3GPP TSG RAN WG1 Meeting #80 **R1-150001**
Athens, Greece, 9th – 13th Feb 2015

Source:	**MCC Support**
Title:	**Final Report of 3GPP TSG RAN WG1 #79 v1.0.0 (San Francisco, USA, 17th – 21st November 2014)**
Document for:	**Approval**

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Main facts summary

3GPP TSG WG RAN1 #79 meeting, hosted by the North American Friends of 3GPP was hold at the Hilton San Francisco Union Square in San Francisco, California - USA.
The meeting started at 9:00 on Monday 17th November and finished at 17:03 on Friday 21st November 2014.
The number of attending delegates, having signed the participants' paper list, was **303.**

The week was scheduled as follows:

- Monday: Common session on Agenda items 1, 2, 3, 4, 6.1 & 6.2 (E-UTRA maintenance Releases up to 12), followed by D2D UE Capabilities (AI 6.2.1.6).
  - Rel-12 UE capabilities session during morning and afternoon coffee breaks chaired by Kazuaki Takeda from NTT DOCOMO.

- Tuesday (LTE): Parallel sessions on
  - LTE D2D Proximity Services (AI 6.2.1) chaired by Matthew Baker on one hand.
  - Licensed-Assisted Access Using LTE (AI 6.3.2) followed by Physical layer functionalities required for operation of Dual Connectivity (AI 6.2.2) chaired by Satoshi Nagata on the other hand.
  - Rel-12 UE capabilities session during morning and afternoon coffee breaks chaired by Kazuaki Takeda from NTT DOCOMO.

- Wednesday (LTE): Parallel sessions on
  - Study on Elevation Beamforming/Full-Dimension (FD) MIMO for LTE (AI 6.3.3), Licensed-Assisted Access Using LTE (AI 6.3.2) followed by Further LTE Physical Layer Enhancements for MTC (AI 6.3.1) chaired by Satoshi Nagata on one hand.
  - Early morning session to review/agree LSs on LTE D2D Proximity Services (AI 6.2.1) chaired by Matthew Baker, then Further LTE Physical Layer Enhancements for MTC (AI 6.3.1) chaired by Wanshi Chen followed by D2D afternoon session on the other hand.

- Wednesday (HSPA): HSPA maintenance (AI 5.1) and Study on Small Data Transmission Enhancements for UMTS (AI 5.2) chaired by Ms Carmela Cozzo from Huawei.

- Thursday (LTE): Parallel sessions on
  - Further LTE Physical Layer Enhancements for MTC (AI 6.3.1), Study on Elevation Beamforming/Full-Dimension (FD) MIMO for LTE (AI 6.3.3), Physical layer functionalities required for operation of Dual Connectivity (AI 6.2.2), Licensed-Assisted Access Using LTE (AI 6.3.2) chaired by Satoshi Nagata on one hand.
  - LTE D2D Proximity Services (AI 6.2.1) chaired by Matthew Baker followed by Study on Indoor Positioning Enhancements for UTRA and LTE (AI 6.3.4) chaired by Wanshi Chen and again and again additional session on LTE D2D Proximity Services on the other hand.
- Thursday (HSPA): Study on Downlink Enhancements for UMTS (AI 5.3) chaired by Gerardo Agni Medina Acosta from Ericsson followed by a review on the remaining maintenance issues.

- Friday: Revision of AIs chaired by Satoshi Nagata.

The list of action points that required RAN1 close follow-up is listed in Annex F (end of document).

The number of contribution documents for this meeting was 911, and those documents were categorized as followed.

Agenda Item	Input Document	Discussed Document
AI 4 to 6.3.5	909	338

Note: The amount of documents includes those discussed during the email discussion session post meeting.

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1 Opening of the meeting

Mr Satoshi Nagata (RAN1 Chairman) welcomed the participants of the RAN WG1 79th meeting and opened the meeting at 09:00. Mr Sharat Chander from AT&T welcomed the delegates on behalf of the North American Friends of 3GPP, Alcatel Lucent, AT&T, BlackBerry, Ericsson, Intel, InterDigital Communications, NII Holdings, QUALCOMM, Rogers Wireless, Sprint, T-Mobile USA, TruePosition, Verizon Wireless and detailed the domestic arrangements for the full week.

Note that Yee Sin Chan from Verizon Wireless made the following statement in relation to the ongoing Advanced Wireless Services (AWS-3) auction in USA:
"All participants are reminded that the FCC's anti-collusion rules are in effect for the AWS-3 auction. To ensure full compliance with these rules, participants must avoid any statements or discussions relating to the auction or to any auction applicant's bids or bidding strategies in the auction, or which could affect any company's bids or bidding strategy. For additional guidance, please consult your own counsel."
Huawei asked clarifying whether the wording "participants" means "participants to this meeting or to the auction" → Verizon Wireless replied "to this meeting".

1.1 Call for IPR

The Chairman drew the attention to Members' obligations under the 3GPP Partner Organizations' IPR policies. Every Individual Member organization is obliged to declare to the Partner Organization or Organizations of which it is a member any IPR owned by the Individual Member or any other organization which is or is likely to become essential to the work of 3GPP.

The attention of the members of this Technical Specification 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 members take note that they are hereby invited:
- to investigate in their company whether their company does own IPRs which are, or are likely to become Essential in respect of the work of the Technical Specification Group.
- to notify the Director-General, or the Chairman of their **respective** Organizational Partners, of all potential IPRs that their company may own, by means of the IPR Statement and the Licensing declaration forms (e.g. see the ETSI IPR forms http://webapp.etsi.org/Ipr/).

1.2 Competition law statement

The Chairman also drew Member's attention to the fact that 3GPP activities are subject to antitrust and competition laws and that compliance with said laws is therefore required of any participant of this WG meeting including the Chairman and Vice Chairmen. In case of question, please contact your legal counsel.
The present meeting will be conducted with strict impartiality and in the interests of 3GPP.
Furthermore, the Chairman reminded Members that timely submission of work items/contributions in advance of WG meetings is important to allow for full and fair consideration of such matters.

1.3 Network usage conditions

The PCG has laid down the following network usage conditions:

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.

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)

2 Approval of Agenda

R1-144545 Draft Agenda for RAN1#79 meeting RAN1 Chairman
Satoshi Nagata (Chairman) proposed the agenda for the meeting, as well the schedule of the week.
Discussion: Focusing on the remaining issues with impacts on RAN2, Mr Chair emphasized the deadline for D2D and SCE → Tuesday evening and the deadline for Dual connectivity → Wednesday evening
LGE asked avoiding overlap between MIMO and Indoor positioning (current indoor positioning discussions include 3D-channel model related issues) → Indoor positioning session shifted by Thursday afternoon.
Decision: The agenda is approved.

Monday morning coffee break: Ericsson → concern having overlap between Indoor positioning and Dual Connectivity sessions. Indoor positioning session shifted after Thursday afternoon coffee break.

3 Approval of Minutes from previous meeting

R1-144546 Final Report of RAN1#78bis meeting MCC
The document was presented by Patrick Mérias (ETSI Mobile Competence Center) and provides the outcomes of last meeting in Slovenia.
Discussion: Note that 16 delegates have written down their names but did not sign, meaning not listed in RAN1#78bis participants list.
MCC reminder → signature is mandatory for participation and further calculation of voting rights (bear in mind that elections will occur in 2015).
TS36.213 getting more and more complex due to high amount of equations – has been splitted into two parts – use of docx file type for TS/TR is not allowed yet but may come up in 2015 with the deployement of the 3GU plateform.
MCC informed the group of the existence of a short introduction of 3GU project in R1-145216.
Decision: The document is approved.

R1-145216 Introduction into 3G Ultimate MCC
Decision: The document (for information only) is noted.

4 Incoming Liaison Statements

EVS codec related

R1-144547 Reply LS on introducing the EVS codec in MTSI CT1, Ericsson = C1-144148
The document was presented by Daniel Larsson from Ericsson and feedbacks to SA4 questioning w.r.t EVS codec.
Discussion: No action needed from RAN1.
Decision: The document is noted.

R1-145189 Reply LS on introducing the EVS codec in MTSI SA4, Panasonic = S4-141419
The document was presented by Hidetoshi Suzuki from Panasonic and informs that SA4 has agreed all new specifications and affected existing specifications of its Rel-12 WI on the EVS codec except the Characterization TR. The specifications pertain not only to the EVS codec algorithms but also to methods related to signalling and transport, i.e., the EVS RTP Payload format and Media Type parameters, and media handling and interaction for the EVS codec in MTSI (Multimedia Telephony Service for IMS). The EVS RTP Payload format and Media Type parameters are specified in enclosed S4-141417: CR to 26.445, and media handling and interaction for the EVS codec in MTSI and EVS codec status are specified in enclosed S4-141418: CR to 26.114 and S4-141386: CR to 26.114.
Discussion: MCC offline note to section 2, action to SA2, two CRs S4-141394 and S4-141395 are referred, while both CRs were revised to S4-141417 and S4-141418 respectively.
No action needed from RAN1.
Decision: The document is noted.

R1-145188 LS on Support of EVS in 3G UTRAN SA4, Qualcomm = S4-141410
The document was presented by Ravi Agarwal from Qualcomm and informs on the launch of the EVS over 3G circuit-switched networks (Rel-13 WI).
SA4 discussed the principles of changes that are needed in TS 26.103 (Codec List for OoBTC in a BICC-based CS CN), including the introduction of a new codec type UMTS_EVS and a new code point for UMTS_EVS. Further, when defining EVS codec mode set(s), EVS bit rates up to a certain limit, e.g. 32 kb/s, could be included. The set of configuration(s) is to be decided based on the feedback from RAN groups (e.g. on RABs and testing considerations).
Discussion: No immediate action from RAN1 - keep SA4 up-to-date.
Decision: The document is noted.

D2D related

R1-144548 LS on Octet alignment in ProSe Direct Discovery CT1, InterDigital = C1-144150
The document was presented by Marian Rudolf from InterDigital and raises the following question to RAN2:
Does the ProSe Discovery Message, sent over PC5, need to be "octet-aligned" (by higher layer) before it is passed down to the MAC layer?
Discussion: No action needed from RAN1.
Decision: The document is noted.

R1-144550 Reply LS on Introducing the ProSe Authorized IE RAN3, Ericsson = R3-142617
The document was presented by Stefano Sorrentino from Ericsson and clarifies that, in order to support X2 mobility, if all eNBs in the same area support ProSe the new IE ("ProSe Authorized") is needed in the X2AP HANDOVER REQUEST message. If ProSe-supporting and non-ProSe-supporting eNBs are deployed in the same area, the new IE is needed only in the S1AP PATH SWITCH REQUEST ACKNOWLEDGE message.
Discussion: No action needed from RAN1.
Decision: The document is noted.

ProSe Lawful Interception

R1-145187 LS on ProSe Lawful Interception - In Network Coverage SA3-LI, British Telecom = SA3LI14_177r2
The document was presented by RAN1 Chair on behalf of BT and raises the following set of questions:
- Do the current Rel-12 RAN specifications allow for the eNB to have knowledge of (access to and/or retains) the ProSe UE ID (Source L2 ID) used in the ProSe One to Many communications of the UEs in the eNB's coverage?
- Do the current Rel-12 RAN specifications allow for the eNB to have knowledge of (access to and/or retains) the ProSe Layer 2 Group ID (ProSe L2 Group ID) used in ProSe One to Many communications?
- Do the current Rel-12 RAN specifications allow the eNB to detect the ProSe One to Many communications, especially the content of communications (e.g., user level MAC PDUs broadcast on its resources)?

Discussion: Mr Chair suggested looking at the draft reply LS.
Decision: The document is noted.

R1-145147 [Draft] LS reply on ProSe Lawful Interception - In Network Coverage Ericsson
The document was presented by Stefano Sorrentino from Ericsson and
- Q1: No.
- Q2: In the general case, no. One of the ProSe communication modes that may be used in network coverage (so called "mode 2") does not include signalling of any identities with the eNB when scheduling a certain ProSe One to Many communication. For the other ProSe One to Many communication mode that may be used when in coverage (so called "mode 1") the eNB may in some cases be aware of the *ProSe L2 Group ID* that a UE indicates to the eNB, however there is no guarantee that a malicious UE would not be using a different *ProSe L2 Group ID* in the actual ProSe communication without the eNB being aware of it.
- Q3: As per architecture model in 23.303 the PC5 interface used for ProSe One to Many communications is only defined between UEs and does not include the eNB. Therefore, reception of ProSe One to Many Communications can only be performed by the UE.

Decision: The document is noted.

R1-145218 [Draft] LS reply on ProSe Lawful Interception - In Network Coverage Huawei
The document was presented by Philippe Sartori from Huawei and provides the following answers:
- Q1: This knowledge is currently not available to the eNB but it could be feasible for mode-1.
- Q2: When the UE is in coverage and operating in mode-1, the eNB has knowledge of the Layer 2 Group ID. When the UE is operating in mode-2, such information is not available.
- Q3: There is no such assumption. However, for mode-1 communication, the eNB can instruct the UE to transmit at maximum power. In that case, while there is no guarantee, there is an increased likelihood that the eNB could detect the mode-1 communication.

Discussion: Mr Chair → what is the difference with R1-145147 - Huawei: emphasizing mode-1
ALU: mode-2 can also be applied (Q1 and Q3)
Decision: The document is noted.

Conclusion: both replies should be further taken into account in the D2D session.

Friday 21st : Reply LS from RAN3 (see details under AI 4.1)
R1-145339 Reply LS on ProSe Lawful Interception - In Network Coverage RAN3, Huawei = R3-143005
R1-145462 [Draft] LS reply on ProSe Lawful Interception - In Network Coverage Huawei (R1-145218)
The document was presented by Philippe Sartori from Huawei.
Decision: The document is noted and final LS is agreed in R1-145473 with following update:
There is no such assumption in the current specifications.

It may be theoretically possible for an eNB to attempt to detect mode-1 or mode-2 communication, however, neither for mode-1 nor for mode-2 there is guarantee that the eNB could detect the communication. There may be less effort and more chance of success for mode-1 communication as more transmission parameters are known by the eNB and the eNB can instruct the UE to transmit at maximum power. An increase in eNB complexity may be also required for such detection, depending on the detailed solution.

RAN1 has not studied eNB detection of ProSe communication. RAN1 currently has no plan to study about it, and therefore, RAN1 is unable to answer at this point. ~~, therefore additional study in RAN1 would be required in order to achieve better understanding of the feasibility and performance of such detection and in order for RAN1 to be able to provide an answer with respect to feasibility and performance limitations of such detection.~~

Discussion post agreement:
Telecom Italia raised a concern adding the last sentence. Would be preferable saying: RAN1 had no time to study it; nothing else.
NEC believes that the study should be in RAN4.

SCE related

R1-144549 LS on monitoring PDCCH with SPS C-RNTI in DC RAN2, CMCC = R2-144662
The document was presented by Tong Hui from CMCC and provides the following agreements made by RAN2:

- SPS functionality is supported for the PSCell of SCG in SeNB.
- SPS can be independently and simultaneously configured in MCG and SCG, respectively.
- The UE need to monitor the PDCCH with SPS C-RNTI on PSCell when it is configured SPS C-RNTI on PSCell of SCG in DC.
- The UE shall monitor the PDCCH with SPS C-RNTI on PCell for MCG and on PSCell for SCG when it is simultaneously configured SPS C-RNTI on PCell and PSCell in DC.

Decision: The document is noted.

R1-144551 Reply LS on DRS measurements RAN4, Huawei = R4-146655
The document was presented by David Mazzarese from Huawei and confirms that:

- Legacy CRS based measurement results and CRS based DRS measurement results could be directly comparable. However the requirements for legacy CRS based measurement and the CRS based DRS measurement can be different.
- The MeasCycleSCell (if configured) is still applicable if SCell is deactivated. How to define the requirement by using MeasCycleSCell (if configured) and DMTC is under discussing in RAN4.

Discussion: No action needed from RAN1.
Decision: The document is noted.

RSRQ measurement definition

R1-144552 Reply LS on revised Rel-12 feature list RAN4, NTT DOCOMO = R4-146816
The document was presented by Kazuaki Takeda from NTT DOCOMO and provides RAN4 decision for introducing:

- New RSRQ definition
- Increase of RSRQ range

Discussion: No action needed from RAN1.
Huawei: DRS case should be taken into account in the capabilities discussion.
Decision: The document is noted.

R1-144554 Reply LS on introducing the new RSRQ measurement definition RAN4, NTT DOCOMO = R4-146819
The document was presented by Hiroki Harada from NTT DOCOMO and provides responses to RAN2 LS in R2-143999 (R1-143688).
Discussion: No action needed from RAN1.
Decision: The document is noted.

Miscellaneous

R1-144553 LS on IncMon RAN4, Intel = R4-146817
The document was presented by Seunghee Han from Intel and provides the following RAN4 agreement w.r.t increased UE carrier monitoring:

- Two scaling factors with values s1=8 and s2=16 are to be used for increased UE carrier monitoring
- It is beneficial for UE to know if the IncMon feature is being configured by the network

- UE applies IncMon requirements (is required to measure more than the legacy number of carriers) when configured with IncMon
- A UE not configured with IncMon applies existing requirements (is not required to measure more than the legacy number of carriers)

Discussion: No action needed from RAN1.
Decision: The document is noted.

4.1 Incoming LS received during RAN1#79

R1-145339 Reply LS on ProSe Lawful Interception - In Network Coverage RAN3, Huawei = R3-143005
The document was presented by Philippe Sartori from Huawei and provides RAN3 answer to SA3-LI. Out of scope for RAN3. There is no support for LI functionality in RAN3 E-UTRAN specifications.
Decision: The document is noted.

R1-145370 Reply LS on Octet alignment in ProSe Direct Discovery RAN2, InterDigital = R2-145321
The document informs RAN1 that the discovery message size will increase to 232 bits (considering the 4 bit recently added by CT1 and another 4 bits required for octet alignment).
Discussion: LS was taken into account in the D2D sessions.
Decision: The document is noted.

R1-145464 Response LS on further MBMS operations support for E-UTRAN RAN2, Alcatel-Lucent = R2-145390
The document confirms that following RAN1 agreements are aligned with RAN2 CR (R2-143911):
For the measurement time and frequency:

- The measurements are made only in subframes and on carriers where the UE is decoding PMCH

For the measurement definitions

- Adopt MBSFN RSRP per MBSFN area
- Adopt MBSFN RSRQ per MBSFN area
  - MBSFN RSSI averaging is over only OFDM symbols carrying MBSFN RS
- Adopt an MCH BLER measurement per MCS per MBSFN area

RAN2 has agreed that the measurements are applicable to both RRC_IDLE and RRC_CONNECTED and for all the MBSFN areas (intra and inter frequency) from which the UE is receiving eMBMS service.
Decision: The document is noted.

R1-145467 LS on RAN2 agreements on RA preamble power ramping suspension RAN2, LGE = R2-145304
The document was presented by Ms Yunjung Yi from LGE and provides RAN2 view on how to avoid transmission power ramping of random access preamble in MAC layer. This is related to the case when the random access preamble transmission for the lower prioritized PRACH is either dropped or power scaled in the PHY layer. The related agreements are provided as below:

A. Regarding the indication from the physical layer,
   => L1 indicates to MAC that for a scheduled lower prioritized PRACH transmission, the power doesn't need to be increased for the next transmission.
   For the indication, RAN2 decided to use the name as 'power ramping suspension'.
B. Regarding increase of random access preamble transmission power,
   => Existing counter in MAC, i.e., PREAMBLE_TRANSMISSION_COUNTER, is used for Power increase
   In MAC, the UE shall increment PREAMBLE_TRANSMISSION_COUNTER by 1 if PHY layer has not indicated *power ramping suspension* to MAC layer. Accordingly, the random access preamble transmission power, i.e., PREAMBLE_RECEIVED_TARGET_POWER shall not be increased.

Decision: The document is noted.

R1-145477 LS on prioritization of WAN Rx over ProSe discovery Rx RAN2, Qualcomm = R2-145401
The document was presented by Saurabha Tavildar from Qualcomm and highlights that RAN1#78bis agreements are not in-line with what RAN2 has previously discussed and agreed.

RAN2 Agreements:
1- Intra- and inter-frequency (and inter-PLMN) ProSe reception does not affect Uu reception (e.g. UEs use DRX occasions in IDLE and CONNECTED to perform ProSe discovery reception or it uses a second RX chain if available).
2- The UE shall not create autonomous gaps.

After discussions in RAN2 on the impact of the recent RAN1 agreements on RAN2 specifications, it was agreed that previous RAN2 agreement should define UE behaviour (i.e. the UE shall not create autonomous gaps or gaps for discovery reception).
Discussion: Alignment with RAN1 is not feasible, according to RAN2.
Ericsson → what the consequences will be w.r.t capabilities impact? Qualcomm → need to be checked.
Decision: The document is noted.

The following incoming LSs are postponed until RAN1#80.

R1-145331	Reply LS on DRS based measurements	RAN4, Huawei	= R4-147820
R1-145371	LS on Rel-12 NAICS CA Capability	RAN4, MediaTek	= R4-147863
R1-145409	LS on measurements for MBMS support	RAN4, Qualcomm	= R4-147870
R1-145410	LS on Rel-12 NAICS 4CRS AP Capability	RAN4, MediaTek	= R4-147878
R1-145466	LS on Rel-12 NAICS CA AP Capability - Clarification	RAN4, MediaTek	= R4-148047

5 UTRA

R1-145237 Chairpersons' summary of the UMTS sessions UMTS Session Chairpersons (Carmela Cozzo, Huawei, Gerardo Agni Medina Acosta, Ericsson)
The document was presented by UMTS Session Chairpersons and provides the outcomes of the HSPA sessions.
Discussion:
Decision: The document is endorsed and the contents are incorporated below.

5.1 Maintenance of UTRA Releases 4 – 12

5.1.1 FDD

R1-145025 On power scaling for DPCCH2 Ericsson
Decision: The document is noted.
R1-145037 25.214 CR0733R1 (Rel-12, F) Clarifications to Maximum Power Scaling for Hetnets and F-EUL Enhancements Qualcomm Incorporated
Decision: The document is noted.

Conclusion:
Further offline discussion is needed to converge to the solution. The updated CR should be a revision of the agreed CR0732 in R1-144420 (from RAN1#78bis meeting)

R1-145230 25.214 CR0732r2 (Rel-12, F) Clarifications to Further EUL Enhancements Qualcomm Incorporated, Ericsson, Huawei, HiSilicon, Nokia Networks
Decision: The document is noted and CR0732r2 is agreed.

R1-145024 25.214 CR0734 (Rel-12, F) Clarification on CQI feedback cycle switching procedure Ericsson
Decision: The document is noted and CR0734 is agreed.

5.1.2 TDD

None.

5.2 Study on Small Data Transmission Enhancements for UMTS

WID in RP-141711.

5.2.1 Scenarios and requirements for small data transmission

R1-144684 Scenarios and requirements for small data transmission Alcatel-Lucent, Alcatel-Lucent Shanghai Bell
Decision: The document is noted.
R1-145161 Challenges for Small Data Transmission in UMTS Nokia Networks
Decision: The document is noted.
R1-145162 Clarifications on Small Data Transmission simulation assumptions Nokia Networks
Decision: The document is noted.

Way forward
- Coverage enhancements should focus on noise limited scenarios in the downlink.
- System level impact should be considered for solutions that have a system impact.

5.2.2 Solutions and evaluation for coverage

R1-145026 Cell search coverage evaluation Ericsson
Decision: The document is noted.
R1-145027 System information acquisition (BCH) coverage evaluation Ericsson
Decision: The document is noted.
R1-145028 Paging channels (PICH and PCH) coverage evaluation Ericsson
Decision: The document is noted.
R1-145029 PRACH preamble coverage evaluation Ericsson
Decision: The document is noted.
R1-145030 Acquisition Indicator channel (AICH) coverage evaluation Ericsson

Decision: The document is noted.
R1-145031 **Enhanced Uplink (EUL) coverage evaluation** **Ericsson**
Decision: The document is noted.
R1-145032 **HS-SCCH and HS-PDSCH coverage evaluation** **Ericsson**
Decision: The document is noted.
R1-145033 **Summary of coverage evaluations** **Ericsson**
Decision: The document is noted.
R1-145134 **Evaluation results on coverage enhancements** **Huawei, HiSilicon**
Decision: The document is noted.

Conclusions on coverage evaluation and possible enhancements
From the evaluation so far, RAN1 has established that the worst channels for coverage are the following channels:
PRACH preamble, PRACH message, EUL, PCH on S-CCPCH. As a way forward, RAN1 should first focus on coverage enhancements of such channels.

R1-145034 **Text proposal on the summary of coverage evaluations** **Ericsson**
Decision: The document is noted. Revise TP in R1-145034, incorporating R1-145134 and other comments provided during the session in R1-145231.
R1-145231 **Text proposal on the summary of coverage evaluations** **Ericsson, Huawei, HiSilicon**
Decision: The document is noted and TP is agreed.

R1-145135 **Solutions for coverage enhancement** **Huawei, HiSilicon**
Decision: The document is noted. It is agreed to insert the content of Sec.2 in R1-145135 in the TR. Prepare TP in R1-145232.
R1-145232 **Solutions for coverage enhancement** **Huawei, HiSilicon**
Decision: The document is noted and TP is agreed.

5.2.3 Other

R1-145035 **Text proposal on the fundamental characteristics of the small data transmission enhancements for UMTS** **Ericsson**
Decision: The document is noted and TP is agreed.

R1-145136 **Evaluation methodology for coverage enhancement solutions** **Huawei, HiSilicon**
Decision: The document is noted. Prepare TP in R1-145233 including Section 2.1.
R1-145233 **Evaluation methodology for coverage enhancement solutions** **Huawei, HiSilicon**
Decision: The document is noted and TP is agreed.

R1-145137 **Considerations on signalling optimizations** **Huawei, HiSilicon**
Decision: The document is noted.
Conclusion:
RAN1 will study layer1 signalling optimization solutions to support massive number of UEs with small data transmissions and/or to improve coverage.

R1-145236 **DraftTR 25.705 v0.1.0 Study on small data transmission enhancements for UMTS** **Ericsson**
Decision: The document is agreed and endorsed as v0.1.0 in R1-145238.

5.3 Study on Downlink Enhancements for UMTS

WID in RP-141657.

5.3.1 Downlink enhancements solutions

None.

5.3.2 Evaluations of downlink enhancements solutions

R1-145036 **On the maximum number of simultaneous non-CPC users in a cell** **Ericsson**
Decision: The document is noted.
R1-145039 **DL evaluation of TPC enhancements** **Qualcomm Incorporated**
Decision: The document is noted.
R1-145138 **Evaluation results on downlink aspects of the solutions** **Huawei, HiSilicon**
Decision: The document is noted.

Prepare a TP in R1-145234 on Evaluation results on downlink aspects of the solutions, including the results provided in R1-145039. The Tables in R1-145138 can be reduced to capture only realistic scenarios.

R1-145234 is for email discussion until Nov 27th - Text Proposal on evaluation results on downlink aspects of the solutions - Huawei (Peter Zhang)
Friday 21st : Note that this discussion is depending from other TP in RAN2 - warning on the possible impacts may go to next plenary.

R1-145040 UL impact from TPC enhancements Qualcomm Incorporated
Conclusion:
The results in R1-145040 will be captured in a TP that will be provided in RAN1 #80.

5.3.3 Other

R1-145139 Text proposal on compressed mode operation for downlink enhancements for UMTS Huawei, HiSilicon
Decision: The document is noted.
Prepare an updated Text proposal on compressed mode operation for downlink enhancements for UMTS taking into account the editorial changes suggested, and the fact that the TPC quality is not necessarily measured slot by slot.
R1-145235 Text proposal on compressed mode operation for downlink enhancements for UMTS Huawei, HiSilicon
Decision: The document is noted and TP is agreed.

R1-145140 Text proposal on impacts on implementation for downlink enhancements for UMTS Huawei, HiSilicon
Decision: The document is noted and TP is agreed.

Conclusion:
This section may be updated to potentially capture the impact on the Node B, additional impacts on the UE side, and also to take into account the solution on decimation.

5.4 Other

R1-145038 EVS over UTRAN - WorkPlan and RAN impacts Qualcomm Incorporated
Decision: The document is noted.
R1-145141 Network assisted interference cancellation and suppression for UMTS Huawei, HiSilicon
Decision: The document is noted.

6 E-UTRA

6.1 Maintenance of E-UTRA Releases 8 – 12

R1-144709 Clarification on UE category with supported spatial layers (36.306) Samsung
The document was presented by Youngbum Kim from Samsung and deals with potential ambiguity in TS36.306 describing "*supportedMIMO-Capability*" in the light of past RAN1 discussions. Therefore, it is proposed:

- Proposal 1: In order to avoid potential ambiguity the RRC parameters in section 4.3.4.7 of TS36.306 (i.e. *ue-Category* and *UE-EUTRA-Capability*) should be clarified as Rel-8 parameters, i.e. *ue-Category* (without suffix) and *UE-EUTRA-Capability* (without suffix).
- Proposal 2: Send an LS to RAN2 capturing above proposal 1 as a RAN1 agreement.

Discussion: Text proposal for TS36.306 is provided in the annex for information.
Ericsson: would be good checking the status in RAN2 → contribution only submitted in RAN1.
Decision: The document is noted. TP is endorsed by RAN1 - Prepare a draft LS to RAN2 until Friday (R1-145219) – (Samsung)

Friday 21st
R1-145219 [DRAFT] LS on clarification of UE category with supported spatial layers Samsung
Decision: The document is noted and final LS is agreed in R1-145457.

R1-144710 36.213 CR0486 (Rel-11, F) Clarification of periodic CSI feedback for subband CQI and PMI Samsung
The document was presented by … from Samsung and clarifies that "the remaining *J K* reporting instances are used in sequence for subband CQI (or subband CQI/second PMI)" reports on *K* full cycles of bandwidth parts, that is "(or subband CQI/second PMI)" is added.
Discussion: Qualcomm → ok but would like to improve the wording
Decision: The document is noted.
R1-144711 36.213 CR0487 (Rel-12, A) Clarification of periodic CSI feedback for subband CQI and PMI Samsung
Decision: The document is noted.
Conclusion: CRs are agreed in principle. Continue discussion until Friday for fine tuning.

Friday 21st

R1-145272 **36.213 CR0486r1 (Rel-11, F) Clarification of periodic CSI feedback for subband CQI and PMI**
Samsung **(R1-144710)**
Decision: The document is noted and CR is agreed.
R1-145273 **36.213 CR0487r1 (Rel-12, A) Clarification of periodic CSI feedback for subband CQI and PMI**
Samsung **(R1-144711)**
Decision: The document is noted and CR is agreed.

R1-145055 **Discussion on TM10 CSI-IM Measurements** **Qualcomm Inc.**
The document was presented by Iyab Sakhnini from Qualcomm and states:

- Observation 1: 36.213 CQI definition mentions that the UE shall use only ZP CSI-RS (within CSI-IM resources) as basis for its interference measurements (for TM10 configured with CSI-IM).
- Observation 2: RAN1#70 agreement and LS to RAN4 are such that UE uses all the signals in the REs configured for CSI-IM as part of interference measurements.
- Observation 3: There is a mismatch between RAN1#70 agreement and TS 36.213 text on the REs the UE uses to measure interference.
- Proposal 1: Clarify the TS 36.213 text on the REs (within CSI-IM resource) that the UE measures interference to reflect the RAN1#70 agreement (i.e.: "*For the purpose of interference measurement on an IMR, the UE shall assume that all signals received on the REs of the IMR are interference"*).

Discussion: Huawei → agree that there is a mitmatch but current behaviour in specification is correct.
Intel → clarification is needed.
Decision: The document is noted. Continue discussion until Friday- (Qualcomm)

Friday 21st
R1-145405 **WF on TM10 CSI-IM Measurements** **Qualcomm**

- Confirm the RAN1#70 agreement
  - For the purpose of interference measurement on an IMR, the UE shall assume that all signals received on the REs of the IMR are interference
  - Further details of how the UE measures the interference on IMR are left to the UE implementation
- Interested companies are encouraged to study possible specification clarifications and submit contributions in next RAN1 meeting (RAN1#80) taking into consideration the following:
  - Definition of CSI-IM interference measurements of 4 REs
  - Collision handling between CSI-IM and resources and primary or secondary synchronization signals or PBCH or EPDCCH
    - CSI-RS resources may be configured by higher layers to collide with PBCH or SS. CSI-RS however is not transmitted by the eNB if such collision happens

Discussion: Mr Chair clarified that sourcing in [] means only single company proposal.
Clarification is still needed.
Decision: The document is noted. For email discussion/approval until 29th January, 2015 – discussion from 15th January, 2015.

R1-145056 **Discussion on default values for TM8/9 codebook subset restriction** **Qualcomm Inc.**
The document was presented by Iyab Sakhnini from Qualcomm and states:

- Observation 1: Network may be configured with TM8 with PMI/RI reporting or TM9 with PMI/RI reporting and CSI-RS ports > 1, and does not send *codebookSubsetRestriction-r10*.
- Observation 2: RAN1 specifications do not specify UE behavior in the case where network configures TM8 with PMI/RI reporting or TM9 with PMI/RI reporting and CSI-RS ports > 1, and does not send *codebookSubsetRestriction-r10*.
- Proposal 1: RAN1 discusses a way to address the default UE behavior in the current specification if the network configures TM8 with PMI/RI reporting or TM9 with PMI/RI reporting and CSI-RS ports > 1, and does not send codebookSubsetRestriction-r10. This can be dealt with in RAN1 specifications by specifying the default UE behavior (e.g. UE assumes all 1's for codebookSubsetRestriction), or in RAN2 by mandating the codebookSubsetRestriction-r10 field to be sent if (TM8 is configured AND PMI/RI configured) OR (TM9 is configured AND PMI/RI configured AND CSI-RS > 1).

Discussion: Ericsson → should be a RAN2 matter, no need for discussion in RAN1.
Samsung → it is a RAN2 issue, observation 1 is likely not the current RAN2 understanding.
Qualcomm → make sense to ask RAN2 (via an LS) what the default behaviour is?
Decision: The document is noted. Qualcomm can bring the issue directly to RAN2.

