consideration on RRC connection establishment procedure Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1707441 RRC support of Multiple numerologies Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

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10.4.1.4 RRM measurements

10.4.1.4.1 Measurement model

Including output from email discussion [98#31][NR] Measurement model TP (Samsung)
Maximum 1 tdoc per company

R2-1706807 Email discussion summary for capturing TP on RRM Model Samsung India report

- MediaTek think the beam filtering part should be included but wonder if each beam needs to be filtered meaning more have to be filtered than actually needed for reporting.
- Samsung think the beams for cell quality derivation and report are different.
- Intel think the beam filtering is needed.
- LG think the beam reporting can be excluded
- Nokia think this figure is the best option discussed in the email but prefer the beam filtering also used for cell quality derivation. Huawei have the same view as Nokia.
- Vivo also think it should be shown in the model. Qualcomm also support to show the beam filtering.
- Nokia think the filter could also be used for beam management.

=> We will keep the beam filtering part in the model.
=> Use the term "L3 beam filtering"
=> Agreed in R2-1707480 (with above agreements captured)

R2-1707310 NR RRM measurement model Samsung Electronics discussion
P2

- Nokia wonders on what basis the UE selects beams to filter. Samsung think it could just be the detected beams. and prefer that k would be less than the number of detected beams.
- Huawei think it cannot be completely up to UE implementation. Ericsson think this may be more of a RAN4 issue.
- Samsung explain the intent was that k could be larger than N and X but smaller than number of detected beams

=> Topics of number of the k beams that are filtered can be left to RAN4

R2-1706486 Consistent viewpoint on Measurement Model for NR Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core
R2-1706664 Discussion on measurement model ZTE CORPORATION discussion Rel-15 NR_newRAT-Core
R2-1706727 NR mobility measurement model Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1707285 TP for 38.300 on NR measurement model Ericsson discussion Rel-15 NR_newRAT-Core

10.4.1.4.2 Cell quality derivation

If any further aspects to discuss, including FFS point from last meeting
Maximum 1 tdoc per company

R2-1707324 Cell Quality Derivation: Absolute or Relative Threshold? Samsung, NEC, CATT, KT, NTT DOCOMO discussion

Proposal: To derive a cell quality from multiple beams, the relative threshold-based approach is more suitable than the absolute threshold-based approach. Accordingly, RAN2 should adopt the cell quality derivation based on the relative threshold.

R2-1707284 On the need for thresholds in cell quality derivation Ericsson discussion Rel-15 NR_newRAT-Core

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Proposal 2 Cell quality should be derived by averaging the best beam with the N-1 best beams where N is network configured i.e. no threshold needs to be configured.

R2-1706661 Remaining issues on cell quality derivation from N beams ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

- Discussion jointly with previous 2 papers
- MediaTek there will anyway be a threshold due to the detectability threshold of the beams. If companies don't like the threshold they don't need to configure it.
- Ericsson wonder why we need a second threshold and that configuring an absolute threshold is not a compromise. Nokia agree with Ericsson.
- Vodafone think the threshold is difficult to set.
- AT+T think that it is very difficult to set the threshold based on early experience with beam based systems.
- DOCOMO think that having a threshold is not needed and have a threshold is unnecessary specification work.
- ATT think it would be useful to ask RAN4 whether the threshold can be set same as the detectability threshold and the range of values should allow this.

Show of hands

1/ In favour of confirming working assumption 15

2/ No in favour of confirmation the working assumption 8

Show of hands on 3 options

1/ Cell quality should be derived by averaging the best beam with the N-1 best beams (no additional threshold) [6] [not acceptable for 6]

2/ Cell quality should be derived by averaging the best beam with the up to N-1 best beams above absolute configured threshold (working assumption with addition to address the case that no beam above the absolute threshold) [14] [not acceptable for 2]

3/ Cell quality should be derived by averaging the best beam with the up to N-1 best beams above relative configured threshold [3] [not acceptable for 3]

Agreement
1 Cell quality should be derived by averaging the best beam with the up to N-1 best beams above absolute configured threshold.

R2-1706401 N and Threshold for cell quality derivation CATT discussion Rel-15 NR_newRAT-Core
R2-1706439 Discussion on Remaining Issues about Cell Quality Derivation OPPO discussion
R2-1706488 Connected mode Cell Quality in NR – open points Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core
R2-1706621 Deriving Cell Quality Using Linear Average or Sum of Beam Measurements Sony discussion Rel-15 NR_newRAT-Core
R2-1706661 Remaining issues on cell quality derivation from N beams ZTE CORPORATION discussion Rel-15 NR_newRAT-Core
R2-1706728 Remaining issues on cell quality derivation Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706915 Remaining issues of cell quality derivation Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core
R2-1706918 How to select good beams for cell quality derivation LG Electronics Inc. discussion Rel-15 NR_newRAT-Core
R2-1707000 Value of N for Cell Quality Derivation CMCC discussion Rel-15 NR_newRAT-Core

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10.4.1.4.3 Measurement report content

Including output from email discussion [98#32][NR] Measurement report content (Intel)
Maximum 1 tdoc per company

R2-1707013 Report of email discussion [98#32][NR] Measurement report content Intel Corporation discussion Rel-15 NR_newRAT-Core

Agreements

1: Measurement report includes the measurement identity of the associated measurement configuration that triggered the reporting

2: Cell measurement quantities can be included in the measurement report. RAN1 to confirm the cell measurement quantities to be supported.

3: The cell measurement quantities to be included in the measurement report are configurable by the network

4: maxReportCells is supported to indicate the maximum number of non serving cells to be reported by the UE (as in LTE)

5: For event triggered reporting:

- PCell and SCells cell quality are always included in the measurement report
- Include cells in the cellsTriggeredList in the measurement report (same as LTE)

FFS cells to be included according to cellsTrigeredList to be clarified

6 Blacklisted cells, if provided, are not used in event evaluation and reporting (as in LTE)

7 If whitelisted cells are provided, only whitelisted cells are used in event evaluation and reporting (as in LTE)

8 Beam measurement (based on NR-SS and CSI-RS) can be included in the measurement report and can be configured by the network (i.e. network configures the UE to report beam identifier only, beam measurement result and identifier, or no beam reporting)

9: Measurement quantities can be configured by the network for beam measurement reporting. RAN1 to confirm the measurement quantities to be supported.

FFS Whether the cell and beam measurement quantities to be reported need to be consistent.

10: For selection of x SS blocks to be included in the measurement report for each cell:

- x can be configured separately from N (N used in cell quality derivation)

FFS how to select the up to x SS blocks to be included

11: For cell events (A1 to A6 events), selection of y CSI-RS resource to be included in the measurement report for each cell:

- y can be configured separately from N (N used in cell quality derivation)

FFS how to select the up to y CSI-RS resource to be included

FFS measurement report content for Cx events

FFS whether to include the cell quality derived from NR-SS for the same cell to be included in a measurement report triggered based on CSI-RS, if the NR-SS measurement is available

R2-1707460 Report of email discussion [98#32][NR] Measurement report content Intel Corporation discussion Rel-15 NR_newRAT-Core

R2-1706490 On the role of beam-related content in NR measurement reporting Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1706729 Measurement reporting for NR SS and CSI-RS Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706895 Discussion on measurement report ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1706914 Remaining issues of NR measurement reports Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

R2-1706922 Measurement report content LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1707286 Remaining open issues on measurement reporting in NR Ericsson discussion Rel-15 NR_newRAT-Core

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R2-1707311 NR Measurement Report Contents Samsung Electronics discussion

10.4.1.4.4 Measurement configuration

Including output from email discussion [98#33][NR/Measurement configuration] (MediaTek)
Maximum 1 tdoc per company

R2-1706570 Report of email discussion [98#33][NR/Measurement configuration] MediaTek Inc. discussion NR_newRAT-Core

P2

- Samsung think we need a better structure for cases where we want something, such as whitelist, specifically applied to only certain measurements. Qualcomm agree with Samsung that whitelist should not be used for all measurements on a carrier.

P3

- Intel explain RAN1 have agreed that for idle SS burst set period is per frequency but for connected 2 SS burst set periodicity can be configured.