Friday 21st
R1-145406 **WF on Default Values for TM8/9 Codebook Subset Restriction** **Qualcomm, Samsung**

- It is RAN1 common understanding that the upper layer field codebookSubsetRestriction-r10 is always signaled to the UE by the eNB in the following cases:
  - If TM8 is configured AND PMI/RI configured
    OR
  - If TM9 is configured AND PMI/RI configured AND number of CSI-RS > 1

Decision: The document is noted and the proposed WF is agreed as RAN1 common understanding.

R1-145181 **36.213 CR0490 (Rel-11,F) Correction of the parameter CSIProcessIndex** **Huawei, HiSilicon**

The document was presented by Yuanjie Li from Huawei and proposes:

- Parameter *CSIProcessIndex* is changed to *csi-ProcessId-r11*.

Discussion: No need to send an LS to RAN2.

Decision: The document is noted and both Rel-11/12 CRs are agreed.

R1-145182 **36.213 CR0491 (Rel-12,A) Correction of the parameter CSIProcessIndex** **Huawei, HiSilicon**

R1-144607 **36.213 CR0485 (Rel-12, F) Correction on TDD-FDD CA with TDD Pcell** **CATT**

The document was presented by Zukang Shen from CATT and deals with the following agreements made in RAN1#76:

- If TDD Pcell self-scheduling is supported, for TDD Pcell case,
  - For DL cross-carrier scheduling: agree on Alt DL-A
    - For DL cross-carrier scheduling with PUCCH on PCell-only, the DL HARQ timing of the scheduled serving cell follows the PCell's timing
    - PCell's timing is defined as:
      - DL HARQ timing determined according to the PCell's SIB1 UL/DL configuration, or DL-reference HARQ timing of the PCell for eIMTA

However, the current specification indicates that for TDD-FDD CA with TDD PCell and an FDD SCell cross carrier scheduled by another serving cell, the DL HARQ timing follows the FDD HARQ timing defined in Table 10.1.3A-1

Discussion: Qualcomm/Samsung → don't think FDD SCell cross carrier scheduling has been discussed.
Huawei: further checking is needed.

Decision: The document is noted. Continue discussion until Friday – (CATT)

Friday 21st

No impact to plenary – several companies requested for further email discussion.

Decision: The CR0485 in R1-144607 is finally agreed for inclusion in Rel-12.

R1-144712 **36.213 CR0488 (Rel-12, F) Correction to PUCCH procedures in case of FDD Pcell and TDD Scell in TDD-FDD CA** **Samsung**

The document was presented by Seung-hoon Park from Samsung and proposes to include in section 7.3.3:

- "For FDD-TDD and the primary cell is frame structure type 1, when PUCCH format 3 is configured for transmission of HARQ-ACK, for special subframe configurations 0 and 5 with normal downlink CP or configurations 0 and 4 with extended downlink CP in a serving cell, the special subframe of the serving cell is excluded from the HARQ-ACK codebook size determination.".

And to include in section 10.1.2A

- "except a special subframe of configurations 0 and 5 with normal downlink CP or of configurations 0 and 4 with extended downlink CP" and "or a special subframe of configurations 0 and 5 with normal downlink CP or of configurations 0 and 4 with extended downlink CP".

Decision: The document is noted. Agreed in principle for PUCCH format 3 part. Continue discussion until Friday about PUCCH format 1b fall back part –(Samsung)

Friday 21st :

R1-145458 **36.213 CR0488r1 (Rel-12, F) Correction to PUCCH procedures in case of FDD Pcell and TDD Scell in TDD-FDD CA** **Samsung** **(R1-144712)**

Decision: The document is noted and it is decided to let the discussion for PUCCH format 1b fall back and PUCCH format 3 parts continue until in RAN1#80 meeting.

R1-145105 **36.213 CR0489 (Rel-12, F) Correction on FDD-TDD HARQ-ACK reporting procedure for primary cell frame structure type 2** **Sharp, CATT, Huawei, HiSilicon, LG Electronics, Nokia Networks, Nokia Corporation**

The document was presented by Alvaro Ruiz Delgado from Sharp and suggests adding:

- three sub-bullets in subcause 7.3.4 to describe, if either PUCCH format 3 or PUCCH format 1b with channel selection is configured for transmission of HARQ-ACK, the determination of the HARQ-ACK feedback bits for the scheduled FDD SCell according to the agreement that DL/UL DCI formats for the scheduled FDD SCell include used DCI fields only.
- a sub-bullet in subcause 7.3.4 to describe, when PUCCH format 3 is configured for transmission of HARQ-ACK, the association of the HARQ-ACK feedback bits for the scheduled FDD SCell according to the agreement that DL/UL DCI formats for the scheduled FDD SCell include used DCI fields only.

Decision: The document is noted. Continue offline discussion until Friday

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Friday 21st : Also supported by Samsung. CR0489 is agreed.

R1-144605 **36.213 CR0484 (Rel-12, F) Correction on eIMTA UL/DL configuration determination** **CATT, Panasonic**
The document was presented by Zukang Shen from CATT and updates the specification text to avoid the possible multiple interpretations.
Decision: The document is noted and CR is agreed.

R1-144646 **Discussion on aperiodic CSI reporting with RI-reference CSI process and Rel-12 CSI subframe sets** **Intel Corporation**
The document was presented by Alexei Davydov from Intel and discusses aperiodic CSI reporting with RI-reference CSI process and Rel-12 CSI subframe sets. Some ambiguities on RI inheritance for CSI subframe sets were identified in TM10 with multiple CSI processes. RAN1 should discuss these cases and determine the corresponding changes to RAN1 specification to resolve possible ambiguity in the UE implementation.
Discussion: Further check needed.
Decision: The document is noted. Continue discussion until Friday – (Intel)

Friday 21st : No change needed

R1-144671 **36214 CR0024 (Rel-12, B) Introduction of MBSFN radio measurement** **Intel Corporation**
The document was presented by Seunghee Han from Intel and introduces MBSFN RSRP, MBSFN RSRQ and MCH BLER with the same text proposal as in R1-135918 and the square brackets from the R1-135918 are removed.
Discussion: Situation in RAN2 should be checked.
Ericsson → there is ALU contribution in RAN2 on the issue – reply LS to RAN1 is expected by this meeting.
Fujitsu → improve the wording.
Decision: The document is noted. Continue discussion until Friday – (Intel)

Friday 21st :
R1-145388 **36.214 CR0020r1 (Rel-12, B) Introduction of MBSFN radio measurements** **Intel Corporation, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Samsung, Ericsson (R1-135918)**
Decision: The document is noted and CR is agreed.

R1-145090 **36.212 CR0163r2 (Rel-12, F) Correction for rate matching parameters for UE categories 11 and 12 for 36.212 Huawei**
The document was presented by Brian Classon from Huawei.
Decision: The document is noted and CR is agreed as basis of next update (including editorial change of TM).

R1-145212 **Discussion on cat0 UE features in Rel-12** **Intel Corporation** **(R1-144672)**
The document was presented by Seunghee Han from Intel and is summarized as follows:
Proposal 1: All the existing optional features for Rel-8/9/10/11 are also optional for cat 0 UE.
Proposal 2: All Rel-12 features are optional for cat 0 UE.
Proposal 3: The following Rel-11 feature groups are to be optional for cat 0 UE:
- 5-1 (CRS interference handling) for FeICIC WI
- 7-2 (UL CoMP operation) for CoMP WI

Proposal 4: The following Rel-10 feature groups are to be optional for cat 0 UE:
- 1-1 (DMRS with OCC and SGH disabling) for UL MIMO
- 1-4 (Aperiodic SRS) for UL MIMO
- 4-1 (eICIC measurement restriction) for eICIC

Proposal 5: All other features than above remain the same.
Proposal 6: The same mandatory/optional features for cat 0 FDD UE apply for cat 0 HD-FDD.
Discussion: Huawei: no need (some features are related to Rel-13 discussions).
Panasonic: may proposals 3 and 4 be agreeable?
CATT: Can be brought to RAN.
Decision: The document is noted.

R1-145163 **36.212 CR0167 (Rel-12, F) Correction to K_{MIMO} definition for UE Cat. 0** **Broadcom Corporation**
The document was presented by … from Broadcom and proposed in Section 5.1.4.1.2, that for UE category 0 K_{MIMO}=1 for all transmission modes.
Discussion: ALU → no need
Broadcom → will lead to deteroriated decoding performance.
Huawei (editor) → from technical view point, proposed text is fine and could be integrated into the spec., if CR is agreed.
Decision: The document is noted. Offline discussion to be continued until Friday including whether CR is needed.

Friday 21st : Broadcom → More technical clarification needed from ALU (only company having concern) – spec inconsistent. ALU still see UE behaviour issues. Mr Chair → no impact to next plenary, let's come back in RAN1#80.

R1-144673 LS on cat0 UE features in Rel-12 Intel Corporation

Decision: The document was not presented. RAN1 recommends to discuss this issue in RAN plenary.

Friday 21st :

R1-145456 **WF on Rel-12 Category 0 UE** **Intel Corporation, Vodafone, InterDigital, Ericsson, Nokia Networks, Nokia Corporation, Panasonic, NEC, Motorola Mobility, Samsung, Orange, AT&T, CMCC, ZTE, Sony, KT Corp., KDDI, SoftBank Mobile, ITL Inc., Sequans, ETRI, Huawei, HiSilicon, Deutsche Telekom** (R1-145251)

The document was presented by Seunghee Han from Intel.

- RAN1 to agree to make the following recommendations:
  - The same features apply for cat0 FDD UEs as those that apply for cat0 HD-FDD UEs.
  - The same mandatory/optional features are supported for cat0 UEs as those that are supported for cat1 UEs except the following:
    - CRS interference handling for FeICIC WI in Rel-11 to be optional
    - DMRS with OCC and SGH disabling for UL MIMO WI in Rel-10 to be optional
  - To send an LS to RAN/RAN2 during meeting week
    - How/whether to be captured is up to RAN2.

Decision: The document is noted and the WF is agreed.

R1-145439 **[DRAFT] LS on cat0 UE features in Rel-12** **Intel Corporation** (R1-144673)

The document was presented by Seunghee Han from Intel.

Discussion: LGE→ clarify it is for Rel-12

Decision: The document is noted and final LS is agreed in R1-145463 with following update

In RAN1 #79, RAN1 discussed the features for Rel-12 category 0 UE and agreed to make the following recommendations:

6.2 LTE Release 12

R1-145200 **Summary of RAN1#78bis email discussions on small cell discovery Huawei, HiSilicon**

The document was presented by David Mazzarese from Huawei and lists the remaining points for SCE discussion:

- UE measurement of a NZP CSI-RS of the DRS in a subframe where the PDSCH or EPDCCH for the UE is mapped to REs of that NZP CSI-RS of the DRS.
- Whether to introduce a new PCID list for CRS-based measurements to indicate which neighboring cells are measured according to DMTC or measured without DMTC.
- Whether to allow a UE to autonomously determine whether it can reliably make legacy CRS-based measurements in subframes outside the DMTC.
- How to capture the agreement [77-08] on UE assumption on the presence of signals and channels on a frequency with a deactivated SCell where a UE is measuring DRS and not receiving MBMS.
- Whether and how to allow measurement of DRS and reception of MBMS on a carrier frequency where cells are performing on/off based on SCell activation/deactivation in Rel-12.

Decision: The document is noted.

R1-145210 **Remaining issues for small cell enhancements** **Samsung** (R1-144713)

The document was presented by Boon loong Ng from Samsung and is summarized below:

MBMS on SCell configured with DRS

Proposal 1: It is assumed that MBMS cannot be supported for SCell performing act/deact based on/off.

Proposal 2: From UE complexity viewpoint, it is preferred that additional signalling is provided to inform the UE whether a deactivated SCell configured with DRS is transmitting legacy signals and hence may provide MBMS.

Observation 1: Deployment scenarios where a subset of cells may not support MBMS is not new and are referred to as "MBSFN Area Reserved Cells" **Error! Reference source not found.**. One example is CSG cells.

Proposal 3: MBMS can be supported on a carrier frequency where there are some cells performing on/off based on CA activation/deactivation.

Configuration of legacy CRS measurement on carrier frequency with DRS measurement configuration

Observation 2: If the UE only measures all non-serving cells (including cells that are not configured with DRS, or are configured with DRS but are not performing on/off) according to DRS measurement assumption, RRM measurement performance for a target legacy cell will be worse than the legacy performance in terms of:

- Measurement report latency, which increase proportionally with the DMTC periodicity, and;
- Measurement accuracy, especially in the low SNR region because UE cannot utilize port 1 for CRS based DRS measurement.

Proposal 4: If a carrier frequency is configured with DMTC, additional signalling is provided to the UE in the form of PCID list that indicates the cells that may only transmit DRS.

- If a cell is not part of the PCID list, the UE assumes that the cell may provide MBMS and legacy RRM measurement performance has to be met; otherwise the UE assumes that the cell may not able to support MBMS and RRM measurement performance for the cell may be relaxed.

Collision of CSI-RS of DRS and PDSCH/EPDCCH

Proposal 5: No performance requirement is specified for UE measurement of a CSI-RS of the DRS in a subframe where the PDSCH or EPDCCH is mapped to REs of that NZP CSI-RS of the DRS.

Decision: The document is noted.

R1-145221 Way Forward on Remaining Issues on Small Cell Discovery Signal Huawei, HiSilicon

The document was presented by David Mazzarese from Huawei.

Decision: The document is noted.

Focus on the Need for a New PCID List (as it has RAN2 impact, said Mr Chair):

Proposed conclusion from R1-145221:

- There is no necessity to configure the UE for both legacy CRS based measurements and DRS measurements for neighboring cells on the same carrier frequency.
- There is no necessity to introduce a new PCID list for CRS-based measurements to indicate which neighboring cells should be measured according to DMTC and which neighbouring cells can be measured outside of the DMTC.
- Supported by : Huawei, HiSilicon, Panasonic, NTT Docomo, Ericsson, NVIDIA

Conclusion:

- There is no consensus on the necessity for the UE to perform legacy CRS based measurements and DRS measurements for different neighboring cells on the same carrier frequency.

Samsung: for the sake of progress, followed the majority and agreed with above conclusion.

Monday 17th afternoon

Collisions of NZP CSI-RS of DRS with PDSCH or EPDCCH

Proposed conclusion from R1-145221:

- No performance requirement is specified for UE measurement of a NZP CSI-RS of the DRS in a subframe where the PDSCH or EPDCCH is mapped to REs of that NZP CSI-RS of the DRS.
- Supported by: Huawei, HiSilicon, Panasonic, NTT Docomo, Ericsson, Samsung, NVIDIA

ALU: do not understand why there is no requirement to be specified

Fujitsu: it is up to RAN4 to decide whether perf.requirement is needed

Conclusion:

- There is no consensus to have a performance requirement for UE measurement of a NZP CSI-RS of the DRS in a subframe where the PDSCH or EPDCCH is mapped to REs of that NZP CSI-RS of the DRS

PDSCH and EPDCCH RE Mapping around DZP CSI-RS

Proposed conclusion from R1-145221:

- PDSCH and EPDCCH RE mapping according to the DZP CSI-RS is applicable over the entire system bandwidth.
- Supported by: Huawei, HiSilicon, Panasonic, NTT Docomo, Ericsson, Samsung, NVIDIA

The above proposal is agreed.

SCell on/off without MBMS

Proposed conclusion from R1-145221:

- For a UE supporting on/off by CA SCell activation/deactivation, if discovery-signal-based measurements configured by higher layers are applicable for a secondary cell, and if the secondary cell is deactivated, the UE shall, except for discovery-signal transmissions, assume that PSS, SSS, PBCH, CRS, PCFICH, PDSCH, PDCCH, EPDCCH, PHICH, DMRS and CSI-RS may be not transmitted by the secondary cell until the subframe where an activation command is received for the secondary cell. This behavior is not valid if the UE is configured by higher layers to receive MBMS from the secondary cell.
- Supported by: Huawei, HiSilicon, Panasonic, NTT Docomo, Ericsson

ALU: Current text is 36.211 is much better

Qualcomm: the last sentence should be deleted. Need to first agree on what the signalling is.

Agreements:

- For a UE not configured to receive MBMS on a carrier frequency by UE internal higher layers,
  - For a UE supporting on/off by CA SCell activation/deactivation, if discovery-signal-based measurements configured by higher layers are applicable for a secondary cell in the same carrier frequency, and if the secondary cell is deactivated, the UE shall, except for discovery-signal transmissions, assume that PSS, SSS, PBCH, CRS, PCFICH, PDSCH, PDCCH, EPDCCH, PHICH, DMRS and CSI-RS may be not transmitted by the secondary cell until the subframe where an activation command is received for the secondary cell

MBMS reception on a carrier frequency where a UE is configured with DRS measurements and a deactivated SCell:

- Alt.1: Use a PCID list to tell the UE which cells may be transmitting signals and channels relevant to MBMS.
  - Supported by: Samsung
- Alt.2: Use signaling (e.g. in SIB) to switch off the UE assumption agreed in [77-08] for all the cells on a carrier frequency where the UE is configured to monitor DRS and has a deactivated SCell.

- Supported by: Qualcomm
- Alt.3: The UE may assume that a cell transmitting SIB13 does not perform on/off based on SCell activation/deactivation.
  - Supported by: Panasonic, Huawei, HiSilicon, LGE, CATT, Nokia Corp., Nokia Networks, ALU, ASB, NTT DOCOMO
- Alt.4: Use an explicit signalling to tell the UE whether the serving cell is transmitting signals and channels relevant to MBMS.
  - Supported by: Qualcomm
- Alt.5: No need to have additional agreement
  - Supported by: Fujitsu, CATT

Agreement:
- For MBMS reception on a carrier frequency where a UE is configured with DRS measurements and a deactivated SCell,
  - The UE may assume that a cell transmitting SIB13 does not perform on/off based on SCell activation/deactivation.

Optional Legacy RSRP Measurements
Proposed conclusion from R1-145221:
- Observation: successfully decoding PBCH for a particular cell should be sufficient for a UE to safely assume that this cell is transmitting legacy CRS. A UE could instead use other means to reliably detect that a cell is transmitting CRS in a subframe.
- If a UE configured with discovery-signal-based measurements on a carrier frequency can reliably detect the presence of CRS ports 0 of a cell outside the DMTC on that carrier frequency, then the UE can use CRS port 0 outside the DMTC for RSRP measurements of that cell.
- If a UE configured with discovery-signal-based measurements on a carrier frequency can reliably detect the presence of CRS port 1 of a cell on that carrier frequency, then the UE can use CRS port 1 for RSRP measurements of that cell.

Ericsson asked whether the observation can be decoupled from the proposal → just an example of what UE behaviour could be.
Qualcomm also agree that the observation is not necessary.

Agreements:
- For RSRP measurement,
  - If a UE configured with discovery-signal-based measurements on a carrier frequency can reliably detect the presence of CRS ports 0 of a cell outside the DMTC on that carrier frequency, then the UE may also use CRS port 0 outside the DMTC for RSRP measurements of that cell
  - If a UE configured with discovery-signal-based measurements on a carrier frequency can reliably detect the presence of CRS port 1 of a cell on that carrier frequency, then the UE may also use CRS port 1 for RSRP measurements of that cell
  - RAN1 agreement is that there is no need to have additional higher layer signaling and additional RRM requirement for above RSRP measurements
  - RAN1 assumes the DRS RRM performance requirements are defined only based on measurements over DRS subframes and antenna port 0
  - Parameter PresenceAntennaPort1 is not applicable for a frequency configured with DRS measurement

LGE: For the sake of progress, and as the only company having concern, finally agreed with the above.

R1-144606 Subframe offset for NZP CSI-RS in DRS CATT
The document was presented by Zukang Shen from CATT and proposes to clarify which SSS should be used as the reference to determine the subframe containing NZP CSI-RS in DRS, by the following:

Proposal: For a DRS NZP CSI-RS, the subframe offset between SSS and the DRS NZP CSI-RS is with respect to the SSS corresponding to the QCL PCID for the DRS NZP CSI-RS.

Discussion: Samsung → the issue should go to RAN2 – there is no ambiguity (already agreed in RAN1)
CATT: RAN1 should provide the right definition to RAN2
Decision: The document is noted, modified and the following conclusion is drawn:

Conclusion:
- RAN1 understanding is that for a DRS NZP CSI-RS, the subframe offset between SSS and the DRS NZP CSI-RS is with respect to the SSS corresponding to the parameter physCellId-r12 in MeasCSI-RS-Config-r12 for the DRS NZP CSI-RS

R1-144875 Discussion on relationship between DRS occasion and DMTC LG Electronics
The document was presented by Ms Yunjung Yi from LGE and proposes to capture the agreements regarding relationship between DRS occasion and DMTC in 36.213.
On one carrier frequency, a UE can expect that cells/TPs configured for discovery-signal-based measurement transmit DRS in every measurement opportunity indicated by DMTC.
Discussion: Panasonic → is 36.213 the right spec.?
Nokia Corp./Ericsson → no need – UE assumes and measures

Decision: The document is noted. No consensus

Prepare draft LS to RAN2/4 to capture all the above agreements/conclusions – (Huawei)

Monday evening
R1-145265 [Draft] LS on additional agreements on small cell discovery Huawei
The document was presented by David Mazzarese from Huawei.
Discussion: Huawei → Comments from Samsung have not been captured.
Decision: The document is noted and shall be revised in R1-145267. Finally agreed in R1-145269.

Channel Interleaver for D2D

R1-145185 On the need of an interleaver for PSDCH/PSCCH/PSSCH Huawei, HiSilicon
The document was presented by Philippe Sartori from Huawei and shows that the PUSCH interleaver does not bring any link performance gain for D2D. This was *a priori* expected because the agreements for no interleaver on the downlink in Rel-8 were based on no performance gain seen with the interleaver. Having the interleaver added for D2D on would require some additional design complexity since a de-interleaver, currently not in the UE implementation, would need to be added. On the other hand, not having the interleaver simply requires removing an existing block.
Proposal: no interleaver is used for D2D
Discussion: Qualcomm suggested looking at their contribution in R1-145072 (under AI 6.2.1.8)
Decision: The document is noted.

R1-145072 Channel Interleaver for D2D Qualcomm Inc.
The document was presented by Saurabha Tavildar from Qualcomm and concludes with:
Observation 1: for perfect AGC, the loss due to no interleaving is about 0.8 dB for D2D communication at large code block sizes.
Observation 2: for 1 symbol AGC, the loss due to no interleaving is about 0.25 dB for D2D communication at large code block sizes.
Proposal: PUSCH channel interleaver is used for all D2D channels.
Discussion: Either way is possible from editor point of view
Decision: The document is noted.

Conclusion: Offline discussion – check on Friday what the situation is.
Friday 21st : Channel interleaver has been discussed in D2D session – refer to 6.2.1.

NAICS

R1-144846 Summary of email discussion on R1-144498 and R1-144490 MediaTek Inc.
The document was presented by Peikai Liao from MediaTek and summarized email discussion [78bis-09].
Discussion: Still no consensus.
Decision: The document is noted.

R1-145012 36.213 CR0483R1 (Rel-12, F) Clarification of the resource allocation and precoding granularity parameter in NAICS NVIDIA, Intel, MediaTek, Samsung, LGE, Acer, ITRI, CHTTL, HTC (R1-144490)
The document was presented by Timo Roman from NVIDIA and proposes adding a paragraph to section 7.1.6 to clarify the parameter *resAllocGranularity-r12*, and to clarify that the sets of consecutive PRBs are mapped starting from the lowest frequency.
Discussion: Also supported by Verizon.
Intel → why does RAN1 need to discuss the issue? No single Tdoc showing the performance degradation is available. Nokia Networks → to reply to RAN3 questioning (Inc_LS in R1-144443).
Decision: The document is noted.

Alt.1: Agree R1-145012.
Alt.2: No text for UE assumption when receiving higher layer signalling of resource allocation and precoding granularity in RAN1 spec. and other WGs can reference corresponding RAN4 test cases for UE assumptions if necessary.
Alt.3: Remove the signalling of resource allocation and precoding granularity in both RRC layer signalling and X2 signalling.
Alt.4: Agree R1-145012 and remove the signalling of resource allocation and precoding granularity in X2 signalling.
Alt.5: Agree R1-145012 and RAN1 recommends RAN4 to specify test cases under the backhaul delay.

Agreement:
- Agree R1-145012 and remove the signalling of resource allocation and precoding granularity in X2 signalling.

Prepare draft LS to RAN2/3, Cc RAN4 to capture all the above agreements/conclusions – (MediaTek)

Monday evening

R1-145266 [Draft] Reply LS for Rel-12 NAICS MediaTek (R1-144847)
The document was presented by Peikai Liao from MediaTek.
Decision: The document is noted and final LS is agreed in R1-145270.

Rel-12 CRs

R1-145192 36.201 CR0008r2 (Rel-12, B) Introduction of TDD-FDD CA, Small-Cell Enhancements, Dual Connectivity, eIMTA, ProSe, WLAN/3GPP interworking, and miscellaneous minor corrections Alcatel-Lucent
The document was presented by Matthew Baker from ALU.
Discussion: No changes compared to the endorsed version from last meeting.
Decision: The document is noted and CR is agreed.

R1-144635 36.211 CR0196r2 (Rel-12, B) Inclusion of ProSe Ericsson
The document was presented by Daniel Larsson from Ericsson.
Decision: The document is noted.
R1-144636 36.211 CR0197r2 (Rel-12, B) Inclusion of small-cell enhancements Ericsson
Continue offline discussion until Friday, all RAN1 delegates who have concerns to above CRs should contact the editor.
Friday 21st : LGE raised a few D2D issues w.r.t 36.211 by email – late but would like them to be considered.

R1-145122 36.213 CR0482R2 (Rel-12, B) CR for Introduction of D2D (ProSe), Dual Connectivity, Small Cell Enhancements and NAICS features Motorola Mobility
Continue offline discussion until Friday, all RAN1 delegates who have concerns to above CR should contact the editor.
MCC: wrong revision number as rev 2 was already made in RAN1#78bis (R1-144537) – withdrawn and further updated on:
Friday 21st
R1-145461 36.213 CR0482R3 (Rel-12, B) CR for Introduction of D2D (ProSe), Dual Connectivity, Small Cell Enhancements and NAICS features Motorola Mobility (R1-145122)

R1-145091 36.212 CR0166 (Rel-12, B) Introduction of Dual Connectivity feature into 36.212 Huawei
The document was presented by Brian Classon from Huawei.
Decision: The document is noted and CR is agreed.

Below CRs not treated as such as covered by the agreements made under the WF R1-145221.
R1-144979 36.214 CR0023R1 (Rel-12, B) Measurement definitions for measurements with discovery reference signals Ericsson
R1-145057 36.214 CR0025 (Rel-12, B) for DRS measurements Qualcomm Inc.

Friday 21st
For small cell enhancement and dual connectivity, editors will submit updated CRs including the agreements up to RAN1#79 until 26th November.
For D2D, 36.211 editor (Stefan), 36.212 editor (Brian), 36.214 editor (Asbjorn) will submit updated CRs including RAN1#79 meeting agreements until 26th November, and 36.213 editor (Bob) will submit it until 1st December
Email approval until 3rd December for above CRs.

UE capabilities

R1-144770 Remaining UE capability topics Ericsson
The document was presented by Daniel Larsson from Ericsson and proposes the following:

- Features 3-1, 3-2 and 3-3 do not require FDD and TDD differentiation.
- Features 3-4 and 3-5 require FDD and TDD differentiation.
- RAN1 recommends that all features for which RAN1 has not yet made a recommendation should be optionally supported in Rel-12.

Discussion: CMCC OK with bullets 1 and 3. Further discussion needed for bullet 2.
Qualcomm → concern with Feature 3-3.
Decision: The document is noted, modified and agreed as follows:

Agreements:

- Features 3-1, 3-2 do not require FDD and TDD differentiation

Continue offline discussion until Tuesday about features 3-3, 3-4, and 3-5.
Friday 21st : covered during D2D session

Possible agreement:

- RAN1 recommends that all Rel-12 features for which RAN1 has not yet made a recommendation (i.e., except for #8-2 and cat. 0 UE) should be optionally supported in Rel-12

Friday 21st : Intel → can a note be drawn w.r.t UE Cat0 as suggested in the above possible agreement– decision will go to plenary – Ok for Intel/Qualcomm.

Not treated.

R1-144647	Discussion on the remaining details of Rel-12 UE category	Intel Corporation
R1-144765	On eMBMS, Discovery Signals and Small Cell On/Off	Ericsson
R1-144766	On Legacy and DRS based Measurements and Small Cell On/Off	Ericsson
R1-144788	Remaining topic of small cell on/off	Panasonic
R1-144847	[Draft] reply LS for Rel-12 NAICS	MediaTek Inc.
R1-144856	Open issue on UE category in Rel-12	NEC
R1-144870	Discussion on the resource allocation and precoding granularity signalling for NAICS	Intel Corporation
R1-144938	Discussion on remaining issues of UE categories	CMCC
R1-144987	Handling of resource allocation and precoding granularity signaling in NAICS	Nokia Networks, Nokia Corporation
R1-145058	Bandwidth assumption for DRS rate matching	Qualcomm Inc.

6.2.1 LTE Device to Device Proximity Services

WID in RP-140518. Exception sheet in RP-141704

Focus on device to device discovery in network coverage (intra-cell and inter-cell) and communication in network coverage (intra-cell and inter-cell), in partial network coverage and outside network coverage. The communication part is targeted to apply only to public safety use. The partial network coverage and out of network coverage scenarios apply only to public safety use. The work will proceed from the starting point of the agreements and working assumptions reached during the study item as captured in TR 36.843.
No relaying, no standardized inter-cell coordination based on X2 or air interface, no out of network discovery in Release 12 and limited time to be spent on inter-frequency discovery.

R1-145441 Chairman's Notes of Agenda Item 6.2.1 LTE Device to Device Proximity Services Ad-Hoc Chairman (Alcatel Lucent)
The document was presented by Matthew Baker from ALU and provides the outcomes of the different D2D sessions all along the week.
Decision: The document is endorsed and the content is incorporated below, including updates made on Friday 21st.

Not treated.

R1-145152	Discussion on Essential Open Issues for Completion of the RAN D2D WI	Ericsson
R1-145222	Remaining issues for D2D	Qualcomm Inc. (R1-145060)

6.2.1.1 D2D synchronization

R1-145059 Draft LS on D2D Synchronization Qualcomm Inc.
Decision: The document is noted and final LS is agreed in R1-145419.

6.2.1.1.1 Remaining details of D2DSS design

R1-144877 Details of D2DSS design LG Electronics
Decision: The document is noted.
R1-144935 Considerations on Remaining Details for PD2DSS and SD2DSS ITRI
Decision: The document is noted.
R1-144566 Final details of D2D synchronization signals Huawei, HiSilicon
Decision: The document is noted.
R1-144685 D2DSS design and resource allocation Alcatel-Lucent Shanghai Bell, Alcatel-Lucent
Decision: The document is noted.

R1-145229 D2DSS signal design Qualcomm Inc. (R1-145061)
Decision: The document is noted.

Agreement:
Total ID space is 168 in each of D2DSSue_net and D2DSSue_oon, i.e. {0…167} for D2DSSue_net

Background:
- Alt 1: total ID space is 168 in each of D2DSSue_net and D2DSSue_oon
  - Intel, Qualcomm, Huawei, HiSilicon, GDBUK, ZTE, Fujitsu, Sharp, Samsung, ITL
- Alt 2: total ID space is 504 in each of D2DSSue_net and D2DSSue_oon
  - Ericsson (using different mappings in subframes 0 and 5, together with 3 PD2DSS sequences)

R1-144649 Design of secondary D2D synchronization signal Intel Corporation
Decision: The document is noted.

Agreement:
- For SD2DSS:
  - A maximum power backoff will be specified for SD2DSS w.r.t. PD2DSS, with the value to be decided by RAN4
    - It is up to UE implementation when to use the maximum power backoff
  - Inform RAN4 that the maximum power back off for SD2DSS due to PAPR/CM is to be decided by RAN4
    - RAN4 may consider PAPR/CM reduction techniques when deciding the value

Supported by: LGE, Huawei, HiSilicon, GDBUK, Qualcomm, ZTE, Ericsson, ALU, ASB, Sharp, NEC, Fujitsu, Nokia Corp., Nokia Networks, CATT

Companies are free to submit proposals based on additional tones in RAN4.

R1-145302 WF on D2DSS Qualcomm, ALU, ASB, Huawei, HiSilicon, General Dynamics, Samsung, ETRI, Sharp
Decision: The document is noted.

Agreements:
- 2 PD2DSS sequence root indices are used: {26, 37}
- D2DSSue_net is defined by PD2DSS root index 26 on both symbols
- D2DSSue_oon is defined by PD2DSS root index 37 on both symbols

LGE observes that using the same root indices in a given subframe may not be optimal in terms of synchronisation performance.
Intel observes that using different root indices might have allowed more implementation options and provided better performance in case of large frequency offsets.
ZTE observes that this choice of root indices may not be optimal in terms of correlation with DMRS sequences.

R1-145312 WF on PD2DSS Design Intel Corporation, LGE
Decision: The document is noted.

R1-145300 WF on D2DSS symbol locations Huawei, HiSilicon, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell
Decision: The document is noted.

Alt 1:
- Two consecutive symbols with cyclically continuous transmission are used for PD2DSS transmission
- 1a: Intel, GDBUK, Qualcomm, Fujitsu, Samsung
  - S….PP….S
- 1b: LGE, CATT
  - PP……SS

Alt 2:
- Two PD2DSS/SD2DSS are paired in consecutive SC-FDMA symbols
- Two PD2DSS/SD2DSS pairs are distributed to two slots with minimum distance of 7 symbols for normal CP and 6 symbols for extended CP.

R1-145303 WF on D2DSS Symbol Location Qualcomm Inc., Ericsson, LGE
Decision: The document is noted. Also supported by Sharp

Agreements:
- PD2DSS symbols are adjacent
  - No changes in signal design
- SD2DSS symbols are adjacent
- Antenna port X (where X is a new AP defined by the spec editor) is used for transmission of PD2DSS, SD2DSS

  - At least for synchronisation resources that are not used for both communication and discovery, in-coverage UEs may assume the same Doppler shift/spread for the DMRS (for PD2DSCH) and PD2DSS within the same synchronization resource
    - Exact wording for specification is up to the Editor(s)
  - Note that from the receiving UE's perspective, the composite received signal may come from different UEs
    - How/if this needs to be captured in the specification is to be proposed by the Editor(s)
- Normal CP symbol locations:
  - PD2DSS: *l = 1 and 2* in the first slot
  - SD2DSS: *l = 4 and 5* in the second slot
- Extended CP symbol locations:
  - PD2DSS: *l = 0 and 1* in the first slot
  - SD2DSS: *l = 3 and 4* in the second slot

Agreement:
SD2DSS sequence:
- The subframe#0 sequence is transmitted on both the symbols.
- SD2DSS sequences are length 62 and centred on d.c.

Background:
- Alt 1: same on the two symbols, LGE, GDBUK, Intel, Fujitsu, Qualcomm, Sharp, Microsoft, ZTE, Nokia Corp., Nokia Networks
  - 1a: using the sequence that has the lowest CM from the SF0 and 5 sequences: LGE, GDBUK, Qualcomm, ZTE, (Nokia Corp., Nokia Networks),
  - 1b: using the SF0 sequence: Ericsson, Intel, Fujitsu, Qualcomm, Sharp, Microsoft, CATT, (Nokia Corp., Nokia Networks, Huawei, HiSilicon, ALU, ASB, LGE)
- Alt 2: different on the two symbols, with different power:
  - ALU, ASB, Huawei, HiSilicon, Ericsson

Not treated.

R1-144608	Design of PD2DSS and SD2DSS	CATT
R1-144637	Discussion on D2DSS and PD2DSCH resource allocation	Fujitsu
R1-144638	Discussion on detailed D2DSS design	Fujitsu
R1-144648	Design of primary D2D synchronization signal	Intel Corporation
R1-144714	D2D synchronization signal design, considering information indication	Samsung
R1-144761	D2D Synchronization Signal and Channel Design	Lenovo
R1-144831	PD2DSS root indices selection	ZTE
R1-144838	Details of D2D Synchronization Signal Design	Sharp
R1-144872	Remaining details of D2DSS design	General Dynamics UK
R1-145041	On remaining details of D2DSS design	InterDigital
R1-145108	Remaining details on D2D synchronization signal design	ITL Inc.
R1-145159	Remaining details of D2DSS Design and Resource Allocation	Ericsson
R1-145255	WF on D2DSS	Qualcomm Inc., ALU, ASB, Ericsson, Huawei, HiSilicon, General Dynamics
R1-145313	WF on SD2DSS PAPR/CM Reduction	Intel Corporation

6.2.1.1.2 Remaining details of PD2DSCH content and design

Agreement: on PD2DSCH contents
- DFN: 14 bits = 10 bits counter + 4 bits offset
- TDD UL-DL config: 3 bits:
  - In case of FDD, this field is set to 000, purely for the purpose of decoding of PD2DSCH and does not imply any other UE behaviour
  - The UE is assumed to know a priori the duplex mode of the carrier
- In-coverage indicator: 1 bit
- Sidelink system bandwidth: 3 bits
- Reserved field: 20 bits set to a SIB-signalled or preconfigured value in Rel-12

- Inform RAN2 about the above content for PD2DSCH - include in LS to RAN2 and RRC spreadsheet.
- Indicate to RAN2 that the resource pool preconfiguration can be per value of system bandwidth.

Not agreed:

- Power control: 1 bit to switch between {maximum power} and {a preconfigured power level}, for use only when out-of-coverage
  - yes: LGE, Ericsson, Nokia Corp., Nokia Networks
  - no: USDoC, Qualcomm, Microsoft, ZTE, Fujitsu, III, GDBUK, Samsung, ALU, ASB, Sharp

Agreement:
- The PSSID is entirely indicated by the D2DSS.

R1-144567 On the necessity of transmitting the uplink system bandwidth on the PD2DSCH Huawei, HiSilicon
Decision: The document is noted.
R1-144686 PD2DSCH design and resource allocation Alcatel-Lucent, Alcatel-Lucent Shanghai Bell
Decision: The document is noted.

R1-144609 Remaining design for PD2DSCH CATT
Decision: The document is noted.

Proposal: Include the following in PD2DSCH:

Indication content	Number of bits
SA & Mode 2 data period.	2bits
Offset indication for Mode 2 data pool within an instance of saPeriod	Up to 9bits according to SA period
Bitmap for Mode 2 data pool	42, of which 2 bits are set to a fixed value in case of FDD
Mode 2 data cyclic prefix length to ensure the same CP length in data subframe	1bit
Total	Up to 54 bits

- Alt 1: Include the above table in PD2DSCH
  - CATT
- Alt 2: Indicate to RAN2 that the resource pool preconfiguration can be per value of system bandwidth.
  - NEC, Microsoft, ZTE, Huawei, HiSilicon, NTT DOCOMO, Vodafone, III, Sharp, Panasonic, CATT
- Alt 3: Do nothing
  -
- Alt 4: Remove System Bandwidth from PD2DSCH
  - ALU, ASB, Intel

R1-144878 Remaining Details of PD2DSCH content and design LG Electronics
Decision: The document is noted.

Agreement:
- For PD2DSCH:
  - 2 DMRS symbols are provided for PD2DSCH demodulation, in the same locations as PUSCH
  - PD2DSCH is mapped to the central 6 PRBs in all symbols in the subframe except D2DSS symbols, DMRS symbols and the last symbol.
    - PD2DSCH is rate-matched around D2DSS and DMRS; the last symbol is punctured

R1-145299 WF on PD2DSCH Details Qualcomm
Decision: The document is noted.

Agreements:

	Scrambling				DMRS base sequence				DMRS	
	Cell ID	RNTI	Slot	Code	Group	Sequence	Delta shift	Cell ID	CS	OCC
PD2DSCH	D2DSS ID {0-335}	Fixed to 0	Fixed to 0	0	Disabled	Disabled	0	D2DSS ID bits 4-9	D2DSS ID bits 1-3	D2DSS ID bit 0

Agreements:
- D2DSS ID in D2DSSue_net has range {0-167}
- D2DSS ID in D2DSSue_oon has range {168-335}

- PSSID is the same as D2DSS ID
- Note that the index in the agreement where the index of the D2DSS sequence in D2DSSue_oon is the same as the index of the D2DSS sequence in D2DSSue_net assumes that the index is relative to the start of the range of the respective set of sequences.

Not treated.

R1-144568	The remaining issues for PD2DSCH content and channel design	Huawei, HiSilicon
R1-144639	Discussion of contents of PD2DSCH	Fujitsu
R1-144674	On synchronization channel design for D2D operation (PD2DSCH)	Intel Corporation
R1-144715	PD2DSCH Content and remaining aspects of PD2DSCH design	Samsung
R1-144716	Considerations on D2D frame number in PD2DSCH	Samsung
R1-144873	Remaining details of PD2DSCH content and design	General Dynamics UK
R1-144980	PD2DSCH contents	Nokia Corporation, Nokia Networks
R1-145042	On remaining details of PD2DSCH design	InterDigital
R1-145062	PD2DSCH content and design	Qualcomm Inc.
R1-145142	Remaining details of PD2DSCH content	Microsoft Corporation
R1-145153	Remaining details of PD2DSCH design	Ericsson
R1-145228	WF on PD2DSCH demodulation	LG Electronics, InterDigital Communications, Lenovo
R1-145304	WF on PD2DSCH content	Huawei, HiSilicon, Qualcomm, Microsoft, General Dynamics, CATT
R1-145381	WF on remaining details of PD2DSCH design	LG Electronics, Lenovo

6.2.1.1.3 Remaining details of synchronization and re-synchronization procedures

R1-145092 **D2D synchronization procedure** **Huawei, HiSilicon**
Decision: The document is noted.

R1-144675 **Remaining Details of D2D Synchronization Procedure** **Intel Corporation**
Decision: The document is noted.

R1-144832 **D2D Synchronization Procedure** **ZTE**
Decision: The document is noted.

R1-144719 **Remaining issues on conditions for D2DSS transmission** **Samsung**
Decision: The document is noted.

R1-144880 **Details of D2D Synchronization and Re-synchronization Procedures** **LG Electronics**
Decision: The document is noted.

R1-145157 **Transmitter Behaviour for D2D Synchronization** **Ericsson**
Decision: The document is noted.

Proposals:
- A UE keeps memory of and uses the last used D2D transmit synchronization reference in any case where a suitable external synchronization reference is unavailable
- In case of a synchronization reference change, the UE completes the ongoing data scheduling cycle and associated (re)transmissions using the original synchronization reference.
- Discovery is temporarily suspended during changes of synchronization.

R1-145156 **Receiver Behaviour for D2D Synchronization** **Ericsson**
Decision: The document is noted.

R1-145063 **Details of synchronization procedure** **Qualcomm Inc.**
Decision: The document is noted.

Proposal: Send LS to RAN4:
- Detection requirements for out-of-coverage UEs to detect at least UE D2D synchronization source are to be specified by RAN4

Prepare draft LS for approval at 8.30am on Wed – R1-145274
Wednesday 19th
R1-145274 [Draft] LS on D2D Synchronization procedure Qualcomm
Decision: The document is noted. Handled in other LS.

R1-145227 **WF on synchronization procedure** **LG Electronics, Qualcomm, NEC, General Dynamics, ETRI, CEWiT, Ericsson**
Decision: The document is noted.

Agreement:

- When an out-of-coverage UE selects D2D synchronization source using a D2DSS in D2DSSue_oon as its transmit timing reference, it transmits:
  - the same D2DSS, with no indication of hop count,
  - in the other out-of-coverage synchronization resource,
  - the DFN of the subframe in which the PD2DSCH is transmitted
- DFN is transmitted as 10-bit counter with 10ms granularity and a 4-bit offset with range 0-9ms

Question: Does the in-coverage synchronization resource have to be the same as one of the out-of-coverage synchronization resources?
- yes (i.e. only 2 sync resources in partial coverage case): Huawei, HiSilicon, ALU, ASB, Sharp, ETRI, Microsoft
- no (i.e. may have 3 sync resources in partial coverage case):

Agreement: The in-coverage synchronization resource is the same as one of the out-of-coverage synchronization resources.

Agreement:
- 1 bit is included in PD2DSCH to indicate whether a UE is in coverage or not.
  - Set to 1 if the UE is in coverage
  - Set to 0 if the UE is out of coverage
- When an out-of-coverage UE selects D2D synchronization source using a D2DSS in D2DSSue_net and the PD2DSCH indicating "in coverage" as its transmit timing reference, it transmits:
  - the same D2DSS in D2DSSue_net
  - in the other out-of-coverage synchronization resource,
  - the DFN of the subframe in which the PD2DSCH is transmitted
- When an out-of-coverage UE selects D2D synchronization source using a D2DSS in D2DSSue_net and the PD2DSCH indicating "out-of-coverage" as its transmit timing reference, it transmits:
  - FFS between:
    - the same D2DSS in D2DSSue_net
    - a D2DSS in D2DSSue_oon
  - in the other (i.e. other than the detected one) out-of-coverage synchronization resource,
  - the DFN of the subframe in which the PD2DSCH is transmitted
- FFS what potential prioritisation may or may not be given to D2DSS in D2DSSue_net if PD2DSCH indicates "out-of-coverage"

Background:
- When an out-of-coverage UE selects D2D synchronization source using a D2DSS in D2DSSue_oon as its transmit timing reference:
  - it transmits:
    - Alt 1: the same D2DSS,
      - 1a: with indication of hop count in PD2DSCH
        - Ericsson, CATT, Qualcomm, ETRI, Microsoft, Huawei, HiSilicon, LGE, GDBUK, ITL, KPN, (Intel , Fujitsu)
      - 1b: with no indication of hop count
        - Ericsson, NEC, GDBUK, ZTE, LGE, Panasonic, ITL, Qualcomm, Nokia Corp., Nokia Networks, USDoC, (ALU, ASB, Sharp)
    - Alt 2: a D2DSS with different PSSID
      - 2a: with indication of hop count
        - Intel, Fujitsu, Huawei (only if on PD2DSCH), HiSilicon, Sharp, Samsung (if <=2)
      - 2b: with no indication of hop count
        - ALU, ASB, Sharp
  - it uses:
    - Alt A: the same synchronization resource
      - ALU, ASB, Ericsson, NEC
    - Alt B: the other out-of-coverage synchronization resource
      - Qualcomm, Microsoft, GDBUK, LGE, Huawei, HiSilicon, Nokia Corp., Nokia Networks, ETRI, ZTE, Fujitsu, Sharp
      - using the DFN of the subframe in which the PD2DSCH is transmitted
- When an out-of-coverage UE selects D2D synchronization source using a D2DSS in D2DSSue_net as its transmit timing reference, it transmits:
  - a D2DSS
    - Alt 1: in D2DSSue_net
      - 1a: with 1 bit in PD2DSCH to indicate whether in coverage or not

- CATT, LGE, GDBUK, ETRI, Qualcomm, ITL, ZTE, (Ericsson), (Sharp)
- ~~1b: no indication of whether in coverage or not~~
  - ~~Ericsson, Sharp,~~
- Alt 2: in D2DSSue_oon
  - Nokia Corp., Nokia Networks, ALU, ASB, Huawei, HiSilicon, Fujitsu
- in the other out-of-coverage synchronization resource,
- the DFN of the subframe in which the PD2DSCH is transmitted

Wednesday 19th

R1-145288 WF on Synchronization Behavior (Transmitter) Ericsson
Decision: The document is noted.

Agreements:
In-coverage UE:
- If a UE is transmitting D2DSS/PD2DSCH
  - If the UE is camping/connected to an eNB
    - The D2DSS sequences and PD2DSCH contents are signalled by the eNB and no content is obtained from the pre-configuration
      - DFN: same as SFN + subframe number in which the PD2DSCH is transmitted
      - In-coverage indicator: 1
      - Reserved field: from SIB
    - D2DSS belongs to D2DSSue_net

Partial Coverage
- If a UE is transmitting D2DSS/PD2DSCH
  - If the UE selects D2DSS/PD2DSCH from in-coverage UEs as its transmission timing reference and D2DSS belongs to D2DSSue_net (and thus the UE is not camping/connected to an eNB)
    - The D2DSS sequences and PD2DSCH contents are the same as the received D2DSS/PD2DSCH and not the pre-configuration, except for:
      - DFN: subframe in which the PD2DSCH is transmitted
      - In-coverage indicator: 0

Out of coverage case 1
- If a UE is transmitting D2DSS/PD2DSCH
  - If the UE selects D2DSS/PD2DSCH from out-of-coverage UEs as its transmission timing reference and D2DSS belongs to D2DSSue_net (and thus the UE is not camping/connected to an eNB)
    - The PD2DSCH contents are the same as the received PD2DSCH, except for:
      - DFN: subframe in which the PD2DSCH is transmitted
    - D2DSS is the sequence in D2DSSue_oon that has the same index as the received sequence in D2DSSue_net

Out of coverage case 2
- If a UE is transmitting D2DSS/PD2DSCH
  - If the UE selects D2DSS/PD2DSCH from out-of-coverage UEs as its transmission timing reference and D2DSS belongs to D2DSSue_oon (and thus the UE is not camping/connected to an eNB)
    - The D2DSS sequence is the same as the received D2DSS
    - PD2DSCH contents are the same as the received PD2DSCH, except for:
      - DFN: subframe in which the PD2DSCH is transmitted

Out of coverage case 3:
- If a UE is transmitting D2DSS/PD2DSCH
  - If the UE does not select any D2DSS/PD2DSCH as its transmission timing reference and it is not camping/connected to an eNB
    - The PD2DSCH contents are determined by the pre-configuration, except for
      - In-coverage indicator: 0
      - DFN: using preconfigured value of syncOffsetIndicator, with the rest of the DFN being up to UE implementation for the first transmission
    - D2DSS sequence is arbitrarily selected from D2DSSue_oon, and can only be reselected if there is a change of transmission timing reference

R1-145387 WF on Detecting Out-of-sync State Samsung
Decision: The document is noted.

Proposal:
- For a UE which is a sync source using a D2DSS from D2DSSue_oon,

- the UE transmits a periodically changed D2DSS from D2DSSue_oon.
- The periodicity for changing D2DSS is n* {32*40} ms.
- The periodicity starts at DFN#0

R1-145271 WF on D2DSS transmission condition LG Electronics, Samsung, ETRI
Decision: The document is noted.

Proposal:
- Definition for D2DSS cycle:
  - The length of each D2DSS cycle is 1028(=32*40) ms.
  - One D2DSS cycle starts at the first subframe of DFN #0.
- A communication UE which transmitted D2DSS in a subframe continues to transmit D2DSS in the subsequent D2DSS subframes within a D2DSS cycle.
  - The actual D2DSS transmission is subject to the agreed conditions to stop D2DSS transmissions.

R1-145305 WF on triggering condition(s) of D2DSS transmission Nokia Corp., Nokia Networks, Samsung, ITRI, III
Decision: The document is noted.

Agreement:
- For an in-coverage D2D communication-capable UE that is not transmitting SA or D2D data, in each subframe in the D2DSS resource that does not conflict with cellular transmission from the UE perspective, the UE shall transmit D2DSS if the UE is RRC_Connected and the eNB has instructed it (by dedicated signalling) to start D2DSS transmission, AND the eNB has not instructed the UE (by dedicated signalling) to stop D2DSS transmission

R1-145308 WF on Selection and Reselection of Synchronization Source Samsung, LGE, KDDI, Qualcomm, III, ITRI
Decision: The document is noted.

Proposal:
- *For out-of-coverage UEs, a periodic silent and scanning period (SSP) is provided for reselection of D2D synchronization source*
  - The periodicity of SSP is fixed to {32*40} ms
  - The duration of SSP is fixed ~~– between one of {40, 80}~~ ms
    - The UE does not transmit any D2D signals/channels during SSP except a maximum of one occurrence of D2DSS/PD2DSCH.
  - The SSP starts at DFN #0.
  - All the D2D UEs acquired the same timing reference shall follow the same SSP.
- *RAN4 to discuss requirements for an out-of-coverage UE to detect a higher priority D2D sync source within n SSP occurrences if received signal strength is above certain threshold.*
  - *RAN4 to discuss n, value of the threshold, and probability of detection*

R1-145292 [Draft] LS on D2D Synchronization Procedure Ericsson
Decision: The document is noted. Include also the agreement in AI 6.2.1.3 on order of priority for synchronisation source selection. Final LS is agreed in R1-145295

Thursday 20th
The previous agreed LS is revised in R1-145297.
R1-145297 [Draft] LS on D2D Synchronization Procedure Qualcomm
Decision: The document is noted. Add a sentence: This LS supersedes 5295; none of the agreements in 5295 have been changed, but some additional agreements are included that had not previously been notified to RAN4 (indicated with change tracking). Keep Stefano Sorrentino (Ericsson) as additional contact.
Final LS is agreed in R1-145298.

Thursday 20th

Agreements:
- The order of decreasing priority for synchronisation source selection is as follows:
  1. eNBs that meet the Scriterion
  2. UEs within network coverage (among which higher priority is given to D2DSS received with higher synchSourceThresh measurement)

3. UEs out of network coverage transmitting D2DSS from D2DSSue_net (among which higher priority is given to D2DSS received with higher synchSourceThresh measurement)
4. UEs out of network coverage transmitting D2DSS from D2DSSue_oon (among which higher priority is given to D2DSS received with higher synchSourceThresh measurement)

- If none of the above are selected, the UE uses its own internal clock.
- Any possible hysteresis or reselection timer for the synchSourceThresh measurement is up to UE implementation.
- Any possible performance requirements related to synchronisation source selection are up to RAN4.
- It is up to RAN4 to define any possible criterion to ensure that only UEs which are received reliably are taken into account in the above selection procedure.

Stefano's question:
A UE is configured for inter-cell discovery, and it receives a few D2DSS and discovery messages, is it allowed to perform any estimation on the D2DSS in order to aid demodulation of the discovery message? If so, which D2DSS should be used?

R1-145155 **Outstanding Issues for D2D QCL, Scrambling and Timing Ericsson**
Decision: The document is noted.

Proposal:

	SA	Physical D2D data channel	Physical D2D discovery channel	Physical D2D discovery channel
D2DSS	Doppler shift, Doppler spread and average delay if associated to same (original) D2DSS ID.	Doppler shift, Doppler spread and average delay if associated to same (original) D2DSS ID.	Doppler shift, Doppler spread and average delay if associated to same (original) D2DSS ID.	Doppler shift, Doppler spread and average delay if associated to same (original) D2DSS ID.
PD2DSCH	Doppler shift, Doppler spread and average delay if associated to same (original) D2DSS ID.	Doppler shift, Doppler spread and average delay if associated to same (original) D2DSS ID.	Doppler shift, Doppler spread and average delay if associated to same (original) D2DSS ID.	Doppler shift, Doppler spread and average delay if associated to same (original) D2DSS ID.
SA		All large-scale channel properties if associated to same data transmission		

Revisit on Friday:
R1-145459 WF on Reception Timing assumptions Ericsson

Draft LS to RAN4 on additional agreements on D2DSS, PD2DSCH and synchronization procedure in R1-145420 – Qualcomm – revisit on Friday.

Friday 21st
R1-145420 **[Draft] LS on D2D Synchronization Signal Design and Procedure Qualcomm**
The document was presented by Saurabha Tavildar from Qualcomm and provides the agreements in RAN1 relating to D2D synchronization signal design and procedure, measurement and transmission timing.
Discussion: Intel → note added by Qualcomm has not been discussed.
Remove "note companies are free to submit proposals based on additional tones in RAN4"
Decision: The document is noted.
R1-145422 **[Draft] LS on D2D Synchronization Signal Design and Procedure Qualcomm Inc (R1-145420)**
Decision: The document is noted and final LS is agreed in R1-145478

R1-145459 **WF on Reception Timing Assumptions Ericsson**
The document was presented by Stefano Sorrentino from Ericsson.
- A UE may assume that SA, PD2DSCH and D2D discovery messages are received with the same timing as the D2DSS associated to the synchronization source that determines the SFN/DFN of the incoming signal.
- A UE may assume that a D2D data message is received with the same timing as the associated SA shifted by the D2D reception timing adjustment in the associated SA.

Discussion: Concern whether this should be captured in RAN4 spec., instead of RAN1 spec.
ALU → more a UE implementation issue. Ericsson → strange to leave timing assumptions to UE implementation.
Qualcomm → a compromise could be to not capture it in RAN1 spec and send an LS to RAN4 along these lines.
ALU/LGE no need to send LS to RAN4
Decision: The document is noted.

Possible agreement:

- A UE may assume that SA, PD2DSCH and D2D discovery messages are received with the same timing as the D2DSS associated to the synchronization source that determines the SFN/DFN of the SA, PD2DSCH and D2D discovery messages.

R1-145460 WF on Remaining D2D Issues Qualcomm Inc.(Rapporteur)

The document was presented by Shailesh Patil from Qualcomm and deals with various open issues (incl. type 2b hopping, and overlap with SRS).

Decision: The document is noted and the following agreements are achieved:

Agreement:

- For both Type 1 and Type 2B discovery, the frequency resource on the k^{th} $(1 \le k \le L-1)$ repeated transmission is given as
  - $n_f(k) = [n_f(0) + k*floor(N_f/L)]$ modulo N_f
  - Here,
    - L is the total number of transmissions by a UE within a discovery period.
    - N_f is the total number of discovery resources within a sub-frame.
    - $n_f(0)$ is the index in frequency of the first discovery transmission within a discovery period.
    - $n_f(k)$ is the index in frequency of the k^{th} repeated transmission within a discovery period

Agreement:

- Leave the T-RPT index to subframe bitmap mapping up to editor (36.213 Bob (Motorola mobility))

Agreement:

- DCI-5 shall use the same search space as DCI-0.
  - That is, search space is "common and UE specific" by C-RNTI" for PDCCH and "UE specific by C-RNTI" for EPDCCH

Agreement:

- A UE drops the entire D2D transmission in sub-frame n if the UE transmits an uplink SRS signal in a sub-frame n on the same component carrier except for Mode 1 data if Mode 1 data CP length and WAN CP length are equal

Agreement:

- The DL RSRP used for deciding on D2D operation is defined using the paired DL carrier for FDD and the same carrier for TDD

R1-145423 WF on Sync Procedure Specification Qualcomm Inc

- Synchronization procedure for ProSe/D2D is captured in RAN1 specifications (36.213)

Discussion: ALU suggested RAN1 to follow the synch procedure as captured by RAN2

- RAN2 intends to specify in RRC which fields are set how under which condition. Other aspects are assumed to be captured in RAN1 specifications.

Decision: The document is noted and it is agreed that RAN1 will follow the above recommendation from RAN2 chairman's note regarding how to capture synchronization procedure in specification.

R1-145465 WF on condition to become a synchronization source Samsung, Nokia Corp., Nokia Networks

- For out-of-coverage UEs,
  - *A UE can become a D2D Synchronization Source*
    if received signal strength of the D2DSS(s) of the selected synchronization source by the UE are below X dBm.

Discussion: Also supported by Qualcomm.

Ericsson suggested sending an LS to inform RAN4 – according to Qualcomm, this has been already captured in R1-145422.

Decision: The document is noted, modified and agreed as:

Agreement:

- For out-of-coverage UEs transmitting SA or data,
  - *A UE shall transmit D2DSS if the D2D measurement for selected transmission timing reference is below SynchSourceThresh*
- Note: above agreement will be captured in the final LS in R1-145478.

Not treated.

R1-144610 D2D synchronization procedure in partial and out-of-coverage scenario CATT

R1-144611 Synchronization resource allocation for out-of-coverage UEs CATT

R1-144640 Discussion of D2D synchronization procedure Fujitsu
R1-144687 D2D synchronization and re-synchronization procedure Alcatel-Lucent Shanghai Bell, Alcatel-Lucent
R1-144717 D2D Silent and scanning period for reselection procedure Samsung
R1-144718 Analysis of flat synchronization schemes for out-of-coverage Samsung
R1-144720 D2DSS transmission considering UE states Samsung
R1-144790 Remaining issues on D2D synchronization procedure Panasonic (R1-144101)
R1-144857 On triggering conditions for D2DSS transmission NEC
R1-144858 D2D synchronization procedure for out-of-network coverage NEC
R1-144879 Evaluation results on the D2D synchronization procedure for out-of-coverage network LG Electronics
R1-144925 D2D Re-synchronization Procedure in Varied Coverage HTC
R1-144936 The Coverage Enhancement of eNB's Timing in D2DSS Transmission ITRI
R1-144937 Synchronization and Re-synchronization Procedures for the Coverage Enhancement of eNB's Timing using D2DSS Transmission ITRI
R1-144981 Discussion on conditions for D2DSS transmission Nokia Corporation, Nokia Networks
R1-145043 On the D2D (re-)synchronization procedure InterDigital
R1-145093 Remaining conditions for D2DSS transmission Huawei, HiSilicon
R1-145126 D2DSS transmission in exceptional cases III
R1-145144 Issues in D2D synchronization procedures Microsoft Corporation
R1-145309 WF on Tx Timing Synchronization Samsung, Qualcomm
R1-145310 WF on Conditions for Synchronization Sources in Out-of-coverage Samsung, Nokia Corp., Nokia Networks
R1-145311 WF on Conditions for Flat Synchronization Samsung, CEWiT

6.2.1.2 Remaining aspects of D2D transmission timing

Agreement:
- Type 2b discovery: DL timing is used.
- D2DSS: DL timing is used
- Mode 2 data:
  - RRC_Idle UEs use DL timing
  - RRC_Connected UEs use DL timing

Ericsson, NEC, Nokia Corp. and Sharp observe that by choosing DL timing for mode 2 data for RRC_Connected UEs, the possibility for the eNB to receive mode 2 data is made more complex and performance may be degraded.

Background:
- Alt 1: DL timing
  - ZTE, Qualcomm, Intel, GDBUK, ALU, ASB, USDoC, Microsoft, Panasonic, (Huawei, HiSilicon, LGE, Samsung, Nokia Corp., Nokia Networks)
- Alt 2: UL timing
  - Sharp, LGE, Fujitsu, Huawei, HiSilicon, Samsung, NEC, Ericsson
- Alt 3: Configurable between DL and UL timing
  - Ericsson, Sharp, Fujitsu, NEC, Nokia Corp., Nokia Networks

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Friday 21st
R1-145160 TA Granularity in the SA Ericsson
Proposal:
- 11 bits are used to indicate D2D reception timing adjustment in SA (at least for Mode1), giving values of TA spaced at intervals corresponding to 16Ts with a cell radius of 100km

Discussion: ALU it's too late to change previous agreement on TA field in the SA.
Ericsson: this raises a technical point – cannot argue against such an answer "too late"
Mr Chair stopped the discussion due to lack of time.
Decision: The document is noted.

Not treated.
R1-144612 Remaining aspects of transmission timing for D2D CATT
R1-144650 On remaining details of transmission timing for Type 2B discovery Intel Corporation
R1-144651 On Remaining Aspects of Transmission Timing for D2D Communication Intel Corporation
R1-144688 D2D Transmission Timing Setting Alcatel-Lucent, Alcatel-Lucent Shanghai Bell
R1-144721 Discussion of TA in D2D SA Samsung
R1-144722 Discussion on D2D transmission timing Samsung
R1-144791 Further discussion on timing advance in D2D Panasonic (R1-144100)
R1-144833 Remaining issues for D2D transmission timing ZTE

R1-144839	Remaining issues on D2D transmission timing	Sharp
R1-144874	Remaining aspects of D2D transmission timing	General Dynamics UK
R1-144881	Remaining issues on D2D transmission timing	LG Electronics
R1-144959	Transmission timing of Type 2B discovery	NTT DOCOMO
R1-145064	Transmission timing for D2D	Qualcomm Inc.
R1-145094	Discovery transmission timing	Huawei, HiSilicon
R1-145143	Remaining details of D2D transmission timing	Microsoft Corporation
R1-145306	WF on timing for Mode 2	LG Electronics, Samsung, Sharp

6.2.1.3 Measurements

Including definition of synchSourceThresh measurement.

R1-144569 D2D measurement definitions Huawei, HiSilicon
Decision: The document is noted.
R1-145065 D2DSS Measurement Qualcomm Inc.
Decision: The document is noted.

Agreement:
- Inform RAN2 that RAN1 assumes that existing L3 filtering applies to D2D synchSourceThresh measurement for out-of-coverage, and that this filtering is agnostic to which symbols are being used, which will be decided in RAN1.
    - The filter parameters are assumed to be preconfigured

Agree on Wed which symbols the measurement is to be made on, and then inform RAN4.

Wednesday 19th
R1-145226 WF on D2DSS quality LG Electronics, Qualcomm
Decision: The document is noted.
Proposal:
- Threshold for minimum D2DSS quality (*MinSyncQualThresh*) is defined.
    - For selection of transmission timing reference, a UE prioritizes a received D2DSS from a UE with measurement above *MinSyncQualThresh* over another D2DSS received from a UE with measurement below *MinSyncQualThresh*.
        - An out-coverage UE does not select a D2DSS in D2DSSue_net whose measurement is below this *MinSyncQualThresh* if it detects another D2DSS in D2DSSue_oon whose measurement is above *MinSyncQualThresh*.
    - *MinSyncQualThresh* is not configurable and potentially different from *SyncSourceThresh*.
        - Ask RAN4 to determine this threshold. RAN1 recommendation is that *MinSyncQualThresh* is determined by adding an offset to the minimum received power required for reliable detection of D2DSS/PD2DSCH.
    - The same measurement is used for the threshold tests with *MinSyncQualThresh* and *SyncSourceThresh*.

Thursday 20th
R1-145149 D2DSS Based Measurements Ericsson
Decision: The document is noted.

Possibilities for synchSourceThresh measurement:
- PD2DSS
- SD2DSS
- PD2DSCH
- DMRS

R1-145382 WF on on D2D synchronization measurement LG Electronics, ALU, ASB, Lenovo
Decision: The document is noted.

Agreements:
- UE measurements for SynchSourceThresh are based on DMRS in the central 6 PRBs in the subframe of D2DSS/PD2DSCH transmission
- The measurement is defined as the linear average at least within one subframe over the power contributions (in [W]) of the resource elements that carry DMRS for a given D2DSS ID
- Each measurement reported to higher layers is made using only one synchronization resource
- Exact wording to be determined by the spec editor when writing the CR

Agreed clarification: For D2D communication both in-coverage and out-of-coverage, the transmission periodicity of D2DSS in each synchronization resource is 40ms, subject to the other already-agreed conditions.

Not treated.

R1-144642	Discussion of D2D measurement	Fujitsu
R1-144676	On Measurements for D2D Synchronization Procedure	Intel Corporation
R1-144689	Consideration of D2D measurements	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell
R1-144882	Measurement for D2D synchronization	LG Electronics

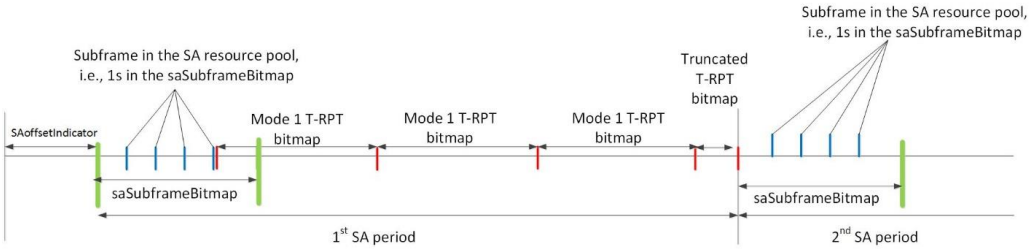
6.2.1.4 Remaining details of resource pool configuration

Including remaining overlap cases.

R1-145066 D2D Resource pool configuration Qualcomm Inc.
Decision: The document is noted.
R1-145268 WF on Resource Pool Definition Qualcomm Inc. (Rapporteur), Kyocera, LGE, Panasonic (R1-145252)
Decision: The document is noted.

Agreements:

- offsetIndicator should directly indicate offset
- One of the two synchronisation resources that can be configured for out-of-coverage can be pre-configured using a synchOffsetIndicator which indicates a subframe offset with respect to the start of DFN#0, range {0..39};
  - the other of the two synchronisation resources that can be configured for out-of-coverage has an independently pre-configured offset
- mode2TRPTSubset can be pre-configured for OOC
- Mode 1 Data CP length is signalled in the SIB for neighbour cells
- Within an SA period, Mode 1 data sub-frames
  - start after the last sub-frame of the saSubframeBitmap that contains SA resources, i.e., after the last '1' of the saSubframeBitmap
  - end before the first sub-frame of the saSubframeBitmap of the next SA period
  - An example Mode 1 SA & Data resource pool configuration shown below:



R1-145125 Remaining issues on assigned D2D resource allocation for release 12 U.S. Department Of Commerce
Decision: The document is noted.
R1-145209 Enabling assigned resources for D2D communication Qualcomm Inc., U.S. Department of Commerce
Decision: The document is noted.