Agreements

1: In NR, each measurement identity links one measurement object with one reporting configuration. By configuring multiple measurement identities it is possible to link more than one measurement object to the same reporting configuration, as well as to link more than one reporting configuration to the same measurement object.

2: In NR, a list of 'blacklisted' cells can be configured as part of the measurement object.

3 A list of 'whitelisted' cells can be configured as in LTE

FFS Whether the whitelisted cells are part of the measurement object as in LTE or moved to some other part of the measurement configuration.

4 For NR-SS based RRM measurement, SS burst set periodicities can be configured.

FFS Maximum number of possible periodicities (1 or more) per carrier. To be concluded after considering LS from RAN1.

5: NR-SS configuration for CONNECTED UE can be provided by dedicated signalling.

6: CSI-RS measurement configuration is provided via dedicated signalling.

R2-1706581 Draft LS to RAN1 on RRM Measurement Configuration in NR MediaTek Inc. discussion NR_newRAT-Core

=> Noted

R2-1706622 S-measure for Connected Mode Measurements Sony discussion Rel-15 NR_newRAT-Core

R2-1706665 Measurement configuation in NR ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1706730 Measurement configuration and procedures for SS and CSI-RS Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706947 Measurement configuration Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706968 CSI-RS configuration for RRM measurement in RRC_CONNECTED state vivo discussion Rel-15 NR_newRAT-Core

R2-1707060 Signaling configuration for xSS Intel Corporation discussion Rel-15 NR_newRAT-Core

Late

R2-1707218 NR RRM measurement configuration Samsung Telecommunications discussion Rel-15

10.4.1.4.5 Measurement events

Any additional aspects of measurement events, including Cx events, etc

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R2-1706402 Introduction of events C1 and C2 CATT discussion Rel-15 NR_newRAT-Core

- Samsung ask why these events are needed. CATT explain they are for management of the CSI-RS resource set. Ericsson think that NR should support the same as LTE.
- MediaTek think this is needed for a cell with multiple TRP.
- Huawei think another way would be to use A4 / A5 to work on CSI-RS resource sets.
- OPPO support the proposal.
- Intel think this is needed for beam management and is similar to the motivation for LTE.
- Samsung think that for intra-cell there should be no RRC involvement.
- Qualcomm think this is not needed for RRM but if it is for beam management then do we need the L3 filter. LG think that beam management should be at lower layers.
- Nokia would also like to understand the motivation. If intra-cell beam management then there should be no RRC involvement. Intel think it is to manage the resources to be used for CSI reporting.

=> Noted

R2-1706487 On measurement events and the need of reportOnLeave Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1706331 Discussion on Additional Measurement Event for NR OPPO discussion

R2-1706444 Measurement report trigger condition Spreadtrum Communications discussion Rel-15

R2-1706623 Comparison of Cells with Different Numbers of Good Beams Sony discussion Rel-15 NR_newRAT-Core

R2-1706756 N-mismatch Problem in NR Measurement Events MediaTek Inc. discussion

R2-1706921 Required measurement report events in LTE and NR LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1706948 Measurement events Ericsson discussion Rel-15 NR_newRAT-Core

R2-1707219 Reconfiguration beam management CSI RS config upon intra-cell mobility Samsung Telecommunications discussion Rel-15

10.4.1.4.6 Inter-RAT measurements

Inter-RAT E-UTRA measurements for the purpose of inter-RAT handover from NR to -E-UTRA

R2-1706732 Events and measurements for handover from NR to E-UTRA Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706403 Inter-RAT measurement for NR CATT discussion Rel-15 NR_newRAT-Core

R2-1706671 Inter-RAT measurements for NR handover to EUTRAN ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

10.4.1.4.7 Measurement gaps

For intial discussion in RAN2 but may be difficult to progress without input from RAN4.

R2-1706332 Measurement Gap Configuration Considering the Beam Sweeping OPPO discussion

R2-1706445 Sliding measurement GAP Spreadtrum Communications discussion Rel-15

R2-1706565 Measurement gap considering SS block window in NR Fujitsu discussion Rel-15 NR_newRAT-Core

R2-1706613 Measurement gap for NR Samsung discussion Rel-15 NR_newRAT-Core

R2-1706677 Consideration on the measurement gap ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

R2-1706733 Measurement gaps and gap control information for SS and CSI-RS Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706734 Measurement gap coordination Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706757 Measurement Gaps in NR MediaTek Inc. discussion

R2-1706969 Discussion on measurement gap vivo discussion Rel-15 NR_newRAT-Core

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R2-1707207 Configuration of measurement gap in NR Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707229 Draft LS to RAN4 on need of measurement gaps Ericsson discussion Rel-15 NR_newRAT-Core

10.4.1.4.8 Other

Other RRM related aspects

R2-1707289 TP on measurements for TS 38.331 Ericsson discussion Rel-15 NR_newRAT-Core
- *moved from 10.4.1.1 to 10.4.1.4.8*

✉ **[NR-AH2#xx][NR/RRM] TP on RRM ()**
TP in R2-1707289 to be updated based on agreements from this meeting to be used as initial input and then progressed by email.
Intended outcome: Agreeable TP to be submitted to next meeting
Deadline: Thursday 2017-08-03

R2-1706428 RRM measurement bandwidth in NR Samsung discussion Rel-15
R2-1706429 RRM considerations for adaptive bandwidth in NR Samsung discussion Rel-15
R2-1706430 RRM measurement for multiple numerologies in NR Samsung discussion Rel-15
R2-1706602 Considerations on fast access inter-site small cells in NR Nokia, Alcatel-Lucent Shanghai Bell discussion
R2-1706717 Speed depent mobility for connected UEs Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1707237 Measurement configurations and signaling for fast setup Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707287 Effect of N>1 vs. N=1 for cell quality derivation Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707288 UE speed based measurement report parameter scaling in NR Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707312 NR CSI-RS configuration for L3 mobility Samsung Electronics discussion
R2-1707329 Discussion on s-Measure Considering NR-SS and CSI-RS Samsung Electronics discussion
R2-1707330 The Impact of Beam Sweeping on RRM Measurement Samsung Electronics discussion
R2-1707348 Definition of s-Measure for NR Convida Wireless discussion NR_newRAT-Core

10.4.1.5 System information

10.4.1.5.1 System information content/structure

Progress details of the content and structure of system information with initial priority on MIB and SIB1 that may be required for EN-DC operation

PBCH content

R2-1706751 Contents of NR-PBCH from RAN2 viewpoints NTT DOCOMO, INC. discussion Rel-15 NR_newRAT-Core
P1
- Ericsson think the area ID and value tag should be in MIB.
- Huawei think the cell id extension is not needed on SIB one. Think we should leave cell id extension to RAN1. Vodafone ask if the cell id extension is the same as the global cell id today. DOCOMO understand that RAN1 are referring to the physical cell id.
- Samsung understand that RAN1 are discussing the physical cell id extension. They assume 1000 cell can be represented by PCI and they are discussion how to go beyond 1000 but not

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clear on the motivation for doing this. Nokia think the motivation is to avoid PCI confusion and collision and ease the cell planning given the smaller cell size at high freq. MediaTek think it might be needed one day but not now.

- Vivo think the cell ID extension should be concluded in RAN1.
- AT+T confirm the discussion in RAN1 was about the physical cell id.

P2

- Samsung ask if the intent is to remove the cell barred bit from SIB1. DOCOMO propose to remove cell barred and IFRI bit from SIB1 and place in MIB.
- Ericsson think this will not be a common case and hence it can be in SIB1. For NSA there can be an indication in MIB that there is no SIB1 and hence the UE knows the cell is barred.
- Nokia ask if all the camping parameters would be in MIB. DOCOMO think the other camping parameters can remain in SIB1. This proposal is to address the NSA case.
- LG think the benefit is just a few ms to obtain SIB1. Prefer not to include in MIB.
- Vivo share the view of Ericsson. For NSA some indication is needed in MIB.
- Nokia think everyone agrees they something is needed in SIB that the cell is only for NSA.
- Samsung think the behaviour is the same for the cellBarred bit and an NSA indication in MIB. Qualcomm agreed with Samsung and support the proposal.
- Ericsson think the information could be implicit by the UE not detecting the SIB1. Qualcomm think this is the problem we try to avoid.
- Nokia wonder if NSA cells will eventually become SA cells. AT+T think NSA is an important use case for a long time. Support to have an explicit indication

Agreements

1 For cell ID extension we can indicate to RAN1 that RAN2 understand this to be referring to physical cell ID extension (i.e. not related to GCI) and RAN2 has not identified a RAN2 need for Cell ID extension and leave the discussion and final decision whether this is needed to RAN1. Can further indicate that there will be a GCI in SIB1. Can also indicate that adding such an extension in future releases would be possible but it would not be understood by legacy UEs.