Conclusion: No consensus; too late for Rel-12.

D2D resource overlap

R1-145375 WF on other D2D channel in D2DSS subframe ZTE, Huawei, HiSilicon
Decision: The document is noted.
Proposal:

- Discovery signals can be transmitted in D2DSS subframes, when PD2DSCH is not present
  - Discovery transmissions would occupy SC-FDMA symbols other than those for D2DSS and DMRS
  - Rate matching is assumed to account for the overhead of D2DSS

R1-145254 WF on Discovery & D2DSS Overlap Qualcomm Inc., Intel, Kyocera, Samsung, General Dynamics, III
Decision: The document is noted.

Agreement:

- Discovery, SA and data transmissions shall not take place in D2DSS subframes configured for transmission of D2DSS

Friday 21st

R1-144677 On overlap of different types of D2D resource pools Intel Corporation

The document was presented by Alexey Khoryaev from Intel and proposes:

Proposal 1

- For associated SA and Data pools, the pool overlap at the subframe level (in time) is prohibited by specification.
- For non-associated SA and Data pools, D2D TX prioritizes SA over Data, if network/eNB signaling for pool usage/priority is not defined.

Proposal 2

- Follow eNodeB/network configuration (e.g. pool usage index and/or priority rule) to decide on prioritization rule between Data and Discovery.

Proposal 3

- If UE operation in two modes at a time is supported, an UE prioritizes Mode-1 transmission over Mode-2 transmission.

Proposal 4

- Type 1 and Type 2B discovery TX pools should not overlap in time and frequency.
- In case of time-domain collisions from a single UE's perspective between the allocated Type 2B discovery resource and the randomly selected Type 1 discovery resource, the UE should prioritize transmission on Type 2B discovery resource and drop Type 1 discovery transmission on that subframe.

Decision: The document is noted.

R1-145374 WF on Transmitting UE behavior for overlapped resource pools ZTE, LGE

The document was presented by Yifei Yuan from ZTE.

- From a UE perspective,
  - Transmission priority of SA is higher than that of D2D data, in both cases of associated and non-associated pools

Decision: The document is noted.

Conclusion:

- In case of time domain overlap of SA an data resource pool, the transmission and reception of SA and data is up to UE implementation

Agreement:

- In case of time-domain collisions from a single UE's perspective between the allocated Type 2B discovery resource and the randomly selected Type 1 discovery resource, the UE should prioritize transmission on Type 2B discovery resource and drop Type 1 discovery transmission on that subframe

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Other

R1-144793 Clarification on Mode 1 data starting position Panasonic

Decision: The document is noted.

Friday 21st

R1-145154 Prioritization rules between resource pools Ericsson

The document was presented by Stefano Sorrentino from Ericsson and proposes:

- If UE transmission capabilities are limited at a given time:
  - Cellular UL has highest priority
  - D2D transmission on the Pcell has second highest priority
  - D2D transmission on an out of coverage carrier has third highest priority
  - When transmitting on the Pcell communication has higher priority than discovery
- If UE reception capabilities are limited at a given time:
  - Cellular DL has highest priority
  - D2D reception on carrier(s) configured/signaled by the serving eNB has second highest priority
  - D2D reception on carrier(s) not configured/signaled by the serving eNB has third highest priority
    - Note: this case includes inter-PLMN D2D reception
  - Among the carrier(s) configured/signaled by the serving eNB, communication has higher priority than discovery
  - Among the carrier(s) not configured/signaled by the serving eNB, communication has higher priority than discovery

Decision: The document is noted, modified and the following is agreed:

Agreements:

- If UE transmission capabilities are limited at a given time:
  - Cellular UL has highest priority
  - Communication has higher priority than discovery both with in a carrier and across carriers
- If UE reception capabilities are limited at a given time:
  - Cellular DL has highest priority
  - Communication reception is the second priority
  - D2D discovery is the third priority
  - Among D2D discovery on multiple carriers
    - D2D discovery reception on carrier(s) configured/signaled by the serving eNB has the highest priority
    - D2D discovery reception on carrier(s) not configured/signaled by the serving eNB has the second highest priority
      - Note: this case includes inter-PLMN D2D reception

R1-144726 Remaining details of D2D communication design Samsung

The document was presented by … from Samsung and proposes:

- If a resource release mechanism can be introduced in Rel-12, the UE always transmits the SA granted by the eNB, regardless of whether there is data or not in the buffer at the time of SA transmission.
- Otherwise, transmitting SA or not is up to UE implementation in case that the UE has no data to transmit at the time of SA transmission.

Decision: The document is noted.

R1-145307 WF on SA and data transmission LG Electronics, Samsung, ZTE

- For Mode 1, a UE shall transmit SA in the next instance of SA resource pool that starts at least 4ms after subframe *n,* if the UE detects Mode 1 grant at subframe *n*.
- For D2D data, a UE shall not transmit data MAC PDU if the UE has no data to transmit at a given subframe.
  - The transmitter UE shall release the subsequent assigned resources after having no data to transmit in X consecutive subframes of T-RPT opportunities within a SA period.
  - The receiver UE is not required to detect any data after X consecutive subframes of detecting no data in the assigned T-RPT subframes within a SA period.
  - X can be fixed or dependent on the SA period e.g. X is valid only if SA period is larger than 40ms.

Decision: The document is noted. No consensus.

Not treated.

R1-144570	Transmission and reception in the D2DSS/PD2DSCH overlapped resource	Huawei, HiSilicon
R1-144613	On D2D resource collision	CATT
R1-144643	Discussion of D2D resource pool allocation	Fujitsu
R1-144652	On overlap of multiple D2D resource pools and UE behavior	Intel Corporation
R1-144690	Remaining Details of Resource Pool Configurations	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell
R1-144723	Remaining issues on D2DSS/PD2DSCH overlap with other D2D channels	Samsung
R1-144724	Remaining issues on overlap of SA/D2D Data transmissions	Samsung
R1-144792	Discussion on D2D channel collision handling	Panasonic
R1-144834	Discussion on overlapping of resource pools	ZTE
R1-144883	Remaining Details of Resource Overlap Handling	LG Electronics
R1-144884	Remaining Details on DL Gap for D2D Discovery	LG Electronics
R1-144957	Remaining details of resource allocation for D2DSS/PD2DSCH	Kyocera
R1-145095	Remaining details on type-2B discovery	Huawei, HiSilicon
R1-145150	Remaining details of Discovery Resource Allocation	Ericsson
R1-145154	Prioritization rules between resource pools	Ericsson
R1-145256	WF on other D2D transmissions in D2DSS resource	LG Electronics, Qualcomm
R1-145257	WF on remaining details on DL gap for D2D discovery	LG Electronics, Qualcomm
R1-145314	WF on Remaining Details of MAC PDU Transmission	Intel, Qualcomm

6.2.1.5 Remaining details of Power Control

R1-145258 WF on Transmit Power Reduction "LG Electronics, Qualcomm, General Dynamics UK, Kyocera"

Decision: The document is noted.

Agreement:

- D2D transmission power is constant within a subframe with the exception of any power reduction applied to SD2DSS w.r.t. PD2DSS
- Both SD2DSS symbols within a subframe are transmitted with the same power

R1-144691 **D2D power control details** **Alcatel-Lucent Shanghai Bell, Alcatel-Lucent**
Decision: The document is noted.

~~Agreement:~~
DCI format 5 power control parameter applies to D2DSS and PD2DSCH as well as SA and data:
~~Working Assumption:~~
- starting from the subframe which is 4 subframes after DCI5 is received,
- until either
  - the end of the SA period that starts at least 4 subframes after the subframe in which the DCI5 is received, or
  - 4 subframes after the next DCI5 is received,
  - whichever is sooner.
- If no DCI5 is received before the end of the SA period, the power control reverts to the open loop power control at the end of the SA period.

Working Assumption can be revisited on Friday if a problem is identified.

Friday 21st

Agreement:
DCI format 5 power control parameter applies to D2DSS and PD2DSCH as well as Mode 1 SA and Mode 1 data:
- starting with the first SA period that starts at least 4 subframes after the subframe in which the DCI 5 is received until the end of the SA period

Agreement:
If multiple DCI5 are received within the SA period, the last one that was received at least 4 subframes before the start of next SA period will be used to determine all the included parameters for the next SA period

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Not treated.
R1-144641 Discussion of details of D2D power control mechanism Fujitsu
R1-144653 On remaining details of power control Intel Corporation
R1-144885 Further details on D2D transmission power control LG Electronics
R1-144982 On remaining details of power control for D2D transmissions Nokia Corporation, Nokia Networks
R1-145151 Inter-Carrier Aspects of D2D Power Control Ericsson

6.2.1.6 D2D UE capabilities

R1-145250 **Offline discussion on ProSe UE capabilities** **NTT DOCOMO**
The document was presented by Kazuaki Takeda from NTT DOCOMO and provides UE capability for ProSe table that applies to single carrier D2D operation.
Discussion: Remaining issues are:
- Multi-carrier operation.
- Simultaneous discovery and DL Uu in the same carrier.

Decision: The document is noted and the table is agreed together with the note assuming updating feature group name of 4-3 to "Communication"

R1-145158 **Remaining Details of Soft Buffer Sharing Ericsson**
The document was presented by Stefano Sorrentino from Ericsson and concludes with:
Observations:
- The aggregated data rate X only includes D2D data and discovery channel bit rates
- Cellular DL and UL capabilities are unaffected by D2D transmission and reception
- D2D control channels can always be decoded by the UE and is not considered in the aggregated data

Proposal:
- For communication, the aggregated data rate X received from multiple UEs is defined as the total number of transport blocks bits received within a TTI
  - The maximum number of transport block bits in a TTI is set to 46888.
- For discovery, the aggregated data rate X received from multiple UEs is defined as 50 times the discovery message size.

Decision: The document is noted.

R1-145096 **UE and D2D capability Huawei, HiSilicon**
The document was presented by Philippe Sartori from Huawei. Regarding SA_{MAX}, the number of SAs a UE is expected to receive and simultaneously process should be dependent on the D2D category. To some extent, SA_{MAX} is linked to X.
For the lowest category, being able to process a maximum of two SAs: one for a voice call, and one for a low data transmission with a similar data rate as for voice is suggested. Given that the most often used bit rate from the AMR codec is 12.2 kbps, 24.4. kbps should suffice but, in order to include some higher layer overhead, having X=32 kbps is proposed.
For the second D2D category, up to 8 simultaneous communications, which would lead to X=128 kbps is proposed.

D2D category	*X*	SA_{MAX}
1	*32 kbps*	*2*
2	*128 kbps*	*8*

Decision: The document is noted.

Possible agreements:

- For D2D communication, from a receiving D2D UE perspective,
  - The number of max. HARQ processes per D2D UE is [~~8 or~~16]
    - Partition of soft buffer for each HARQ process is UE implementation
    - FFS: Synchronization status of transmitters transmitting these HARQ processes
  - D2D SA and PD2DSCH are not considered in the aggregated data
  - The aggregated data rate can be split among HARQ processes
  - The aggregated data rate X received from multiple UEs is defined as the total number of transport blocks bits received
    - The maximum number of transport block bits summed across all HARQ processes is set to [46888]
    - Any given transport block is limited to [23444] bits.
- FFS: Definition of HARQ process

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Tuesday 18th

R1-145275 UE features list on Rel-12 LTE NTT DOCOMO

Decision: The document is noted.

Conclusion: Send the spreadsheet as is to RAN2: draft LS to be prepared in R1-145276 – for approve at 8.30am on Wed.
For 4-4, inform RAN2:
- RAN1 was not able to reach consensus on the need for a specific UE capability.

Wednesday 19th

R1-145276 [Draft] LS on updated LTE Rel-12 UE feature list NTT DOCOMO

Decision: The document is noted and final LS is agreed in R1-145287.

R1-145280 WF on discovery soft buffer Ericsson

- For D2D discovery, from a receiving D2D UE perspective,
  - The number of max. HARQ processes per D2D UE is [16*50]
    - Partition of soft buffer for each HARQ process is UE implementation
    - FFS: Synchronization status of transmitters transmitting these HARQ processes
  - The aggregated data rate can be split among HARQ processes
  - The aggregated data rate X received from multiple UEs is defined as the total number of transport blocks bits received
    - The maximum number of transport block bits summed across all HARQ processes is set to [16*50*232]
    - Any given transport block is limited to [232] bits.
- FFS: Definition of HARQ process

Decision: The document is noted.

Discuss offline definition of HARQ process for both communication and discovery.

R1-145358 Way Forward on ProSe UE category CATT

Proposal: Inform RAN2 immediately of the following (to be updated with more detail later):

- Define one "ProSe communication ~~UE category~~capability" (exact terminology TBD) for L1 Tx/Rx processing capability for ProSe communication per ProSe communication capable UE
- Define one "ProSe discovery ~~UE category~~capability" (exact terminology TBD) for L1 Tx/Rx processing capability for ProSe discovery per ProSe discovery capable UE
- The L1 Tx/Rx processing capability for ProSe communication and ProSe discovery is independent of the L1 Tx/Rx processing capability indicated by the existing UE category
- No standardized mechanism to share the UE's L1 Tx/Rx processing capability among WAN, ProSe communication, and ProSe discovery
- The definition of L2 processing capability for the "ProSe communication UE category" and/or the "ProSe discovery category" is up to RAN2 decision

Decision: The document is noted. Discuss offline and revisit with rest of soft buffer discussion later on Wed pm.

Wednesday 19th

R1-145289 WF on D2D HARQ process definition LG Electronics

Decision: The document is noted.

Agreements:
- For D2D, use the term "maximum number of [Sidelink Processes]" instead of "maximum number of HARQ processes"
- The maximum number of [Sidelink Processes] is the maximum number of sidelink transport blocks that a UE can handle at a given time instant.
- Working Assumption: A transport block is assumed to have stopped being handled when it is sent to higher layers, or if the maximum number of retransmissions is reached and the UE discards the transport block without sending it to higher layers.
- RAN2 can confirm the final wording.

Agreements:
For D2D communication, from a receiving D2D UE perspective,
- The maximum number of Sidelink processes that a D2D UE is expected to handle is 16
  - It is RAN1's understanding that a single FFT per carrier can be used to receive these Sidelink processes (note that this does not imply anything about whether the UE is expected to receive on more than one carrier simultaneously)
- The maximum number of Sidelink transport block bits received within a TTI is set to 25456
- The maximum number of bits of a single Sidelink transport block is 25456
- SA and PD2DSCH are not included

For D2D discovery, from a receiving D2D UE perspective,
- The maximum number of Sidelink processes that a D2D UE is expected to handle is a UE capability which is one of {50, 400}
  - It is RAN1's understanding that a single FFT per carrier can be used to receive these Sidelink processes (note that this does not imply anything about whether the UE is expected to receive on more than one carrier simultaneously)
- The maximum number of transport block bits received within a TTI is set to 50*~~256~~232
- The maximum number of bits of a single Sidelink transport block is ~~256~~ 232 bits.

It is RAN1's understanding that there is no LBRM in D2D, and the performance requirements will be defined assuming that the UE can store all the soft bits received associated with a given transport block.

Send an LS to RAN2 cc RAN4 with the above agreements: Stefano R1-145291

R1-145291 **[Draft] LS on Maximum Number of Sidelink Processes and Maximum Transport Block Size** **Ericsson**
R1-145294

Decision: The document is noted. Change 256 to 232 twice (as CRC is not included in the numbers of bits in 36.306)
Attach an update of the UE capability spreadsheet.
Final LS is agreed in R1-145294.

R1-145296 **Draft LS on updated LTE Rel-12 D2D UE feature list** **Qualcomm**
Decision: The document is noted. Remove "TBD if FDD/TDD differentiation is needed for this additional signaling." twice.
Final LS is agreed in R1-145301.

Not treated.
R1-144678 Discussion on UE D2D capabilities Intel Corporation
R1-144692 D2D UE capabilities Alcatel-Lucent, Alcatel-Lucent Shanghai Bell
R1-144871 Discovery monitoring in RRC Connected Samsung
R1-144886 Discussion on D2D UE Capabilities LG Electronics
R1-144983 Feature groups for D2D discovery and communications Nokia Corporation, Nokia Networks
R1-144984 UE capabilities for D2D discovery and communications for multicarrier operations Nokia Corporation, Nokia Networks
R1-145067 D2D Capabilities Qualcomm Inc.
R1-145148 On D2D UE capabilities Ericsson
R1-145225 WF on D2D UE features LG Electronics, Qualcomm, ITRI
R1-145262 WF on D2D Transmitter Capabilities Ericsson, ALU, ASB
R1-145263 WF on Soft Buffer for D2D Ericsson

6.2.1.7 Evaluations of D2D and WAN co-existence

R1-144571 **D2D and WAN coexistence** **Huawei, HiSilicon**
This contribution considers solutions to reduce the D2D in-band emission impact on cellular performance and proposes to adopt the following two techniques for mitigating D2D ↔ cellular interference.
- Delaying PUCCH technique: can reduce the impact on DL throughput to less than 1%.
- D2D power control technique: can reduce the impact on PUCCH BLER /UL throughput by 50% at the cost of about 6% reduction in number of successful D2D VoIP links. Maximum power triggered when no cellular scheduled can improve the D2D performance while not impacting the cellular performance.

Decision: The document is noted.

Due to lack of time, no more contributions were treated.

Telecom Italia was displeased by the limited time on this issue – very little time was given to D2D WAN coexistence during all meetings (including RAN1#79). Telecom Italia requested that above statement be clearly minuted.

Not treated.

R1-144693	Evaluation of Impact of D2D to WAN system performance	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent
R1-144725	WAN and D2D priority handling for type 1 discovery	Samsung
R1-144794	Evaluation of D2D and WAN co-existence with D2D power control	Panasonic
R1-144840	D2D and WAN co-existence considerations	Sharp
R1-144859	Downlink HARQ reporting for WAN	NEC
R1-144887	HARQ-ACK Transmission Shift for D2D and WAN Co-existence	LG Electronics
R1-144926	Multiplexing between D2D and WAN	HTC
R1-145068	Simulation results for D2D and WAN coexistence	Qualcomm Inc.
R1-145121	Discussion on D2D and WAN co-existence	Potevio
R1-145259	WF on multiplexing UL HARQ-ACK TX and D2D TX/RX	LG Electronics

6.2.1.8 Others

Remaining details of discovery & communication

R1-145069 Remaining details of D2D discovery Qualcomm Inc.
Decision: The document is noted.

Agreements:
- Discovery message size (excluding the CRC) should be increased to 232 bits.
- A UE with a shared D2D/cellular Rx chain and is receiving D2D discovery signals on an UL carrier is not expected to read DL signals on the DL carrier paired to such UL carrier during the subframes belonging to the D2D discovery pools on that UL carrier as well as one subframe preceding and following these subframes.

FFS whether a similar rule is needed for D2DSS resources.

The following is not agreed:
- Proposal 4: eNodeB may signal RRC_CONNECTED UEs on whether it can or cannot skip reading DL signals during subframes corresponding to D2D discovery pools on paired UL carrier.

Wednesday 19th

R1-145072 Channel Interleaver for D2D Qualcomm Inc.
Decision: The document is noted.

Agreement: PUSCH channel interleaver is used for all D2D channels.

R1-145353 **WF on D2D out of coverage resource allocation on a TDD(FDD) carrier** **ZTE, CATT, Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell**
Decision: The document is noted. Also supported by CMCC and NEC

Agreements:
- Minute that it is RAN1's intention that D2D out of coverage resource allocation based on FDD resource mapping is not allowed in a TDD carrier in a TDD band in a given country.
- Specify that on a TDD carrier in a TDD band, an out-of-coverage UE shall have and use a preconfigured TDD configuration with respect to DFN#0 unless overridden by PD2DSCH
- The TDD configuration parameter in preconfiguration does not apply on an FDD carrier in an FDD band in a given country

Send this in an LS to RAN2: R1-145290 (Ruyue)
R1-145290 **LS on D2D out of coverage resource allocation** **ZTE**
Decision: The document is noted. Add a sentence to say this resolves the FFS in cell F4 in the RRC parameter spreadsheet.
Final LS is agreed in R1-145291.

HW proposal:

- If the UE decodes a PD2DSCH which indicates TDD, the UE shall not operate as in FDD

Wednesday 19th early morning session:

R1-145281 LS to RAN2 with all agreements Qualcomm
Decision: The document is noted. Add a note that UE capability / cat info will come separately. RAN1 is also continuing to discuss synchronisation procedure and has not yet decided where this should be captured.
Correct the title.
Final LS is agreed in R1-145284.

R1-145279 Update of RRC parameter spreadsheet Qualcomm
Decision: The document is noted. Delete comment in row 23.
Delete "Same configuration across cells" in L7
J18-> cell specific
Final LS is agreed in R1-145285.

6.2.2 Physical layer functionalities required for operation of Dual Connectivity

Revised WID in RP-141266. Exception sheet in RP-141265

6.2.2.1 Power-control related aspects

PRACH handling and its power-control, SRS handling and its power-control, and other remaining power-control related aspects, will be discussed.

R1-145340 Outcome of offline discussion on dual connectivity NTT DOCOMO
The document was presented by Fred Takeda from NTT DOCOMO.
Decision: The document is noted.

PRACH handling/PC

R1-145337 WF on PRACH power ramping in dual connectivity Ericsson, NEC, Nokia Corporation, Nokia Networks, Qualcomm, LG, Samsung, Huawei, HiSilicon
The document was presented by Yufei Blankenship from Ericsson.
- Alt.1: Not to increase it if PRACH is dropped
- Alt.2: Not to increase it if either PRACH is dropped or power-scaled
- Alt.3: No change in the current spec – increase it even if PRACH is dropped or power-scaled
- Alt.4: It would increase the counter but in calculating the new power, maximum power of previous PRACH is taken into account
- Alt.5: It is up to UE implementation to increment or not to increment in case PRACH is power-scaled including it is dropped
- Alt.6: Not to increment it if PRACH is dropped; it is up to UE implementation to increment or not to increment in case PRACH is power-scaled

Decision: The document is noted.

Agreements:
- Not to increment preamble power if PRACH is dropped,
- It is up to UE implementation to increment or not to increment in case PRACH is power-scaled
- It is up to RAN2 to decide how to capture in specification
  - RAN1 does not discuss handling of counter related to RACH preamble

R1-145343 WF on PRACH handling in dual connectivity LG Electronics, Huawei, HiSilicon, InterDigital, Nokia Networks, Nokia Corp, Intel
The document was presented by Ms Yunjung Yi from LGE. With reference to WAs of RAN1#78bis meeting.
- Replace the first WA with the following clarification
  - *In PCM1, if two PRACHs collide and two PRACHs are intended to start at the same subframe or a PRACH overlap with other channels,*
    - PCell PRACH > other PRACHs > other channels
- Replace the second WA with the following clarification
  - *In PCM2, if two PRACHs collide and the difference of the starting time of two PRACH transmissions is less than 1msec or a PRACH overlap with other channels, when prioritized PRACH is transmitted at least one subframe after the subframe in which the UE shall be ready to transmit a preamble according to 36.213 section 6.1.1,*
    - Pcell PRACH > Other PRACH > other channels

Discussion: Samsung → still brings a lot of complexity to the UE.
Possible alternatives
Alt.1: agree the second WA – supported by Panasonic, InterDigital
Alt.2: replace the second WA as suggested in R1-145343 – supported by Huawei, HiSilicon, Nokia Networks, LGE, InterDigital, Networks, Nokia Corp, Intel, Ericsson
Conclusion: Alt.2 is agreed.
Decision: The document is noted.

With reference to the agreements made in RAN1#78bis meeting, the following is agreed:

Agreements:
- For a UE in a power-limited case, the following are assumed with regards to PRACH prioritization across CGs
  - *In PCM1, if two PRACHs collide and two PRACHs are intended to start at the same subframe, or a PRACH overlap with other channels,*
    - PCell PRACH > other PRACHs > other channels
  - *In PCM2, if two PRACHs collide and the difference of the starting time of two PRACH transmissions is less than 1msec, or a PRACH overlap with other channels,*
    - *when prioritized PRACH is transmitted at least one subframe after the subframe in which the UE shall be ready to transmit a preamble according to 36.213 section 6.1.1,,*
      - PCell PRACH > other PRACHs > other channels
  - Other than above two sub-bullets, on-going transmission is prioritized
  - Priority among other PRACHs is up to UE implementation
  - It is up to UE implantation that lower prioritized PRACH is power scaled or dropped,
    - Not to increment preamble power if PRACH is dropped;
    - It is up to UE implementation to increment or not to increment in case PRACH is power-scaled
    - It is up to RAN2 to decide how to capture in specification
      - RAN1 does not discuss handling of counter related to RACH preamble

Prepare draft LS to RAN2 (LGE).
R1-145347 **LS on additional agreements on PRACH on dual connectivity RAN1, LGE**
The document was presented by Ms Yunjung Yi from LGE.
Decision: The document is noted and LS is agreed.

Thursday 20th
- Note: For PRACH prioritization purposes, SRS transmission is considered as ongoing transmission from the start of subframe containing SRS

SRS handling/PC

R1-145333 **Proposals on SRS power allocation in dual connectivity InterDigital, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, LG, Samsung**
The document was presented by Paul Marinier from InterDigital.
- In PCM1, dynamic power sharing is supported for SRS
  - Guaranteed power (P_MeNB/P_SeNB) is applicable to SRS
  - Same power allocation principle as for PUCCH/PUSCH is used for SRS in last symbol but power allocation between CG's may be different in last symbol (option B1)
- In PCM2, SRS has lower priority than the other CG's PUCCH/PUSCH transmission starting earlier than SRS
  - SRS power in a CG is limited by the power allocated to the other CG in subframe overlapping with SRS and starting earlier (option B2)

Decision: The document is noted.

Agreements
- In PCM1, dynamic power sharing is supported for SRS
  - Maximum power of CG in last symbol containing SRS is at least the guaranteed power
  - Same power allocation principle as for PUCCH/PUSCH is used for SRS in last symbol but power allocation between CG's may be different in last symbol

R1-145190 **Summary of email discussion [78bis-14]: Proposals on SRS handling for Dual-Connectivity LG Electronics**
The document was presented by Fred Takeda (NTT DOCOMO) on behalf of LGE and proposes:
- For SRS handling if the requested SRS power is not satisfied in PCM1,
  - Discuss and decide the approach mainly focusing on two alternatives discussed in the email discussions as the followings:

  - Alt1. Drop SRS if SRS overlaps with PUCCH/PUSCH (either in the same CG or the other CG) and FFS on the case with only SRS(s) in both CGs
  - Alt2. Apply Rel-11 within a CG by treating the total allocated power as if PCmax
- Clarify the power allocation for SRS in PCM1 considering shortened PUCCH/PUSCH transmission.
- For power allocation for SRS in PCM2, discuss and decide the approach mainly focusing on alternatives discussed in the email discussions as the followings:
  - Option 1: Power per CG is computed at subframe-boundary. SRS power is not accounted for the total allocated power per CG, SRS power will be limited by max {total allocated power per CG with PUCCH/PUSCH, PxeNB}
  - Option 2: Power per CG is computed at subframe-boundary. SRS power is accounted for the total power per CG, CG associated with earlier timing will gets the higher priority
  - Option 3: Power per CG is computed per transmission. SRS power is computed at SRS-containing OFDM symbol

Discussion:
For power allocation for SRS in PCM2
Option 1 Supported by LGE, InterDigital – objected by ALU, ASB
Option 2: Supported by Nokia Networks, Nokia Corp., Qualcomm, Panasonic, Ericsson, CATT, NTT DOCOMO – objected by Huawei, HiSilicon, InterDigital
Option 3: Supported by InterDigital, ALU, ASB, Huawei, HiSilicon, Samsung, LGE, Intel – objected by Qualcomm, Panasonic
Huawei asked whether the common understanding is that the performances of option3 are the best. LGE → not convinced that's the case.
For SRS handling if the requested SRS power is not satisfied in PCM1

- Alt1. Drop SRS if SRS overlaps with PUCCH/PUSCH (either in the same CG or the other CG) and FFS on the case with only SRS(s) in both CGs
  - Supported by InterDigital, LGE
- Alt2. Apply Rel-11 within a CG by treating the total allocated power as if Pcmax
  - Supported by Qualcomm, NTT DOCOMO, Nokia Networks, Nokia Corp., CATT, Ericsson, Samsung, NEC, Panasonic
- Alt.3: If there is a single SRS transmission in a CG, in case of power limitation, SRS is dropped. If there is only more than one SRS in a CG, they are power scaled.
  - Supported by Huawei, HiSilicon

Decision: The document is noted.

Agreement:

- For SRS handling if the requested SRS power is not satisfied in PCM1/2,
  - Apply Rel-11 within a CG by treating the total allocated power in the symbol containing SRS as if PCmax

Possible agreements:

- In PCM2, SRS has lower priority than the other CG's PUCCH/PUSCH transmission starting earlier than SRS
  - SRS power in a CG is limited by the power allocated to the other CG in subframe overlapping with SRS and starting earlier

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Thursday 20th
NEC supports Option 2
ALU if the choice is between Option 1 and 2, clearly go for option 2.
InterDigital ok for option 2 if no other choice
Huawei → no objection

Agreement:

- For power allocation for SRS in PCM2,
  - Power per CG is computed at subframe-boundary. SRS power is accounted for the total power per CG, CG associated with earlier timing will gets the higher priority

LGE → case when SRS overlaps with PRACH, SRS will be prioritized – are we all confident with that case?
Note for PRACH prioritization is added to previous agreement.

UL/DL-SCH overshooting

R1-144805 UE capability for Dual Connectivity ZTE
The document was presented by Zhisong Zuo from ZTE and proposes:

- For UL-SCH in dual connectivity, prioritization among UL-SCHs is up to UE implementation (note: No specification effort is needed for this issue).
- UE band combination defined in CA can be reused for DC capability with possible extension.

Discussion: debate whether clarification to what goes to the specification is needed
Decision: The document is noted.

Conclusion: No consensus of UE behaviour of UL/DL-SCH overshooting

UE transmit antenna selection, UE capability aspect

R1-144876 **Discussions on dual connectivity remaining issues for physical layer aspects LG Electronics**
The document was presented by Ms Yunjung Yi from LGE and proposes:

- Proposal 1: Confirm the first working assumption with the following modification:
  - If two PRACHs collide and the difference of the starting time of two PRACH transmissions is equal or less than [33us] or only one PRACH in a given subframe, and if the UE applies PCM1
    - PCell PRACH > other PRACHs > other channels
- Proposal 2: Confirm the second working assumption "For the case of retransmission of PRACH or UE-initiated PRACH, PCell PRACH > other PRACHs > other channels".
- Proposal 3: Ask RAN2 whether indication of a PRACH drop due to power limited case is needed.
- Proposal 4: In allocating/computing the remaining power in PCM1, consider only overlapped transmissions.
- Proposal 5: In allocating/computing the remaining power in PCM2, consider only PUCCH/PUSCH and the guaranteed power.
- Proposal 6: Apply the same handling for SRS with lower power allocated than the requested in PCM1 and PCM2.
- Proposal 7: Simultaneous TX/RX between MCG and SCG is supported. Simultaneous TX/RX capability can be remained as an optional within a CG
- Proposal 8: Clarify the maximum number of aperiodic CSI reports triggered in one subframe in dual connectivity.
- Proposal 9: Specify the following UE behavior. When a UE is configured with dual connectivity and if the total eNBs scheduling for DL-SCHs at a given TTI is larger than the defined processing capability, the prioritization between DL-SCHs is left up to UE implementation
- Proposal 10: Clarification on uplink antenna selection change is needed.

Decision: The document is noted.

Agreements:

- For aperiodic CSI reporting, limit of one aperiodic CSI request is per CG
- In dual connectivity, CSI processing requirement should be the same as in Rel-11
- Rel-12 CSI subframe sets and dual connectivity can be simultaneously supported

Not treated.

R1-144615 Remaining issues on dual connectivity power control CATT
R1-144656 Remaining power control issues for Dual Connectivity Intel Corporation
R1-144729 Remaining Power Control Aspects for Dual Connectivity Samsung
R1-144763 PRACH handling in power-limited dual-connectivity Ericsson
R1-144764 SRS handling and remaining power control issues in dual-connectivity Ericsson
R1-144789 Remaining topic of DC TPC Panasonic
R1-144804 SRS power allocation on Dual Connectivity ZTE
R1-144961 Remaining aspects of dual connectivity NTT DOCOMO
R1-144978 Preamble target power when dropping PRACH in power-limited dual-connectivity Ericsson
R1-144986 Remaining Power Control Issues in Dual Connectivity Nokia Networks, Nokia Corporation
R1-145044 PRACH prioritization in dual connectivity InterDigital
R1-145046 Power sharing in PCM2 with no overlapping transmissions InterDigital
R1-145073 PRACH power control Qualcomm Inc.
R1-145097 Power allocation for SRS in dual connectivity Huawei, HiSilicon
R1-145098 Determination of reserved power in dual connectivity Huawei, HiSilicon
R1-145111 Remaining issues of SRS handling on Dual Connectivity KT Corp.
R1-145194 Remaining Issues on UL Power Control and Power Scaling for Dual Connectivity Alcatel-Lucent, Alcatel-Lucent Shanghai Bell (R1-144694)
R1-145206 SRS power allocation and handling in dual connectivity InterDigital (R1-145045)
R1-145207 Capturing PCM1 agreements in specification InterDigital

6.2.2.2 *Others*

Not treated.

R1-144616 Other open issues of dual connectivity CATT
R1-145074 Remaining details of physical layer functionalities for dual-connectivity Qualcomm Inc.
R1-145075 Capability signaling for dual-connectivity Qualcomm Inc.

6.3 LTE Release 13

6.3.1 Further LTE Physical Layer Enhancements for MTC

WID in RP-141660.
Consider Rel-12 agreements as a starting point when applicable.

6.3.1.1 Design targets and general considerations

Note that this agenda item will focus only on generic techniques, so channel-specific techniques should be submitted under the relevant agenda items of 6.3.1.2

R1-144795 Design target and general consideration on MTC Panasonic
Decision: The document is noted.
R1-144931 Discussion on simultaneous usage of the MTC enhancement functions KDDI corporation
Decision: The document is noted.
R1-144962 Features for Rel-13 Low Cost MTC with UE Complexity Reduction NTT DOCOMO
Decision: The document is noted.

Not treated.
R1-144796 Revisiting Rel-12 agreements and working assumptions on MTC Panasonic

6.3.1.1.1 Coverage enhancement target

Coverage enhancement targets for Rel-13 low complexity UEs and other UEs

R1-144555 Coverage enhancement targets for MTC Ericsson
Decision: The document is noted.
R1-144860 Coverage enhancement for Rel-13 low complexity UEs NEC
Decision: The document is noted.
R1-144890 Considerations on coverage enhancement for MTC LG Electronics
Decision: The document is noted.

R1-145348 WF on coverage enhancement targets for MTC Ericsson, AT&T, InterDigital, MediaTek, NEC, Nokia Networks, Nokia Corporation, Orange, Panasonic, Qualcomm, Sierra Wireless, Sony, Verizon, ZTE
Discussion: Also supported by Samsung.
Decision: The document is noted.

R1-145365 WF on coverage enhancement target for MTC Huawei, HiSilicon, Samsung
Discussion: Samsung withdrew support of R1-145365.
Decision: The document is noted.

Wednesday 19th evening
R1-145384 WF on coverage enhancement targets for MTC Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, AT&T, DTAG, Intel, InterDigital, KDDI, KT, LG Electronics, Nokia Networks, Nokia Corporation, Panasonic, Qualcomm, Sierra Wireless, Sony (R1-145348)
The document was presented by Johan Bergman from Ericsson.

- The coverage enhancement targets for non Rel-13 low complexity UE are:
  - For FDD, the target MCL is 155.7 dB.
  - For TDD, the target MCL is 155.7 dB [for UL-DL configuration 1].
- RAN1 has discussed the coverage enhancement targets for Rel-13 low complexity UEs and agreed to target the same MCL as for other UEs.
  - This means that some channel(s) may need to be enhanced more than 15 dB.
  - The target is set under the assumption that this doesn't require significant additional work compared to targeting only up to 15 dB.
- The above targets are assuming that the maximum UE transmission power P [dBm] of the new UE power class is ≥20 dBm.
  - Working assumption: If RAN4 agrees that P < 20 dBm, the target uplink MCL for the new UE power class is reduced correspondingly to 155.7 - (20 - P) dB.
- When applicable, the MCL targets are valid under the assumptions in TR 36.888 subclauses 5.2 and 5.2.1.2
  - The reference system has 10 MHz system bandwidth and no power boosting.

Discussion: Huawei → do not feel confortable with the WF – would like to get RAN4 feedback.

Samsung requested to have FFS "If RAN4 agrees that P < 20 dBm, the target uplink MCL for the new UE power class is reduced correspondingly to 155.7 - (20 - P) dB" → as the only complaining company, agree to have it as working assumption.
Decision: The document is noted and agreed as above.

Not treated.

R1-144573 Measurement, reporting, and configuration of coverage enhancement Huawei, HiSilicon
R1-144617 Coverage enhancement targets for Rel-13 low complexity UEs and other UEs CATT
R1-144657 Coverage enhancement target for MTC Intel Corporation
R1-144695 Coverage Enhancement Targets Alcatel-Lucent, Alcatel-Lucent Shanghai Bell
R1-144730 Coverage Enhancement for Low Cost UEs Samsung
R1-144814 Coverage enhancement target for Rel-13 low complexity UEs ZTE
R1-144988 Coverage Enhancement Target for MTC Nokia Networks, Nokia Corporation
R1-145047 Coverage enhancement target for Rel-13 MTC InterDigital

6.3.1.1.2 UE complexity reduction techniques

The UE complexity reduction techniques that can be considered are listed in the WID.

R1-145332 Notes from offline MTC session WI rapporteur (Johan Bergman, Ericsson)
Decision: The document is noted and the contents of R1-145332 are copied below:

R1-144991 UE Complexity Reduction Techniques Nokia Networks, Nokia Corporation
Decision: The document is noted.
R1-145016 Battery Technology Impacts on Maximum UE Transmit Power for MTC Sony
Decision: The document is noted.
R1-144575 On simultaneous reception for MTC UEs Huawei, HiSilicon
Decision: The document is noted.

Agreements:

- UE is not required to support simultaneous reception of more than one transport block for unicast transmission in a subframe at least for Rel-13 low complexity UE.
  - Note that the transport block here refers to the ones carried by PDSCH
- UE is not required to support simultaneous reception of a transport block for unicast transmission and a transport block for broadcast transmission in a subframe at least for Rel-13 low complexity UE.
  - If eNB schedules unicast and broadcast simultaneously to the same UE, the UE behaviour is FFS
  - Note that the transport block here refers to the ones carried by PDSCH
- UE is not required to support simultaneous reception of multiple transport blocks for broadcast transmission (SIB/paging/RAR) in a subframe at least for Rel-13 low complexity UE in enhanced coverage.
  - If eNB transmits multiple transport blocks for broadcast transmission simultaneously to the UE, in this case, the UE behaviour is FFS.
  - Note that the transport block here refers to the ones carried by PDSCH
  - The case of MBMS, if supported, is FFS

Working assumption:

- UE is not required to support simultaneous reception of multiple transport blocks for broadcast transmission (SIB/paging/RAR) in a subframe for Rel-13 low complexity UEs not in enhanced coverage
  - If eNB transmits multiple transport blocks for broadcast transmission simultaneously to the UE, in this case, the UE behaviour is FFS.
  - Note that the transport block here refers to the ones carried by PDSCH
  - The case of MBMS, if supported, is FFS

R1-144580 Impacts of reduced maximum TBS support Huawei, HiSilicon
Decision: The document is noted.

Agreement:

- The maximum TBS for unicast transmission for Rel-13 low complexity UE is approximately 1000 bits.

Potential aspects to cover in LS to RAN2:

- Relevant RAN1 agreements
- Aspects of the maximum TBS for broadcast (e.g. SIB)
- Aspects of support for simultaneous reception of transport blocks
- Need for indication of Rel-13 low complexity UE during RACH/paging

- Need for indication of repetition level during RACH/paging
- Aspects of mobility support

Potential aspects to cover in LS to RAN4:
- Relevant RAN1 agreements
- Re-tuning time aspects
- DC subcarrier aspects
- Duplex distance aspects
- Aspects of the new UE power class (if any)
- Pros and cons of potential modulation order restriction (to QPSK)

R1-144556 UE complexity reduction techniques for MTC Ericsson
Decision: The document is noted.
R1-144578 Relationship between cost and complexity reduction in an LTE modem Huawei, HiSilicon
Decision: The document is noted.
R1-144658 UE complexity reduction for MTC Intel Corporation
Decision: The document is noted.
R1-144696 Considerations on bandwidth reduced operation for Rel-13 MTC UE Alcatel-Lucent, Alcatel-Lucent Shanghai Bell
Decision: The document is noted.
R1-144815 Bandwidth reduction for low complexity UEs ZTE
Decision: The document is noted.
R1-144848 Consideration on Bandwidth Reduction for Rel-13 MTC UE MediaTek Inc.
Decision: The document is noted.
R1-144990 Assumptions and constraints for supporting 1.4 MHz low cost MTC UE Nokia Networks, Nokia Corporation
Decision: The document is noted.
R1-145076 UE complexity reduction Qualcomm Inc.
Decision: The document is noted.

R1-145344 WF on NB Operation for MTC Qualcomm, Ericsson, Nokia Networks, DoCoMo, NEC, ALU, ASB, Sony, Sharp, CATT, Interdigital, Intel, Samsung, ZTE, KT, Panasonic, Sierra Wireless, MediaTek, Fujitsu
Decision: The document is noted.

Agreements:
- Support narrow bandwidth operations of 6 RBs in both RF and baseband with possible retuning to another narrowband region (within the cell system bandwidth) for communications.
  - Send LS to RAN4 regarding retuning time – (Qualcomm), draft to be prepared by Thursday
    - There were two companies in RAN1 considering an implementation composed of wideband RF and narrowband baseband
    - In the discussion of retuning time and multiplexing of UE, RAN4 should also discuss how to handle DC subcarrier, duplex distance for FDD, and channel raster within each link

Note: Offline discussion for possibly another or the same LS covering more issues to RAN4, including the ones identified in R1-145332 – (Qualcomm)

Thursday 20th
R1-145407 [Draft] LS on Support of Narrowband Operation for MTC Qualcomm (R1-145399)
Discussion: Intel requested what does duplex distance mean. Ericsson → details of the LS contents can be discussed over email.
Decision: The document is noted. Continue offline – (Qualcomm)
R1-145448 [Draft] LS on Support of Narrowband Operation for MTC Qualcomm (R1-145407)
The document was presented by Hao Xu from Qualcomm.
Discussion: Huawei worried about using the wording "feasibility" and related impacts – may be adding "feasibility and cost"
Qualcomm wondered whether RAN4 will feel confortable with assessing cost figures.
MCC will provide the correct WI code
Decision: The document is noted and agreed in R1-145451 with following update
- how to handle DC subcarrier,
- ~~feasibility of variable~~ Tx-Rx carrier center frequency separation within system bandwidth
- channel raster within each link

R1-145408 [Draft] LS on Additional Aspects for MTC Qualcomm (R1-145404)
Discussion: Few having concern with the sentence "Time domain channel estimation filtering across multiple subframes is found to be beneficial" – better to get the statement "be beneficial" removed.

Decision: The document is noted. Continue offline – (Qualcomm)
R1-145449 **[Draft] LS on Additional Aspects for MTC** **Qualcomm** **(R1-145408)**
Decision: The document is noted and final LS is agreed in R1-145455.

R1-145345 **WF on SIB for MTC** **Qualcomm, Ericsson, Panasonic, Nokia Networks, DoCoMo, ALU, ASB, Sierra Wireless, NEC, InterDigital, CATT, ZTE, Samsung, MediaTek, Fujitsu, LG**

Proposed agreement:
- Introduce new SIB(s) for Rel-13 low complexity UEs in normal and enhanced coverage.
  - Rel-13 low complexity UEs do not need to read legacy SIBs
  - Exact size(s) and update rate(s) can be decided jointly with RAN2
  - This does not preclude the possibility of using a subset of the new SIB(s) for normal coverage or enhanced coverage
  - FFS whether UEs of other category in enhanced coverage can use this SIB(s)

Further discussion offline. Companies are encouraged to provide alternatives if there are concerns over the above proposal.

R1-145377 **Summary of SIB Performance Results** **Nokia Networks, Nokia Corporation**

R1-145366 **Proposal for RAN4 guidance on retuning time** **Huawei, HiSilicon**

Wednesday 19th evening
R1-145392 **WF on SIBs for MTC** **Huawei, HiSilicon, ALU, ASB, CATT, Ericsson, Intel, InterDigital, MediaTek, NEC, NTT DOCOMO, Sony, Sierra Wireless, ZTE**
The document was presented by Matthew Webb from Huawei.
- RAN1 will make observations on the efficiency of different TBS support for broadcast
- RAN1 recommends that RAN2 consider introducing new SIB(s) for Rel-13 low complexity UEs in normal and enhanced coverage.
  - ~~Rel-13 low complexity UEs do not need to read legacy SIBs~~
  - A Rel-13 low complexity UE will not be able to
    - Receive SI-messages in more than 6 contiguous PRBs
    - Receive PDCCH which schedules transmissions of legacy SIBs in system BW greater than 1.4 MHz
  - Maximum TBS, SIB Exact size(s) and time-domain aspects including e.g. SI-windows and SIB update rate(s) can be decided jointly with RAN2
  - This does not preclude the possibility of using a subset of the new SIB(s) for normal coverage or enhanced coverage
  - FFS whether UEs of other category in enhanced coverage can use this SIB(s)
- Send the above recommendation and the WA from RAN1#78bis on TBS in an LS to RAN2.

Decision: The document is noted, modified and agreed as follows:

Agreements:
- RAN1 recommends that RAN2 consider introducing new SIB(s) for Rel-13 low complexity UEs in normal and enhanced coverage
  - A Rel-13 low complexity UE will not be able to
    - Receive SI-messages in more than 6 contiguous PRBs
    - Receive PDCCH which schedules transmissions of legacy SIBs
      - FFS: Whether UE can receive PDCCH which schedules transmissions of legacy SIBs in 1.4 MHz system BW case
  - Maximum TBS, SIB size(s) and time-domain aspects including e.g. SI-windows and SIB update rate(s) can be decided jointly with RAN2
  - This does not preclude the possibility of using a subset of the new SIB(s) for normal coverage or enhanced coverage
  - FFS whether UEs of other category in enhanced coverage can use this SIB(s)
- RAN1 recommends RAN2 to consider limiting support of mobility for Rel-13 low complexity UEs to reduce SIB size at least in enhanced coverage

Send the above recommendation together with the WA and agreements made both in RAN1#78bis and RAN1#79 on TBS in an LS to RAN2 – (Huawei), prepare draft LS by Thursday

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Thursday 20th
R1-145401 **[Draft] LS on simultaneous reception requirements and SIBS for MTC UEs** **Huawei**
Discussion: Ericsson → asked again sufficient time for detailed review
Decision: The document is noted.
R1-145413 **[Draft] LS on simultaneous reception requirements and SIBS for MTC Ues** **Huawei (R1-145401)**
Decision: The document is noted and final LS agreed in R1-145416.

R1-145391 Observations on SIB Performance for MTC Nokia Networks, Nokia Corporation
The document was presented by Rapeepat Ratasuk from Nokia Networks.

- RAN1 has considered the performance of SIB for Rel-13 low-complexity UE
  - Simulation scenario – 10MHz system bandwidth, 1Rx antenna, 6 PRBs, EPA (1 Hz) channel, 1% BLER target
  - RAN1 did not consider coverage enhancement techniques except for repetition techniques
- Based on simulation results provided in RAN1#79, it is seen that, for Rel-13 low complexity UE in normal coverage (SNR = -4dB)
  - Repetition is required to transmit SIB messages
  - The number of repetitions can be high
    - e.g. 16-32 repetitions are required for SIB size of 328 bits
  - The number of repetitions increases with the SIB size
    - e.g. 16-32 repetitions are required for SIB size of 328 bits, 30-40 repetitions are required SIB size of 504 bits
  - For a given SIB size, FFS whether it may be more efficient to use one SIB rather than multiple smaller SIBs
    - e.g. 40-80 repetitions are required for SIB size of 1000 bits, while 30-40 repetitions are required for SIB size of 504 bits
- Based on simulation results provided in RAN1#79, it is seen that, for Rel-13 low complexity UE in enhanced coverage (SNR = -14.3 dB)
  - The number of repetitions can be very high
    - e.g. 150 repetitions are required for SIB size of 328 bits
  - The number of repetitions increases with the SIB size
    - e.g. 100 repetitions are required for SIB size of 152 bits, 150 repetitions are required SIB size of 328 bits
  - For a given SIB size, FFS whether it may be more efficient to use one SIB rather than multiple smaller SIBs
    - ~~e.g. 160 repetitions are required for SIB size of 1000 bits, while 160 repetitions are required for SIB size of 504 bits [Note these results are for 10% BLER]~~
  - Note that SIB results for UE in enhanced coverage are only from one company, so above observation for UE in enhanced coverage is based on a preliminary RAN1 evaluation results and RAN1 will continue to evaluate it
  - RAN1 will evaluate SIB results for UE in enhanced coverage until 15th January, 2015 – (Ericsson)

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Decision: The document is noted. Prepare draft LS to RAN2 by Thursday – Rapeepat (Nokia Networks)

Thursday 20th

R1-145403 [Draft] LS on Observations on SIB Performance for Rel-13 Low-Complexity UE Nokia Networks
Discussion: LGE → clarification that the observations are from preliminary evaluations
Decision: The document is noted. Final LS is agreed in R1-145414 with following updates and change attachment file to zip file:
RAN1 has discussed and made the following observations from preliminary evaluations on the performance of SIB for Rel-13 low complexity UE.

Not treated.

R1-144574	Analysis of RAN1 aspects of broadcast TBS support	Huawei, HiSilicon
R1-144576	DL TM and CQI reporting reduction for LC UEs	Huawei, HiSilicon
R1-144577	Analysis of performance impacts of eliminating downlink TMs	Huawei, HiSilicon
R1-144579	Reporting relaxations for power consumption reduction in MTC UEs	Huawei, HiSilicon
R1-144618	Discussion on UE RF bandwidth reduction	CATT
R1-144731	UE complexity reduction considerations for MTC UEs	Samsung
R1-144854	Simultaneously reception of unicast and broadcast for Rel-13 MTC UE	MediaTek Inc.
R1-144891	Discussion on low cost UEs	LG Electronics
R1-144989	Impacts of Reducing the Maximum UE Power	Nokia Networks, Nokia Corporation
R1-145077	Coverage enhancements	Qualcomm Inc.
R1-145211	Reduced UE complexity for Rel-13 MTC	InterDigital (R1-145048)

6.3.1.1.3 UE power consumption reduction techniques

Power consumption should be considered in general but specific techniques can be proposed here.

Not treated.

R1-144557	UE power consumption reduction techniques for MTC	Ericsson
R1-144599	Coverage Enhancement Power Consumption Breakdown and Proposals	Sierra Wireless
R1-144659	UE power consumption reduction for MTC	Intel Corporation
R1-144732	UE power consumption reduction considerations for MTC UEs	Samsung
R1-144816	Solutions to reduce the UE power consumption	ZTE
R1-144892	UE power consumption reduction	LG Electronics

R1-144992 UE Power Consumption Reduction Techniques Nokia Networks, Nokia Corporation
R1-145017 Mobility Support Impact on Power Consumption for MTC Devices Sony
R1-145078 Power consumption reduction Qualcomm Inc.

6.3.1.2 Technical solutions and simulation results

Note that simulation results that can be provided are exemplified in the RAN1#78bis minutes. Also note that reduced UE bandwidth of 1.4 MHz in downlink and uplink is to be prioritized as the most important complexity reduction technique for Rel-13 MTC UEs.

6.3.1.2.1 Physical data channels and associated physical control channels

PDSCH/PUSCH, Physical downlink control channel for MTC, PHICH, PUCCH

R1-144817 Physical downlink control channel for MTC enhancement ZTE
The document was presented by Ms Huiying Fang from ZTE and proposes:
- Proposal 1: Considering system efficiency and common design, EPDCCH for unicast traffic and control-less mode for broadcast traffic is preferable for both low complexity and coverage enhancement scenario.
- Proposal 2: The detail mechanism of determining configuration of the USS before RRC connection establishment should be further studied.
- Proposal 3: At least for UE-specific search space, EPDCCH repetition should be taken as the baseline to enhance coverage.
- Proposal 4: For UE-specific control information, repetition times for EPDCCH could be determined by the coverage improvement level of the specific UE. Adjustment of repetition level for EPDCCH needs further study.
- Proposal 5: Compact DCI and frequency hopping can be further considered for EPDCCH to reduce power consumption or repetition times.

Decision: The document is noted.

R1-145020 Comparison of Narrowband PDCCH and ePDCCH Operation Sony
The document was presented by Martin Beale from Sony and suggests agreeing on the meanings of the terms "ePDCCH for MTC" and "narrowband control channel region for MTC" before attempting to agree on the choice of Physical Downlink Control Channel for MTC. This will allow companies to compare the merits of the two approaches in order to agree on a way forward.
Decision: The document is noted.

R1-144781 Considerations of physical downlink control channel for MTC Fujitsu
The document was presented by … from Fujitsu and proposes:
- It needs further study on how the common search space of a narrowband MTC physical control channel is accommodated in larger system bandwidths.
- The UE behaviour in detection of the MTC physical control channel and the scheduled PDSCH needs careful study.
- Semi-static configuration of the MTC resource allocation should be considered for physical control channel design.

Decision: The document is noted.

R1-145393 WF on Physical downlink control channel for MTC Ericsson, Sony, Panasonic, InterDigital, LG Electronics, NTT DOCOMO, NEC, Sharp, Qualcomm
The document was presented by Johan Bergman from Ericsson.
- Legacy PCFICH, PDCCH and PHICH are not received by Rel-13 low complexity UEs and enhanced coverage UEs at least for system BW>1.4MHz.
  - CFI where the UE can start control/data reception is a fixed value predefined in the specification.
    - For each of the scenario in Table 6.7-1 of TS36.211, the fixed CFI value corresponds to the maximum number of OFDM symbols used for PDCCH
    - FFS CRS symbols in legacy control region
  - It is FFS how to handle "PHICH functionality".
  - FFS: Whether UE can receive PDCCH in 1.4 MHz system BW case
- For the 'Physical downlink control channel for MTC' for Rel-13 low complexity UEs and enhanced coverage UEs,
  - The design of DCI prioritizes reducing the DCI size.
  - The UE monitors multiple 'Physical downlink control channel for MTC' decoding candidates at least for the UE-specific search space.
  - FFS: whether RS for 'Physical downlink control channel for MTC' is based on DMRS, CRS or both.
  - FFS: For enhanced coverage UEs the 'Physical downlink control channel for MTC' is allowed to be mapped to fully occupy 6 PRB pairs.

Discussion: Samsung disagreed having fixed value for CFI and leave it FFS.
Decision: The document is noted.

Possible agreements:

- Legacy PCFICH, PDCCH and PHICH are not received by Rel-13 low complexity UEs and enhanced coverage UEs at least for system BW>1.4MHz
  - FFS: CFI where the UE can start control/data reception is a fixed value predefined in the specification
    - FFS: For each of the scenario in Table 6.7-1 of TS36.211, the fixed CFI value corresponds to the maximum number of OFDM symbols used for PDCCH
    - FFS: CRS symbols in legacy control region
  - It is FFS how to handle "PHICH functionality"
  - FFS: Whether UE can receive PDCCH in 1.4 MHz system BW case
- For the 'Physical downlink control channel for MTC' for Rel-13 low complexity UEs and enhanced coverage UEs,
  - The design of DCI prioritizes reducing the DCI size
  - The UE monitors multiple 'Physical downlink control channel for MTC' decoding candidates at least for the UE-specific search space
  - FFS: whether RS for 'Physical downlink control channel for MTC' is based on DMRS, CRS or both
  - FFS: For enhanced coverage UEs the 'Physical downlink control channel for MTC' is allowed to be mapped to fully occupy 6 PRB pairs

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Thursday 20th evening

Agreement:

- Legacy PCFICH, PDCCH and PHICH are not received by Rel-13 low complexity UEs at least for system BW>1.4MHz
  - CFI where the UE can start control/data reception is provided by one of following alternatives
    - Alt. 1: Signaling in MIB
    - Alt. 2: Signaling in SIB
      - CFI is a fixed value predefined in the specification at least for PDSCH for at least part of system informations
    - Alt. 3: Fixed in a specification for all subframes
    - Note: RAN1 will conclude it among above 3 alternatives in RAN1 #80 meeting
- At least for unicast channel,
  - For the 'Physical downlink control channel for MTC' for Rel-13 low complexity UEs and UEs in enhanced coverage,
    - Strive to reduce active transmission/reception time by considering the DCI size
    - UE monitoring of multiple 'Physical downlink control channel for MTC' decoding candidates and/or one or more repetition level(s) is supported at least for the UE-specific search space
    - FFS: whether RS for 'Physical downlink control channel for MTC' is based on DMRS, CRS or both
    - **Working assumption:** For enhanced coverage UEs, one 'Physical downlink control channel for MTC' containing one DCI is allowed to be mapped to fully occupy available REs in 6 PRB pairs
- FFS: SIB/RAR/Paging operation without 'Physical downlink control channel for MTC' for Rel-13 low complexity UEs and UEs in enhanced coverage
- FFS: Common search space of 'Physical downlink control channel for MTC' for Rel-13 low complexity UEs and UEs in enhanced coverage

R1-145385 WF on cross-subframe scheduling for MTC LG Electronics, Alcatel-Lucent, Alactel-Lucent Shanghai Bell, InterDigital, ETRI, ZTE, CATT, Ericsson
Also supported by Huawei, HiSilicon
Decision: The document is noted and agreed as follows:

Agreement:

- At least for unicast PDSCH transmission scheduled by 'Physical downlink control channel for MTC', cross-subframe scheduling is supported at least for Rel-13 UE supporting enhanced coverage

Not treated.

R1-144558	Physical channel timing relationships for MTC	Ericsson
R1-144559	Physical resource allocation for MTC	Ericsson
R1-144560	Link performance for data transmission for MTC	Ericsson
R1-144581	DL physical control channels for MTC	Huawei, HiSilicon
R1-144582	Uplink control channel design for MTC UEs	Huawei, HiSilicon
R1-144619	PUSCH coverage enhancement for Rel-13 low complexity UEs and other UEs	CATT
R1-144620	Physical downlink control channel for Rel-13 low complexity UEs	CATT
R1-144621	PHICH for Rel-13 low complexity UEs	CATT
R1-144660	Data channel enhancement for MTC	Intel Corporation
R1-144661	Control channel enhancement for unicast transmission for MTC	Intel Corporation
R1-144697	Coverage enhancement for physical data & control channels	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell

R1-144733	Signalling and Reception of DL Data/Control Channels	Samsung	
R1-144734	Signalling and Reception of UL Data/Control Channels	Samsung	
R1-144762	Downlink and Uplink Control Channels for R13 MTC	Lenovo	
R1-144797	Consideration on data channel and associated control channel for MTC	Panasonic	(R1-144109)
R1-144798	Multiple subframe code spreading for MTC UEs	Panasonic	(R1-144108)
R1-144799	Consideration on frequency hopping for MTC Ues	Panasonic	
R1-144818	Considerations on physical data channels for MTC enhancement	ZTE	
R1-144819	Considerations on physical uplink control channel for MTC enhancement	ZTE	
R1-144849	Discussion and Performance evaluation for uplink PSD boosting	MediaTek Inc.	
R1-144850	Discussions on UL HARQ for Rel-13 MTC UE	MediaTek Inc.	
R1-144853	Discussion on PUCCH for Rel-13 MTC UE	MediaTek Inc.	
R1-144861	Coverage enhancement for PUSCH	NEC	
R1-144862	PUCCH for Rel-13 Low complexity MTC	NEC	
R1-144863	Details of Physical Downlink Control Channel for MTC	NEC	
R1-144893	EPDCCH and PDSCH related issues for MTC	LG Electronics	
R1-144894	Considerations on PUCCH and PUSCH design for MTC	LG Electronics	
R1-144916	Consideration on Uplink Reference Signal for MTC	ETRI	
R1-144917	PUSCH link performance for both coverage enhancement and low power consumption	ETRI	
R1-144934	Physical data channels and associated physical control channels	ITRI	
R1-144958	Impact on physical channel regarding bandwidth reduction	ASUSTeK	
R1-144963	Consideration on EPDCCH for low cost MTC	NTT DOCOMO	
R1-144964	Design of EPDCCH Search Space for low cost MTC	NTT DOCOMO	
R1-144965	Consideration on PDSCH for low cost MTC	NTT DOCOMO	
R1-144966	Initial views on PUCCH for Rel-13 Low cost MTC	NTT DOCOMO	
R1-144993	Data Channel Enhancement for MTC	Nokia Networks, Nokia Corporation	
R1-144994	PDSCH and PUSCH Performance Results	Nokia Networks, Nokia Corporation	
R1-144995	Control Channel Enhancement for MTC	Nokia Networks, Nokia Corporation	
R1-145018	MTC Operation with a Narrowband PDCCH	Sony	
R1-145019	MTC Operation using ePDCCH	Sony	
R1-145021	PHICH Operation for MTC	Sony	
R1-145049	Physical channels for unicast traffic in Rel-13 MTC	InterDigital	
R1-145079	Physical data channels and associated physical control channels	Qualcomm Inc.	
R1-145099	Transmission of small transport blocks	Huawei, HiSilicon	
R1-145100	Control channel support for non-MTC UEs	Huawei, HiSilicon	
R1-145112	Consideration on PHICH for MTC UEs	KT Corp.	
R1-145184	On DL physical control channel for MTC in 1.4 MHz system bandwidth	Huawei, HiSilicon	
R1-145198	Coverage Enhancement PUSCH Simulation Results and Proposals	Sierra Wireless	(R1-144600)

6.3.1.2.2 Common control messages

RAN1 findings on SIB, RAR and Paging will be provided as input to continued discussion in RAN2

Following Thursday afternoon ad-hoc session

R1-145446 WF on RAR/Paging for MTC Nokia Networks, Nokia Corporation, DoCoMo, Ericsson, ETRI, Qualcomm, Intel, KDDI, Sharp, Sierra Wireless, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, NEC, InterDigital, MediaTek, ZTE, Huawei, HiSilicon, Panasonic, Sony, Samsung, LG Electronics

The document was presented by Rapeepat Ratasuk from Nokia Networks.

- RAR/Paging messages for Rel-13 low-complexity UEs and/or UEs operating coverage enhancements (CE) are transmitted separately from RAR/Paging messages for other UEs
- RAR/paging message intended for Rel-13 low-complexity UE and/or UE operating CE can support PDSCH subframe bundling/repetition with multiple bundle sizes/repetition levels
- For paging,
  - The eNB needs knowledge that the UE to be paged is a Rel-13 low-complexity UE and/or is a UE that is to be paged using CE
  - If possible, it is beneficial for eNB to have knowledge on the required amount of coverage enhancement during Paging message transmission

Discussion: CATT asked adding that proposed paging is beneficial from RAN1 perspective and question SA2/RAN2/RAN3 whether it is feasible

Decision: The document is noted and agreed as follows:

Agreements:

- RAR/Paging messages for Rel-13 low-complexity UEs and/or UEs operating coverage enhancements (CE) are transmitted separately from RAR/Paging messages for other UEs

- RAR/paging message intended for Rel-13 low-complexity UE and/or UE operating CE can support PDSCH subframe bundling/repetition with multiple bundle sizes/repetition levels
- For paging, from RAN1 perspective, followings are beneficial
  - The eNB needs knowledge that the UE to be paged is a Rel-13 low-complexity UE and/or is a UE that is to be paged using CE
  - If possible, it is beneficial for eNB to have knowledge on the required amount of coverage enhancement during Paging message transmission

Prepare LS to RAN2, RAN3, SA2 in R1-145450.
R1-145450 [DRAFT] LS on Paging for MTC Nokia Networks [RAN1]
Decision: The document is noted and final LS is agreed in R1-145454.

Not treated.
R1-144562 RAR and Paging for MTC Ericsson
R1-144563 SIB transmission for MTC Ericsson
R1-144583 Control-less transmission of common messages for low complexity Rel-13 UEs Huawei, HiSilicon
R1-144584 Paging and RAR transmission for MTC and CE UEs Huawei, HiSilicon
R1-144698 Coverage enhancement for common control messages Alcatel-Lucent, Alcatel-Lucent Shanghai Bell

R1-144735 Signalling and Design of UE-common Control Messages Samsung
R1-144782 The impacts on RAR caused by preamble repetition Fujitsu
R1-144800 Consideration on SIBs/RAR/paging for Rel-13 MTC Panasonic (R1-144110)
R1-144820 Considerations on common control messages for MTC enhancement ZTE
R1-144841 Common messages for Rel-13 MTC UEs Sharp
R1-144851 SIB, RAR and Paging for Rel-13 MTC UE in normal and coverage extension MediaTek Inc.
R1-144895 Common control message transmission for MTC LG Electronics
R1-144967 Views on Random Access Procedure in Rel-13 Low Cost MTC NTT DOCOMO
R1-144996 Design of Common Control Messages for MTC Nokia Networks, Nokia Corporation
R1-144997 SIB/RAR/Paging Performance Results Nokia Networks, Nokia Corporation
R1-145050 RAR and Paging for Rel-13 MTC InterDigital
R1-145080 Common control messages Qualcomm Inc.
R1-145101 Control-centric transmission of common messages for Rel-13 UEs Huawei, HiSilicon
R1-145113 Common control messages for Rel-13 MTC KT Corp.
R1-145208 SIB Performance for Rel-13 low complexity MTC NEC (R1-144864)
R1-145215 Common control message enhancement for MTC Intel Corporation (R1-144662)
R1-145390 WF on RAR/Paging for MTC Nokia Networks, Nokia Corporation, Ericsson, DoCoMo, Qualcomm, Intel, Panasonic, Sierra Wireless, Alcatel Lucent, NEC, InterDigital, MediaTek, Huawei, HiSilicon

6.3.1.2.3 Other physical channels and signals

Investigate whether the agreements and working assumptions from Rel-12 low cost MTC WI related to PSS/SSS, PBCH and PRACH are applicable or whether further enhancements are needed. UE power consumption is the new aspect to be considered.

R1-145386 "WF on PSS/SSS for MTC Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Ericsson, Huawei, HiSilicon, Sony, LG, Nokia Networks, Nokia Corporation, Samsung, Interdigital, Qualcomm, ZTE
The document was presented by Shin horng Wong from ALU.
- No RAN1 modifications are required for PSS/SSS to support Rel-13 Low Complexity MTC UEs in normal coverage and in enhancement coverage

Discussion: MediaTek → suggested looking at R1-145342 where they proposed higher density SYNC channel (may reduce synchronization acquisition time and so reduce the power consumption).
Decision: The document is noted.

R1-145342 Discussion on Synchronization for Rel-13 MTC UE for Coverage Enhancement MediaTek Inc. (R1-144852)
The document was presented by … from MediaTek and considers introducing a new SYNC channel (mSYNC) supporting finer CFO estimation and fast acquisition for LC UEs with coverage enhancement from the perspective of power consumption.
Decision: The document is noted.