2 There is some indication in MIB that a cell is not campable (at least to address the NSA cell case). If additional information is needed then at most this information would be 2 bits.

FFS whether the SIB1 presence flag (understood to be RMSI in RAN1's terminology) or omission of SIB1 scheduling information could be used for this purpose or an additional indicator (could be today's cellbarred bit) is needed.

FFS whether an intra-freq Reselection indicator would be useful in MIB.

3 RAN2 will let RAN1 conclude how much of SFN to include in MIB and RAN2 can further discuss how much additional SFN should be carried in a SIB. Can discuss more offline whether RAN2 have a preference for the minimum number of SFN bits that can be determined by reading MIB.

R2-1706493 Content of the NR Master Information Block (NR-MIB) Ericsson discussion Rel-15 NR_newRAT-Core

- OPPO support proposal 1.
- Samsung don’t see a need for a value tag for SIB1 as change in SIB1 will be indicated by paging
- Vivo see some benefit to include value and area but concerned about size.
- Huawei think that it is not useful for have a value tag for SIB1 as it will contain many cell specific content.
- MediaTek think that value tag is useful for cell specific SIBs.
- DOCOMO ask if we include in the MIB how is it set for NSA. Normally MIB will only include fields that are used for all deployments and not optional fields.
- Qualcomm don’t see value to have vale tag in MIB. Intel agree. Lenovo also don’t see a need for this to be included in MIB. LG also think it is not essential and think that the value tag size would need to be large due to frequent changes of any of the other messages. CMCC also think SIB1 will change more frequently and we should be careful with MIB size

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- CATT see some value to include this.
- Panasonic think if many value tags then SIB1 is better.

Agreement
1 RAN2 will indicate to RAN1 that no value tag/area related info will be included in MIB

=> Draft LS in R2-1707469 (Huawei, offline discussion 09)

R2-1707469 [DRAFT][LS to RAN1 to indicate that no value tag/area related info will be included in MIB] Huawei LS out Rel-15 NR_newRAT-Core To: RAN1

- Nokia thinks it is a dangerous message that RAN2 only care about the SIB1 scheduling. We should avoid cases where the UE needs to acquire SIB1 before it can determine SFN and perform various functions (e.g. handover).

=> For SFN we can say that we assume that the SFN that can be derived from the PBCH (including explicit and implicit bits) would be same as in LTE.

=> For HSFN we can just say not needed in PBCH.

=> Revised in R2-1707482

R2-1707482 [DRAFT][LS to RAN1 to indicate that no value tag/area related info will be included in MIB] Huawei LS out Rel-15 NR_newRAT-Core To: RAN1

=> Add "For NR, we will also have GCI in SIB1"

=> Approved LS in R2-1707490

R2-1706763	Discussion on PBCH content to reply RAN1 LS	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706404	Contents for Minimum SI	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1706494	Draft Reply LS on NR-PBCH content	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1706541	Content of NR-PBCH	MediaTek Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1706624	Barring Indication in MIB	Sony	discussion	Rel-15	NR_newRAT-Core
R2-1706694	Structure and Contents of NR MIB and NR SIB1	InterDigital	discussion	Rel-15	NR_newRAT-Core
R2-1706764	Draft reply LS on PBCH content to reply RAN1 LS	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706970	Draft Reply LS on PBCH content	vivo	LS out	Rel-15	NR_newRAT-Core RAN1
R2-1706971	NR PBCH Content	vivo	discussion	Rel-15	NR_newRAT-Core
R2-1707177	MIB contents	LG Electronics France	discussion	Rel-15	NR_newRAT-Core

Other

R2-1706830	Remaining aspects of Minimum System Information contents	Samsung India	discussion		
R2-1707438	SIBs needed for NSA	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706495	System information structure and contents	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1706580	System information handling in EN-DC	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1706762	Detailed design on the contents of System Information	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706956	Consideration on the content of minimal SI	ZTE CORPORATION	discussion	Rel-15	NR_newRAT-Core
R2-1707020	System information to be provided in NR	Intel Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1707320	Organization of System Information	Qualcomm Incorporated	discussion	Rel-15	NR_newRAT-Core

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R2-1707461 System Information for supporting the supplementary uplink (SUL) frequency CMCC Discussion

- *Late document*

10.4.1.5.2 Stored system information

Further details of stored SI including index/identifier format
Maximum 1 tdoc per company

R2-1707110 Necessity of Area ID for on-demand SI NTT DOCOMO, INC. discussion Rel-15 NR_newRAT-Core

R2-1706695 Details of Stored System Information for NR InterDigital discussion Rel-15 NR_newRAT-Core

R2-1706605 On structure of SI index MediaTek Inc. discussion

R2-1706673 Consideration on the stored other SI ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

- *moved from 10.4.1.5 to 10.4.1.5.3*

R2-1706405 Indexed SI in NR CATT discussion Rel-15 NR_newRAT-Core

R2-1706496 Stored and indexed system information Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706765 Area ID and value tag for SIBs Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706819 Signalling of System Information Area Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1706831 Index based approach and Stored SI Samsung India discussion

R2-1706919 Remaining open issues regarding index based SI LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1706946 Transmission of area ID and value tag for SI ITL discussion Rel-15

R2-1707096 Further on Index based SI distributions Lenovo, Motorola Mobility discussion NR_newRAT-Core

R2-1707203 The format of the SI index/identifier PANASONIC R&D Center Germany discussion Rel-15

R2-1707321 SI index/identifier Qualcomm Incorporated discussion Rel-15 NR_newRAT-Core

10.4.1.5.3 System information modification

Maximum 1 tdoc per company

R2-1706972 SI Change Notification vivo discussion Rel-15 NR_newRAT-Core

R2-1706528 System Information Update in NR Samsung Electronics Co., Ltd discussion Rel-15 NR_newRAT-Core

R2-1706333 Discussion on System Information Modification in NR System OPPO discussion

R2-1706406 SI change notification in NR CATT discussion Rel-15 NR_newRAT-Core

R2-1706497 Change of System Information in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706606 NR SI Update MediaTek Inc. discussion

R2-1706696 SI Modification Procedure for NR InterDigital discussion Rel-15 NR_newRAT-Core

R2-1706766 SI Update procedure Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706820 System Information Modification in NR Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1707184 System information modification LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1706672 Consideration on the system information modification ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

- *moved from 10.4.1.5 to 10.4.1.5.3*

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10.4.1.5.4 System information scheduling

Maximum 1 tdoc per company

R2-1706767 Considerations on System Information scheduling Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706529 SI Message TX/RX in NR Samsung Electronics Co., Ltd discussion Rel-15 NR_newRAT-Core

R2-1706334 Consideration on Scheduling of System Information OPPO discussion

R2-1706498 System information scheduling Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706822 Indication for On-Demand SI Broadcast Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1706952 Details of Other SI scheduling information ETRI discussion

R2-1707185 System information scheduling LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

10.4.1.5.5 On demand system information

[98#34][NR] On demand SI (Lenovo) [98#34][NR] On demand SI (Lenovo)
Including need for additional bit to indicate is SI message is actually being broadcast
Maximum 1 tdoc per company

R2-1707090 Summary of [98#34][NR] On demand SI (Lenovo) Lenovo, Motorola Mobility report Rel-15 NR_newRAT-Core

Agreements for Msg1 based SI request method:

1: RAPID is included in Msg2.

2: Fields Timing Alignment Information, UL grant and Temporary C-RNTI are not included in Msg2.

3: RACH procedure for SI requests is considered successful when Msg2 containing a RAPID corresponding to the transmitted preamble is received.

4: Msg2 reception uses RA-RNTI that corresponds to the Msg1 transmitted by the UE (details of RA-RNTI selection left to UP discussion)

5: UE retransmits RACH preamble according to NR RACH power ramping

6: Msg1 for SI request re-transmission is continued until reaching max preamble transmissions. Thereafter, a Random Access problem to upper layers is indicated. (depending on the NR RACH procedure design)

FFS: Upper layer actions when MAC reports Random Access problem. To be discussed in CP session.

7: Back off is applicable for Msg1 based SI requests but no special Back off subheader/ procedure is required.

Agreements for Msg3 based SI request method:

1: UE determines successful Msg3 based on reception of Msg4

FFS Details of the Msg4 content used to confirm successful Msg3. To be discussed initially CP.

2: Preamble(s) for SI request using Msg3 based Method are not reserved.

3: RRC signalling is used for SI request in Msg3.

FFS: RRC signalling how to indicate the requested SI/SIB details left to ASN.1 work.

5: Temporary C-RNTI received in Msg2 is used for Msg4 reception

R2-1707317 Consideration on on-demand SI TX request in NR Qualcomm Incorporated, Sony, NTT DOCOMO, INC., ZTE, Sanechips discussion Rel-15 NR_newRAT-Core

R2-1706335 Consideration on Remaining Issues of On-Demand SI OPPO discussion

R2-1706407 Additional indicator in support of on-demand SI Request CATT discussion Rel-15 NR_newRAT-Core

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R2-1706447 Additional indicator for on demand SI scheduling Spreadtrum Communications discussion Rel-15
R2-1706499 On-demand system information procedure Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706527 On Demand SI: Remaining Issues Samsung Electronics Co., Ltd discussion Rel-15 NR_newRAT-Core
R2-1706566 Multiple other SI requests in MSG1 Fujitsu discussion Rel-15 NR_newRAT-Core
R2-1706607 On-demand SI broadcast MediaTek Inc. discussion
R2-1706697 On Demand SI Request Procedure InterDigital discussion Rel-15 NR_newRAT-Core
R2-1706768 On demand SI acquisition and failure handling Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706824 SI Request and Delivery using Msg 3 Approach Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core
R2-1706854 Considerations on On-demand SI request ITL discussion
R2-1706872 Remain issues of on-demand SI Beijing Xiaomi Mobile Software discussion Rel-15
=> Revised to R2-1707456
R2-1707456 Remain issues of on-demand SI Beijing Xiaomi Mobile Software discussion Rel-15
R2-1706934 Discussion on Additional Bit to Indicate Broadcasted On-demand SI Shenzhen Coolpad Technologies discussion Rel-15 NR_newRAT-Core
R2-1706954 Further discussion on Other SI broadcast indication ETRI discussion
R2-1706973 On demand SI General Procedure vivo discussion Rel-15 NR_newRAT-Core
R2-1707092 Remaining Issues in On demand SI Request Lenovo, Motorola Mobility discussion NR_newRAT-Core
R2-1707180 On-demand SI delivery procedure LG Electronics Inc. discussion Rel-15 NR_newRAT-Core
R2-1707379 On demand SI request at RLAU NEC discussion Rel-15 NR_newRAT-Core

10.4.1.5.6 System information -other

Other system information related aspects

R2-1707243 Rapporteur Text Proposal to 38.331 on System Information Ericsson discussion Rel-15 NR_newRAT-Core
- moved from 10.4.1.1 to 10.4.1.5.6

✉ **[NR-AH2#xx][NR] TP on system information (Samsung or Ericsson)**
Starting from R2-1707243 add agreements from this meeting and then progress the TP by email,
Intended outcome: Agreeable TP to next meeting
Deadline: Thursday 2017-08-03

R2-1706352 On demand SI acquisition China Telecom Corporation Ltd. discussion NR_newRAT-Core
R2-1706500 System information content at network sharing Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706501 System Information validity Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706502 Encoding of broadcasted system information Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706503 Dedicated System Information Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706530 SFN based Broadcast TX at Higher Frequencies Samsung Electronics Co., Ltd discussion Rel-15 NR_newRAT-Core
R2-1706531 [DRAFT] LS on SFN based Broadcast Transmission Samsung Electronics Co., Ltd discussion Rel-15 NR_newRAT-Core
R2-1706769 Beam specific SI transmission Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

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R2-1706770 Assisted Delivery of Minimum SI Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706816 On supporting multiple modification periods in NR Samsung Research America discussion NR_newRAT-Core
R2-1706923 Other-SI request and acquisition in CONNECTED LG Electronics Inc. discussion Rel-15 NR_newRAT-Core
R2-1706974 Discussion on other SI request vivo discussion Rel-15 NR_newRAT-Core
R2-1707186 UE dedicated on-demand SI delivery in NR LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

10.4.1.6 Inactive state

Noting that details of procedures for state transitions involving inactive (e.g. RRC Connection Resume) are covered in be discussed in 10.4.1.3

10.4.1.6.1 RAN area configuration

Maximum 1 tdoc per company

R2-1706491 Discussion on RAN notification area configuration SHARP Corporation discussion Rel-15
R2-1706839 RAN based notification area Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core
R2-1706353 RAN area configuration China Telecom Corporation Ltd. discussion NR_newRAT-Core
R2-1706408 Open issues on RNA CATT discussion Rel-15 NR_newRAT-Core
R2-1706567 RAN based notification area configuration Fujitsu discussion Rel-15 NR_newRAT-Core
R2-1706735 RAN notification area configuration Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706758 RAN-based Notification Area in NR MediaTek Inc. discussion
R2-1706813 RAN notification area for NR Samsung discussion Rel-15 NR_newRAT-Core
R2-1707042 RAN notification area configuration Intel Corporation discussion Rel-15 NR_newRAT-Core
R2-1707137 RAN area configuration LG Electronics France discussion NR_newRAT-Core
R2-1707301 RAN area configuration aspects Ericsson discussion Rel-15 NR_newRAT-Core

10.4.1.6.2 RAN area update procedure

Maximum 1 tdoc per company

R2-1706358 RAN-based Notification Area Update for RRC_INACTIVE UEs MTI discussion
R2-1706409 Periodic RNA update procedure CATT discussion Rel-15 NR_newRAT-Core
R2-1706698 RAN Location Area Update Procedure for NR InterDigital discussion Rel-15 NR_newRAT-Core
R2-1706736 Discussion on CN location Update and RNA Update for inactive state Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1707143 Remaining FFS about RAN area update procedure LG Electronics France discussion NR_newRAT-Core
R2-1707299 RAN area update in RRC_INACTIVE Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706674 Consideration on Ran area update procedure ZTE CORPORATION discussion Rel-15 NR_newRAT-Core

- *Moved from 10.4.1.6 to 10.4.1.6.2*

10.4.1.6.3 Paging in inactive

RRC procedure to respond to paging, including any differences between RAN and CN paging

R2-1706410 procedure of paging in inactive CATT discussion Rel-15 NR_newRAT-Core

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R2-1707044	RAN-initiated paging details	Intel Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1706737	RAN initiated paging	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1707145	CN-initiated paging for a UE in RRC_INACTIVE	LG Electronics France	discussion		NR_newRAT-Core
R2-1707183	RAN paging DRX in RRC_INACTIVE	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1707302	Paging in RRC_INACTIVE	Ericsson	discussion	Rel-15	NR_newRAT-Core

Late

R2-1707444	Further considerations on the CN and RAN paging	Samsung	discussion	Rel-15	NR_newRAT-Core

10.4.1.6.4 Inactive - other

Other inactive state related aspects

R2-1707045	Inactive and dual connectivity	Intel Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1706837	Consisten support of RRC_INACTIVE	Nokia, Alcatel-Lucent Shanghai Bell	discussion	Rel-15	NR_newRAT-Core
R2-1706897	Call type or establishment cause for NR access control	ZTE CORPORATION	discussion	Rel-15	NR_newRAT-Core