Agreements:
- No RAN1 modifications are required for PSS/SSS to support Rel-13 Low Complexity MTC UEs in normal coverage and in enhancement coverage
- FFS: Enhanced PSS/SSS for battery life time improvement
  - UEs can not rely on the existence of any enhanced PSS/SSS

- FFS: Potential cell ID collision in normal coverage mode condition with enh. coverage mode reception

R1-145400 WF on PBCH repetition for Coverage Enhancement of MTC LG Electronics, Nokia Networks, Nokia Corp, Qualcomm, NEC, CATT, Huawei, HiSilicon, ZTE, Samsung
The document was presented by Ms Yunjung Yi from LGE.
- Agree that PBCH related agreements and working assumptions in Rel-12 captured in the background are applied for Rel-13 low-complexity UEs and coverage enhancement UEs

Decision: The document is noted, modified as follows:

Agreements:
- Agree that PBCH related agreements in Rel-12 captured in the background in R1-145400 are applied for Rel-13 low-complexity UEs and coverage enhancement UEs
- Working assumption: Legacy PBCH is utilized by Rel-13 low complexity UEs and coverage enhancement UEs in both normal and enhanced coverage
  - Note: FFS: utilize spare bits in MIB

R1-145398 WF on PRACH for Rel-13 low-complexity UE InterDigital, Ericsson, Panasonic, Intel, KT Corp., ALU, ASB, LG Electronics, Huawei, HiSilicon, Nokia Networks, CATT, Sierra Wireless, Sharp
The document was presented by Moon-il Lee from InterDigital.
- RAN1 confirms that all PRACH related agreements in Rel-12 LC-MTC are applied for Rel-13 low-complexity UE excepts for following:
  - If UE does not receive a RAR after 1 attempt, it moves to next highest level (e.g. 5 to 10, and 10 to 15).

Decision: The document is noted.

Agreements:
- RAN1 confirms that following PRACH related agreements in Rel-12 LC-MTC are applied for Rel-13 low-complexity UE
  - For PRACH multiplexing scheme, CDM, and/or TDM and/or FDM are supported
  - After the initial random access procedure, for a physical channel using repetition, the repetition level is up to network
  - Multiple PRACH repetition levels are supported
  - Repeating the existing preamble formats for PRACH enhancement
  - In addition, define additional time/freq. resource region(s) separate for "enhanced coverage" UEs.
    - Within new region, at least CDM is allowed.
  - Specified maximum numbers of levels: Working assumption of 3 (this does not include "zero coverage extension"). More evidence needed if we were to extend this.
  - eNB-configurable number of levels (1, 2, 3) up to specified max level.
  - 1 attempt = configured number of repetitions.

R1-145373 Way Forward on PRACH enhancement for Rel-13 MTC ZTE, Qualcomm, InterDigital, Ericsson, NEC, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATT, NTT DOCOMO, Huawei, HiSilicon
The document was presented by Ms… from ZTE.
- Rel-13 low complexity UE can be identified by PRACH.
  - FFS for detailed indication method, e.g., Preamble and/or resource allocation

Discussion: Also supported by LGE and Samsung.
Decision: The document is noted and agreed.

Conclusion of Thursday morning session:
Ericsson asked to set-up an offline discussion in the afternoon → Intel: can the offline session intention be clarified if there is no time left MTC
Ericsson → to look at simulation results and identify any missing aspects, if any.
Mr Chair → a slot will be allocated in the afternoon
Ericsson → then offline may look at some WFs.

Prepare draft LS to RAN2 to indicate PRACH/PBCH agreements and WA until Friday – (Ericsson)
Friday 21st
R1-145472 [Draft] LS on PBCH and RACH for LTE Rel-13 MTC Ericsson
Discussion: Panasonic → LS does not capture the agreements
Ericsson → attempt to make it more easy to read – Ericsson's interpretation of the agreements
Decision: The document is noted. Revision is needed.
R1-145476 [Draft] LS on PBCH and RACH for LTE Rel-13 MTC Ericsson (R1-145472)

Discussion: LGE requested an email discussion as they've had no time to look at it.
Decision: The document is noted for email approval until 15th January, 2015 – (Ericsson)

R1-145394	WF on repetition of data associated channels for MTC	Ericsson, InterDigital, NEC, Sharp
R1-145447	Summary of PUSCH Performance Results In RAN#79	Sierra Wireless (R1-145397)

Friday 21st : Sierra Wireless requested the set-up for an email discussion on PUSCH
Huawei → Not convinced such an email is needed.

Not treated.

R1-144564	PSS/SSS and PBCH for MTC	Ericsson
R1-144565	PRACH for MTC	Ericsson
R1-144585	PSS/SSS coverage enhancement	Huawei, HiSilicon
R1-144586	PRACH coverage enhancement	Huawei, HiSilicon
R1-144587	PBCH/MIB coverage enhancement	Huawei, HiSilicon
R1-144601	Coverage Enhancement PBCH Simulation Results and Proposals	Sierra Wireless
R1-144622	PBCH coverage enhancement	CATT
R1-144623	PRACH coverage enhancement	CATT
R1-144663	SCH and PBCH enhancement for MTC	Intel Corporation
R1-144664	PRACH enhancement for MTC	Intel Corporation
R1-144699	PSS/SSS, PBCH and PRACH operation under power conusmption reduction	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell
R1-144736	Signalling and Design for SCH, PBCH, and PRACH	Samsung
R1-144783	PRACH Support for Devices in Deep Coverage Holes	Fujitsu
R1-144821	Considerations on Physical broadcast channel for MTC enhancement	ZTE
R1-144822	Technical solutions for PRACH for MTC enhancement	ZTE
R1-144842	PRACH for Rel-13 MTC UEs	Sharp
R1-144896	Rel-12 agreements on PSS/SSS, PBCH and PRACH for MTC	LG Electronics
R1-144897	Considerations on CSI reporting for low complexity UE	LG Electronics
R1-144898	Considerations of PRACH design for MTC UE	LG Electronics
R1-144998	PBCH Acquisition Time and Enhancement for MTC	Nokia Networks, Nokia Corporation
R1-144999	PRACH Enhancement for MTC	Nokia Networks, Nokia Corporation
R1-145051	PBCH and PRACH for Rel-13 MTC	InterDigital
R1-145081	Other physical channels and signals	Qualcomm Inc.

6.3.1.3 Others

Not treated.

R1-144588	Coverage enhancement for MTC UEs - capability or mimicry?	Huawei, HiSilicon
R1-145102	SupporThe document was presented by … from … and	

6.3.2 Licensed-Assisted Access Using LTE

SID in RP-141664.

R1-144771 **36.889 v0.0.3 Study on licensed-assisted access using LTE Ericsson, Huawei**
The document was presented by Havish Koorapaty from Ericsson and includes updates with regulatory requirements for LAA (section 4) and with deployment scenarios for LAA (section 6).
Decision: The document is noted and v0.0.3 is agreed.

R1-144772 **Text proposal on Rel-13 LAA functionalities for TR36.889 Ericsson**
The document was presented by Havish Koorapaty from Ericsson.
Discussion: CableLabs requested making reference to backoff in *Listen-before-talk* (Clear channel assessment) section.
Huawei → the proposed text is aligned with the agreement made in last meeting.
Panasonic → the intention is not to preclude anything but just reflect the agreements from RAN1#78bis.
Decision: The document is noted. Continue discussion within Tuesday – (Ericsson)

Tuesday evening
R1-145334 **Text proposal on Rel-13 LAA functionalities for TR36.889 Ericsson, CHTTL, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, NTT Docomo, Sharp, Huawei, HiSilicon, Nokia Corporation, Nokia Networks, InterDigital, Qualcomm (R1-144772)**

Decision: The document is noted and TP is agreed assuming the following update:

- *Listen-before-talk* (Clear channel assessment)

The listen-before-talk (LBT) procedure is defined as a mechanism by which an equipment applies a clear channel assessment (CCA) check before using the channel. The CCA utilizes at least energy detection to determine the presence or absence of other signals on a channel in order to determine if a channel is occupied or clear, respectively. European and Japanese regulations mandate the usage of LBT in the unlicensed bands. Apart from regulatory requirements, carrier sensing via LBT is one way~~necessary~~ for~~will lead to~~ fair sharing of the unlicensed spectrum and hence it is considered to be a vital feature for fair and friendly operation in the unlicensed spectrum in a single global solution framework.

R1-144774 Text proposal on Rel-13 LAA evaluation scenarios and framework for TR36.889 Ericsson
The document was presented by Havish Koorapaty from Ericsson and provides a text proposal to include some of the agreements from RAN1#78bis into TR 36.889
Decision: The document is noted and TP is agreed.

R1-144773 Updates to Regulatory Requirements for Unlicensed Spectrum Ericsson
The document was presented by Ms Sorour Falahati from Ericsson and proposes to incorporate into Section 4.1.1 (Regulatory Requirements) of TR 36.889:

- Text for channel bandwidth requirements in Europe into Section 4.1.1 (Regulatory Requirements) of TR 36.889:
- Text for extended CCA for load-based LBT description into Section 4.1.1 (Regulatory Requirements) of TR 36.889.
- Text for TPC requirements in Europe.

Discussion: Huawei → alternative text proposal is available in R1-145321.
Decision: The document is noted.

R1-145321 Remaining aspects of existing unlicensed spectrum regulatory requirements Huawei, HiSilicon (R1-145104)
The document was presented by David Mazzarese from Huawei and proposes:

- The requirements of nominal channel bandwidth and occupied channel bandwidth should be captured in TR 36.889.
- LAA-LTE design should focus on channel bandwidth of 5MHz and above. The impact of occupied channel bandwidth limitation needs to be considered for LAA uplink transmission.

Decision: The document is noted.

R1-144905 Further regulation issues for LAA LG Electronics
The document was presented by Joon Kui Ahn from LGE and deals with issues on the regulatory requirements in 5 GHz unlicensed spectrum for LAA which may affect the LAA design, especially regarding LBT operation, maximum PSD and minimum occupied bandwidth. It is suggested sending an LS to RAN4 to ask for a clarification on the following regulatory requirements

Point 1: In LBT regulation in Japan and Europe, it should be clarified whether "carrier-sensing node" and the consequent "transmitting node" should be identical or not. In other words, whether it is allowed a master node does carrier sensing and triggers a slave node's transmission based on the sensing result
Point 2: In maximum PSD regulation in most region, it should be clarified whether PSD regulation is satisfied if transmit power is under the maximum PSD in an average-sense within each specified unit bandwidth (e.g. per-MHz)
Point 3: In minimum occupied bandwidth regulation in Europe, it should be clarified if there is any restriction or assumption on the signal waveform to occupy a certain bandwidth

Discussion: Nokia Networks agreed that all points need to be clarified, wondered whether RAN4 is the right target…
Broadcom → make sense sending LS to RAN4
Decision: The document is noted. Continue discussion within Tuesday – (Ericsson, Huawei, LGE)

Tuesday evening
R1-145341 Updates to Regulatory Requirements for Unlicensed Spectrum Ericsson (R1-144773)
Decision: The document is noted and the updates are agreed.

Friday 21st :
R1-145470 TR 36.889 v0.0.5 Study on licensed-assisted access using LTE Ericsson, Huawei (R1-145252)
The document was presented by Havish Koorapaty from Ericsson.
Decision: The document is noted and TR is endorsed as version 0.1.0 in R1-145474.

R1-145471 [DRAFT] LS on agreements on Licensed-Assisted Access using LTE Ericsson, Huawei
The document was presented by Havish Koorapaty from Ericsson and informs RAN2 and RAN4 about the conclusions reached within the SI
Discussion: Should include the just endorsed v0.1.0 of the TR.
Decision: The document is noted and final LS is agreed in R1-145475.

6.3.2.1 Remaining details of evaluation methodologies

Finalize evaluation assumptions and methodologies for modelling of PHY layer options for LAA

R1-144775 Email Discussion (78bis-15) Summary on Evaluation Methodology for LAA Ericsson
The document was presented by Havish Koorapaty from Ericsson.
Discussion: Mr Chair decided looking at WFs focusing first on layout.
Decision: The document is noted.

WFs on Layout

R1-145322 WF on LAA Evaluation Assumptions - Layout and Number of Carriers, Nodes and UEs Ericsson, Qualcomm
The document was presented by Havish Koorapaty from Ericsson.
Discussion: Broadcom → concern with the number of UEs being considered in the single channel case for both indoor and outdoor scenarios.
CableLabs → cannot agree on this proposal based on their experience – assumptions are not aligned with realistic deployement scenarios
Decision: The document is noted.

R1-145264 WF on Indoor deployment density for coexistence evaluations Cisco Systems, CableLabs, Broadcom, Ruckus Wireless, AT&T
The document was presented by Vikram Chandrasekhar from Cisco.
- Motivation: To model capacity optimized enterprise scenario, a high density AP deployment should be factored into account during coexistence studies.
  - The floor plan (6000 sq. meter floor or 16146 sq. ft./AP) under email discussion [78bis-15] does not model a high density AP deployment
  - Prior work by IEEE WG, practical field deployments and real-world AP density measurements provide a reference point for determining AP density.
- Proposal
  - For indoor enterprise, adopt an managed AP density between 3000 – 5000 sq. ft./AP/operator.
    - Assuming X = 4 AP/operator the proposed floor plan area lies between 12000 – 20000 sq. feet.
  - Density of managed APs will be modeled independently of density of unmanaged Wi-Fi APs (if any).

Decision: The document is noted.

R1-145325 WF on LAA Evaluation Assumptions - Layout and Number of Carriers, Nodes and UEs Cisco Systems, Broadcom, Ruckus Wireless, CableLabs
The document was presented by Vikram Chandrasekhar from Cisco. Basically same template as the one used in R1-145322 but with 80 UEs per operator. Also addition of Unmanaged Devices: 10 /channel for Indoor scenario.
Discussion: Qualcomm did not agree with the proposed density – too high.
Decision: The document is noted.

Possible agreements
- Agree R1-145322 at least for DL only LAA coexistence evaluations
- FFS : DL + UL LAA coexistence evaluations

Supported by Ericsson, Huawei, HiSilicon, Nokia Corp., NTT DOCOMO, Qualcomm, Samsung, CMCC, Fujitsu, Sharp, InterDigital, Nokia Networks, Verizon, ZTE, ITRI, Kyocera, ALU, ASB
Cisco still worried about the density – not aligned with traffic models
Broadcom also cannot agree without having clarify traffic models issue
Still having concerns: Broadcom, CableLabs, Ruckus Wireless, Blackberry, Cisco

Agreements:
- Agree R1-145322 at least for DL only LAA coexistence evaluations
- FFS : DL + UL LAA coexistence evaluations

WFs on Channel Bandwidth

R1-145323 WF on LAA Evaluation Assumptions - UE Bandwidth, Cell Selection, Network Synchronization, Performance Metrics Ericsson, Qualcomm, Samsung, ZTE
The document was presented by Havish Koorapaty from Ericsson.
- UE Bandwidth assumptions
  - UE bandwidth for LAA: 10 MHz licensed + 20 MHz unlicensed,
    - CA scheduling assumptions stated when reporting results
    - Served traffic per small cell per carrier can be reported
  - UE bandwidth for Wi-Fi: 20 MHz unlicensed
  - Cell selection is based on RSRP for both Wi-Fi and LAA

- Network synchronization:
  - Nodes of same operator are synchronized, nodes of different operators are not synchronized
- Performance metrics in addition to UPT and Latency CDF
  - If VoIP users are included, number of VoIP users with 98%ile latency greater than 50 ms should be reported

Discussion: Network synchronization: Telecom Italia requested adding a note about unsynchronized networks from one operator – Ericsson → was briefly discussed offline but no consensus
Decision: The document is noted.

R1-145316 **Way Forward on Wi-Fi wider channel bandwidth Broadcom Corporation, AT&T, BlackBerry, CableLabs, Cisco Systems, Ruckus Wireless**
The document was presented by Baoguo Yang from Broadcom.

- The wider channel bandwidths such as 80MHz of 802.11AC should be included in the evaluation in order to investigate the aspects of mutual coexistence between Wi-Fi and LAA with 802.11AC wider channel working mode.
  - The 802.11AC wider channel bandwidth adaptation should be also included in the evaluation.

Discussion: Fujitsu suggested using 20 MHz UE bandwidth but not precluding the evalution of 80 MHz case. Furthermore, more details are necessary prior any agreement of this WF.
Ericsson → carrier aggregation is an issue to be considered.
Nokia Networks → do evaluations of 80 MHz bring more information than 20 MHz evaluations.
Decision: The document is noted.

Agreements:

- UE Bandwidth assumptions
  - UE bandwidth for LAA: 10 MHz licensed + 20 MHz unlicensed,
    - CA scheduling assumptions stated when reporting results
    - Served traffic per small cell per carrier can be reported
  - UE bandwidth for Wi-Fi: 20 MHz unlicensed
- Cell selection is based on RSRP for both Wi-Fi and LAA

Possible agreements:

- The wider channel bandwidths such as 80MHz of 802.11AC should be included in the evaluation in order to investigate the aspects of mutual coexistence between Wi-Fi and LAA with 802.11AC wider channel working mode.
  - The 802.11AC wider channel bandwidth adaptation should be also included in the evaluation.
- For the aggressor Wi-Fi and LAA networks, they can either use 4 single 20 MHz or 80 MHz UE bandwidth assumptions

Possible agreements:

- UE Bandwidth assumptions
  - Not preclude to evaluate larger UE bandwidth (e.g., 80 MHz)

ALU: why single channel is OK for the agressor, not for the victim

Conclusion:

- FFS: Larger UE/STA bandwidth assumptions (e.g., 80MHz)

Agreement:

- Network synchronization for LAA evaluations:
  - Nodes of same operator are synchronized, nodes of different operators are not synchronized
  - Note that LAA design should be applicable both for synchronous and asynchronous intra-/inter-operator case

Tuesday afternoon

Possible agreements:

- Performance metrics in addition to UPT and Latency CDF
  - If VoIP users are included, number of VoIP users with 98%ile latency greater than 50 ms should be reported
  - Note on UPT calculation
    - Unfinished files should be incorporated in the UPT calculation
      - The number of served bits (possibly zero) of an unfinished file by the end of the simulation is divided by the served time (simulation end time –file arrival time)

Tuesday afternoon after coffee break
R1-145338 **WF on LAA Evaluation Assumptions - UPT calculation Ericsson, Huawei, HiSilicon, LGE, Samsung**
The document was presented by Havish Koorapaty from Ericsson.
Decision: The document is noted and the WF is agreed.

Agreement:

- Performance metrics in addition to UPT and Latency CDF
  - If VoIP users are included, number of VoIP users with 98%ile latency greater than 50 ms should be reported

R1-145330 **WF on LAA Evaluation Assumptions - Antenna Configuration, MCS, Wi-Fi Detailed Assumptions and Duplexing** **Ericsson, Samsung, Qualcomm, Huawei, HiSilicon, Intel**

The document was presented by Ms Sorour Falahati from Ericsson.

Discussion: Broadcom requested more time to review it.

Decision: The document is noted, modified and agreed as:

Agreements:

- Wi-Fi system evaluation assumptions

Parameter		Value
MCS		802.11ac MCS table without 256 QAM Optional: include 256QAM (should be the same as for LAA)
Antenna configuration		2Tx2Rx in DL, Cross-polarized Optional: 1Tx2Rx in DL. UL: 1Tx2Rx (should be the same as for LAA) Baseline: open loop Company should state assumptions if assumed otherwise
Channel coding		BCC Optional: LDPC code
Frame aggregation		A-MPDU
MPDU size		Up to each company
Max PPDU duration		~~FFS:~~ Baseline:< 4 ms (Asynchronous to LTE timing) Company should state assumptions if assumed otherwise
MAC	Coordination	DCF If VoIP users are included, EDCA can be used
	SIFS, DIFS	SIFS, DIFS
	Detection	Energy detection & preamble detection
	RTS/CTS	Optional
	Contention window	Per DCF If VoIP users are included, per EDCA can be used
CCA-CS		-82dBm and preamble decoding (Note preamble occupies the 20MHz system bandwidth with rate 1/2 coding and BPSK modulation)
CCA-ED		-62dBm FFS: Optional: -72dBm ~~(only for secondary channel)~~
ACK Modeled (successful reception, resources utilized)		Yes
Rate control		Up to each company; should state assumption when reporting results
Channel selection		Up to each company; should state assumption when reporting results

Note: OFDM symbol length is 4 micro sec

Agreements:

- LAA system assumptions

Parameters	Value
PCI planning for each NW	Planned
Antenna configuration	2Tx2Rx in DL, Cross-polarized. Optional: 1Tx2Rx in DL. 1Tx2Rx in UL (should be the same as for Wi-Fi)
Transmission schemes	Based on TM4 or TM10, QPSK/16QAM/64QAM Optional: include 256QAM (should be the same as for Wi-Fi)
Turbo code block interleaving depth	Per LTE specs (1-14 LTE OFDM symbols dependent on MCS and PRB allocation)
Scheduling	Proportional fair
Link adaptation	Realistic
CCA-ED	Up to each company; should state assumption when reporting results
Channel selection	Up to each company; should state assumption when reporting results

R1-145315 Way Forward on Mixed Traffic Model Broadcom, AT&T, CableLabs, Cisco Systems, Ruckus Wireless
The document was presented by Baoguo Yang from Broadcom.
- The mixed traffic model with real time traffic like VoIP and best effort traffic like FTP should be used in the Wi-Fi network that is not replaced by LAA for the coexistence evaluation in order to investigate the LAA impact on real time services.
  - 20% of STAs have VoIP and 80% of STAs have FTP
  - The VoIP traffic model is based on G.729A
    - VoIP packet interval 20ms, VoIP packet size 60Bytes (Payload plus IP header overhead), VoIP data rate 24kbps
- The EDCA QOS should be used in Wi-Fi network together with a mixed traffic model in the coexistence evaluation in order to investigate the LAA impact on real time services

Discussion: AT&T → evaluations of optional topics may imply re-considering traffic model impacts in the future.
Decision: The document is noted, modified and agreed as follows:

Agreements:
- The mixed traffic model with real time traffic like VoIP and best effort traffic like FTP should be added as an optional model (in addition to existing FTP traffic models) used in the Wi-Fi network that is not replaced by LAA for the coexistence evaluation in order to investigate the LAA impact on real time services.
  - Two additional stations added with above have VoIP
  - The VoIP traffic model is based on G.729A
    - Traffic model definition is written in R1-145315 appendix
  - Voice activity is assumed to be 100% statistics are independently reported in each direction
  - No associated control plane traffic is modelled
- The EDCA QOS could be used in Wi-Fi network together with a mixed traffic model in the coexistence evaluation in order to investigate the LAA impact on real time services

R1-145317 Way Forward on User Plane Traffic Duplex CableLabs, Broadcom, Cisco, Orange, KDDI, Kyocera, Ruckus Wireless, Sony
The document was presented by Jennifer Andreoli-Fang from CableLabs.
- To maintain a constant transmitting node count, the victim operator network send UL and DL traffic, while the Aggressor operator network (Wi-Fi or LAA) sends only DL traffic. This applies to user plane traffic only, i.e. FTP model 3 + VoIP traffic.
- The modelling of control plane ACK/NACK signalling is outside the scope of this proposal.

Discussion: Some companies raised concern incorporating UL traffic.
Decision: The document is noted, modified and agreed as:

Agreements:
- For DL only LAA evaluations,
  - Victim operator network send DL traffic, while the Aggressor operator network (Wi-Fi or LAA) sends only DL traffic. This applies to user plane traffic only
    - FFS: Victim operator network send UL traffic case

R1-145335 WF on LAA Evaluation Assumptions - FTP packet size Ericsson, Qualcomm, Nokia Corporation, Nokia Networks, Samsung, ALU, ASB, Huawei, HiSilicon
The document was presented by Ms Sorour Falahati from Ericsson.
- File size for FTP models is 0.5 MB

Decision: The document is noted and WF is agreed.

R1-145336 WF on LAA Evaluation Assumptions - Load factor Intel, Samsung, Qualcomm, Ericsson
The document was presented by Eddy Kwon from Intel.
- A new metric, *load factor* is defined to characterize the system load:
  - Load factor of the i-th eNB (or AP) = sum of the period of time during which the i-th eNB (or AP) has data to transmit (i.e., its queue is not empty) / total simulation time
  - Average load factor: load factor averaged over the all eNBs (or APs)
- The average load factor(s) should be provided along with the simulation results. For instance,
  - Average load factor of 10-20%: low traffic load
  - Average load factor of 35-45%: medium traffic load
  - Average load factor of 60-70%: high traffic load

Discussion: "Buffer occupancy" may be better wording than "Load factor"
Decision: The document is noted.

Thursday 20th

R1-145444 Summary of Adhoc sessions on LAA Ericsson

The document was presented by Havish Koorapaty from Ericsson.

Decision: The document is noted. Mr Chair went through all points one by one.

Agreements:

- Transmit power assumption for evaluations

	Licensed cell	Unlicensed cell
Total BS TX power	24dBm(Ptotal per carrier)	18 dBm across aggregated carriers Optional: 24 dBm
Total UE TX power	Total UE TX power: 23dBm across aggregated cells Max total UE TX power per cell in licensed spectrum: 23dBm Max total UE TX power across aggregated cells in unlicensed spectrum: 18dBm	

R1-145383 WF on Cell Association LG Electronics, NTT DOCOMO, Fujitsu

Decision: The document is noted.

Notes from ad-hoc: Change RSRP to RSS for WiFi.

- For WiFi STAs,
  - Cell association based on RSS of WiFi APs
    - RSS of WiFi: Received signal power strength
  - RSS threshold is -82 dBm

Cell selection based on unlicensed band RSRP or RSS. Capture this in tables.

Agreements:

- Cell association assumption for evaluations
  - For WiFi STAs,
    - Cell association is based on unlicensed band RSS of WiFi APs
      - RSS of WiFi: Received signal power strength
      - RSS threshold is -82 dBm
  - For LAA UEs,
    - Cell association is based on unlicensed band RSRP

R1-145320 Summary of initial co-existence evaluations Huawei, HiSilicon, Cisco, NTT Docomo, ZTE

Continue offline discussion until Thursday – (Huawei)

Decision: The document is noted.

Notes from ad-hoc: Alternate proposed agreement:

- Companies should at least provide results with CCA for coexistence evaluations

Agreement:

- Companies should at least provide results with LBT for coexistence evaluations

R1-145336 WF on LAA Evaluation Assumptions - Load factor Intel, Samsung, Qualcomm, Ericsson

Working assumption:

A new metric, *buffer occupancy* is defined:

- Buffer occupancy of the i-th small cell/UE (Wi-Fi & LAA) = sum of the period of time during which the i-th small cell/UE has data to transmit including retransmissions (i.e., its queue is not empty) / total simulation time
- Average buffer occupancy: buffer occupancy averaged over the all small cells/UEs of the same operator

- The average buffer occupancy can be provided in addition to the offered traffic along with the simulation results.
- FFS: Whether and how to capture this metric in the TR
- Note: This is not a metric that will be used to make comparisons between different evaluations

R1-145445 Proposal on modified resource utilization for LAA evaluation NTT DOCOMO (R1-145443)

Introcuce a new metric for indicating traffic load for WIFI APs and LBT-based LAA cells

Decision: The document is noted and is for email discussion/approval until 11th December, 2014 including other metrics – how are the metrics used to classify results from different companies? – (NTT DOCOMO)

R1-145380 **Way Forward on Subframe Structure, Numerology and System Bandwidth for LAA** **Qualcomm, Intel, Nokia Corporation, Nokia Networks, ETRI, NTT DOCOMO, CATT**
Also supported by ALU, ASB
Decision: The document is noted. Possible conclusion from adhoc:

- For coexistence evaluations
  - Normal CP is used.
  - Companies can consider fractional OFDM symbol transmissions

Above possible conclusion is agreed.

Not treated.
R1-144602 Evaluation assumptions and methodologies for modeling of PHY layer options for LAA Cisco
R1-144624 Remaining details of LAA evaluation methodologies CATT
R1-144665 On remaining details of coexistence evaluation methodology Intel Corporation
R1-144700 Remaining details of evaluation methodologies and simulation assumptions for LAA Alcatel-Lucent Shanghai Bell, Alcatel-Lucent
R1-144737 Remaining details of evaluation methodologies for LAA Samsung
R1-144776 Remaining details on evaluation methodology Ericsson
R1-144784 Open issues for LAA evaluation Fujitsu
R1-144823 Remaining details of evaluation methodologies ZTE
R1-144843 LAA evaluation methodology Sharp
R1-144865 Discussion on evaluation methodology for LAA NEC
R1-144899 Cell association in LAA evaluation LG Electronics
R1-144929 Considerations on LAA-LTE designs for fair co-existence KDDI corporation
R1-144930 Fairness indicator and evaluation assumptions for LAA-LTE and Wi-Fi co-existence KDDI corporation
R1-144932 Further discussion on coexistence evaluation assumptions for LAA ITRI
R1-144939 Discussion on detailed evaluation assumptions of LAA CMCC
R1-144950 Discussions on the evaluation assumptions of LAA CATR
R1-144956 Remaining details of the evaluation assumptions for LAA Kyocera
R1-145000 Simulation Assumptions for LTE Licensed Assisted Access Nokia Corporation, Nokia Networks
R1-145082 Deployment scenarios and evaluation methodology Qualcomm Inc.
R1-145103 Remaining aspects of LAA evaluation methodology Huawei, HiSilicon
R1-145106 Views on remaining details of evaluation methodologies NTT DOCOMO
R1-145129 Carrier Number and Unmanaged Wi-Fi Considerations CableLabs, Broadcom
R1-145130 AP density and Carrier Number Considerations CableLabs, Broadcom
R1-145146 Remaining details of coexistence evaluation assumptions for LAA CHTTL
R1-145164 Motivation to use the mixed traffic model for LAA coexistence evaluation Broadcom Corporation
R1-145165 Motivation for including only DL traffic in the aggressor Wi-Fi network for co-existence evaluations Broadcom Corporation
R1-145166 Wi-Fi CCA energy detection & preamble detection thresholds setting in LAA coexistence evaluation Broadcom Corporation
R1-145186 On the need to model RTS/CTS in LAA coexistence scenarios InterDigital
R1-145195 User Plane Traffic Duplex Considerations CableLabs, Broadcom (R1-145131)
R1-145197 Preliminary performance evaluation for Licensed-Assisted Access using LTE ZTE (R1-144824)
R1-145318 Way Forward on Carrier Number and Unmanaged Wi-Fi CableLabs, AT&T, BlackBerry, Broadcom, Kyocera, MediaTek, Orange, Sony
R1-145319 Way Forward on Static Channel Selection for Unmanaged Wi-Fi APs CableLabs, AT&T, BlackBerry, Broadcom, Cisco, Sony
R1-145453 Text proposal on coexistence evaluation assumptions for LAA for TR36.889 Ericsson, Huawei

6.3.2.2 PHY layer options for LAA

Identify candidate detailed solutions, especially for DL transmission without UL in unlicensed spectrum. Detailed description of identified PHY layer options are required and initial coexistence evaluation results can be provided.
Including analysis of standards impacts.

R1-144590 **Further analysis on the required functionalities for LAA** **Huawei, HiSilicon**
The document was presented by David Mazzarese from Huawei and proposes:

- Fast LAA SCell on/off should be introduced for LBT and discontinuous transmission. The signaling for LAA SCell ON/OFF indication could be transmitted on the licensed PCell.
- Discovery reference signal (DRS), NZP CSI-RS, CSI-IM with possible enhancements can be studied to support synchronization, RRM and CSI measurements on the LAA SCell. Transmission mode 10 can be a starting point for a transmission mode supported on LAA-LTE SCells.
- Synchronization and measurements based on aperiodic RS transmissions should be supported for LAA-LTE.

- The hidden node problem needs to be considered for LAA-LTE. Interference measurement and report mechanism could be used to detect the hidden node. In addition, RTS/CTS scheme with possible enhancements could also be considered to solve the problem.

Decision: The document is noted.

R1-144739 Discussion on channel access mechanisms for LAA Samsung

The document was presented by … from Samsung and concludes:

Observation 1 (for Frame Based Equipment):

- The design of a short fixed frame period could provide a good balance between co-existence with other radio equipments and opportunity for getting the channel due to the shorter time interval between CCA instances.
- The design of a long fixed frame period could be a straightforward way to realize LAA. However, such design might result in a low opportunity to acquire the channel due to the longer time interval between CCA instances. In addition, having a long fixed frame period may not be efficiency in case of low load since there is a constant (minimum) back-off of a fixed frame period if the channel is found to be occupied.
- Simultaneous transmissions from the synchronized cells (reuse of one) can be naturally achieved without violating LBT requirement. In the case of asynchronous LAA network (e.g. multi-operator deployment), it can be beneficial from WiFi co-existence standpoint to allow alignment of LAA cells' transmissions much as possible.

Observation 2 (for Load Based Equipment):

- LBE could be more adaptive to change of load of a channel than FBE since LBE can operate channel sensing on continuous CCA slots
- WiFi APs apply the channel access mechanism following LBE, LBE could provide a fairer channel access for LAA than FBE when co-existing with WiFi
- When following LBE operation, LAA would need to be designed taking into account characteristics such that the ECCA period can change at every ECCA timing in a range of any number of OFDM symbols.

Both FBE based and LBE based LAA channel access mechanisms should be further studied and evaluated during the SI phase.

Decision: The document is noted.

R1-144940 Discussion on possible solutions for LAA CMCC

The document was presented by Xiaodong Shen from CMCC and proposes:

- A modified LBE mechanism with fixed frame structure and extended CCA can be a candidate solution for LAA design and Re-use the 1ms subframe structure of licensed LTE.
- A specific approach should be studied to improve the special efficiency decreased by extended CCA mechanism.
- An enhanced channel selection mechanism based on energy detection and signal detection, e.g., RS-based LAA-LAA signal detection mechanism, should be considered and evaluated during study stage.
- UE-assisted mechanism can be a candidate solution for solving hidden node issue for co-channel case.
- SCell (E)PDCCH transmitted on the licensed carrier only is beneficial and cross-carrier scheduling from PCell to SCell should be considered to schedule SCell PDSCH/PUSCH.
- Re-using the currently design of DRS as a starting point.
- CRS would be no longer reserved for data transmission (only discontinuous CRS in DRS will be reserved)
- Considering the interference WiFi may suffer from LAA DRS, new DRS pattern/period could be introduced.
- Unlicensed carrier cannot be configured as PCell.
- Broadcasting of certain system information (e.g. MIB, SIB, paging) on unlicensed carrier is not necessary.
- Enhanced HARQ mechanism should be considered, e.g. SCell HARQ retransmission on a PCell or a SCell different from initial transmission may be considered.

Decision: The document is noted.

R1-145003 On Listen Before Talk and Channel Access Nokia Networks, Nokia Corporation

The document was presented by Timo Lunttila from Nokia Networks and

- Observation #1: A single global solution which enhances LTE to enable licensed-assisted access to unlicensed spectrum must fulfill, besides others, the LBT rules defined by ETSI.
- Proposal #1: Frame structure type 2 building blocks are used to facilitate LBT.
- Proposal #2: LBT/CCA arrangement should be flexible enough to support coexistence of two UE categories, DL-only and UL & DL in the same cell.
- Proposal #3: LTE LAA Uplink operation should consider as a baseline ETSI rules defined for Frame Based Equipment.
- Proposal #4: LTE LAA Downlink operation should consider as a baseline ETSI rules defined for Load Based Equipment.
- Proposal #5: LTE LAA shall support configurable burst length and flexible UL/DL operation.