- *Moved from 10.4.1.6 to 10.4.1.6.4*

R2-1706504	RAN sharing and identifier aspects in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1706738	Inter-RAT mobility for inactive UE	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706739	Support of Redistribution priority in NR	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706814	Inter-RAT mobility in the RRC INACTIVE state	Samsung	discussion	Rel-15	NR_newRAT-Core
R2-1706829	PLMN Selection in RRC INACTIVE state	Samsung India	discussion		
R2-1706881	RRC_INACTIVE Principles	Qualcomm Incorporated	discussion		
R2-1706888	Unified RRC connection control procedure	Qualcomm Incorporated	discussion		
R2-1706975	DRX configuration for Inactive UE	vivo	discussion	Rel-15	NR_newRAT-Core
R2-1707043	NAS/AS interaction when resuming	Intel Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1707054	Cell reselection for inactive UEs	Intel Corporation	discussion	Rel-15	NR_newRAT-Core
R2-1707146	Handling of radio bearers and security for data transmission in RRC_INACTIVE	LG Electronics France	discussion	Rel-15	NR_newRAT-Core
R2-1707147	Offloading UEs in RRC_INACTIVE	LG Electronics France	discussion		
R2-1707293	Mobility between LTE and NR for inactive Ues	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1707295	TP to 38.331 on RRC states	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1707300	CN area updating in RRC_INACTIVE	Ericsson	discussion	Rel-15	NR_newRAT-Core

10.4.1.7 Access control

Continue to progress unified access control

R2-1707483

=> Noted

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R2-1706821 On Access Category for NR Access Barring NTT DOCOMO INC. discussion NR_newRAT-Core

R2-1706983 Access Barring in NG-RAN Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

- *Moved from 10.4.1.6 to 10.4.1.7*

R2-1706818 NR access control Samsung Research America discussion NR_newRAT-Core

R2-1706890 Unified Access Control in different RRC Modes Qualcomm Incorporated discussion

R2-1706984 Access Control applicability to different RRC states Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

- *Moved from 10.4.1.6 to 10.4.1.7*

R2-1706993 Unified Access Control for NR CMCC discussion Rel-15 NR_newRAT-Core

R2-1706340 Discussion on access control in NR OPPO discussion Rel-15 NR_newRAT-Core

R2-1706411 Access control mechanism in NR CATT discussion Rel-15 NR_newRAT-Core

R2-1706505 Access Control for NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706506 Access Control for RRC_CONNECTED Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706507 Access Control for RRC_INACTIVE Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706508 Unified Access Control Assessment Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706509 Signalling of Access Control Parameters Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706510 Default access control categories Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706511 Establishment causes for NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706771 Basic Access Control in NR Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706772 RRC Establishment Cause Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706773 Access Control for MT Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core

R2-1706836 Measurement gaps in NR Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

R2-1707046 5G access control mechanism Intel Corporation discussion Rel-15 NR_newRAT-Core

R2-1707135 Access category based access barring mechanism for RRC_CONNECTED LG Electronics France discussion Rel-15 NR_newRAT-Core

R2-1707138 Access category based access barring for RRC_IDLE and RRC_INACTIVE LG Electronics France discussion Rel-15 NR_newRAT-Core

R2-1707181 PWS support for NR LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1707182 Random Access Backoff and Access Barring LG Electronics Inc. discussion Rel-15 NR_newRAT-Core

R2-1707244 DRAFT LS on Establishment Causes and Call Types in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706985 Congestion Control for RRC_CONNNECTED Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core

- *Moved from 10.4.1.6 to 10.4.1.7*

10.4.1.8 Other

Other RRC related aspects

R2-1706431 Numerology configuration in NR Samsung discussion Rel-15

R2-1706512 Wait Timer in NR Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706701 RRC processing delays in NR and EN-DC Ericsson discussion Rel-15 NR_newRAT-Core

R2-1706885 RRC signalling to support LTE+NR Co-existence Samsung India discussion

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R2-1706913 NR forward compatibility issue for CSG LG Electronics discussion Rel-15
R2-1707009 Control of UE beamforming in RRC_CONNECTED ASUSTEK COMPUTER (SHANGHAI) discussion NR_newRAT-Core
R2-1707144 Configurable cause for NR LG Electronics France discussion Rel-15 NR_newRAT-Core
R2-1707363 UE Assistance Information for energy efficiency enhancement Samsung Electronics discussion

10.4.2 Idle/inactive mode procedures

10.4.2.1 TS

Latest 38.304, other rapporteur inputs, anything related to specification methodology. Please submit any new text proposals to the appropriate agenda item.

R2-1707392 New Generation Radio Access Network; User Equipment (UE) procedures in Idle mode Qualcomm Incorporateddraft TSRel-15 38.304 0.0.3 NR_newRAT-Core

10.4.2.2 Selection/reselection rules

Basic criteria and rules for cell selection and reselection
Maximum 1 tdoc per company

R2-1706740 Cell selection and reselection rules Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706760 Cell Selection and Reselection in NR MediaTek Inc. discussion
R2-1706841 Cell selection and reselection for NR IDLE - cell selection/reselection criteria Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core
R2-1707055 Further considerations for cell (re)selection Intel Corporation discussion Rel-15 NR_newRAT-Core
R2-1707278 Cell selection and re-selection criteria and measurement rules Ericsson discussion Rel-15 NR_newRAT-Core
R2-1707313 Cell Selection/Reselection in NR IDLE mode Samsung Electronics discussion
R2-1707395 Cell selection and reselection for NR Qualcomm Incorporateddiscussion
R2-1707447 Discussion on cell (re)selection while the beam number is less than N HTC Corporation discussion Rel-15 NR_newRAT-Core

10.4.2.3 Cell quality derivation

Derivation of cell quantity from beam measurements (including filtering and FFS points from previous meetings)
Maximum 1 tdoc per company

R2-1706413 Considerations on idle mode measurement CATT discussion Rel-15 NR_newRAT-Core
R2-1706743 Derivation of cell quality in IDLE/INACTIVE Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706840 Cell selection and reselection for NR IDLE - cell quality derivation Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT-Core
R2-1706898 Consideration on NR paging ZTE CORPORATION discussion Rel-15 NR_newRAT-Core
R2-1706976 Discussion on idle mode mobility vivo discussion Rel-15 NR_newRAT-Core
R2-1707056 Cell quality derivation for idle mobility Intel Corporation discussion Rel-15 NR_newRAT-Core

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R2-1707281	Cell quality derivation for Idle/inactive UE's	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1707314	Cell quality derivation for NR IDLE mode	Samsung Electronics	discussion		
R2-1707349	Cell Quality Derivation for Cell Reselection	Convida Wireless	discussion		NR_newRAT-Core

10.4.2.4 Service based reselection

Maximum 1 tdoc per company

R2-1706414	Service based cell reselection	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1706513	Service-based RAT/frequency selection in INACTIVE or in IDLE	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1706539	Cell Re-selection: Service Specific Frequency Prioritisation in NR	Samsung Electronics Co., Ltd	discussion	Rel-15	NR_newRAT-Core
R2-1706741	Service based camping	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706924	Service based reselection	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1707057	Service based cell reselection	Intel Corporation	discussion	Rel-15	NR_newRAT-Core

10.4.2.5 Selection/reselection - other aspects

Including, for example mobility states, speed dependent scaling, CSG (if supported), cell reservations, etc

R2-1706412	Service types in inactive Mode	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1706514	Cell Selection and Camping Limitations in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1706636	Camping in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1706742	Speed dependent mobility for idle mode	Huawei, HiSilicon	discussion	Rel-15	NR_newRAT-Core
R2-1706893	CSG Type Functionality for NR	Qualcomm Incorporated, Deutsche Telekom	discussion		
R2-1706925	Mobility state estimation in NR	LG Electronics Inc.	discussion	Rel-15	NR_newRAT-Core
R2-1706933	Idle Measurement Enhancement using UE speed	LG Electronics	discussion	Rel-15	
R2-1706977	Assistant information for idle measurement	vivo	discussion	Rel-15	NR_newRAT-Core
R2-1706978	Consideration on forward compatibilitiy	vivo	discussion	Rel-15	NR_newRAT-Core
R2-1707280	States' based cell reselection parameter scaling in NR	Ericsson	discussion	Rel-15	NR_newRAT-Core
R2-1707315	Speed dependant scaling of measurement related parameters in NR IDLE/ INACTIVE mode	Samsung Electronics	discussion		
R2-1707347	Cell Barring and Reservations for NR	Qualcomm Incorporated	discussion		

10.4.2.6 Idle/inactive paging

Including beam related aspects, response driven paging and calculation of paging occasion.