Decision: The document is noted.

WFs

R1-145379 WF on LAA functionalities Huawei, HiSilicon, Intel, Kyocera, CATR, Ericsson, NTT DOCOMO, Nokia Networks, Nokia Corporation, CATT, Sharp, ZTE

The document was presented by Ms Yuan Xia from Huawei.

- DL LAA design should assume subframe boundary alignment across cells according to the Rel-12 CA timing relationships
  - At least for LBE, some signal(s) can be transmitted between the time eNB is permitted to transmit and the start of data transmission
    - This does not imply the data transmission can start only at the subframe boundary
    - The duration of this signals(s) is part of the maximum transmission duration
    - The content/function/duration of this signal is FFS
  - This does not imply network synchronization
- At least subframe or multi-subframe level on/off on the LAA Scell can be considered for efficient transmission on the unlicensed band
- Support at least the following functionalities in addition to the current LAA TR on the unlicensed band
  - RRM measurement
  - AGC setting
  - Coarse synchronization and fine frequency/time tracking
  - CSI measurement, including channel and interference
- Rel-12 DRS can be the starting point for at least RRM measurement
- The following functionalities are supported by legacy specifications and/or implementations
  - *Transmit Power Control* as per regulatory requirement
  - *Dynamic frequency selection* for radar avoidance at eNB in certain bands/regions
    - FFS the necessity for enhancements to power control (not related to regulatory requirement)
    - FFS if the DFS for radar avoidance is needed to be supported in the UE

Decision: The document is noted, modified and agreed as follows:

Agreements:

- DL LAA design should assume subframe boundary alignment according to the Rel-12 CA timing relationships across serving cells aggregated by CA
  - At least for LBE, some signal(s) can be transmitted by eNB between the time eNB is permitted to transmit and the start of data transmission at least to reserve the channel
    - This does not imply the data transmission can start only at the subframe boundary
      - Possible restriction on starting position of data transmission can be considered
    - The duration of this signals(s) is part of the maximum transmission duration
    - The content/additional function/duration of this signal is FFS
  - This does not imply network synchronization

Agreements:

- Support at least the following functionalities in addition to the current LAA TR on the unlicensed band
  - RRM measurement including cell identification
  - AGC setting
  - Coarse synchronization
  - Fine frequency/time estimation for at least demodulation
  - CSI measurement, including channel and interference
- Rel-12 DRS can be the starting point for at least RRM measurement including cell identification
- The following functionalities are supported by legacy specifications and/or implementations
  - ~~Working assumption~~: *Transmit Power Control* as per regulatory requirement
  - *Dynamic frequency selection* for radar avoidance at eNB in certain bands/regions
- FFS: if the DFS for radar avoidance is needed to be supported in the UE

Note from Thursday 20th evening session: Above WA is deleted - *Transmit Power Control* is part of the agreement.

R1-145380 Way Forward on Subframe Structure, Numerology and System Bandwidth for LAA Qualcomm, Intel, Nokia Corporation, Nokia Networks, ETRI, NTT DOCOMO, CATT

The document was presented by Srinivas Yerramalli from Qualcomm.

- For DL transmission, retain at least the following numerology
  - OFDM symbol duration
  - subcarrier spacing
  - CP length
  - DC subcarrier insertion
  - #subcarriers per PRB
- FFS: Support for normal CP only or both normal and extended CP

- This does not preclude transmission on a fraction of an OFDM symbol
- No new system BW options in LAA when compared to Release 12
  - Support at least 20MHz system BW option in the 5GHz band
- FFS: System bandwidths < 5MHz are not considered for PHY layer options in LAA

Discussion: Also supported by ALU, ASB
Decision: The document is noted.

Possible conclusion:
- Study further following aspects in RAN1 #80 meeting
  - Support for normal CP only or both normal and extended CP
  - Transmission on a fraction of an OFDM symbol

Possible agreements:
- Support at least 20MHz system BW option in the 5GHz band
- System bandwidths < 5 MHz are not considered for PHY layer options in LAA

Continue offline discussion until Thursday – (Qualcomm)

Thursday 20th
Agreements:
- For LAA design option,
  - Support at least 20MHz system BW option in the 5GHz band
  - System bandwidths < 5 MHz are not considered for PHY layer options in LAA

Not treated.

R1-144589	Preliminary results of coexistence evaluation for LAA	Huawei, HiSilicon
R1-144591	Detailed solutions for carrier selection and LBT for LAA	Huawei, HiSilicon
R1-144603	Initial co-existence evaluations comparing LAA versus Wi-Fi	Cisco
R1-144604	Candidate Detailed Solutions for DL Transmissions in Unlicensed Spectrum	Cisco
R1-144625	Listen before talk for LAA	CATT
R1-144626	Discontinuous transmission on Scell for LAA	CATT
R1-144627	Data and control signalling transmissions for LAA	CATT
R1-144628	Other functionalities for LAA	CATT
R1-144666	Discussion on PHY layer options for LAA using LTE	Intel Corporation
R1-144701	LBT Enhancements for Licensed-Assisted Access	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent
R1-144702	Channel Selection for Licensed-Assisted Access	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell
R1-144703	Hidden node problem and potential solutions for LAA	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent
R1-144738	Initial evaluation results on LAA	Samsung
R1-144740	Discussion on carrier selection for LAA	Samsung
R1-144741	Discussion on DL power control for LAA	Samsung
R1-144742	Discussion on LAA cell discovery and RRM measurement mechanisms	Samsung
R1-144743	Discussion on CSI measurement aspects for LAA	Samsung
R1-144777	Details on support of DFS, TPC, carrier selection and bandwidth occupancy	Ericsson
R1-144779	Required Functionality for supporting RRM, CSI and Time-Frequency Tracking	Ericsson
R1-144780	PHY layer options to support RRM, CSI and time/freq tracking	Ericsson
R1-144785	DL data and CRS transmission for LAA	Fujitsu
R1-144801	Discussion on LAA synchronization and discovery	Panasonic
R1-144802	Discussion on LAA subframe boundary alignment	Panasonic
R1-144825	Analysis of PHY layer solutions for LAA design	ZTE
R1-144826	Potential solutions to obtain unlicensed spectrum	ZTE
R1-144827	Considerations on Measurement for LAA	ZTE
R1-144828	Frame structure design for LAA considering LBT	ZTE
R1-144829	HARQ related issues for Licensed-assisted access using LTE	ZTE
R1-144830	Analysis of LAA UL enhancement	ZTE
R1-144844	Considerations on LAA functionalities	Sharp
R1-144866	Impact of LBT regulation LAA;	NEC
R1-144867	Simulation results for coexistence evaluation	NEC
R1-144900	LBT operation details and initial evaluation results	LG Electronics
R1-144901	Carrier selection and other coexistence methods	LG Electronics
R1-144902	CSI feedback and handling interference variation in unlicensed band	LG Electronics
R1-144903	Measurement and synchronization in LAA	LG Electronics
R1-144904	Data scheduling and control signaling in LAA	LG Electronics
R1-144919	Preamble field for time-aligned load based equipment type LBT mechanism	ETRI
R1-144920	Considerations on LAA solution from simulation result	ETRI

R1-144921	Required functionalities and possible solution related to SCE operation in unlicensed carrier	ETRI
R1-144928	Measurement and Synchronization for LAA-LTE	HTC
R1-144941	Transmission of control signalling in unlicensed band	CMCC
R1-144955	Further considerations on the essential functionalities for LAA	Kyocera
R1-144970	Views on issues related to LAA UL	NTT DOCOMO
R1-145001	On LTE LAA inter-cell interference management mechanisms	Nokia Networks, Nokia Corporation
R1-145002	On UE synchronization in LTE LAA	Nokia Networks, Nokia Corporation
R1-145004	LAA LBT operation using Reservation signals	Nokia Corporation, Nokia Networks
R1-145013	Discussion on potential solutions for LAA-LTE	NVIDIA
R1-145052	On L1 design for LTE LAA DL-only mode	InterDigital
R1-145083	Required functionalities and design targets	Qualcomm Inc.
R1-145084	Solutions for required functionalities and design targets	Qualcomm Inc.
R1-145107	Views on PHY layer options for LAA DL	NTT DOCOMO
R1-145109	Discussion on Channel Access Mechanism based on LBT for LAA	ITL Inc.
R1-145110	The on/off state indication of Scell in LAA unlicensed carrier for DL measurement	ITL Inc.
R1-145123	Physical Layer options for LAA-LTE	Motorola Mobility
R1-145128	Avoid hidden node problem by full-duplex radio from UE perspective	III
R1-145132	Discussion on the comparison of LBE and FBE for LBT	Coolpad
R1-145133	Discussion on LBT mechanism in LAA	Coolpad
R1-145145	Considerations on Listen Before Talk for fair coexistence	ATR
R1-145167	Robust Coexistence LAA-LTE	Broadcom Corporation
R1-145168	Initial Evaluation of Clear Channel Assessment mechanisms for LAA	Broadcom Corporation
R1-145193	Details of Listen-Before-Talk for LAA	Ericsson (R1-144778)
R1-145217	Initial evaluation results and analysis on LBT mechanism for LAA DL	NTT DOCOMO (R1-144969)
R1-145324	Avoid hidden node problem by pseudo signalling from eNB perspective	III (R1-145127)

6.3.2.3 Others

Not treated.

R1-144744	Discussion on UL transmssion for LAA	Samsung
R1-144745	Discussion on the impacts of Pcell duplex mode for LAA	Samsung
R1-144803	Discussion on charging aspect in LAA	Panasonic
R1-144922	Coexistence interference impact from LTE on WLAN	ETRI

6.3.3 Study on Elevation Beamforming/Full-Dimension (FD) MIMO for LTE

SID in RP-141644.

R1-145005 TR 36.897 v0.1.0 Study on Elevation Beamforming/Full-Dimension (FD) MIMO for LTE Nokia Networks, Samsung

The document was presented by Bishwarup Mondal from Nokia Networks and includes the agreements made in RAN1#78bis in clause 3, 5 and annex A.

Decision: The document is noted and TR v0.1.0 is agreed.

6.3.3.1 Remaining Details on Deployment Scenarios and Evaluation Methodology

Including deployment scenarios, 2D antenna array modelling, target operating frequency range, traffic model, etc.

R1-144971 Summary of Email Discussion [78bis-16] HetNet Separate Frequency Scenario Assumption for Elevation BF/FD-MIMO NTT DOCOMO

The document was presented by Chongning Na from NTT DOCOMO and summarizes the email discussion on the HetNet scenario with separate frequency band.

Decision: The document is noted.

R1-145351 WF on remaining details of HetNet scenario with separate frequency LG Electronics, NTT DOCOMO, CHTTL

The document was presented by Young Tae from LGE.

Discussion: Initial comment from Ericsson → would have been more efficient to see such WF earlier for review.
Ericsson → concern with radius for small cell center dropping in a cluster (Rc) = 50m
Mr Chair suggested going through slide by slide.

Decision: The document is noted.

Agreements:

- Remaining parameters for small cell dropping are defined as follows:
  - Minimum distance separation between small cell centers (Dscc) = 40m for 4 small cells per cluster

- Confirm the agreement on UE dropping made in RAN1#78bis meeting
  - 2/3 UEs randomly and uniformly dropped within the clusters, 1/3 UEs randomly and uniformly dropped throughout the macro geographical area. 20% UEs are outdoor and 80% UEs are indoor.

Possible conclusion:
- Compare following two alternatives in RAN1 #80 meeting
  - Alt. 1: Same inter-band cell selection is used for comparison between Phase 1 and Phase 2.
  - Alt. 2: The same ratio of small cell UEs are assumed for the evaluations of Phase 1 and Phase 2

Continue offline discussion until Thursday

Wednesday 19th afternoon

R1-145378 WF on remaining details of HetNet scenario with separate frequency LG Electronics, NTT DOCOMO, CHTTL

The document was presented by Young Tae from LGE.
Discussion: Also supported by KDDI.
Decision: The document is noted.

Possible agreements
- Radius for UE dropping in a cluster is 70m.
- Radius for small cell center dropping in a cluster (Rc) = 50m
- Supported by LGE, ALU, ASB, NTT DOCOMO, Huawei, HiSilicon, NEC, KDDI, Samsung, CHTTL

Possible agreements
- Radius for UE dropping in a cluster is 100m.
- Radius for small cell center dropping in a cluster (Rc) = 80m
- Supported by Ericsson

Possible agreements
- Radius for UE dropping in a cluster is 120m.
- Radius for small cell center dropping in a cluster (Rc) = 100m
- Supported by Ericsson

Agreements:
- HetNet scenario assumption for Elevation BF/FD-MIMO
  - Radius for UE dropping in a cluster is 70m
  - Radius for small cell center dropping in a cluster (Rc) = 50m

R1-144704 Some remaining details and clarifications for scenario and evaluation methodology Alcatel-Lucent, Alcatel-Lucent Shanghai Bell

The document (focus on UE Association Model) was presented by Min Zhang from ALU and proposes:
- Proposal 4: RSRQ and 0dB cell association bias should be considered as the starting point for further enhancement.

Decision: The document is noted.

Working assumption:
- Use the following UE association method for HetNet scenario with separate frequency evaluations for Phase 1 evaluation:
  - Geometry-based UE association with bias (i.e., RSRP of the target cell divided by the summation of RSRPs of all cells in the same frequency plus noise power for only simulation). Bias value is FFS
  - Tilting value for small cells and bias value are jointly determined with targeted small cell UE ratios of 2/3 for phase 1
- Note: Companies are recommended to provide evaluation results to validate this approximation
- Note: Companies are also recommended to provide evaluation results of tilting and bias values

Email discussion/approval to confirm above WA until 15th January, 2015

Agreements:
- HetNet scenario assumptions for Elevation BF/FD-MIMO for phase 1/2 evaluation

Deployment on macro cell layer	3D-UMa ISD 500m
Polarized antenna modeling	Model -2 from 36.873
Traffic model	Mandatory: FTP Model 1 with packet size 0.5 Mbytes (medium ~20% RU*, ~50% RU, high ~70%RU), the number of UEs is variable and according to desired load for bursty Optional: Full buffer model Note: RU is for small cell layer
Wrapping method	Mandatory: Geographical distance based Optional: Radio distance based

Handover margin	3dB
Metrics	Mean, 5%, 50% UPT
System bandwidth	10MHz (50 PRBs)
Carrier Frequency	2GHz for macro cells, 3.5GHz for small cells

*RU clarification: multiple SU or MU layers are not counted multiple times towards RU, max RU=100%

Network synchronization	Synchronized
UE Speed	3km/h
UE array orientation	$\Omega_{UT,a}$ uniformly distributed on [0,360] degree, $\Omega_{UT,b}$ = 90 degree, $\Omega_{UT,g}$ = 0 degree
UE antenna pattern	Isotropic antenna gain pattern $A'(\theta',\phi') = 1$
Receiver	Non-ideal channel estimation and interference modeling, detailed guidelines according to Rel-12 [71-12] assumptions
	LMMSE-IRC receiver, detailed guidelines according to Rel-12 [71-12] assumptions
Polarization model	Model 2
UE Rx configuration	2 Rx x-polar (+90/0)

Agreements:

HetNet scenario assumptions for Elevation BF/FD-MIMO for phase 1 evaluation

Feedback	PUSCH 3-2 for non-reciprocity operation (PUSCH 3-0 for reciprocity based operation)
	CQI, PMI and RI reporting triggered per 5ms
	Feedback delay is 5 ms
	Rel-10 8Tx codebook based for non-reciprocity based operation (SRS for reciprocity based operation only for TDD)
Transmission scheme	TM10, single CSI process, dynamic SU/MU-MIMO with rank adaptation*
Overhead	3 symbols for DL CCHs, 2 CRS ports and DM-RS with 12 REs per PRB
Scheduler	Frequency selective scheduling (multiple UEs per TTI allowed)
BS antenna configuration	(M,N,P) = (8,4,2), M_{TXRU} = 1 for macro cells (M,N,P) = (4,4,2), M_{TXRU} = 1 for small cells
Number of UE transmit antennas	1 or 2

* Single CSI process is used for phase 1 simulation only and the number of CSI processes allowed will be discussed in phase 2 simulation

CSI-RS, CRS	CSI-RS 1-1 mapping to TXRU, only CRS port 0 is modeled for UE attachment, CRS port 0 is associated with the first column with +45 degree pol, CRS port 0 to TXRU mapping is given by [1, 0, 0, 0, 0, 0, 0, 0]
Downtilt	Baseline: Antenna downtilting angle θ_{etilt} = 100 degree for macro cell
CSI-RS/SRS periodicity	5 msec

R1-145346 **WF on number of antenna columns for homogeneous scenarios in phase 2 Samsung, Qualcomm, CHTTL, Nokia Networks, Nokia Corporation, Huawei, HiSilicon, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, InterDigital, NTT DOCOMO, Motorola Mobility, LG Electronics**

The document was presented by Taeyoung Kim from Samsung.

- Maximum number of antenna columns (N) for homogeneous scenarios in phase 2 is 4

Discussion: Premature according to Ericsson – SI just starting – suggested looking at R1-145357.
Same view from ZTE, Intel.
Nokia Networks → should not be viewed as a restriction – aligned with the scope
Decision: The document is noted.

R1-145357 **Way forward on the number of antenna element rows M and columns N for Phase 2 evaluations Ericsson, Intel, ZTE, AT&T**

The document was presented by Mattias Frenne from Ericsson.

- The number of rows (M) and columns (N) of antenna elements for Phase 2 evaluations in this SI are
  - M,N ={1,2,4,8,16}
  - max(M*N) = 32

Discussion: Also supported by Verizon Wireless, ETRI, Sprint, Deutsche Telekom.
AT&T → let's follow the approach as many region in the world (with different requirements) need to be considered – be opened mind.
Decision: The document is noted.

Possible agreement:

- The number of rows (M) and columns (N) of antenna elements for Phase 2 evaluations in this SI are
  - M,N ={1,2,4}
  - max(M*N) = (8, 16)

Possible agreement:
- The number of rows (M) and columns (N) of antenna elements for Phase 2 evaluations in this SI are
  - M,N ={1,2,4,8}
  - max(M*N) = 16

Possible agreement:
- The number of columns (N) of antenna elements for homogeneous scenarios for Phase 2 evaluations in this SI is {1,2,4,8} and N=16 is optional

Possible agreement:
- The number of columns (N) of antenna elements for homogeneous scenarios for Phase 2 evaluations in this SI is {1,2,4} and N = 8, 16 is optional
  - Note Max(M*N) = 32
  - Note M is 4 or 8, and (M*N) = (2,16), (2,8) are optional

Ericsson objected having N = 8 as optional
Nokia Networks objected having N = 8 as mandatory

N = 8 as optional supported by Huawei, HiSilicon, Nokia Networks, Nokia Corp., Samsung, LGE, NTT DOCOMO, Qualcomm, MotM, NEC, ALU, ASB, CeWIT
N = 8 as mandatory supported by Ericsson, Intel, AT&T, Deutsche Telekom, ETRI, ZTE, Verizon, CATT
Ericsson maintained its objection taking "N = 8 as optional" either as agreement or working assumption

Conclusion: No consensus. Continue offline discussion until Thursday – (Nokia Networks/Ericsson)

Thursday 20th

R1-145417 WF on number of antenna columns Nokia Networks, Nokia Corporation, Ericsson, Samsung

The document was presented by Bishwarup Mondal from Nokia Networks and suggests that the focus of the evaluation of the specification enhancement proposals should follow the prioritization below:

{1, 2, 4} 1st priority
{8, 16} 2nd priority

Note-0: The specification enhancement proposals should be applicable to 1, 2, 4, 8, 16.
Note-1: Companies are encouraged to provide evaluation results including 8, 16 columns
Note-2: Note that lack of sufficient study/evaluations for the second priority cases (as noted above) will not have impact to close SI

Discussion: Also supported by Deutsche Telekom, AT&T.
Decision: The document is noted, amended and agreed as follows:

Agreements:
- The focus of the evaluation of the specification enhancement proposals in this SI should follow the prioritization noted below
  - The number of columns (N) of antenna elements for homogeneous scenarios for Phase 2
    - N = {1, 2, 4} 1st priority
    - N = {8, 16} 2nd priority
- Note-0: Companies are encouraged to provide evaluation results including 8, 16 columns
- Note-1: Note that lack of sufficient study/evaluations for the second priority cases (as noted above) will not have impact to close SI
- Note-2: Max(M*N) = 32
- Note-3: When N = 16, M = 2

R1-145356 WF on prioritization of antenna configurations Nokia Networks, Nokia Corporation, Samsung, CHTTL

The document was presented by Bishwarup Mondal from Nokia Networks.
Discussion: Column "N=1" empty means not prioritized.
Ericsson → all antenna configurations are equally weighted, concern having N=4 as top priority – N=1 enhancement is also to be studied.
Decision: The document is noted, modified and agreed as follows:

Agreements:
- Prioritization of antenna configurations for phase-2 enhancement proposal

	N=1	N=2	N=4
M=8,	8TXRU	8TXRU	8 TXRU

homogeneous @ 2 GHz	16TXRU	16TXRU	16 TXRU 32 TXRU 64 TXRU
M=4, small cells @ 3.5 GHz			8 TXRU 16 TXRU 32 TXRU

- FFS: N=8, 16
- The enhancements to specifications should also allow other TXRU configurations with total number of TXRU = 8, 16, 32, 64
- Both 1D and 2D TXRU virtualization are allowed

R1-145349 Proposal on SRS estimation error modeling CMCC, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATT, Ericsson, Huawei, HiSilicon, INTEL, Nokia Net., Nokia Corp., QUALCOMM, NEC, ZTE
The document was presented by Hui Tong from CMCC.
- SRS error is included in evaluations for reciprocity based operation
- It is suggested capturing the proposed SRS error modeling in TR
- Details of calculation on should be provided by each company

Decision: The document is noted.

~~**Working assumption:** to agree R1-145349~~
Continue offline discussion including Antenna gain imbalance modelling and SRS power control error modelling until Thursday

Thursday 20th
R1-145389 Proposal on SRS estimation error modeling CMCC, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATT, Ericsson, Huawei, HiSilicon, Intel, InterDigital, Nokia Net., Nokia Corp., QUALCOMM, Samsung, NEC, ZTE (R1-145349)
Decision: The document is noted. Above WA is withdrawn and R1-145389 is agreed.

R1-145372 WF on simulation assumptions for co-channel HetNet Huawei, HiSilicon, Deutsche Telekom, CMCC, China Telecom, ALU, ASB
The document was presented by Jianghua Liu from Huawei.
Decision: The document is noted.

Agreements:
- Simulation assumptions for HetNet scenario with same frequency bands is a table in R1-145372
  - No coordination among any antenna arrays
    - No coordination between Macro and Small cells
    - No coordination among small cells
    - No coordination among Macro cells
  - Note that cell association without coordination can be studied in this study

HetNet scenario
Alt.1: HetNet scenario with separate frequency bands
Alt.2: HetNet scenario with ssame frequency bands with no EV/FD-MIMO in small cells
Alt.3: HetNet scenario with ssame frequency bands with EV/FD-MIMO in small cellsher
Debat whether all the above scenarios should be studied or kind of priority needs to be decided (mainly due to SI time constraints)
All simulation results shall anyway be captured in the TR.
AT&T strongly recommended treating Alt.1 and 2 with the same priority. At least would like to see simulation results for both.
Samsung suggested to wait and see what the simulations are at next meeting → may help how RAN1 should handle them and solve the issue. Same view from Ericsson.

Agreements:
- Following HetNet scenarios are prioritized with the following order
  - HetNet scenario with separate frequency bands
  - HetNet scenario with same frequency bands with no Elevation BF/FD-MIMO in small cells
  - HetNet scenario with same frequency bands with Elevation BF/FD-MIMO in small cells

Possible conclusion:
- Note that lack of sufficient study/evaluations for HetNet scenarios will not have impact to close SI

Continue discussion until Thursday – (Nokia Networks)

Thursday 20th

Conclusion:
- No consensus to have a note that lack of sufficient study/evaluations for HetNet scenarios for non-prioritized scenario(s) will not have impact to close SI

R1-145418 **WF on Remaining Simulation Assumptions for Co-channel HetNet Huawei, HiSilicon, Alcatel Lucent, Alcatel Lucent Shanghai Bell**
- The remaining simulation assumptions for co-channel HetNet phase 1 evaluation
  - UE attachment: Based on RSRP (formula defined in TR36.873) from CRS port 0
  - Downtilt: for small cell, the downtilt is 100 degrees
  - In case omni-directional antenna is used for small cell, it is deployed in the small cell center

Decision: The document is noted and modified as follows:

Agreements:
- The remaining simulation assumptions for co-channel HetNet phase 1 evaluation
  - UE attachment: Based on RSRP (formula defined in TR36.873) from CRS port 0
  - FFS: Downtilt: for small cell, the downtilt is 100 degrees
    - Email approval until 27th November, 2014 – (Huawei)
  - In case omni-directional antenna is used for small cell, it is deployed in the small cell center
  - Antenna pattern for small cell omni-directional follows TR36.819 assumption for 3D antenna pattern for low power node

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Not treated.

R1-144592	Remaining Details on Deployment Scenarios and Evaluation Methodology	Huawei, HiSilicon
R1-144667	On Cell Association in Phase Two Evaluation	Intel Corporation
R1-144668	Antenna Array Modelling for Phase Two Evaluation	Intel Corporation
R1-144681	Geometry Study of Non-cochannel HetNet Scenario	Intel Corporation
R1-144746	Evaluation assumptions for uplink FD-MIMO	Samsung
R1-144747	Evaluation Assumptions for Separate Channel HetNet Scenario	Samsung
R1-144748	Evaluation Assumptions for Co-channel HetNet Scenario	Samsung
R1-144749	Prioritization of phase 2 evaluation for homogeneous scenario	Samsung
R1-144750	CRS modeling and TXRU virtualization for phase 2 evaluations	Samsung
R1-144751	Antenna port to TXRU virtualization mapping	Samsung
R1-144752	Discussion on 2D antenna configuration	Samsung
R1-144807	Remaining Details on Antenna Modeling	ZTE
R1-144868	Views on TXRU virtualization	NEC
R1-144942	Further discussion on TXRU virtualization	CMCC
R1-144943	SRS and antenna calibration error modeling	CMCC
R1-144944	Non-full-buffer traffic model for video streaming	CMCC
R1-144952	Discussion on the remaining issues of the deployment scenario	China Telecom
R1-144972	Remaining Details on Evaluation Assumptions for HetNet Scenarios with Separate Frequency	NTT DOCOMO
R1-144973	Evaluation on Tilting Angle for HetNet Scenario Using Different Frequency Bands	NTT DOCOMO
R1-145006	On Deployment Scenarios and Evaluation Methodology	Nokia Networks, Nokia Corporation
R1-145085	Remaining details on Deployment Scenarios and Evaluation Methodology for EBF/FD-MIMO	Qualcomm Inc.
R1-145171	Modeling hardware imperfections in 2DAA	Ericsson
R1-145172	Details of heterogeneous network scenarios	Ericsson
R1-145199	Depolarization Matrix Scaling in the Outdoor-to -Indoor 3D Channel Model	Motorola Mobility (R1-145124)
R1-145213	Phase 2 modeling of 2D Antenna Arrays	Ericsson (R1-145169)
R1-145223	On the number of antenna columns	Ericsson (R1-145170)
R1-145326	Analysis on small-cell and UE dropping models in HetNet	LG Electronics (R1-144906)
R1-145327	Analysis on UE association modeling in HetNet	LG Electronics (R1-144907)

6.3.3.2 Performance of Rel. 12 Downlink MIMO Using 3D-UMa and 3D-UMi Channel Models

R1-145361 **WF on capturing phase 1 results Samsung**
The document was presented by Hyoungju Ji from Samsung and captures Phase 1 evaluation results in an excel sheet. Company can check their results before inclusion in TR.
Decision: The document is noted and agreed.

R1-145355 **WF on simulations for enhancement proposals Nokia Networks, Nokia Corporation**
The document was presented by Bishwarup Mondal from Nokia Networks.

Discussion: CATT suggested looking at R1-145362.
Decision: The document is noted.

R1-145362 Observation on Phase I evaluation of EBF/FD-MIMO based on Rel.12 CATT, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CMCC, Ericsson, Intel,
The document (submitted under AI 6.3.3.3) was presented by Runhua Chen from CATT.

- It is observed that multiple standard transparent EBF/FD-MIMO schemes based on Rel-12 can achieve performance gain over the phase I scheme, including and not limited to
  - 2D CSI-RS virtualization
    - Each TXRU corresponding to an antenna port
    - CSI-RS antenna ports of a CSI-RS resource distributed in horizontal and/or vertical domains
    - Includes 1D CSI-RS virtualization (phase I) as a special case
  - Vertical/horizontal sectorization
  - Elevation-beamformed CSI-RS
  - Reciprocity based operation
- Standard enhancements for EBF/FD-MIMO and performance should be further studied in Phase 2, compared to standard-transparent Rel.12 schemes.

Discussion: Samsung → cannot agree this observation at this stage – more cross-checking needed
Decision: The document is noted. No consensus.

R1-145402 WF on simulations for enhancement proposals Nokia Networks, Nokia Corporation, Ericsson, Samsung, CATT, LG, Huawei, HiSilicon, Motorola Mobility, Qualcomm, ALU, ASB, NTT DOCOMO, Intel (R1-145355)
Decision: The document is noted, modified as follows:

Agreements:

- For a given antenna array configuration, an enhancement proposal that requires specifications change should at least be provided with the following:
  - ~~FFS:~~ A baseline case
    - ~~FFS:~~ A baseline is considered to have no specification impact to Rel-12 and providing the best performance achievable using Rel-12 specifications
  - An enhancement case
    - An enhancement is considered to have specification impact to Rel-12
  - The enhancement case should at least be evaluated against the baseline case(s)
  - Antenna array configuration is given by the parameters {M,N,P,Q}
  - Baseline and Enhancement cases assume the same values for M, N, P, Q
    - 1D TXRU virtualization: The total number of associated TXRUs: $Q= M_{TXRU} * N * P$ according to TXRU model-1 (as defined in RAN1#78bis)
    - 2D TXRU virtualization: The total number of TXRUs Q should be described by the proponent

Possible agreements:

- TXRU virtualization models
  - For a given array antenna configuration, the Baseline and Enhancement cases can
    - assume different virtualization weight vectors (for1D or 2D virtualization)
    - assume different TXRU architecture options (e.g. sub-array architecture, full-connection architecture, 2D architecture)
  - Companies are encouraged to additionally provide both baseline and enhancement case results for the same architecture option
  - Introduce the following TXRU virtualization model:
    - Sub-array partition model 2
    - $q(i)=w(i)x(i)$, $i=1, .., M_{TXRU}$
    - The length of $w(i)$ is given by $K = M/M_{TXRU}$
    - w is given by
      - a. Option A:

$$w_k(i) = \frac{1}{\sqrt{K}} \exp\left(-j \frac{2\pi}{\lambda} (k-1) d_v \cos\theta_{etilt}(i) \right) \text{ for } k = 1,\ldots,K, i = 1,\ldots,M_{TXRU}$$

      - b. Option B: $w_k(i)$ as given by the proponent company
  - The description for 2D TXRU virtualization model to be provided on Thursday

Continue offline discussion until Thursday – (Nokia net.)

Thursday 20th
Above TXRU virtualization models are agreed.
Note that companies are free to choose TXRU virtualization models not agreed in RAN1.

R1-145411 Way forward on 2D TXRU Virtualization Intel, Ericsson, CATT, Qualcomm

Also supported by Motorola Mobility

- Capture the 2D TXRU Virtualization text into the latest version of TR 36.897

Decision: The document is noted and the WF is agreed.

Conclusion:

Companies are encouraged to share details of the baseline case before RAN1#80 via email discussion until 15th January, 2015, for instance,

- TXRU virtualization weights (for 1D or 2D virtualization)
- CSI-RS to TXRU virtualization
- CSI-RS port indexing
- Cell association weights and method
- SRS configurations including the number of SRS ports, periodicity, SRS bandwidth

Not treated.

R1-144593 Performance Evaluation of Rel. 12 Downlink MIMO Using 3D-UMa and 3D-UMi Channel Models Huawei, HiSilicon
R1-144669 System Evaluation of Rel-12 Systems With 3D Channel Model Intel Corporation
R1-144706 Performance of Rel-12 AAS for 3D UMa and 3D UMi scenarios Alcatel-Lucent Shanghai Bell, Alcatel-Lucent
R1-144869 Initial performance evaluation NEC
R1-144908 Initial full buffer evaluation results for Phase 1 LG Electronics
R1-144945 Phase I 3D-MIMO Performance Evaluations CMCC
R1-144948 Evaluation of Rel.12 MIMO with beamformed CSI-RS with 8 TXRU CATT
R1-144951 Initial evaluation results of Rel-12 DL MIMO using 3D channel modelling CATR
R1-144974 Phase 1 Evaluation Results for the Homogeneous Network Scenarios NTT DOCOMO
R1-145008 Phase-1 simulation results for codebook based operation Nokia Networks, Nokia Corporation
R1-145009 Phase-1 simulation results for reciprocity based operation Nokia Networks, Nokia Corporation
R1-145014 Phase-1 performance evaluation results using 3D-UMa and 3D-UMi channel models NVIDIA
R1-145015 Performance of UE-specific elevation beamforming using two NZP CSI-RS resources NVIDIA
R1-145053 Evaluation results of Rel-12 DL MIMO scheme InterDigital
R1-145086 Performance of Rel-12 DL MIMO using 3D-UMa and 3D-Umi Qualcomm Inc.
R1-145196 Performance Evaluation of Rel.12 Downlink MIMO in the Het-Net Scenarios Huawei, HiSilicon (R1-145183)
R1-145201 "Phase 1 Evaluation Results of Homogeneous Network " ZTE (R1-144808)
R1-145202 Phase 1 Evaluation Results of Co-channel Heterogeneous Network ZTE (R1-144809)
R1-145224 Phase 1 calibration of Rel-12 MIMO Ericsson (R1-145173)
R1-145328 Initial non-full buffer evaluation results for Phase 1 LG Electronics (R1-144909)
R1-145350 Phase 1 evaluation results for homogeneous networks Samsung (R1-144753)
R1-145354 Vertical sectorization performance with Rel-12 Nokia Networks, Nokia Corporation (R1-145007)
R1-145363 Performance of Rel.12 MIMO based EBF/FDMIMO with 8 TXRU CATT (R1-144629)

6.3.3.3 Potential Enhancements Targeting 2D Antenna Array

Performance for 8 TXRUs is treated in this meeting.