R2-1706341	Discussion on paging in NR	OPPO	discussion	Rel-15	NR_newRAT-Core
R2-1706349	Paging Occasion and Time Slot(s) Determination in NR	OPPO	discussion		NR_newRAT-Core
R2-1706415	Paging in multi-beam operation	CATT	discussion	Rel-15	NR_newRAT-Core
R2-1706432	Paging for wideband NR carrier	Samsung	discussion	Rel-15	
R2-1706515	DRX in idle state	Ericsson	discussion	Rel-15	NR_newRAT-Core

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R2-1706537 Paging in NR – Beamforming Aspects Samsung Electronics Co., Ltd discussion Rel-15 NR_newRAT-Core
R2-1706538 PO Determination for Paging Reception Samsung Electronics Co., Ltd discussion Rel-15 NR_newRAT-Core
R2-1706637 Paging delivery in NR Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706638 Response-driven paging to reduce beam sweeping overhead in NR Ericsson discussion Rel-15 NR_newRAT-Core
R2-1706699 Paging in High Frequency InterDigital discussion Rel-15 NR_newRAT-Core
R2-1706744 Paging mechanism with beam sweeping Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
R2-1706759 RAN-initiated Paging in NR MediaTek Inc. discussion
R2-1706761 Overhead Reduction for Paging in Multi-beam Operation MediaTek Inc. discussion
R2-1706860 Comparison of Different Solutions for Response Driven Paging Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT
R2-1706861 Configurable Paging Procedure for NR Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT
R2-1706862 Evaluation of Uplink Access using Paging Indicators Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-15 NR_newRAT
R2-1706882 Consideration on NR paging Qualcomm Incorporated discussion
R2-1706886 Use of multiple P-RNTIs for NR paging Qualcomm Incorporated discussion
R2-1707058 Calculation of paging occasion Intel Corporation discussion Rel-15 NR_newRAT-Core
R2-1707139 CN paging DRX in RRC_IDLE LG Electronics France discussion Rel-15 NR_newRAT-Core
R2-1707352 UE Assisted Paging Convida Wireless discussion Rel-15 NR_newRAT-Core

Withdrawn
R2-1706416 Paging repetition for NR CATT discussion Rel-15 NR_newRAT-Core
=> Withdrawn

10.4.3 UE capability specification

Note, this agenda item is ite,s related to specification structure and pinciples. UE capabilities for NSA and SA will take place in agenda item 10.2.6

10.4.3.1 TS

Latest 38.304, other rapporteur inputs, anything related to specification methodology.

R2-1706601 Ramifications of including ASN.1 for UE capabilities in 38.306 Nokia, Alcatel-Lucent Shanghai Bell discussion
R2-1707059 Open issues on TS38.306 Intel Corporation discussion Rel-15 NR_newRAT-Core
R2-1707386 Draft TS 38.306 v0.0.2 Intel Corporation (UK) Ltd discussion Rel-15 NR_newRAT-Core
R2-1707433 Handling of UE capability related parts in TS38.331 Huawei, HiSilicon discussion Rel-15 NR_newRAT-Core
- *Moved from 10.4.1.1 to 10.4.3.1*

11 Comebacks

This agenda item will be used during the meeting. No documents are supposed to be submitted by delegates.

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11.1 Breakout sessions

11.1.1 Report from user plane break-out session

R2-1707500 Report from user plane break-out Session, Vice-Chair (InterDigital)
CBF: Report from user plane break-out Session, Vice-Chair (InterDigital)
=> Approved

11.2 Main session

11.3 Email Discussions from main session

Deadline Thursday, 2017-07-06, 23:59 Pacific Time

Please request TDoc numbers for the following email discussions from MCC if not already indicated below

[NR-AH2#01][NR] LS to RAN4 on capability sharing (Nokia)
Intended outcome: Approved LS
Deadline: Thursday 2017-07-06
=> Approved in R2-1707505

[NR-AH2#02][NR UP] LS to SA2 on QoS – Huawei
- Provide agreements to SA2.
- Related to agreement 6 – ask SA2 about RAN awareness of the default QoS for the PDU session

Intended outcome: Approved LS
Deadline: Thursday 2017-07-06
=> Approved in R2-1707506

Deadline Thursday, 2017-07-13, 23:59 Pacific Time

Please request TDoc numbers for the following email discussions from MCC if not already indicated below

[NR-AH2#03][NR] TS 38.300 (Nokia)
Update TS based on agreements from this meeting
Intended outcome: Endorsed draft TS
Deadline: Thursday 2017-07-13
=> Agreeable in R2-1707748 (as v0.6.0)

[NR-AH2#04][NR] TS 37.340 (ZTE)
Update TS based on agreements from this meeting.
Any endorsed RAN3 TPs may alos be incorporated.
Discuss whether SN change for split bearer or bearer type change for one bearer will impact other bearers or not, and consider possible solutions for this case.
Intended outcome: Endorsed draft TS
Deadline: Thursday 2017-07-13
=> Agreeable in R2-1708080 (as v0.2.1)

[NR-AH2#05][NR UP] Running TS 38.321 – Samsung
Running TS capturing agreements
Intended outcome: Endorsed draft TS
Deadline: Thursday 2017-07-13
=> Endorsed in R2-1707510 (as v0.2.0)

[NR-AH2#06][NR UP] Running TS 38.322 – Mediatek

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Running TS capturing agreements
Intended outcome: Endorsed draft TS
Deadline: Thursday 2017-07-13
=> Endorsed in R2-1707508 (as v0.2.0)

[NR-AH2#07][NR UP] Running TS 38.323 – LG
Endorse running TS capturing agreements
Intended outcome: Endorsed draft TS
Deadline: Thursday 2017-07-13
=> Endorsed in R2-1707507 (as v 0.2.0)

[NR-AH2#08][NR UP] Running TS 37.324 – Huawei
Running TS capturing agreements
Intended outcome: Endorsed draft TS
Deadline: Thursday 2017-07-13
=> Endorsed in R2-1707509 (as v0.1.0)

Deadline Thursday, 2017-08-03, 23:59 Pacific Time

TDoc numbers for the following email discussions may be requested via 3GU tool

[NR-AH2#09][NR/] UE capabilities (Intel)
Progress the possible solutions for introducing per UE baseband capabilities separated from the band combinations and minimise per band combination signalling (i.e. related to agreement 5 for R2-1707021). Aim to decide the high level solution in August meeting.
Intended outcome: Report to next meeting
Deadline: Thursday 2017-08-03
=> Summary of the email discussion in R2-1708785 (not available).

[NR-AH2#10][NR] TP on baseline handover procedure (Huawei)
TP to update stage 2 based on agreements from this meeting.
Intended outcome: Agreeable TP to next meeting.
Deadline: Thursday 2017-08-03
=> TP provided in R2-1708873.

[NR-AH2#11][NR] Baseline handover procedure (Ericsson)
Progress details of the information to be carried over Xx and RRC for handover.
Intended outcome: Report to next meeting
Deadline: Thursday 2017-08-03
=> Summary of the email discussion in R2-1707860.

[NR-AH2#12][NR] RRCConnectionReconfiguration structure (Ericsson)
Progress the high level structure of the RRCConnectionReconfiguration message. Could also start to draft ASN.1 text.
Intended outcome: Report and possible TP to next meeting
Deadline: Thursday 2017-08-03
=> Summary of the email discussion in R2-1708036.
=> TP provided in R2-1708037.

[NR-AH2#13][NR/RRM] TP on RRM (Ericsson)
TP in R2-1707289 to be updated based on agreements from this meeting and then progressed by email.
Intended outcome: Agreeable TP to next meeting

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Deadline: Thursday 2017-08-03
=> Summary of the email discussion in R2-1707855.

[NR-AH2#14][NR] TP on system information (Samsung)
Starting from R2-1707243 add agreements from this meeting and then progress the TP by email,
Intended outcome: Agreeable TP to next meeting
Deadline: Thursday 2017-08-03
=> TP provided in R2-1709494.

[NR-AH2#15][NR UP] LCP - Mediatek
- Discuss parameters needed to be visible to the MAC and purpose
- Options for processing order of grants
- Modelling options if possible (second/third phase)

Intended outcome: Report to next meeting
Deadline: Thursday 2017-08-03
=> Summary of the email discussion in R2-1709538.

[NR-AH2#16][NR] Bearer type change (Huawei)
Discuss whether SN change for split bearer or bearer type change for one bearer will impact other bearers or not, and consider possible solutions for this case.
Intended outcome: Report to next meeting
Deadline: Thursday 2017-08-03
=> Summary of the email discussion in R2-1709623.

12 Outgoing LSs

Draft LSs should be submitted to their corresponding agenda item if there is one. If there is no appropriate agenda item, draft LSs may be submitted to this agenda item.

13 Any other business

14 Closing of the meeting (20:00)

The meeting was closed at 20:25 by the chairman.

Annex A: List of participants

RAN2 NR AdHoc#2 participants list: http://webapp.etsi.org/3GPPRegistration/fViewPart.asp?mid=18514
Total number of participants: 195 (registered 291)

Annex B: List of Tdocs

The list of tdocs of RAN2 NR AdHoc#2 is attached to this report.
The total number of tdocs was 1212 of which 1192 tdocs were available.

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Annex C:
Incoming liaison statements for TSG RAN2 NR AdHoc#2

TDoc	Title	Source	Status	Rel	Related WIs	To	Cc	Original LS
R2-1706302	LS on RAT restriction in 5GS (C1-172642; contact: Qualcomm)	CT1	noted	Rel-15	5GS_Ph1-CT	SA1, SA2	RAN2	C1-172642
R2-1706303	LS on default access categories (C1-172663; contact: Intel)	CT1	noted	Rel-15	FS_NR_newRAT, 5GS_Ph1-CT	SA1	RAN2, SA2	C1-172663
R2-1706304	LS on NR-PBCH content (R1-1709789; contact: Ericsson)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1709789
R2-1706305	Reply LS on power sharing mechanism between LTE and NR (R1-1709790; contact: NTT DOCOMO)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN4	RAN2	R1-1709790
R2-1706306	LS on UL data transmission without UL grant for NR (R1-1709805; contact: Huawei)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2		R1-1709805
R2-1706307	Reply LS on the feasibility of DC-related mobility enhancements in NR (R1-1709809; contact: Intel)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2	RAN4	R1-1709809
R2-1706308	LS on the support of supplementary uplink in NR (R1-1709843; contact: CMCC)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2, RAN4		R1-1709843
R2-1706309	Reply to LS on Dual Connectivity with 5GC (R3-172004; contact: Ericsson)	RAN3	noted	Rel-15	5GS_Ph1	SA2, RAN2		R3-172004
R2-1706310	Response LS on RAN2 LTE-NR interworking procedure related conclusions (R3-172013; contact: Huawei)	RAN3	noted	Rel-15	NR_newRAT-Core	RAN2		R3-172013
R2-1706311	Reply LS on the need for EPS Bearer ID knowledge in NG-RAN for (inter-RAT) inter-system handover (R3-172028; contact: Intel)	RAN3	noted	Rel-15	5GS_Ph1	SA2	RAN2	R3-172028
R2-1706312	Reply LS on Emergency Support in NR (RP-171434; contact: T-Mobile)	RAN	noted	Rel-15	NR_newRAT-Core	SA2	SA, RAN1, RAN2, RAN3	RP-171434
R2-1706313	Reply LS on Closed Subscriber Group in 5GS RP-171479; contact: Qualcomm)	RAN	noted	Rel-15	SMARTER, NR_newRAT	SA1, RAN2	SA2, SA3, RAN3	RP-171479
R2-1706314	Reply LS on UE categories for NR and LTE-NR Dual Connectivity (RP-171480; contact: NTT DOCOMO)	RAN	noted	Rel-15	NR_newRAT-Core	RAN2, RAN1	RAN4	RP-171480
R2-1706315	LS on NR Edge Computing (RP-171497; contact: Nokia)	RAN	noted	Rel-15	NR_newRAT-Core	SA2	SA, RAN2, RAN3	RP-171497
R2-1706316	Request to update maximum data rate values in EPS (S2-173685; contact: Vodafone)	SA2	noted	Rel-15	5GS_Ph1, EDCE5	RAN3, CT4, CT1, CT3, SA5	SA1, RAN2	S2-173685
R2-1706317	LS on Emergency Support in NR (S2-173700; contact: Nokia)	SA2	noted	Rel-15	5GS_Ph1	RAN	SA, RAN1, RAN2, RAN3	S2-173700
R2-1706318	Response LS regarding RAN support for NW slicing	SA2	noted	Rel-15	NR_newRAT	RAN3, RAN2	CT1	S2-174051

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	(S2-174051; contact: Nokia)							
R2-1706319	SA2 RRC INACTIVE assumptions (S2-174075; contact: Qualcomm)	SA2	noted	Rel-15	5GS_Ph1	RAN2, RAN3		S2-174075
R2-1706320	Reply LS on actions for integrity check failure on SgNB (S3-171484; contact: Huawei)	SA3	noted	Rel-15	NR_newRAT-Core	RAN2		S3-171484
R2-1706321	LS on algorithm selection in E-UTRA-NR Dual Connectivity (S3-171485; Qualcomm)	SA3	noted	Rel-15	EDCE5	RAN2	CT1	S3-171485
R2-1707449	LS on Support for fake gNB detection mechanisms (S3-171568; contact: Nokia)	SA3	noted	Rel-15	NR_newRAT-Core	RAN1, RAN2, RAN4		S3-171568
R2-1707477	LS on non-contiguous CA (R1-1711825; contact: AT&T)	RAN1	noted	Rel-15	NR_newRAT-Core	RAN2, RAN4		R1-1711825
R2-1707488	LS on Single UL transmission (R1-1711878; contact: NTT DOCOMO)	RAN1	available	Rel-15	NR_newRAT-Core	RAN2, RAN3, RAN4		R1-1711878
R2-1707489	LS on Beam Aspects of NR RACH (R1-1711880; contact: Huawei)	RAN1	available	Rel-15	NR_newRAT-Core	RAN2		R1-1711880

24 incoming LS, of which 22 were noted.

Annex D:
Outgoing liaison statements of TSG RAN2 NR AdHoc#2

TDoc	Title	Release	Related WIs	To	Cc
R2-1707464	LS on changing the Neighbour cell Relation acronym to “NCR” (To: SA5, RAN3)	Rel-15	NR_newRAT-Core	SA5, RAN3	
R2-1707490	Reply LS on PBCH content	Rel-15	NR_newRAT-Core	RAN1	
R2-1707496	Reply LS on algorithm selection in E-UTRA-NR Dual Connectivity	Rel-15	EDCE5	SA3, CT1	
R2-1707498	LS reply on NR security input parameters	Rel-15	NR_newRAT-Core	SA3	
R2-1707499	Reply LS to RAN1 on UL data transmission without UL grant for NR	Rel-15	NR_newRAT-Core	RAN1	
R2-1707501	LS to SA3 on security keys in EN-DC and actions upon DRB IP check failure	Rel-15	NR_newRAT-Core	SA3	
R2-1707502	LS to RAN3 on MN-initiated SN change for delta signalling	Rel-15	NR_newRAT-Core	RAN3	
R2-1707503	LS to RAN1 on NR basic handover	Rel-15	NR_newRAT-Core	RAN1	
R2-1707504	LS to RAN1 on Random Access	Rel-15	NR_newRAT-Core	RAN1	
R2-1707505	LS on shared baseband capabilities for MR-DC	Rel-15	NR_newRAT-Core	RAN4	RAN1
R2-1707506	LS on default DRB establishment for PDU session	Rel-15	NR_newRAT-Core	SA2	RAN3

11 outgoing LS.

Annex E:
List of agreed CRs

No CRs were agreed in this AdHoc meeting.