R1-145352 WF on UE attachment for Phase 2 LG Electronics, Nokia, Nokia Networks, Samsung

The document was presented by … from LGE.

- Companies can select their Phase 2 UE attachment method out of at least one of the following three options:
  - Opt.1: Based on CRS port 0 associated to a single TXRU with weights [1,0,0,...,0] or [0,1,0,…,0] (e.g., a single cell or vertical sectorization with different cell-ID)
  - Opt.2: Based on CRS port 0 associated to all the TXRUs comprising a column with same pol with weights all one with power normalization (e.g., vertical sectorization with same cell-ID)
  - Opt.3: If other methods are considered, proponents should explicitly describe the methods used for evaluation.

Discussion: Intel → power limitation (in opt 1) need to be considered.

Decision: The document is noted. Continue offline discussion until Thursday

R1-145412 WF on CRS virtualization for Phase 2 LG Electronics , CEWiT, Ericsson, Intel, ITRI, Nokia Corporation, Nokia Networks, Motorola Mobility, NTT DOCOMO, Qualcomm, Samsung, ZTE

The document was presented by Jonghyun Park from LGE.

- Companies can select their Phase 2 CRS virtualization method (needed for UE attachment) out of at least one of the following three options:

- Opt.1: CRS port 0 associated to a single TXRU with weights [1,0,0,...,0] or [0,1,0,…,0] (e.g., a single cell or vertical sectorization with different cell-ID). Note that CRS port 0 to TXRU mapping is ideal in this option.
- Opt.2: CRS port 0 associated to all the TXRUs comprising a column with same pol with weights all one with power normalization (e.g., vertical sectorization with same cell-ID)
- Opt.3: If other methods are considered, proponents should explicitly describe the methods used for evaluation.

Decision: The document is noted.

Thursday conclusion:

- Companies can select their Phase 2 CRS virtualization method (needed for UE attachment) out of at least one of the following three options:
  - Opt.1: CRS port 0 associated to a single TXRU with weights [1,0,0,...,0] or [0,1,0,…,0] Note that CRS port 0 to TXRU mapping is ideal in this option.
  - Opt.2: CRS port 0 associated to all the TXRUs comprising a column with same pol with weights all one with power normalization
  - Opt.3: If other methods are considered, proponents should explicitly describe the methods used for evaluation.

Not treated.

R1-144594 Potential Enhancements with 2D Antenna Array Huawei, HiSilicon
R1-144630 Discussion on standard transparent baseline schemes for EBF/FD-MIMO comparison CATT
R1-144631 Evaluation of FD MIMO with beamformed CSI-RS with 16-64 TXRU CATT
R1-144632 Discussion on potential standard enhancements targeting 2D antenna array CATT
R1-144634 On cell association of FD MIMO evaluation CATT
R1-144644 High level views on schemes for elevation beamforming/Full-dimension MIMO for LTE Fujitsu
R1-144645 Discussion on possible CSI-RS enhancement for elevation beamforming/Full-dimension MIMO Fujitsu
R1-144670 Potential Performance of FD-MIMO Systems with 8 TXRUs Intel Corporation
R1-144682 UERS Based Diversity Transmission for Large Antenna Array Intel Corporation
R1-144683 Elevation Beamforming for SU-MIMO and MU-MIMO Intel Corporation
R1-144707 Proposals for enhancement and corresponding evaluations Alcatel-Lucent Shanghai Bell, Alcatel-Lucent

R1-144754 Support of High Order Multi-User Spatial Multiplexing for FD-MIMO Samsung
R1-144755 Uplink FD-MIMO evaluation results for homogeneous scenario Samsung
R1-144757 Open-loop transmission scheme for FD-MIMO Samsung
R1-144758 Evaluation results on vertical sectorization Samsung
R1-144759 Discussions on FD-MIMO with 8 to 64 TXRUs Samsung
R1-144760 Discussions on MIMO precoding with subarray partition and full connection Samsung
R1-144813 Initial Consideration on Enhancements Targeting 2D Antenna Array for EB/FD-MIMO ZTE
R1-144911 Discussion on DFT-based vertical feedback LG Electronics
R1-144912 Discussion on RS design enhancements LG Electronics
R1-144923 Potential CSI-RS and CSI feedback enhancements for EBF/FD-MIMO ETRI
R1-144933 View on Enhancement for EBF/FD-MIMO ITRI
R1-144946 Standard transparent performance evaluation for 16/32/64TXRU with channel reciprocity CMCC
R1-144947 Spec Enhancement for Reciprocity based Operation CMCC
R1-144949 Evaluation of vertical sectorization with 16-64 TXRU CATT
R1-144953 Views on System Design of EB/FD-MIMO China Telecom
R1-144954 CSI-RS Design and CSI Reporting for EB/FD-MIMO China Telecom
R1-144975 Initial Evaluation of Elevation BF and FD-MIMO in HetNet Scenario Using Separate Frequency Bands NTT DOCOMO
R1-144976 Precoding Schemes for Elevation Beamforming and FD-MIMO NTT DOCOMO
R1-145010 Potential enhancements for EBF/FD-MIMO Nokia Networks, Nokia Corporation
R1-145022 On Reference Signals for RRM Measurements in FD-MIMO Sony
R1-145054 Initial evaluation results on 2D antenna array InterDigital
R1-145087 Elevation BF/FD-MIMO with 2D antenna array Qualcomm Inc.
R1-145088 Initial results on 2D antenna array with 8TXRU Qualcomm Inc.
R1-145176 Performance using 8 TXRU and potential standard changes Ericsson
R1-145177 Initial results for more than 8 TXRU Ericsson
R1-145178 Enhancements of 2D antenna array requirements Ericsson
R1-145191 MU-CSI feedback scheme realizing the potential MU-MIMO gain ETRI (R1-144924)
R1-145203 Initial Evaluation Results of 2D Array System with up to 64 TXRUs ZTE (R1-144810)
R1-145204 Initial Evaluation Results of 2D Array System with 8 TXRUs ZTE (R1-144811)
R1-145205 Initial Evaluation Results of TDD System with SRS Error Modeling ZTE (R1-144812)
R1-145329 Analysis on UE-dedicated elevation beamforming with 8 TXRUs LG Electronics (R1-144910)
R1-145359 Standard transparent techniques and performance Ericsson (R1-145214)
R1-145360 Coverage aspects of increasing the number of antenna ports Ericsson (R1-145174)

R1-145364 Evaluation of FD MIMO with 16-64 TXRU CATT (R1-144633)

6.3.3.4 Others

The document was presented by … from … and
Discussion:
Decision: The document is noted.

6.3.4 Study on Indoor Positioning Enhancements for UTRA and LTE

SID in RP-141102.

R1-145442 Summary of Ad-hoc session on Study on Indoor Positioning Enhancements for UTRA and LTE Ad-Hoc Chairman (Qualcomm)
The document was presented by Wanshi Chen from Qualcomm and provides the outcomes of the Indoor Positioning session.
Discussion: NextNav suggested having some email discussion to progress on FFS issues.
Ericsson → prefers to concentrate on Rel-12 finalization – taking into account Xmas and end of the year, would like to avoid too many email discussions (recalled the low number of TUs allocated to SI at this meeting – main reason for poor progress)
NextNav's answer to Mr Chair question: 2TU will be devoted to Indoor Positioning at RAN1#80.
Huawei → let's use the time between meetings for companies to think about FFS and wait till RAN1#80.
Decision: The document is endorsed and contents are incorporated below.

R1-145114 37.857 v0.1.0 Study on Indoor Positioning Enhancements for UTRA and LTE NextNav
Decision: The document is noted and version 0.1.0 of TR 37.857 is endorsed.

R1-145117 FCC E911 NPRM requirements intro NextNav
Decision: The document is noted.

6.3.4.1 Deployment Scenarios and Evaluation Methodology

Define a 3D system model, including indoor channel model, to study indoor positioning

R1-144708 Evaluation Methodology for Indoor Positioning Alcatel-Lucent, Alcatel-Lucent Shanghai Bell
Discussion: AT&T commented that Small Cells should not be the only scenario evaluated; macro-only scenarios should also be evaluated (also supported by CMCC). In many areas, the deployment of small cells will not be justified from an economic standpoint for some operators, yet government regulations will mandate emergency call support, along with accurate positioning.
Decision: The document is noted.
R1-144767 Details of deployment scenarios for indoor positioning evaluation Ericsson
Decision: The document is noted.
R1-144913 Details of evaluation scenarios and methodology for enhanced indoor positioning LG Electronics
Decision: The document is noted.
R1-145115 Way forward on simulation methodology for indoor positioning NextNav, AT&T
Decision: The document is noted.
R1-145116 Way Forward on Indoor Positioning Simulation Scenarios NextNav, AT&T, III, US DOC
Decision: The document is noted.

R1-145396 WF on evaluation scenarios and assumptions for indoor positioning study LG Electronics, Ericsson, Huawei, HiSilicon, III, Nokia Networks, Nokia Corporation, Qualcomm
Decision: The document is noted.

Agreement:

- Take R1-145396 as a working assumption, except
  - FFS synchronization error
  - FFS the number of floors (up to 8)
  - FFS whether or not to additionally have different carrier frequencies for macro and small cells
    - E.g., 2GHz macro + 3.5GHz small cells
  - FFS the cluster/density of small cells
    - FFS whether the total number of small cells can be zero
  - FFS UE dropping model
  - For outdoor macro + outdoor small cell scenario
    - FFS the antenna height for small cells
  - For outdoor macro + indoor small cell scenario
    - FFS whether to use single or dual-strip model for indoor small cells

R1-145395 WF on assumptions of antenna height for outdoor small cell ZTE

Decision: The document is noted.

R1-145415 Way forward on simulation assumptions for OTDOA Huawei, HiSilicon, Qualcomm, Ericsson, Intel, Nokia Networks, Nokia, ALU, ASB, ZTE, LGE

Decision: The document is noted.

Agreement:

- Agree on R1-145415, with the following changes:
  - FFS synchronization error
  - Adding 0dB power boosting as optional

Friday 21st : NextNav requested for an email discussion regarding R1-145415 focused on OTDOA.
Ericsson re-emphasized that current priority is the finilization of Rel-12 work – email discussion is pointless at this stage
Conclusion: No consensus.

Not treated.

R1-144679 Baseline simulation scenarios for indoor positioning enhancements Intel Corporation
R1-144680 Channel model for indoor positioning enhancements Intel Corporation
R1-144768 Evaluation methodology for indoor positioning Ericsson
R1-144769 Positioning techniques for generating baseline performance Ericsson
R1-144806 Evaluation methodology for indoor positioning ZTE
R1-144845 UTDOA Assumptions and Parameters for E-UTRA Indoor Positioning Study TruePosition
R1-144914 Discussion on eNB antenna height modeling LG Electronics
R1-145011 Channel Model and Scenario Considerations for Indoor Positioning Nokia Networks, Nokia Corporation

R1-145023 Indoor Positioning using Angle of Arrival Sony
R1-145089 Simulation Assumptions and Parameters for E-UTRA Indoor Positioning Study Qualcomm Inc.
R1-145118 TP for performance metric definition NextNav
R1-145119 TP for TR 37.857 channel model NextNav
R1-145120 Proposal on Test Vector Methodology for Indoor Positioning NextNav
R1-145367 Further discussion on evaluated scenarios and the performance metric for indoor positioning Huawei, HiSilicon (R1-144595)
R1-145368 Further discussion on channel model for indoor positioning Huawei, HiSilicon (R1-144596)
R1-145369 Discussion on the simulation methodology for baseline indoor positioning technologies Huawei, HiSilicon (R1-144597)

6.3.4.2 Others

Not treated.

R1-144598 Discussion on the positioning enhancement for indoor scenarios Huawei, HiSilicon

6.3.5 Other

Not treated.

R1-144855 Motivation for enhanced MU-MIMO and network assisted interference cancellation MediaTek Inc.
R1-145180 Discussion on Wider Spectrum and Small Cell Further Enhancements for Rel-13 Huawei, HiSilicon

7 Closing of the meeting (Day 5: 5:00 PM at the latest)

Mr Chair thanked all the delegates for hard working days, with a special attention to D2D long sessions – tough meeting to get Release 12 finalized.

Mr Chair also thanked the RAN1 Vice Chairmen, as well as Carmela Cozzo and Gerardo Agni Medina Acosta for chairing parallel sessions. Thanks also was given to the Secretary Patrick Merias.

Now was the time for some unofficial fun, watching a short diaporama entittled “This is my life” kindly prepared by Mr Chair... Well appreciated and applauded by all.

Mr Chair wished a safe journey back home to all and closed the meeting at 17:03.
ENJOY THANKSGIVING, XMAS and END OF THE YEAR festivities.
See you all in Athens.

Annex A: List of Tdocs at RAN1 #79

Please see excel file attached to this report

Annex B: List of CRs agreed at RAN1 #79

TS	CR	Rev	Rel	Title	Cat	Vsn	TD#	Source to WG	Work Item
25.214	732	2	Rel-12	Clarifications to Further EUL Enhancements	F	12.0.0	R1-145230	QUALCOMM Incorporated, Ericsson, Huawei, HiSilicon, Nokia Networks	EDCH_enh-Core
25.214	734	-	Rel-12	Clarification on the CQI feedback cycle switching procedure	F	12.0.0	R1-145024	Ericsson	EDCH_enh-Core
36.201	8	3	Rel-12	Introduction of TDD-FDD CA, Small-Cell Enhancements, Dual Connectivity, eIMTA, WLAN/3GPP interworking	B	12.0.0	R1-145492	Alcatel-Lucent	LTE_CA_TDD_FDD-Core, LTE_SC_enh_L1-Core, LTE_SC_enh_dualC-Core, LTE_TDD_eIMTA-Core, UTRA_LTE_WLAN_interw
36.201	9	-	Rel-12	Introduction of D2D feature into 36.201	B	12.0.0	R1-145493	Alcatel-Lucent	LTE_D2D_Prox-Core
36.211	195	3	Rel-12	Clarification of PUSCH rate matching with SRS	F	12.3.0	R1-145430	LG Electronics	LTE_CA -Core
36.211	196	4	Rel-12	Inclusion of ProSe	B	12.3.0	R1-145489	Ericsson	LTE_D2D_Prox-Core
36.211	197	4	Rel-12	Inclusion of small-cell enhancements	B	12.3.0	R1-145490	Ericsson	LTE_SC_enh_L1-Core
36.212	162	2	Rel-12	Introduction of D2D feature into 36.212	B	12.2.0	R1-145485	Huawei	LTE_D2D_Prox-Core
36.212	163	3	Rel-12	Correction for rate matching parameters for UE categories 11 and 12 for 36.212	F	12.2.0	R1-145486	Huawei	LTE_SC_enh_L1-Core
36.212	164	3	Rel-12	Clarification of PUSCH rate matching with SRS	F	12.2.0	R1-145431	LG Electronics	LTE_CA -Core
36.212	166	-	Rel-12	Introduction of Dual Connectivity feature into 36.212	B	12.2.0	R1-145091	Huawei	LTE_SC_enh_dualC-Core
36.213	482	5	Rel-12	Introduction of Dual Connectivity, Small Cell Enhancements, NAICS, eIMTA, and TDD-FDD CA features	B	12.3.0	R1-145491	Editor (Motorola Mobility)	LTE_SC_enh_dualC-Core, LTE_SC_enh_L1-Core, LTE_NAICS-Core, LTE_TDD_eIMTA-Core, LTE_CA_TDD_FDD-Core
36.213	486	1	Rel-11	Clarification of periodic CSI feedback for subband CQI and PMI	F	11.8.0	R1-145272	Samsung	LTE_eDL_MIMO-Core
36.213	487	1	Rel-12	Clarification of periodic CSI feedback for subband CQI and PMI	A	12.3.0	R1-145273	Samsung	LTE_eDL_MIMO-Core
36.213	490	-	Rel-11	Correction of the parameter CSIProcessIndex	F	11.8.0	R1-145181	Huawei, HiSilicon	COMP_LTE_DL-Core
36.213	491	-	Rel-12	Correction of the parameter CSIProcessIndex	A	12.3.0	R1-145182	Huawei, HiSilicon	COMP_LTE_DL-Core
36.213	492	-	Rel-12	Introduction of D2D feature into 36.213	B	12.3.0	R1-145494	Motorola Mobility	LTE_D2D_Prox-Core
36.214	20	1	Rel-12	Introduction of MBSFN radio measurement	B	12.0.0	R1-145388	Intel Corporation, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Samsung, Ericsson	MBMS_LTE_OS-Core
36.214	23	3	Rel-12	Measurement definitions for measurements with discovery signals	B	12.0.0	R1-145488	Ericsson, [Samsung, Huawei, HiSilicon, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Nokia Corporation, Nokia Networks]	LTE_SC_enh_L1-Core
36.214	26	1	Rel-12	Inclusion of measurement for ProSe	B	12.0.0	R1-145487	Ericsson	LTE_D2D_Prox-Core

Annex C-1: List of Outgoing LSs from RAN1 #79

R1	Response to (Ic LS)	To	Cc	Title	Contact	Ref'd /Attachd Tdoc	Release	WI
R1-145269		R2, R4		LS on additional agreements on small cell discovery	Huawei		Rel-12	LTE_SC_enh_L1
R1-145270	R3-142566 (R1-144443)	R2, R3	R4	Reply LS for Rel-12 NAICS	MediaTek		Rel-12	LTE_NAICS
R1-145347		R2, R4		LS on additional agreements on PRACH on dual connectivity	LGE		Rel-12	LTE_SC_enh_dualC
R1-145284		R2		LS on List of RAN1 Agreements	Qualcomm	List of RAN1 agreements relevant to RAN2	Rel-12	LTE_D2D_Prox-Core
R1-145285		R2		LS on RRC parameters for ProSe LTE D2D	Qualcomm		Rel-12	LTE_D2D_Prox-Core
R1-145287		R2	R3, R4	LS on updated LTE Rel-12 UE feature list	NTT DOCOMO	R1-145287 RAN1 UE feature list on Rel-12 LTE.xls	Rel-12	-
R1-145293		R2		LS on D2D out of coverage resource allocation	ZTE		Rel-12	LTE_D2D_Prox-Core
R1-145294		R2	R4	LS on Maximum Number of Sidelink Processes and Maximum Transport Block Size	Ericsson		Rel-12	LTE_D2D_Prox-Core
R1-145298		R2, R4		LS on D2D Synchronization Procedure	Ericsson, Qualcomm		Rel-12	LTE_D2D_Prox-Core
R1-145301		R2	R3, R4	LS on updated LTE Rel-12 UE feature list	Qualcomm	R1-145301 RAN1 UE feature list on Rel-12 LTE.xls	Rel-12	-
R1-145463		RAN, R2	R4	LS on cat0 UE features in Rel-12	Intel		Rel-12	LC_MTC_LTE-Core
R1-145414		R2	-	LS on Observations on SIB Performance for Rel-13 Low-Complexity UE	Nokia Networks	R1-145377	Rel-13	LTE_MTCe2_L1-Core
R1-145416		R2	-	LS on simultaneous reception requirements and SIBs for MTC UEs	Huawei		Rel-13	LTE_MTCe2_L1-Core
R1-145419		R4	-	LS on D2D Synchronization	Qualcomm		Rel-12	LTE_D2D_Prox-Core
R1-145451		R4	-	LS on Support of Narrowband Operation for MTC	Qualcomm		Rel-13	LTE_MTCe2_L1-Core
R1-145454		R2, R3, S2	-	LS on Paging for MTC	Nokia Networks		Rel-13	LTE_MTCe2_L1-Core
R1-145455		R4	-	LS on Additional Aspects for MTC	Qualcomm		Rel-13	LTE_MTCe2_L1-Core
R1-145457		R2	-	LS on clarification of UE category with supported spatial layers	Samsung		Rel-10	LTE_eDL_MIMO
R1-145473	SA3LI14_177r2 (R1-145187)	S3LI	R2, R3	LS reply on ProSe Lawful Interception – In Network Coverage	Huawei		Rel-12	LTE_D2D_Prox-Core
R1-145475		R2, R4	-	LS on agreements on Licensed-Assisted Access	Ericsson, Huawei	R1-145474	Rel-13	FS_LAA_LTE

R1	Response to (Ic LS)	To	Cc	Title	Contact	Ref'd /Attachd Tdoc	Release	WI
				using LTE				
R1-145478		R4	-	LS on D2D Synchronization Signal Design and Procedure	Qualcomm		Rel-12	LTE_D2D_Prox-Core
R1-145495		R2		LS on PBCH and RACH for LTE Rel-13 MTC	Ericsson		Rel-13	LTE_MTCe2_L1-Core

Annex C-2: List of Incoming LSs from RAN1 #79

Source	Original Tdoc nbr	RAN1 Tdoc nbr	To	Cc	Title	Response to (Ic LS)	Release	WI	Contact
C1	C1-144148	R1-144547	S4	C3, C4, S2, R1, R2, R4	Reply LS on introducing the EVS codec in MTSI	S4-140750	Rel-12	EVS_codec	Ericsson
C1	C1-144150	R1-144548	R2	R1	LS on Octet alignment in ProSe Direct Discovery		Rel-12	ProSe-CT	InterDigital
R2	R2-144662	R1-144549	R1		LS on monitoring PDCCH with SPS C-RNTI in DC		Rel-12	LTE_SC_enh_dualC-Core	CMCC
R3	R3-142617	R1-144550	S2	R1, R2, S1	Reply LS on Introducing the ProSe Authorized IE	R3-141552	Rel-12	LTE_D2D_Prox	Ericsson
R4	R4-146655	R1-144551	R2	R1	Reply LS on DRS measurements	R2-143976	Rel-12	LTE Small Cell Enhancement (LTE_SCE)	Huawei
R4	R4-146816	R1-144552	R2	R1, R3	Reply LS on revised Rel-12 feature list		Rel-12	TEI12	NTT DOCOMO
R4	R4-146817	R1-144553	R2	R1	LS on IncMon		Rel-12	LTE_UTRA_IncMon-Core	Intel
R4	R4-146819	R1-144554	R2, G2	R1, G1	Reply LS on introducing the new RSRQ measurement definition	R4-146597	Rel-12	TEI12	NTT DOCOMO
S3-LI	SA3LI14_177r2	R1-145187	R1, R2, R3	R4	LS on ProSe Lawful Interception – In Network Coverage		Rel-12	LI12	British Telecom
S4	S4-141410	R1-145188	R1, R2, R3, C1, C3, C4	RAN, S2	LS on Support of EVS in 3G UTRAN		Rel-13		Qualcomm
S4	S4-141419	R1-145189	C1, C3, C4, S2	R1, R2	Reply LS on introducing the EVS codec in MTSI		Rel-12	EVS_codec	Panasonic
R4	R4-147820	R1-145331	R2	R1	Reply LS on DRS based measurements	R2-144689	Rel-12	LTE Small Cell Enhancement (LTE_SCE)	Huawei
R3	R3-143005	R1-145339	S3-LI	R2, R1, R4	Reply LS on ProSe Lawful Interception – In Network Coverage	SA3LI14_177r2	Rel-12	ProSe	Huawei
R2	R2-145321	R1-145370	C1, R1		Reply LS on Octet alignment in ProSe Direct Discovery	C1-144150	Rel-12	LTE_D2D_Prox-Core	InterDigital
R4	R4-147863	R1-145371	R2	R1	LS on Rel-12 NAICS CA Capability		Rel-12	LTE_NAICS	MediaTek
R4	R4-147870	R1-145409	R2	R1	LS on measurements for MBMS support		Rel-12	MBMS_LTE_OS-Core	Qualcomm
R4	R4-147878	R1-145410	R2	R1	LS on Rel-12 NAICS 4CRS AP Capability		Rel-12	LTE_NAICS	MediaTek
R2	R2-145390	R1-145464	R1	R4	Response LS on further MBMS operations support for E-UTRAN		Rel-12	MBMS_LTE_OS-Core	Alcatel-Lucent
R4	R4-148047	R1-145466	R2	R1	LS on Rel-12 NAICS CA AP Capability - Clarification		Rel-12	LTE_NAICS	MediaTek
R2	R2-145304	R1-145467	R1	R4	LS on RAN2 agreements on RA preamble power ramping suspension		Rel-12	LTE_SC_enh_dualC-Core	LGE
R2	R2-145401	R1-145477	R1	R4	LS on prioritization of WAN Rx over ProSe discovery Rx		Rel-12	LTE_D2D_Prox-Core	Qualcomm

Annex D: List of Approved updated WIDs

None

Annex E: List of draft TSs/TRs agreed at RAN1 #79

Tdoc Number	Title	Source	Conclusion/Decision
R1-144771	TR 36.889 v0.0.3 Study on licensed-assisted access using LTE	Ericsson, Huawei	Agreed
R1-145005	TR 36.897 v0.1.0 Study on Elevation Beamforming/Full-Dimension (FD) MIMO for LTE	Nokia Networks, Samsung	Agreed
R1-145114	TR 37.857 v0.1.0 Study on Indoor Positioning Enhancements for UTRA and LTE	NextNav	Agreed
R1-145238	TR 25.705 v0.1.0 Study on small data transmission enhancements for UMTS	Ericsson	Agreed
R1-145474	TR 36.889 v0.1.0 Study on licensed-assisted access using LTE	Ericsson, Huawei	Agreed

Annex F: List of actions

- **Outgoing LS.**

[79-04] Johan (Ericsson)
R1-145476 **[Draft] LS on PBCH and RACH for LTE Rel-13 MTC Ericsson**
Email approval until 15th January, 2015
Done: Final LS is agreed in R1-145495 as per email decision sent out by Mr Chair on January 16th.

- **CR approval**

[79-02] Stefan (Ericsson), Brian (Huawei), Bob (Motorola mobility), Asbjorn (Ericsson), Matthew (ALU)

R1-145485	36.212 CR0162r2 (Rel-12, B) Introduction of D2D feature into 36.212	Huawei	(R1-144505)
R1-145486	36.212 CR0163r3 (Rel-12, F) Correction for rate matching parameters for UE categories 11 and 12 for 36.212	Huawei	(R1-145090)
R1-145487	36.214 CR0026r1 (Rel-12, B) Inclusion of measurement for ProSe	Ericsson	(R1-145479)
R1-145488	36.214 CR0023r3 (Rel-12, B) Measurement definitions for measurements with discovery reference signals	Ericsson	(R1-145480)
R1-145489	36.211 CR0196r4 (Rel-12, B) Inclusion of ProSe	Ericsson	(R1-145481)
R1-145490	36.211 CR0197r4 (Rel-12, B) Inclusion of small-cell enhancements	Ericsson	(R1-145482)
R1-145491	36.213 CR0482R5 (Rel 12, B) Introduction of Dual Connectivity, Small Cell Enhancements, NAICS, eIMTA, and TDD-FDD CA features	Motorola Mobility	(R1-145484)
R1-145492	36.201 CR0008r3 (Rel-12, B) Introduction of TDD-FDD CA, Small-Cell Enhancements, Dual Connectivity, eIMTA, ProSe, WLAN/3GPP interworking, and miscellaneous minor corrections	Alcatel-Lucent	(R1-145192)
R1-145493	36.201 CR0009 (Rel-12, B) Introduction of D2D feature into 36.201	Alcatel-Lucent	
R1-145494	36.213 CR0492 (Rel 12, B) Introduction of D2D feature into 36.213	Motorola Mobility	

Email approval until 3rd December for above CRs
For small cell enhancement and dual connectivity, editors will submit updated CRs including up to RAN1 #79 meeting agreements until 26th November

For D2D, 36.211 editor (Stefan), 36.212 editor (Brian), 36.214 editor (Asbjorn) will submit updated CRs including RAN1 #79 meeting agreements until 26th November, and 36.213 editor (Bob) will submit it until 1st December

Done: Above set of CRs get agreed according to Mr Chair's decision on Dec.6th.

Follow-up of [78bis-02]

Background: Initially planned for inclusion by Rel-12 CR editors, WI code of R1-144516, R1-144517 was indeed Rel-10 (LTE_CA) and decision was made to submit them to pleanry for approval in separate package.

R1-145430	36.211 CR0195r3 (Rel-12, F) Clarification of PUSCH rate matching with SRS	LG Electronics	(R1-144516)
R1-145431	36.212 CR0164r3 (Rel-12, F) Clarification of PUSCH rate matching with SRS	LG Electronics	(R1-144517)

Done: Both CRs get agreed according to Mr Chair's decision on Dec.5th.

- **Text proposal for TS and TR**

[79-20] Peter Zhang (Huawei)

R1-145234	Text Proposal on evaluation results on downlink aspects of the solutions	Huawei, HiSilicon, Qualcomm Inc.	

Email discussion until Nov 27th

Done: Further to decision made on Dec. 3rd, the proposed TP is agreed.

- **Miscellaneous**

[79-01] Peter (Qualcomm)

R1-145405 **WF on TM10 CSI-IM Measurements** **Qualcomm**

Email discussion/approval until 29th January, 2015 – starting from 15th January, 2015

Done: No conclusion – discussion summary shall be prepared, as requesed by Mr Chair on Jan 30th, as an input to next meeting. Status to be checked in RAN1#80.

- Rel-13

[79-03] Johan (Ericsson)

SIB evaluations for UE in enhanced coverage

Email discussion until 15th January, 2015

Done: An email discussion summary attempting to capture the results and the observations from the SIB simulation results shall be prepared as input to next meeting. Status to be checked in RAN1#80.

[79-05] Hiroki (NTT DOCOMO)

R1-145445 Proposal on modified resource utilization for LAA evaluation NTT DOCOMO

Email approval until 11th December, 2014 about R1-145445 and other metrics and how they are used to classify results from different companies

Done: Summary of the email discussion on Load factor metrics for LAA evaluation is made in R1-145496. The conclusion is as follows:
- **No consensus on new load factor metric other than the current working assumption**
- **Companies can report output load factor metric in addition to the offered load and performance metrics such as UPT and latency**
  - **Baseline of output load factor metric is Buffer occupancy**

[79-06] Jonghyun (LG Electronics)
UE association method for HetNet scenario with separate frequency Phase 1 evaluation
Email discussion/approval to confirm WA including optimization of tilting and bias values until 8th January, 2015
Done: Further to the email decision (posted by Mr Chair on January 21st), the following is agreed:
- **Working assumption on the UE association method for HetNet scenario with separate frequency evaluations for Phase 1 evaluation is confirmed with the following note:**
  - **These simulation assumptions use macro cells only for cell association and approximate the cell association behavior of separate frequency heterogeneous networks with full buffer traffic on all cells. The cell association statistics of UEs with non-full buffer traffic could therefore differ by an undetermined amount from when traffic is simulated on the macro cell and an RSRQ or RSRP based cell association method is used.**
- **In addition, the following values are taken as working assumptions for optimization of tilting and bias values:**
  - **Bias value is 2 dB**
  - **Tilting value is 120 degree**

[79-07] Liu (Huawei)
Downtilt for co-channel HetNet Phase 1 evaluation
Email approval until 27th November, 2014
Done: According to Mr Chair's decision on December 22nd, the following is agreed:
- **For phase 1 evaluation (for calibration purpose), the downtilt is 120 degrees for directional antenna configuration, and 90 degrees for 3D-omni antenna configuration in small cell with co-channel HetNet.**
  - **Note: The downtilt angle for directional antenna is chosen based on geometry without considering UE association ratio for macro and small cell layers. In terms of performance, downtilt values need to be optimized in phase 2.**

[79-08] Bishwarup (Nokia net.)
Baseline case for EBF/FD-MIMO
Companies are encouraged to share details of the baseline case before RAN1#80 via email discussion until 15th January, 2015
Done: Status to be checked in RAN1#80.

[79-09] Tyler (MotM)
Modeling O2I XPR in EBF/FD-MIMO SI Evaluations
Email discussion until 15th January, 2015
Done: According to Mr Chair's email discussion on Jan 27th, the following proposal is agreed:
- **Retain the UMa/UMi O2I XPR standard deviation of 11 dB currently specified in 36.873 for the EBF/FD-MIMO SI.**

- **RAN1 will revise 36.873 to reduce this standard deviation to a value in the set {3,7} dB in future SI/WIs that use the 3D channel model**

CR for 3D channel model TR shall be prepared as input to next meeting.

Annex G: List of participants at RAN1 #79

Please see excel file attached to this report

Annex H: **TSG RAN WG1 meetings in 2015 – 2016**

TITLE	TYPE	DATES	LOCATION	CTRY
3GPPRAN1#80	WG	9 – 13 Feb 2015	Athens	Greece
3GPPRAN1#80bis	WG	20 – 24 Apr 2015	Belgrade	Serbia
3GPPRAN1#81	WG	25 – 29 May 2015	Fukuoka	Japan
3GPPRAN1#82	WG	24 – 28 Aug 2015	Beijing (TBC)	China
3GPPRAN1#82bis	WG	5 – 9 Oct 2015	Malmö	Sweden
3GPPRAN1#83	WG	16 – 20 Nov 2015	Anaheim (TBC)	US
3GPPRAN1#84	WG	15 – 19 Feb 2016	Malta	Malta
3GPPRAN1#84bis	WG	11 – 15 Apr 2016	TBD	TBD
3GPPRAN1#85	WG	23 – 27 May 2016	TBD	TBD
3GPPRAN1#86	WG	22 – 26 Aug 2016	Goteborg (TBC)	Sweden
3GPPRAN1#86bis	WG	10 – 14 Oct 2016	TBD	TBD
3GPPRAN1#87	WG	14 – 18 Nov 2016	TBD	TBD

MEETING TYPES	
AH = Ad Hoc	CM = Chairmen's meeting
JM = Joint	OR = Ordinary
PM = Preparatory Meeting	RG = Rapporteurs Group
RM = Resolution Meeting	SG = Steering Group
ST = Startup Meeting	TG = Task Group
WG = Working Group	XO = Extraordinary

End of document