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TDoc	Title	Source	Rel	Spec	Related WIs	CR	Rev	Ca

Annex F: History

Document history		
Date	**TSG RAN WG2 Tdoc**	**Subject**
19.07.2017	-	Draft report v1
20.08.2017		Draft report v2
21.08.2017	R2-1707602	Final version submitted to RAN2#99 for approval
		Author: **Dr. Juha Korhonen** ETSI Mobile Competence Centre (MCC) Tel. +33 (0)4 92 94 42 00 email: Juha.Korhonen@etsi.org

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Appendix 27



3GPP_TSG_RAN_WG2 Archives

June 2017, Week 2

New in LISTSERV 17.0 ×

3GPP_TSG_RAN_WG2@LIST.ETSI.ORG

Options: Use Monospaced 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: Re: [98#25][NR] TS 38.300 (Nokia)
From: "Sebire, Benoist (Nokia - JP/Tokyo)" <benoist.sebire@NOKIA.COM>
Reply To: Sebire, Benoist (Nokia - JP/Tokyo)
Date: Sun, 11 Jun 2017 22:05:22 +0000
Content-Type: multipart/mixed
Parts/Attachments: text/plain (7 kB) , text/html (36 kB) , R2-1706206.zip (3 MB)

Petitioners' Exhibit 1008, p. 773
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Dear Chandrika and Riikka,

Many years ago a RAN2 chair declared that in RAN2 meetings, we do not say when we support something, only when we disagree. I will therefore consider your silence as support for the proposals below ☺

Please find attached version 0.4.1 of the TS.

This concludes the email discussion – thank you.

Regards,
Benoist

From: "Sebire, Benoist (Nokia - JP/Tokyo)" <benoist.sebire@NOKIA.COM>
Reply-To: "Sebire, Benoist (Nokia - JP/Tokyo)" <benoist.sebire@nokia.com>
Date: Friday 9 June 2017 8:46
To: "3GPP_TSG_RAN_WG2@LIST.ETSI.ORG" <3GPP_TSG_RAN_WG2@LIST.ETSI.ORG>
Subject: Re: [98#25][NR] TS 38.300 (Nokia)

Dear Chandrika and Riikka,

As instructed by the Chairman for quite a few meetings now, "Please **provide comments on the first version of the document at least 24h before the deadline**. " – late comments do not help anyone. So please next time, for the sake of progress (giving everyone a chance to review your comments and my corresponding update), give your comments earlier – thank you.

CATT:

1. Since subclause 7.3 already describes those two methods and since we typically do not capture what we do not do, I did not think we needed anything new in the Stage 2 to reflect that agreement → no changes unless you had any particular update in mind?
2. I misread agreement 4 as applying to INACTIVE as well → my mistake, I will put INACTIVE as FFS

Ericsson:

1. You are right, I should have checked the agenda item where the agreement was captured → agreement moved to 9.2.4, but without the mention "working assumption" as everything can always be discussed based on inputs – even frozen releases :-)
2. I intentionally left the other agreements out from the Stage 2 as I considered them more Stage 3.

Please find attached a draft update.

Regards,
Benoist

From: Riikka Susitaival <riikka.susitaival@ERICSSON.COM>
Reply-To: Riikka Susitaival <riikka.susitaival@ERICSSON.COM>
Date: Thursday 8 June 2017 23:01
To: "3GPP_TSG_RAN_WG2@LIST.ETSI.ORG" <3GPP_TSG_RAN_WG2@LIST.ETSI.ORG>
Subject: Re: [98#25][NR] TS 38.300 (Nokia)

Hello Benoist,

We were also in understanding that DL is 8th of June pacific time.

Anyhow, there are few comments:

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For measurement, in our understanding, there was working assumption made for RRM measurements in connected mode:

- Agreements for combining of beam measurements if N > 1:
- 1 Averaging will be based on power values (i.e. not dBm values)
- Working assumption: Average of up to best N of the detected beams above absolute threshold

So is the following text in wrong place (or we have missed some other agreement):
In multi-beam operations, the measurement quantity of a cell is derived amongst the detected beams corresponding to that cell: averaging (based on power values) of up to the N best beams above an absolute threshold.

We could also add a note to state that this is still working assumption.

In general, we think that there are quite many agreements achieved for RRM measurements. Some of those could be captured in Stage-2 but we may can discuss more in the next meeting (we can provide TP).

Then we note that for System info, there were some agreements about value tag and area ID. We wonder if the general idea of area ID could be captured also in Stage-2.

Regards,
Riikka

From: Chandrika [mailto:chandrika@CATT.CN]
Sent: 8. kesäkuuta 2017 12:52
To: 3GPP_TSG_RAN_WG2@LIST.ETSI.ORG
Subject: Re: [98#25][NR] TS 38.300 (Nokia)

Dear Benoist,

Thank you for update of the TS.
The deadline for the discussion is today (2017-06-08) right?
We have a couple comments as below. As you have already provided the final version, you could take these points in to account in the next update during the meeting.

1). The below agreement on SI may not have reflected in the stage-2.

> Agreements
> 1 Only progress on the two agreed approaches for delivering on-demand system information (via dedicated signalling to RRC_CONNECTED UEs; via SI-Message broadcast to RRC_IDLE and RRC_INACTIVE UEs) and refrain from introducing additional solution variants.

2). In section 7.4, it is indicated that: In RRC_IDLE and RRC_INACTIVE, the UE NAS tells RRC the access category and the Connection Request includes some information to enable the gNB to decide whether to reject the request

It is FFS for RRC_Inactive

> Agreements
> 1 RAN2 aims that the 5G AC mechanism for a UE in RRC_IDLE is applicable to a UE in RRC_INACTIVE.
> FFS if any aspects may not be applicable or may need to be changed for RRC_INACTIVE relative to RRC_IDLE (to be addressed by both CT1 and RAN2).
> 2 RAN2 aims to define the 5G AC mechanism for a UE in RRC_CONNECTED. Details FFS
>
> 3 UE NAS provides the access category information to UE RRC layer for RRC_IDLE

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FFS for RRC_INACTIVE

4 Connection Request will include some information to enable the gNB to decide whether to reject the connection request
FFS whether the information that is included is e.g. provided by NAS, derived from the AC, etc
FFS for RRC_INACTIVE

Best regards
Chandrika

From: Sebire, Benoist (Nokia - JP/Tokyo) [mailto:benoist.sebire@NOKIA.COM]
Sent: Thursday, June 08, 2017 8:06 AM
To: 3GPP_TSG_RAN_WG2@LIST.ETSI.ORG
Subject: Re: [98#25][NR] TS 38.300 (Nokia)

Dear All,

Now that the deadline has passed, please find attached the final version 0.3.1 of 38.300.

Two minor editorial corrections highlighted in yellow for convenience.

Regards,
Benoist

From: "Sebire, Benoist (Nokia - JP/Tokyo)" <benoist.sebire@NOKIA.COM>
Reply-To: "Sebire, Benoist (Nokia - JP/Tokyo)" <benoist.sebire@nokia.com>
Date: Wednesday 7 June 2017 9:59
To: "3GPP_TSG_RAN_WG2@LIST.ETSI.ORG" <3GPP_TSG_RAN_WG2@LIST.ETSI.ORG>
Subject: Re: [98#25][NR] TS 38.300 (Nokia)

Dear All,

Please find attached a minor update capturing some comments received:

Nokia

1. agreements on access control missing → added to 7.4
2. agreement on TM mode for SRB 0 was captured in a confusing manner → clarification added in section 6.3.1 to exclude TM modes for other SRBs

Intel

1. Spelling mistake in 4.3.1.1 → corrected
2. Agreement related to DRX for RAN paging missing → captured in 7.2
3. 9.2.2 RRC_ACTIVE should be changed to RRC_CONNECTED → corrected
4. Suggestion to remove "*Handover signalling procedures adopt the same principle as Rel-13 E-UTRAN as specified in TS 36.300 [2].*" as it is obvious from the rest of the section and may turn out to be a problematic statement in later releases → removed

Corresponding changes have been highlighted in yellow for convenience.

Regards,
Benoist

From: "Sebire, Benoist (Nokia - JP/Tokyo)" <benoist.sebire@NOKIA.COM>
Reply-To: "Sebire, Benoist (Nokia - JP/Tokyo)" <benoist.sebire@nokia.com>

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Date: Tuesday 30 May 2017 10:26
To: "3GPP_TSG_RAN_WG2@LIST.ETSI.ORG" <3GPP_TSG_RAN_WG2@LIST.ETSI.ORG>
Subject: [98#25][NR] TS 38.300 (Nokia)

ATOM RSS1 RSS2

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